CONSULTANCY REPORT

MID-TERM REVIEW OF THE

UNEP/GEF PROJECT "REGIONAL PROGRAM OF ACTION AND DEMONSTRATION OF SUSTAINABLE ALTERNATIVES TO DDT FOR MALARIA VECTOR CONTROL IN MEXICO AND CENTRAL AMERICA"

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ABREVIATIONS

CCA	Comisión para la Cooperación Ambiental de América del Norte
CCAD	Comité Directivo Nacional y la Comisión de Cooperación Ambiental para el Desarrollo
CDC	Center for Desease Control
COMUDE	Municipal Council for Development
COCODE	Comunitarian Council for Development
EHCA	Elimination of Habitat of Anophelins Breeding Sites
HAG	Health action group
FAO	
GCT	Groups of Communitarian Work
GDP	Gross Domestic Product
GEF	
GIS	Georeferenced Information System
GMCE	Global Malaria Control Strategy
GPS	
IEC	Information Education and Comunication
INCAP	
IRET	Regional Institute of Toxicology (IRET)
MCP	Malaria Control Programme
MOH	Ministry of Health
NAP	Nattional
PAHO	Panamerican Health Organization
POP	Persistent Pesticides
RBM	Roll Back Malaria
TB	Tuberculosis
TCC	Technical Cooperation Proyect
UNON	
VBD	Vector Born Diseases
UNEP	
WHO	World Health Organization

EXECUTIVE SUMMARY

1. INTRODUCTION

The aims of the project are to implement demonstration projects of vector control without DDT or other persstent pesticides that can be replicable in other parts of the world; the strengthening of national and local institutional capacity to control malaria without the use of DDT; and elimination of DDT stockpiles in the eight participating countries. The project involves eight countries: Mexico, Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama. Nine sites for demonstration projects were selected in each country. Project duration is 36 months from august 2003 to July 2006. A mid-term evaluation was executed at the end of the second year of the project (september 2005).

2. METODOLOGY

The mid-term review was conducted as an in-depth evaluation using a participatory approach. It is a descriptive multicase study, using several sources of informartion. Four demonstrative areas were evaluated in Mexico, Panama, Costa Rica and Guatemala.

3. PROJECT PERFORMANCE

The project oficially began in May 2003, but the intervention in the communities began in may or june of 2005. The institutional arrangements that influenced the delay were, the adaptation of the management mechanisms among the national and local realities and the delay in the Regional and National Coordinators hiring and the designation of the Focal Points.

Accomplishment of the general objective

All the countries have adapted, in demonstrative areas, techniques of vectorial control without using persistent insecticides. Only Panama, carried out a spraying with Sumithion in one of the demonstrative communities to control a malaria epidemics.

Advances in Component 1: Demonstrative Projects

With the exception of Mexico, all countries executed the data gathering and finished the reports of the base line. The personnel of the national and local teams, from all the countries are trained and applying new approaches of

malaria control without persistent pesticides. Leaders, communitarian agents and teachers are informed, strongly appropriated and mobilized and there is a high participation in the activities of vectorial control.

The control strategy is a combination of several interventions with good impact in the elimination of breeding sites and refuges of anophelines. The interventions that embrace: elimination of mosquito breeding sites by physical media colled EHCA, fishes sowing, clean house, clean patio and houses whitewashing (painting with lime) with communitarian participation. In Mexico, communitarian agents participate systematically in the pre and post evaluation of the EHCA activities. The diagnostic and treatment coverage has been amplified, but there are still weacknesses in the opportuneness of the microscopic diagnostic and in the control of samples quality. There are very important differences in: treatment schemes, in strategy of cases identification and the elimination of the human host of plasmodium.

With the exception of Mexico, the information of cost efeectiviness of the interventions is not being gathered and there is not a protocol and study guide, but there are evidences about the lower cost, lower logistic necessities and the human resources of these strategies.

All the countries are executing activities to promote the public alert about health and environmental risks due to the DDT use. Experts from all countries were trained to carry aout the studies about enviromental impact and the national laboratories have the necessary equipment for this purpose.

There is a web page, periodiacally updated, but is not frecuently visited by the national and local teams. This limitation has been surpassed through the Regional Technical meetings and the eight phone conferences where there are exchange of experiences, transferences of technology and the coordination of activities.

There is an excellent development of the Georeferenced Information System (GIS), but still is not used in the intervention monitoring. All the countries do not have an specific computarized program for processing and analysis of data. At regional and local level there is a monitoring system in development. Although, all the countries are documenting the experience, there is not a format to unify its systematization. From the indicators proposed in the hadbook, only Mexico use them completely.

Advances in Component 2. Building Institutional capacity

All countries have developed building institutional capacity activities through the training of national personnel and the delivery of equipment. The technical teams, National Committees and Local Committees were constituted. The local committees have inserted in the structures of the Ministry of Health using the technical and management experience of the malaria control programs. Not all the countries executed completely the operative plans from 2004 because of the delay in personnel hiring and the funds outlays. There is an accurate intern

and interinstitutionally coordination, but the coordination between projects is not satisfactory.

Component 3. Elimination of DDT stockpiles

All the countries have completed the upgrade of the national inventories of DDT and other persistent plaguicides. There are still a lot of places where the persistent insecticides are badly stored and with a high risk of environmental pollution. There is a delay in the hiring of the company that will carry out the packing, transportation and elimination of DDT.

Component 4. Coordination and management

In the visited countries, the management sytem of the Project has been adapted to the local realities and specically to the PAHO´s administrative and financial systems. They are regularly working in the Regional Technical Committee, the technical teams , the national operative committees, the local operative groups and the communitarian groups. The Regional Committee, the National Operative Committees have a multisectorial constitution, but the presence of other sectors, as environment sector is weak. There is an effort to involve the municipalities, the universities and the other institutions related with environment and agriculture. The participation from the private sector, particularly from private companies is limited.

Perception of development, sustainability and replicability

The valuation of success of the project in average goes from moderately satisfactory to satisfactory. The major success in importance order is in: the objectives pertinence, the community empowerment, cost effectiviness and impact. The lowest perception is in monitoring and evaluation and financial planning. The major development of the model is in the prevention and vector control, cases management and community participation The minor development is in the information and surveillance system.

The countries report the existente of plans for sustainability and replication of the model to other areas, but it has not been done at the local level. The model is being replied in a spontaneous way in neighbour areas to the demonstratives. The sanitary workers and the communities have been capable to absorb and to integrate new control and information technologies as the GISEPI. The major threat to the sustainability of the project is the funds deflection to control epidemics and the mitigation of storms and hurricanes impact.

4. CONCLUTIONS AND RECOMMENDATIONS

There was an initial delay because of the preparatory activies that were not taken in mind in the project design. For this reason the most important recommendation to the donors is to approve the extension of the project, not to do it is going to loose the opportunity of having a highly cost effective and reaplicable model.

The project uses an eco systemic approach, with five elements that characterize it: i) A strategy of prevention and integral control, based in epidemiological model of health fields, ii) multidisciplinary and multisectorial approach. iii) the community participation as the central axis of the control activities, iv) equity, with priority in the rural areas, of indigenous predominance in critical poverty and malaria persistence. There are no definitions, or policies of gender equity.

The project uses a combination of control methods in concordance with the policy of the Global Malaria Control Startegy and the Roll Back Malaria: risk approach and intervention focalization, selective control of vectors, rapid diagnostic, opportune treatment and to strength the local capability of basic information (GIS) and investigation. Have been introduced non documented innovations in the recent international bibliography, as the elimination of the human host of plasmodium (TDU 3x3x3), houses whitewashing. The countries have adapted the model to the conditions, resources and local capabilities.

In Guatemala and Mexico there is a great fortress in the activities of evaluation and entomological surveillance, but in Panama and Costa Rica there is a weackness. There is no an uniformity in the schemes of treatment used between the countries for the treatment and the opportune diagnostic and treatment is not good.

In all the visited countries there are national and local teams with high technical level and continous improvement of the skills for the application of the strategy, the communitarian work, the GIS and the analysis capability. A still weak aspect is the project followment and supervision. Each one of the demonstrative projects, the control strategy has been adapted to the health system and the specific care model. There are three models of services organization and health care that have been inserted to the strategy: a verticalized model in Mexico and Panama, an integrated model in Guatemala and horizontal model in Costa Rica.

The contribution from the municipalities in the control and the financing of the activities is still weak and there is not a clear definition of the responsibilities. The presence of epidemics, floods, twisters and tropical storms create a deflection of the political support and resources. An opportunity to reply the control strategy are the Global Fund Projects.

In the technical handbook, a great number of indicators are ennumerated, that are used in Mexico, but the rest of the evaluated countries are using a few indicators. Some of the key interventions so they can be measurables and comparables. It is not clearly defined the methodology that is going to be used to evaluate the project impact. The regional technical meetings are the most important scenarios of planning, monitoring and experiences exchange, the web pages have a limited use.

In the project, the communitarian participation is the project central axis, but its participation in monitoring, evaluation and accountability is weak.The approach of predominant participation is the collaboration from the community and not the

one of social mobilization. The pre and post evaluation of the EHCA activities with communitarian participation is a good pratice that should be extended to all the areas and interventions.

RECOMMENDATION

1. *To strength the trasdisciplinary approach: integrating the Universities and the investigation institutes to the project and designing strategies, sceanrios and instruments that allow the communities to participate in monitoring and evaluation of the interventions.*

2. *To document systematically the interventions.*

3. *To formulate a protocol of evaluation about the cost effectiveness of the interventions and protocols of multicentric studies.*

4. *To elaborate a specific guide of entomology and to train assistants in entomology and communitarian agents.*

5. *Standardize and to update the schemes of treatment used by the countries and to evaluate the impact scheme TDU 3x3x3.*

6. *To increase the number of laboratorios and to improve the quality control.*

7. *To design a computarized program to process and to analyze the information, that can be modified or adapted to each local reality.*

8. *To formulate supervision guides and feedback formats.*

9. *To characterize the organization and care models in the rest of the non evaluated countries, as one of the variables that influence the diferencial impacts of the strategy, and in the sustainabilityand replicability of the model.*

10. *To design in each demonstrative area a plan to guarentee the project sustainability and replicabilit*

11. *To redesign the monitoring, information and surveillance system.*

12. *To develop GIS applications to monitor the interventions.*

13. *To use the phone conferences as a strategy to exchange experiences and to include the local workers and communitarian agents in them.*

14. *To define the role of the municipalities in the malaria and epidemics control.*

15. *To strength the approach of social mobilization and communitarian self management.*

16. *To introduce, in all the demonstrative projects, pre and post evaluations of the EHCA interventions with communitarian participation.*

5. LEARNED LESSONS

The delay in the project´s implementation, suggests the necessity to define more real times for the execution of the multi center (regional) projects, it has to be consider a period for administrative arregements and the personnel hiring. The national, local teams and the community have started a process of apprenticeship to develop a model of multiple alliances, of interinstituional and intersectorial cooperation and community movilization. The model allows high and quick communitarian participation. The georeferenced maps and the pre and post EHCA evaluations are easy alternatives to monitor and to evaluate the results of the project and to educate the community. Malaria is a priority topic of public health in Meso America, but is still in a rear level from dengue and AIDS.

CHAPTER 1

INTRODUCTION, OBJECTIVES AND METHODOLOGY

1.1 INTRODUCTION

Malaria constitutes one of the health problems, which has remained a prioritized concern in the world because it is a cause of substantial human suffering (morbidity and mortality) and because it is a significant impediment to human development in poor countries (wide distribution and high economic impact).

Each year there are more than 300 million episodes of acute malaria illness, primarily affecting the world's poorest populations mainly in Africa. Over a million people die each year with malaria and most of them are children. Severe episodes can result in a 25% loss of household earnings. Malaria-affected countries lose as much as 6% of their GDP (Gross Domestic Product) because of the disease (WHO/RBM, 1999b).

Over the last three decades malaria-related deaths rates have fallen in many regions, particularly in Latin America and Asia, but the global rates due to malaria are no longer falling and are even increasing in Africa (Navarro, 1999b) and in most endemic countries of South America (PAHO/WHO, 2000) and Mesoamerica (Mexico and Central America). This situation reflects the emergence of drug resistance parasites, climate changes, population movements and a reduction in public health capacity within national health services (Navarro, 1999a).

During the last fifty years, international policies to control malaria have been formulated. In 1955, the World Malaria Eradication Campaign began (Najera *et al*, 1992). Its goal was to eradicate malaria in five or ten years. Semi-autonomous governmental agencies were created (Schmunis and Dias, 2000). The control strategy was based mainly in chemical control through the treatment of fever cases with anti-malarial drugs and residual indoor spraying with DDT. The eradication objective was abandoned in the 70's when the 31st World Health Assembly adopted a strategy of malaria control aimed at least at reducing mortality and the negative and social effects of the disease (Najera *et al*, 1992).

In 1992, the Ministerial Conference on Malaria formulated the Global Malaria Control Strategy (GMCE) to face the deterioration of malaria in the world, especially in Africa. The global objectives of the GMCS implementation plan were (WHO, 1992) that by the year 1997 at least 90% of malaria endemic countries will implement appropriate malaria control programmes, and malaria mortality will be reduced by at least 20% compared to 1995 in at least 75% of the endemic countries.

Despite the fact that many countries declared their agreement with GMCS, malaria control efforts in many countries have been undertaken with adverse circumstances: under-funding, staff shortage, and lack of social participation (WHO/RBM, 1999). Due to these constraints, from 1992 to 1998, the epidemiological malaria situation did not improve in many countries: mortality trends maintain almost the same levels in Africa, and in the Central and South America an extended epidemic appeared after "ENSO 1997-1998" (PAHO/WHO, 2000), Katrina and Mitch Hurricanes (PAHO-UNEP-GEF, 2003).

In 1998, WHO launched the Roll Back Malaria Initiative (RBM), which is considered a social movement with the objective of significantly reducing the global burden of malaria through interventions adapted to local needs and reinforcements of the health sector (WHO/RBM, 1999). In the last three years, (1998-2001) an inception process had been carried out in many countries (Alnwick, 2000). RBM was launched when new paradigms and international policies were applied throughout the world: the most important being the globalisation and the structural adjustment and in health the Health Sector Reform.

1.2 STATEMENT OF THE PROBLEM

It is estimated that 89`128.000 people in Mesoamerica live in areas environmentally suitable for the transmission of malaria, of which 23`445.000 (35%) live in endemic areas. Several countries, such Mexico adopted the Global Malaria Control Strategy (GMCS) in 1994 and accepted the Roll Back Malaria Initiative in 1999. In order to apply this recommendation, some policies to transform the malaria control programme were formulated and implemented.

The implementations of these strategies were done in the context of economic, political and debt crisis, structural adjustment process, frequent change of health authorities and staff, emergencies due to natural disasters, the reduction of the number of governmental workers, reduction of the governmental budget, etc.

At the same time, in the region a Health Sector Reform policy process was implemented during the last decade (1990s). Some changes in the health care model have been implemented, such as decentralisation of the central administrative power towards the district, participation of the populations in financing the cost of health services, reduction of personnel as well as attempts to improve inter-sector co-ordination.

Despite the fact that the GMCS and RBM were adopted, malaria has remained a public health priority in Mesoamerica. Economic loss due to malaria was and probably still is as high as that of all other diseases put together and represented an important burden to health services and the economy of poor household (Ruiz and Kroeger, 1994; World Bank, 2000).

DDT has been extensively used as an insecticide for malaria vector control and in agriculture in Mexico and Central America since 1950´s; sprayed not only in

households but also on water surfaces in an attempt to control mosquito breeding. DDT is highly stable toxic compounds that persist in the environment for many years and can accumulate in living organism.

Central American countries are particularly vulnerable to natural hazards such as hurricanes. In 1998, approximately one ton of DDT was washed into Caribbean Sea in Nicaragua as effect of Mitch Hurricane. The existing DDT stockpiles in Central America and Mexico (stored in improper conditions) represent a great risk of water contamination. In order to face this problem a project call "Regional Program of Action and Demonstration of Sustainable Alternatives to DDT for Malaria Vector Control in Mexico and Central America" was implemented from September 2003. This project was developed to support the "Contaminant-based" Operational Programme 10 and "…help demonstrate ways of overcoming barriers to the adoption of best practices that limit contamination of the International Waters environment".

The aims of the project are to implement demonstration projects of vector control without DDT or other persistent pesticides that can be replicable in other parts of the world; the strengthening of national and local institutional capacity to control malaria without the use of DDT; and elimination of DDT stockpiles in the eight participating countries.

The overall objective of the project is to demonstrate methods for malaria vector control without DDT or other persistent pesticides that are replicable, cost-effective and sustainable, thus preventing the reintroduction of DDT in the region. Human health and the environment will be protected in Mexico and Central America by promoting new approaches to malaria control, as part of an integrated and coordinated regional program. The establishment of a regional network will facilitate the exchange of best practices and lessons learned among neighboring countries. A major outcome will be increased government and local community awareness of DDT and other pesticides hazards to the environment and human health, and adjustment of future behavior regarding the use of persistent pesticides.

The scope of the project is regional involving eight countries in Mexico and Latin America: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama. The results of the project will be disseminated to other parts of the world experiencing similar problems, through the proposed GEF projects for Africa, Middle East and North Africa, Southeast Asia and Western Pacific, and India. PAHO and WHO will, using their own networks, disseminate and replicate the results of the project using their own funding as well as other non-GEF funding (such as Global Fund for HIV/AIDS, TB and Malaria). Prior to this project nine sites for demonstration projects were defined and delimited in each country.

The project is implemented by UNEP and executed by the Pan American Health Organization (PAHO) under the overall responsibility of the Director, Division of Health and Environment and National Executing Agencies (i.e. Ministries of Health).

There are four components of activities in the project:

1) Demonstration Projects and Dissemination.
2) Strengthening of national institutional capacity to control malaria without DDT.
3) Elimination of DDT stockpiles.
4) Coordination and Management.

Project duration is 36 months starting August 2003. The project document was approved and signed for internalization by UNON on September 9th, 2003.

A mid-term evaluation was carried out at the end of the second year of the project (September 2005). At the time of the mid-term review, the project might have achieved: i) preparation of technical guidelines for the demonstration sites, including the baseline survey and indicators to be used during the demonstration activities for monitoring purposes; ii) preparation of all nine demonstration sites through local consultations; iii) further development of the web-based information system; iv) inventories of obsolete DDT and other insecticide pesticides, requiring disposal; and all eight countries are signatories to the convention and three countries Honduras, Panama and Mexico have ratified the convention.

1.3 OBJECTIVE AND SCOPE OF THE REVIEW

The objective of this mid-term review is to review and evaluate the implementation of planned project activities and outputs against actual outputs so far and if possible establish project results and impact, sustainability and execution performance. The focus was on four questions:

1. Are the institutional arrangements adequate, effective and timely to develop a sustainable region-wide network, establish inter-sectoral coordination mechanisms at the national and local levels and involve stakeholders actively at the demonstration sites?

2. To what extent are the new malaria control methods demonstrated by this project accepted and adopted by the participating countries and stakeholders, and can these methods effectively serve as reference models for up scaling at national and regional levels?

3. The project has identified performance indicators. To what extent these indicators are adequately and effectively, monitoring the results and impacts achieved at the demonstration sites, and are these indicators in combination with the project's performance indicators an effective tool for measurement of project impact?
4. Can the project effectively help catalyze new activities based on collaboration with other DDT-related malaria control projects, GEF and non-GEF, particularly with emphasis on the linkages to environmental aspects such as water resources management?

The review has assessed:

1. The main changes that the project has caused to the malaria control strategy in the demonstrative places.

2. How the countries have applied and adapted the guide at local level?

3. The structural and functional conditions of programs at local level and identify the favorable and unfavorable factors that have facilitated or limited the implementation of the project.

4. Current situation of projects in relation to: structure and organization of the program, definition of policies and plans, application of control strategies, technology use, program manager, leadership and personnel's training, system of managerial information, intersector coordination and community participation.

5. Delivered outputs: Assessment of the project's success so far in producing each of the programmed outputs, both in quantity and quality as well as usefulness and timeliness.

6. Project outputs, outcomes and impact. Evaluation of the project's success so far in achieving its outcomes.

7. Sustainability of the project.

8. The cost effectiveness of the interventions.

9. Execution performance: Determination of effectiveness and efficiency of project management and supervision of project activities.

1.4. METODOLOGY

The mid-term review was conducted as an in-depth evaluation using a participatory approach where by the task manager and other relevant staff was kept informed and regularly consulted throughout the evaluation.

1.4.1 STUDY DESIGN

This is a multiple comparative descriptive study of cases (Yin, 1994) of the implementation of the malaria control strategy in Mexico and Central America from 2003 to 2005.

The study was carried out in several scenarios:

1. Regional Technical Committee Meeting of the Project for evaluation of advances. It had the attendance of the NAP and Institutional Focal Points of the 8 participant countries, PAHO experts, the Commission of Environmental Cooperation for America of the North (CCA), the Regional Institute of

Toxicology (IRET) with headquarters in Costa Rica and the University of San Luis Potosi of Mexico, partners of the initiative of the project DDT/GEF. The modality was of presentations of advances of the project, it debates on the advances of the results and experts' recommendations in the matter. The modality was presentations of advances of the project and forums of recommendations.

2. Visit to four countries, in which three activity types were executed:

- Interviews with health national authorities and of PAHO, for the case of Mexico and Guatemala.
- Presentation of advances in the provincial capitals
- Presentation of advances in the departmental or county capital where are the demonstrative towns.
- Visits to demonstrative communities:
    1. Mexico, Jurisdiction of Puerto Escondido, State of Oxaca and visits to towns.
    2. Panama, Bocas del Toro-Talamanca, Barranco Montaña town.
    3. Costa Rica, Talamanca District, Sixaola County and visit to Paraiso Town
    4. Guatemala, Coban (Alta Verapaz) and Ixcan, demonstrative towns.

1.4.2 SOURCES OF EVIDENCE AND CODES USED

The complexity and extension of the subject and the multi-theoretical approach, chosen for this study, presupposes a methodological pluralism, therefore a combination of strategies and research techniques were used. In this study, four different sources of evidence were used: three of them involve qualitative methods (documentation, semi-structured collective interviews and participant observation) and one quantitative method (archival records).

The sources of information were coded as follows: “RCI” interviews to regional coordinator; “NI”: individual interviews to national staff, “LI” individual interviews to local staff; “NCI”: collective self administrate interviews to national staff; “LCI“collective self administrated interviews; “PO”: participant observation; “RTC”: Regional Technical Committee; “D”: documents (TR= trimester report). These codes will be quoted throughout the text to ensure that the source of information is clear. The quotations of documents and interviews were translated from Spanish to English by the author.

Interviews

Semi-structured and unstructured interviews with individuals or groups of actors or key informants were carried out. All the interviews, group discussions and workshop were tape-recorded and transcribed.

Type of interviews

The unstructured interviews were carried out during the field visits:

- Mexico; Interviews and field visits to Puerto Escondido,
- Guatemala: Interviews and field visits to Coban and Ixcan in Guatemala,
- Costa Rica. Interviews, and field visits to sites Talamanca and Changuinola in Panama

Self administrate Collective Interviews

A guide was designed for collective self administrate interviews (see Appendix 1). Based on the results of the unstructured interviews, field visits and documents analysis. The objectives of these interviews were to obtain information about the process (formulation, implementation and evaluation), the strategies implemented and institutional structure. These interviews were applied after the field visits by to National and Local committee members.

Informal conversations without recording

During the Technical Committee (San Jose, Costa Rica), field visits informal conversations without recording were conducted as informal conversations. The main ideas of these conversations were register in a notebook.

Participant Observation

The participant observations were made using two techniques according to the circumstances (Bowling, 1997):

1. Direct observation. Unstructured observations of the work of health personnel and community members during the field visits, which were recorded in note forms.
2. Participant observation in national, local and community meetings and field visit evaluations.

Workshops: Evaluator participated in two national meetings in Mexico and Guatemala, six local meetings (Mexico 2, Panama 2, Guatemala 2) and workshops or meetings. All the meetings were recorded and transcribed and the author took additional notes of relevant issues (minutes). In addition, documents and presentation presented in workshops were collected (in order to include the participant observation as part of a triangulated research methodology).

Archival records

In the self-auto-administrate collective interview, national and local staff collected data from archival records. Several sources were used. The most important were:

- Morbidity and other epidemiological (malariological) data from surveillance system.
- Mortality and hospitalised records from vital statistics systems

- Meteorological records from statistical meteorological records
- Service records from management information systems.
- Organisational records: organisational tables, budgets.

1.4.3 STUDY POPULATION AND UNITS OF ANALYSIS

Units of analysis

In terms of units of observation, Yin (1994) recognizes two types of designs: i) about individuals and ii) about organisations. In the present study the unit of observation is the malaria demonstrative project of each country and in three levels:

Central Level: Headquarters of PAHO and Ministry of Health (MOH).
Local Level: Headquarters of demonstrative projects.
Community Level: localities direct involved in the project

Within each level there are various target groups:

At Central Level: authorities, national committee members.
At Local Level: authorities, staff, majors, interested groups and individuals.
At Community Level: leathers, schoolteachers and community members that participate in the project.

1.4.4 DATA ANALYSIS

Four methods of analysis were used according to the type of evidence and the variables involved in the study:

1. *Analysis of document contents*. The content of each document was analysed using a matrix of content analysis. The most relevant findings were classified and grouped according to the research variables.
2. *Meaning categorization.* The contents of interviews and meetings records were classified and grouped by the same procedure as the document analysis (Kvale, 1996).
3. *Statistical analysis.* Epi-Info 6.04 was used to process the quantitative data.
4. Epidemiological Data. For a descriptive analysis of epidemiological, service production and performance data, the number of events, percentages, rates and ratios were used. Increase Ratios (IR) were calculated to demonstrate increase or reduction (Dever, 1991). The formulae are given in the respective chapter.

The Annual Parasite Rate (API) is influenced by the case detection rates. These have had a large variation among countries. The API was standardised using the case detection effort (ABER) for the year 2000 by applying the following formula (Roberts, 1997):

APIs = (EMPSx / Population x) per 1000

APIs = Annual Parasite Rate standardised by sampling effort
x= year
EMPS= Estimate of Malaria Positive Slides

The calculations were as follows:

1. Calculate ABER for each year
   ABER = (number of slides examined/total population) per 100
2. Calculate the Slide positive rate (SPR) for each year (x).
   SPRx= (number of positive slides / number of slides examined) per 100
3. Select the year of comparison. In the present thesis, year 2000 was chosen as the comparison year, because in that year the ABER had the peak during the study period.
4. Calculate the revised estimate of the total number of slides examined for each year multiplied by the ABER of 2000 (standard year) for the population of each year (RESE)
   RESEx = (ABER2000/100) (Population x)
5. Calculate the estimated malaria positive slides (EMPSx) by multiplying the original proportion of positive slides for each year (SPRx) by the revised estimate of the total number of slides examined (RESEx):
   EMPSx = (SPRx) x (RESEx)
6. Then divide the estimate of malaria positive slides (EMPS) by the total population of Ecuador for each year in the series. These quotients, multiplied by 1,000 produced APIs standardised for sampling effort (ABER). Calculate the APIs for each year.
   APIsx = (EMPSx / Population x) per 1,000

1.4.5 VARIABLES

The main variables of study are:

- Existence of a plan or program and contents
- Control strategies and used technology
- Structure and organization of the program
- Administration and Managerial Resources
- Policy of intersector coordination
- Policy of social and community participation
- information System
- Changes in the administration system
- Strategies of control of the program used in the project.
- Outputs, outcomes and impact achieved

1.4.6 QUALITY ASSURANCE AND METHODOLOGICAL LIMITATIONS OF THE RESEARCH

Strategies for quality assurance

The combination of qualitative and quantitative techniques and several sources of evidence were used in order to reduce the influence of the cultural context on

the researcher's interpretation and understanding of the concepts (Mackie and Marsh 1995). In order to assure the quality and capacity for analytical inference, four criteria were used (Yin, 1994):

Validity

In order to construct validity, regional, national and local coordinators, and PAHO officials revised the draft of the case study report. The triangulation strategy was also used to allow convergence and to assure internal validity. In order to assure external validity an explanatory strategy for qualitative data was used.

Reliability

In order to guarantee that the operations of a study (data collection and processing) can be repeated with the same results, the following requirements were applied: the creation of database study and the application of same criteria and techniques in each country.

Representative ness

Due to the short time to make, the evaluation only official documents produced were collected, but they are a good sample of documents. The key interviews have a good representation of the different actors involved in the process. Due to time and access limitations, the collective interviews of Local Headquarters to evaluate the malaria situation had three limitations. First, they were no homogeneous groups, which limited the participation of malaria workers and civil servants in presence of line managers. Second, the sample of demonstrative areas involves only four areas. Finally, the size and composition of each group was different.

This lack of representative ness may have produced results indicating that the situation of the project was better evaluated than it really was. The use of other sources of evidence (interviews, observation and archival analysis) reduces this limitation.

Validation of sources of information

Defined criteria were used to design the interview guides. Permission was asked to tape record and in a few cases, where this was a problem the researcher made brief notes, which were immediately rewritten and analysed. The results of the interviews were used to emphasise relevant topics in future interviews.

Bias and bias control

In order to reduce the author's subjectivity, the evidences were chosen in order of the authorship (official or non-official) and representative ness: the official documents evidences were the first evidences taken, then the non-official documents and interviews, and finally the author's observation. Only official data were used for archival analysis.

1.4.7 FIELD RESEARCH ACTIVITIES

The research activities of the study were planned and executed in three phases:

First Phase

Due to the evaluator did not receive the project documentation and the technical guideline before traveling; the visit to Mexico was conducted as an exploratory field visit. The exploratory study was completed with the participation in San Jose Regional Technical Committee. With these inputs a guideline for participant observation and interviews were designed and applied in the rest of country visits.

The participant observation of the appraiser was carried out with the regional coordinator participation, the national teams (NAP and Focal Point) and the local teams in six towns of the demonstrative projects. At the end of the visit of each country, a discussion was made on the most important outcomes, results and recommendations that should be implemented in consent.

Second Phase

With the results of this observation, an adjustment of the contents of the collective interview and identification of documents were carried out, to be applied in the second phase.

Collective interviews: these collective interviews should be filled using a guide with the participation of all the members of the national and local team.

Documental analysis of contents; the information given by the members of the managerial team of the program will be supplemented with a gathering of documents related with the answers to the interviews.

Statistical analysis: some pertinent data were gathered directly from information systems. The data collection last almost four months (October to January) due to the presence of hurricanes, which reduce the time to fill the forms. At the same time, the regional coordinator and national teams reviewed the first draft of the report.

Third Phase

With the result of self administrate collective interviews, the final report was written and finally, reviewed by key informants for three times more.

1.4.8 ETHICAL ISSUES

The recommendation of this review report intends to have a positive effect on the ongoing project, and therefore achieve a direct impact on people's health. The identification of misuses, weaknesses and strengths can be used to improve the programme implementation.

All participants were informed before or during the field visits to obtaining informed consent to participate. The people involved in interviews were allowed to withdraw whenever they wanted to. A tape recorder was not used when an interviewee refused permission or appeared uncomfortable in its presence.

The observation was related to job activities, which did not affect the privacy and psychological well being of the individual studied. Most of the documents were public documents presented in events or obtained from open archives.

1.4.9 CONSTRAINT AND LIMITATION

The main constraint in this review for the researcher was the short time of field visits. In order to cope with this limitation, two strategies were applied: the collective interviews and the revision of the draft report by regional coordinator, national and local staffs.

CHAPTER 2

PROJECT PERFORMANCE

2.1 PROJECT DEVELOPMENT

This section presents the development about the performance of the project, specially the level of reached goals in products, process, results and the impact. At the same time, this section is a summary of the project, which is deeply described in the next sections.

2.1.1 Activities, products and achieved results

Officially, this project started in May of 2003. At the country level, the project started at different time in each country. Of the evaluated countries Panama and Costa Rica began the activities earlier (April 2004), the rest started the project, at national level, in June of 2004 (Table 1).

The activities of institutional arrangements and the adaptation of the mechanisms of human resources and financial management into the local and national realities delayed for one year the implementation process of the project. Also there was a delay in the Regional Coordinator designation (June 16th, 2004), of the National Coordinators and the designation of focal points. In some countries as El Salvador, Guatemala and Panama there were changes at the institutional focal points, because of the change of Governments, which also affected the project development (RCI). It is important to remark that the delay of redesign and the approval of the mexican project, contributed with the delay of some activities related with the support of Mexico to other countries or it had not had the necessary intensity (RCI).

At local level, the designation of the local coordinator and the beginning of the base line happened in different times, with an early beginning in Costa Rica and a late beginning in Guatemala, Panama and Mexico where it was planned to do start during the firsts days of January. The base line had a different length of time, 8 months in Costa Rica and 1 month in Panama.

With the exception of Costa Rica, the intervention in the communities does not have too much time. The introductory activities of the control strategy without persistent insecticides in all of the visited countries just started in the last 5 months in Panama, two months in Guatemala and one month in Mexico before the evaluation, once the recollection of the data for the base line was finished. In Mexico, the line base will ended in the firsts months of 2006.

Table 1. **Schedule of the project development by countries, November 2005**

DATE	COUNTRY			
	COSTA RICA	**GUATE-MALA**	**MEXICO**	**PANAMA**
Beginning of the Project at national level	April 04	June 04	June 04	April 04
Beginning of the Project at local level	June 04	November 04	August 05	January 05
Designation of the National Coordinator	-------	June 04	May 04	April 04
Designation of the focal point		August 05	August 97	May 04
First disbursement		February 04	March 04	February04
Designation of the local coordinator	May 04 April 04	March 05 September 04	October 05	April 05
First disbursement into the demo area	June 04 July 04		March 04	February04
Beginning of the base line	July 04	March 05	July 05	June 05
End of the base line	February 05	August 05	February 06	June 05
Duration of base line	8 months	6 months	6 months	1 month
Beginning of the control activities in communities	August 04 July 04	August 05	September 05	May 05
Time of intervention in communities (until september 2005)	13 months	2 months	1 month	5 months

Source: Colective interviews selfadminstrated at local and nacional level

Achievement of the general objetive.

About the achievement of the general objective, all the countries have adopted technical alternatives of vector control at the demonstrative areas, not only without using DDT, but also without using of persistent insecticides, that is why it can be evaluate as highly satisfactory. Only Panama, sprayed PH 40% Sumithion in one of the demonstrative communities (Barranco Montaña Adentro) because of the presence of a malaria outbreak. Once that the epidemic was controlled, the use was interrupted (LI).

About the use of insecticides control malaria at national level, Panama reported the use of Fenthion of Baytex 2% (POP), 9910 kg of 2004 in 2003 and 40536 in 2004 and deltametrina (piretroide) 2644,8 Kg in 2001 and 3300 in 2003. Guatemala used 114 kg of Icon (piretroid) in 2001 and deltrametrina 114kg. During 2005, insecticides were not used at the demonstartive areas (NCI).

This important advance about the no use of persistent insecticides for the control of malaria, is threatened for the use of this types of insecticides in dengue outbreaks, happened in 2005. Panama, used Sumithion (insecticide organophosforate).

Advances in component 1

After formulating in consensus the methodology of the base line, denominated Base Line Guide, with the exception of Mexico, all the countries started the data recollection and have finished the report. The temporary results were presented at the last Regional Technical Committee meeting carried out in Costa Rica in from September 12th to 14th in 2005.

The base line not only contributed to the local teams to recollect the information but in some demonstrative localities started interventions related with the training of the community about the characteristics of malaria, its ways of transmission and the relation with the mosquitoes breeding sites, and in some of the cases the beginning of the activities for the control of the breeding sites (NI).

Although, some of the national coordinators and the interviewed focal points have assure that the base line information has been used, from the analysis of the reports, is shown that the culture about the use of the information to adapt the control strategy and the IEC plans still needs to be developed (NI).

Two regional workshops about new alternatives for the control of malaria have been carried out with the national teams from the 8 participant countries. Also, have been made national workshops and communitarian assemblies and meetings with leaders, promoters, volunteers and teachers to facilitate the participation and training of the communities. During the second and third trimester of 2005 have been carried out field interventions for the vector control at the demonstrative localities (D:IT).

In relation with the reached products of this component, the four visited countries have implanted the vector control strategy with the participation of the communities. Mexico, as the proposer of the control strategy, have totally applied the alignment of the Guide. The three remaining countries, have followed this alignments with the appropriate modifications to the particular conditions of each country, particularly in the application of the schemes of treatment. For that, there was an agreement since the beginning of the project, so each country apply the scheme that is proposed by the national normative and recommended by the PAHO/WHO, that is why the mexican scheme appears in the Guide as an option (RCI, PO).

The staff of the national and local teams from all the countries are training in new approaches for malaria control without persistent pesticides. Leaders, communitarian agents and teachers are informed and strongly motivated about the control strategy (PO).

During field visits the evaluator confirmed that the health staff at national and local level and community leaders are strongly involucrate at the activities about malaria control without the use of DDT or other persistent pesticides. The participation of the community in this activities is very high, the strategy rests at the community work (PO).

An immediate effect shown at the evaluation visits is the fact that vector workers are changing their role from direct inspectors to community advisers. In all countries, the process of plans elaboration have started and activities have been carried out to promote the public alert about health and environmental risks because of the DDT use. For that, it has been produced educative materials as leaflets and posters in the native language Ngöbe Buglé and in spanish in Panama, printed brochures, videos in Costa Rica, El Salvador and Mexico. Theater plays and puppet shows which are presented at schools in Costa Rica and Guatemala.

In Guatemala, in coordination with the Ministry of the Environment, it is been made a law to forbid DDT, to have a legal base and also to eliminate other persistent insecticides from the control strategies (NI). Activity which has been intensified in the rest of the countries, specially Nicaragua, Honduras y El Salvador, taking advantage of the national operative committees where other groups are linked (RCI).

Even when the systematic cost effectiveness of the new methods to control the malaria are unsettled, some alternatives of control has been proved in the countries with a high approval from the health workers and the communities, which is an evidence of their viability.

Even there is not a protocol or guide and the information to evaluate the cost effectiviness of the interventionists have not been recollected, there are non quantified evidences about the lower cost, lower logistic needs and human resources of this strategies compared with the insecticide spraying. They are based in the mobilization of the community, resources from the private enterprises and in some cases, resources of the municipalities as in Honduras.

In Honduras, after the training at the 12 demonstrative localities, the health local teams and the Groups of Communitarian Work (GCT), proposed not to use again any type of plagicide for the vectorial control of malaria, commiting theirselves to do, at least once a month, an environmental intervention (cleaning and breeding sites drainage, chaponeo de solares and others). .

Elimination of Habitat of Anophelins Breading Sites (EHCA), clean house and clean patio are the central strategies of the vector control activities. These strategies have as advantages: these do not pollute the water with insecticides, the effects are immediate, these are cheap because these do not need to buy insecticides or equipment to apply them, to make it is necessary domestic tools as machetes, shovels, pickaxes, rakes, wheelbarrows, etc., it helps the formation of healthy habits and it encourages social relations and the communitarian organization (Regional Coordinator Handbook, Mexico). Also, with the pre and post intervention evaluations with the participation of the community it increases the perception of efficiency and credibility in the population (PO).

Two experts from each of the eight countries has been selected and trained in gas cromatography for the evaluation of human and environmental exposure to

DDT and persistent plaguicides newly introduced. Currently, national laboratories relay on trained staff and necessary equipment to analyze the insecticides in the environment and the human health.

A web page was early designed and at this time, during this evaluation, it is used periodically updated, http://shp.paho.org/sde/ddtgef. Slowly, the national coordinators are using this net system and they are encouraging the local executors to optimize the use (RCI), because at the present time they are not using it (RCI). All the documents of the project and the results of the regional events are in the web site, but a major effort has to be done to create a culture of consult and use of the available information. This lack has been improved through Regional Technical Committee meetings and the phonoconferences.

In addition of the Intranet page, the regional coordination has carried out eight phono conferences, where the ejecution of activities have been coordinated. As well as they serve to discuss the proyect advances in each country, offered useful technical cooperation about GIS, method for DDT inventory, elaboration of the base line, development of laboratory nets and others. Of each event, a summary has been elaborated and it has been published at the project's web page and sent to each country by e mail (RCI, IT).

The two meetings of the regional technical committee and the Steering Committee, composed by the Ministry of Health, PAHO, the CCA y CCAD representatives, are also two privileged settings of experience exchanges and technology transferences.

Through all of these strategies, actually exists a net between countries and information and experiences are exchanged. The successful experiences and good practices in a country are replied and adapted by the other countries. Because this exchange has been restricted only to the national coordinators and focal points, the local staholders (health staff and community) request to increase the interships and to share the information and experiences between the projects (LI).

One of the aspects of major development is the Georeferenced Information System (GIS), with support of the Regional Programme of AIS/PAHO/WDC and the Nutrition Institute of Central America and Panamá (INCAP) has been offered technical and decentralized cooperation to six of the eight countries. For that, in each country have been carried out traininig workshops for the national local staff. The ICAP in coordination with AIS/WDC has offered local support to Guatemala, Honduras, El Salvador y Panama, taking comparative advantage of being a regional center of reference of the PAHO. In Panama, the PAHO has also made the alliance with the Gorgas Commemorative Institute and in Nicaragua with the Leon University.

The demonstrative areas staff was trained in GPS use and GIS tools. In all the localities visited there are communitarian maps and in Guatemala and Costa Rica georeferenced there are maps with information about new and repeated cases of malaria, malarious houses and anophelines breeding sites. Mexico is at the process of implemented GIS, but they make use of maps with information

as described previously. The country which shown a major development and application of the GIS was Guatemala, where the workers at local level supported by the INCAP technicians have developed new applications (PO).

As result of the fulfilment of the activities in component one and two, it is clear that the anophelines breeding sites and refugies have been eliminated with alternative strategies (cleaning of the breeding sites, fishes cultive, bacillus and others) with strong communitarian participation. It is also proved the improvement of the case management coberage for malaria cases and its contacts.

In relation with the project monitoring and evaluation, there are reports every three months and annually from each country; the annual reports are presented at regional technical meetings. There are also reports of the regional coordinator visits to the national levels of the countries, as well as reports of the phono conferences, which help to coordinate activities and also are used as monitoring instruments and as a way to exchange technical cooperation.

Two regional-technical meetings have been carried out. At the last meeting in Costa Rica, the evaluator realized that more than share experiences, the presentation of good practices and learned lessons, advanced monitoring can be done. Before the meeting, guides to presentations were sent and most of the countries followed this guide, but the presentation format and the indicators used to report advances were not homogenous. The presentation with the best characteristics was the one from Nicaragua, so is recommended to use this good practice in the future.

An important practice is that at the end of the technical meetings commitments should be established and written, which was done at the field visit in the demonstrative area of Ixcan in Guatemala.

In Mexico, communitarian agents participate systematically on the pre and post evaluations of the EHCAs activities. In the rest of the countries, the evaluation of the Demonstration Projects with the participation of communitarian representatives from the local communities and the society, have not been done because of the short length of time since the intervention. This activity has been planned to be done in a short term time considering that with this project the communitarian participation has been reached during the complete process of planning and execution. The technical workers are noticing the change of attitude for the monitoring processes and participating evaluation (RCI).

According to the local teams, they received continuous visits of monitoring, although because of the long distances between the capital (where the regional team is), and the demonstrative areas, the presence of the national team is not too frequent (LI).

In all of the demonstrative projects there is monitoring system in development. At the evaluation visit was clear that in all the communities there is monitoring of the activities, products and reached results. Although all the countries are documenting the experience, there is not a format to unify the information (PO).

Advances in component 2. Building Cappacity

The activities defined in this component, complement the described at component one, so, some of the expected results are attributed to both components.

With the participation of countries and PAHO experts the technical guide was elaborated, 1000 copies were printed and distributed to the eight countries, in other international events and to the strategic partners of the project. The guide include all the aspects related to the proposed control, but it does not have the detail so the field workers and the communities can develop the propose activities, which is going to be another contribution of the project. However, Mexico has specific operative handbooks which can be used by the other countries: “Manual of the Local Promotor for the Elimination of Habitats y Anophelines breeding sites” adressesed to community promotors and the “Strategy for the Elimination of Habitats of Anophelines breeding sites (EHCAS), Coordinator Manual” adressed to workers and others health workers.

Training courses and workshops have been carried out using the Guide contents. In all of the visited demonstrative projects, have been carried out two kind of workshops: i) with the local health teams, involving vector control staff (where is still available) and the staff from the general services of health; ii) with the participation of local communitarian leaders, communitarian agents of health (volunteers) and local school teachers.

In Honduras, the institutional staff and the communitarian volunteer leaders were trained, not only from the demonstrative areas, but to all the health unities from the six municipalities involved in the project (RTC).

The guide suggests a surveillance and monitoring system, but the countries have adapted the guide to the specific systems of each country. Mexico, has developed a exhaustive monitoring and surveillance system of the interventions, which is a complete application about the guide components.

One of the activities which are being planned and which is also a request from the health workers and local leaders is about making exchange trips and local meetings for the malaria control technicians where they can exchange experiences on alternative control techniques of the malaria vector.

In all the countries, activities of institutional strengthen has been developed through the training of the local and national staff of the Ministries of Health in techniques about selective vector control, epidemiologic surveillance system, monitoring and Georeferenced Information System. The deliver of computers, printers, GPS, cameras, vehicles, have fortified the capability for data processing and analysing in all of the visited demonstrative projects (Table 2).

Also, have been received vehicles and image projectors, especially for the national level, but these resources are insufficient at the local level. In fact, the non satisfied needs at the demonstrative areas are: image projectors to help the training process, vehicles (motorcycles o bicycles) for the transportation of the

health and vector staff to the demonstrative areas (Table 2). In Ixcan, Guatemala, to facilitate the trainings, they need to rent it in Q. 250.0 300.0 quetzales per hour. In Panama, they need asigned transportation at local level, a multimedia projector, a camera, lawn mower and tools and educative material The bought transportation can not be assigned to the local level of MINSA because the laws in Panama about vehicles in IM (international mission) can be just transferred to national institutions after two years. Even though, the vehicle is used through the PAHO in works at local level. In Costa Rica, even when a vehicle was bought nine months before the mid term evaluation, bureaucratic obstacles have take the vehicle away from the demonstrative area (LCI).

Table 2. Received resources and needs for the institutional development

EQUIPMENT	COSTA RICA Local Nat	GUATEMALA Loc (Nat)	MEXICO	PANAMÁ Loc (Nat)
Recieved				
Computers	1	1 (5)	5	2
Printer	1	1 (4)	4	2
Software	1	3 (11)	11	2
GPS	1	2 (10)	10	0
Camera	1	1 (4)	4	0
Vehicles		0		1
Others: tools	Yes	Yes		Yes
Image projects	Yes	Yes (1)	1	1
Needs	Transportation	Image projector Transportation		Projector Transportation

Source: Colective interviews selfadminstrated at local and nacional level

The national coordinators and the focal points have received training and they have enough experience to create refrenece national centers in order to carried out studies of POPs environmental impact.

All the participant countries relay on equipped laboratories and with trained personnel on the study of the impact of DDT in the environment (ground), food (fishes) and people. In each country, different institutions have been involved to create reference laboratories. In Costa Rica, the IRET is the reference laboratory where people work with plaguicides with a good georeferenced information system (RCTR).

With the participation of the University of San Luis de Potosí, it has been improved the national capabilities on the evaluation about risks and samples recollection techniques to make the studies about the impact of DDT.

Advances in component 3

In all the countries, the actualization of the national inventories of DDT and other persistent plaguicides has been completed. In the presentation during the meetings in Costa Rica, it was evident that still, in a lot of places there are persistent insecticides badly stored and with high risk of environmental

contamination. Some countries have made activities to improve the storage of the DDT reserves.

At the moment of the evaluation, four countries have joined to the Stocholm Convention: Guatemala, Belize, Costa Rica and Panama. El Salvador, Honduras, Mexico and Nicaragua have confirmed the adhesion to the convention.

In coordination with the FAO, are contacting companies which are going to pack, to transport and elimination of DDT. The problem is that is been a year since the inventory and the stored DDT haven't been repacked, and less than that, it hasn't been eliminated (LCI).

Advance in component 4

In June of 2004, a regional coordinator and seven national technical coordinators and eight focal points were hired to lead the activities of the demonstratives projects. Because of the governments changes there were delays on the assignation of focal points. At the moment of the mid term evaluation there is one regional-technical team with headquarters at the INCAP which is linked with the eight countries and the national and local teams that are working regularly.

In order to manage the project a Regional Sttering Committee and a Regional Operative Committee were organized. Two meetings with the Sttering Committee and two with the other one were done. The reports of these meetings are published at the web page. In all countries, the national operative committees have organized the operative local groups and the communitarian groups. At the moment of the evaluation, they are working regularly and it's expected the strengthen to make sure the sustainability and transference of the model.

In the visted countries the management system of the project has been adapted to local realities and specially to the PAHO administrative and financial systems.

Table 3. Activities, Products, Inmediate Effects and Reached Results

Component 1. Demostrative projects and disemination

ACTIVITIES	PRODUCTS	INMEDIATE EFFECTS	REACHED RESULTS
1. Planification and ejecution of the demostrative project introduction in the 8 countries 1. 1. Methodology, ejecution and script of the report of the linea de base and technical evaluation. 1. 2. Two regional workshops about new alternatives for the control of malaria ejecuted with the participation of tne 8 national teams of the participant countries. 1. 3. WorkshPAHO and communitarian assemblies and meetings with leaders, promoters, volunteers and teachers to help the communitarian participation and training. 1. 4. Field interventions for the vector control and the analytic costs of environmental and biologic samples	1. Inception phase of the control strategy finished on the nine demonstrative projects. Areas maped at Demonstrative Project. Reports of the lineas de base and technical evaluation finished in 7 of the 8 participant countries. Trained staff of the national teams in new method o control tha malaria without persistent pesticides. Informed and strongly motivated leaders, communitarian agents and teachers, about the control of malaria without persistent pesticides. Review of the alternative strategies and first evaluations of products and results.	Partial use of the base line to adapt the control strategy and the IEC plans. Motivated health staff at national and local level and communitaries leaders involved with the control of malaria without DDT use or others persistent pesticidas. The vector workers change their role from direct inspectors to communitarian advisers.	Elimination of breeding sites and refugies of anophelines with alternative strategies (cleaning, fishes, bacillus) and with a strong communitarian participation. Opening at the cover of the diagnosis and treatment of the malaria cases and its contacts. Elimination of the DDT use or other persistent pesticides to control the malaria.

ACTIVITIES	***PRODUCTS***	**INMEDIATE EFFECTS**	**REACHED RESULTS**
2. Formulation and application of the plan to promote the public alert about the use of DDT and the participation of the 8 countries in the project. 2. 1. Formulation of the plan 2.2. Educative materials, produced or printed - Guide to develop the demonstrative projects, Spanish version 1000 printed copies and PDF in CD ROM. - Macro document of the project, Spanish and English version, printed and in PDF in CD ROM - Promotional poster of the Project, english version. - Educative poster about the control of malaria, Spanish version "Prevent Malaria Disease", educative Trifolio about the control of malaria "For your family and community health prevent malaria", Spanish version, informative Trifolio of the project DDT-GEF, Spanish and English version *3. Evaluation of costs and factibility of the new control methods of malariain different countries and environments partially ejecuted but without an explained methodology.* *4. Evaluation of the environmental and human exposure to DDT and other pesticides.* 4.1. Training experts in gas cromathography.	*2. Formulated plans and ejecution.* Videos produced in Costa Rica, El Salvador and Mexico. Posters and leaflets produced and distributed in Panama. Teather plays and puppet shows presented in schools in Costa Rica, Guatemala and El Salvador. 3. Alternative strategies to control malaria applied in all of the demonstrative projects as factibility indicator. Non quantified evidences of the lower cost and lower logistic needs and human resources. *4. Laboratories with equipment and staff to analyze the insecticides* 4.1. Seven experts (1 per country) trained in gas cromatography. 4.2. All the countries laboratories equipped to analyze with gases cromotography.	Major communitarian participation at the control activities.	

ACTIVITIES	PRODUCTS	INMEDIATE EFFECTS	REACHED RESULTS
5. Implementation of the web page, Intranet page and GIS in development. 5.1. Implemented Web Page and periodically updated. 5.2. Intranet Page and phono conferences. 5.3. Six nacional workshops to train the Project staff (nacional and local) using Georeferenced Information System. Local staff training in GIS supported by INCAP and Gorgas Institute. *6. Monitoring and Project evaluation* 6.1. Evaluation of the demonstartive projects with the participation of local communities representatives and the society. 6.2. Two Regional meetings of evaluation done (Regional-technical committee) 6.3. Monitoring visits with technical support at regional level and from the nacional level to the locals	*5. Net between countries formed, and exchanching information and experiences* 5.1. Web page and Intranet updated and working 5.2. Eight phono conferences ejecuted for coordination 5.3. Trained staff at the demonstartive areas, trained at the GPS use and GIS tools. All the demostratives localities visited (except Mexico) georefenciados maps availables and with infromation about malaria y anophelines breeding sites. 6. Reports very three months n¡and annually from each country presented at the regional technical meetings of monitoring evalution. Reports of technical regional meetings about monitoring advances and exchange of experiences and formulation of agreements and commitments. Reports of visits and help consultancy.	Succesful experiences and good practices of one country are adapted by the other countries. Local teams practice with the GIS application to improve the analysis and the interventions. Exchange of experiences between countries. National and local teams received technical support at the right moment.	Regional net of information and exchange of experiences about studies, elimination of DDT and application of new control technics of vector

Component 2: Strengten of the regional-institutional to control malaria without DDT.

ACTIVITIES	PRODUCTS	INMEDIATE EFFECTS	REACHED RESULTS
1. Elaboration and distrubiton of the printed Technical Handbook about methodoligies used in the project. 2. Workshops and training courses in malaria, environment, entomology and ecology; integration in control vector for malaria, field operations and technical participation of the community. 3. To develope a surveillance system of malaria and information exchange about malaria control at regional level 4. Short term trips and local meetings for technicians in malaria control with the purpose to exchange experiences in alternative technics to malaria vector control vector. 5. Strengh nacional reference centers with trained staff in risk analysis, education and communitarian participation for the control of malaria without DDT or other persistent pesticidas and suitable to exchange information between laboratories and referente centres. 6. Strengh nacional laboratories for chemical evaluation and information exchange.	1. Technical handbook produced by consensus, digital version, 1000 copies printed and distributed. 2. Local and national staff trained in control strategies with communitarian participation. 3. Integrated nacional programs in control of malaria, exchange information and knoledge between countries. Exchange between demonstrative areas will be carried out on 2006. 4. Technicians in control of malaria are trained to use integrated technics in vectors control. It started in the last trimester of 2005 and it will continue during 2006. 5. Reference centers for the study of DDT residual action in Mexico and Costa Rica, they observe international recognized standards and exchange information. 6. Study of needs is finished, in process equipment purchase. Staff trained to evaluate environmental and human contamination with DDT and other persistent plaguicides.	Nacional and local technicians use the handbook to guide and to adapt the control strategies.	IDEM component 1

Component 3: Elimination of DDT reserves

ACTIVITIES	PRODUCTS	INMEDIATE EFFECTS	REACHED RESULTS
1.National inventories of DDT and other persistent plaguicidas upgraded with participation of the 8 countries industries. 136 tons of DDT were identified and should be eliminated on 2006.	Upgraded reports about DDT and other persistent plaguicides are oficially delivered to the 8 countries	Improvement at the storage of DDT reserves.	

Component 4: Management and coordination

1. A Regional coordinator and eight national technicians and eight institucional focal points were hired to manage the activities of the demonstrative projects. 2. Ejecution of two meetings with the Regional Administrative Committee and two with the Regional Operative Committee. 3. Reports elaboration every three months	1. Regional coordinator and the seven national coordinators, selected and working; in Costa Rica wasn´t hired a national coordinator, the management of the project was taken by an international consultant payed by the PAHO regional, local and national teams, constituted and working. 2. Regional and national committees and local groups are constituted and working normally. 3. Management sytem adapted to local realities. 4. Three reports and minutes from the Regional Administrative Committee meetings.	Commitments between countries and political support from the heatlh authorities for the project.	

Source: Visits to the demonstrative areas and documents (three-month period reports)

2.1.2 . Perception of performance, changes, advances, problems and limitations

The valuation of the local and national teams of the four evaluated countries, about the success level of the project, averages between moderadate satisfactory to satisfactory. Guatemala is the most successful country with this project. In Panama, there is an important discrepancy about the perception of the local level, with the national level: the national level goes from satisfactory to highly satisfactory, and at the local level goes from moderate to satisfactory.

This perception not coincide with the facts observed. In fact, despite the difficulties to work with indigenous people, there are a high level of participation of the organized groups, traditional authorities (regional indigenous congress, local chiefs, religious group Mamachi), local governments (majors, corregimiento representants and corregidores). Costa Rica and Mexico have the lowest perception averages, that contrast with the observed in the mid term evaluation, which found a similar level as in Guatemala.

The aspects on which the success perception is the highest in all of the countries (average by variable) is in order of the importance: objectives relevance (means 4.4), communities empowerment and appropriation (meand 4.3), cost effectivity and impact (means 4.1 and 4.4). The lowest perception of success is in monitoring and evaluation (means 3.1) and financial planification (means 3.3).

Table 4. Partners valuation about the success level in the project, November 2005

VARIABLES	Costa Rica	Guate -mala	Mexico	Panama	Medium (SD)
	Loc Nat	Loc Nat	Loc Nat	Loc Nat	Total
Objectives relevance and planned results	4	4 4	5 5	4 5	4.4 (0.53)
Achieved activities and products	4	4 4	3 3	3 4	3.5 (0.53)
Cost efectivity	4	4 4	4 4	5 5	4.1 (0.69)
Impact	3	5 4	5 5	4 5	4.4 (0.79)
Sustainability	5	4 5	3 3	4 3	3.6 (0.79)
Partners participation	3	4 4	4 4	3 5	3.9 (0.69)
Local Team appropriation	5	4 4	4 4	3 5	4.0 (0.58)
Communities appropriation	4	4 5	4 4	4 5	4.3 (0.49)
Approach implementation	3	4 4	4 4	3 4	3.7 (0.49)
Financial planification	3	4 3	2 3	3 5	3.3 (0.95)
Replicability	3	4 4	4 5	4 4	4.0 (0.58)
Monitoring and evaluation	3	4 3	4 1	3 4	3.1 (1.1)
Average (SD) Local National	3.3 (0.49)	4.1 (0.29) 4.0 (0.60)	3.83 (0.8) 3.85 (1.1)	3.6 (0.67) 4.5 (0.67)	

Source: Colective self administrated interviews at local and national level
SCORE: 5 = Highly satisfactory; 4 = Satisfactory; 3 = Moderadate Satisfactory; 2= Unsatisfactory; 1= Highly unsatisfactory
Loc= Local Level; Nat= National Level

.
Coinciding with the success perception, the local and national teams identify the communitarian participation and the vectors control without insecticides as the major advances. In Costa Rica is appreciated the appropriation of the local team, the constituition of Volunteer Commitees, the participation of the partners from the Local Government, Social Organizations, neighbors associations, health boards and other state institutions, the GIS development and Epidemiological Surveillance inter border areas at the demonstrative areas of the project. The local level of Costa Rica specify that in relation with the cost effectiviness of the interventions, is good because most of the dialy activities are making without the project funds and the national staff was not hired. In relation to the sustainability, is specified that these activities have been carried out during the past three years, without fumigating, there is an opportune diagnosis and treatment, that there is a total access to the health services and thare is a coordinated work with other institutions.

In Guatemala, important advances are identified, such as: first the Commmunity Action Groups, teachers and students training, the control of positive mosquito breeding sites, second the actualization of the DDT and other COP´s inventory in Guatemala, third the use and management of GPS´s and the map elaboration by the Public Health staff and the application of systematic strategies for vectors control in the demonstrative areas without using chemicals (fishes, breeding sites cleaning, small engineering works, etc.), finally the control activities carried out by the the communities with support of the Health Ministry.

In Panama, the most important advances are: i) the constitution of the communitarian work groups, the participation of young teams, the communitarian works for malaria control, which includes cleaning shifts and the participation of the University, National Authority of Enviroment, Custom Duty, Migration, Ministry of Farming Development, iii) the constitution of the National Operative Committee and the Demonstartive Area Group, iv) effective incorporation of the traditional authorities (regional indigenous congress, local chiefs), v) upgrading if the DDT inventory and other COP´s, vi) the use and management of GPS and GIS by the local technicians. In relation to surveillance system exists from the begginig of the project, but it have been fortified with the project. A inter borders meeting in Changuinola, Bocas del Toro was carried in march 2004.

In Mexico the most important advnces are: understanding of the program trough informative meetings, the communitarian approval of the demonstrative project, the approval by the the operative staff of the Vectors Control Program.

Table 5. Advances perception, November 2005

VARIABLES	Costa Rica	Guatemala	México	Panamá
Communitarian perception and approval	X	X	X	X
Training, educationand sensiblization and difusión of the project	X	X	X	
Operative staff approval			X	
Intersectorial participation				X
Geographic Information System				
Vectors control without chemicals use		X		X
DDT and other COP´s inventory upgrade		X		X
Surveillance between countries				X

Source: Colective self administrated interviews at local and national level

The development level of the model was evaluated by the level of development of case management, prevention and vector control, comunnitarian participation, information and surveillance system, the descentralization level and the adaptation of the model to the process of the Health Sector Reform. In the total valuation as in the valuation by variables there is a discrepancy of perception between the local and the national level. In all countries, the major development is at the prevention and vector control, the cases management and the communitarian participation. The minor development is in the information and surveillance system (Table 6).

Costa Rica has the most developed model, thanks to the high level of development of case management, prevention and vector control and the communitarian participation. In this country, the minor development is in the information and surveillance system, with a major score at the local level than at the national.

In Guatemala there is a low valuation of communitarian participation, which disagree with the field visit to the demonstrative communities. In Panama there is a big disagreement in the total punctuation and in most of the variables, with a low valuation at the local level.The national level disagrees this perception from the local level “because thare is a high level of acceptanceof the model by the national, regional and local authorities”. In the same way, Panama counts with one of the most effective systems of information and surveillance, with weekly reports about epidemiological situation, blood smere samples diagnosis every five days and the fulfillment of immediates anti vector interventions”.

Mexico has a high valuation in vector control and cases management which coincides with the observed during the evaluation visit. The major weakness is in the Information System, explained by the great quantity of information that it is expected to collect.

Table 6. Evaluation of the model of malaria control

VARIABLE	SCORE	COUNTRY							
		COSTA RICA		GUATE-MALA		MEXICO		PANAMA	
		Loc	Nat	Loc	Nat	Loc	Nat	Loc	Nat
Case management	Sumatory Mean (SD) %	28 2.0 100	27 1.9 96.4	24 1.71 85.7	8 0.57 28.6	24 1.7 85.7	24 1.7 85.7	23 1.64 82.1	22 1.57 78.6
Prevention and vector control	Sumatory Mean (SD) %	4 2.0 100	3 1.5 75.0	3 1.5 75	4 2.0 100	4 2.0 100	4 2.0 100	2 1 50	4 2 100
Communitarian participation	Sumatory Mean (SD) %	12 1.7 85.6	8 1.14 50.0	9 1.28 56	10 1.42 62.5	12 1.7 85.6	12 1.7 85.6	7 1 43	14 2.0 87.5
Information system and surveillance	Sumatory Mean (SD) %	17 1.06 47.2	19 1.36 64.3	15 1.07 53.6	9 0.64 32.1	19 1.36 64.6	20 1.4 71.4	15 1.07 53	28 2 100
Descentralización and Reform	Sumatory Mean (SD) %	17 1.54 77.0	13 1.3 59.1	19 1.72 86.0	14 1.27 63.6	15 1.4 68.2	20 1.8 90.9	10 0.9 45.4	18 1.6 81
Total (96) (2.0) 100	Sumatory Mean %	78 1.6 81.1	70 1.46 72.9	70 1.46 72.9	45 0.94 46.9	74 1.5 77.1	79 1.6 82.2	57 1.2 59.3	86 1.79 89.5

Source: Colective self administrated interviews at local and national level
Loc= Local Level; Nat= National Level
From 48 questions (see Apendix 1) with answers “yes”, “partial”, “no”. The answers were changed into an ordinal scale with the follow scores: yes = 2 points; partial = 1 point; no = 0
Sumatoria = total score (highest score 96)
Mean = average score reached with a maximum of 2 points.
% Development percentage = sumatoria / highest score (96).

The local and national teams notice that the most important limitation are: delay on the payments, the slow consolidation of the National Committee and the lack of transportation at local level (Table 7). According to the interviewed people in Costa Rica, the most important problems or limitations are: the slow consolidation of the National Committee, the complex administrative management to designate the goods for the project, the national emergencies as floods at the demonstrative areas, the slight flexibility of the handbook to adapt it to the local realities, the lack of knowledge on entomology and the lack of professional staff at the demonstrative area.

In Guatemala the problems are: i) the late payments by the donator, which limits some of the planed activities, ii) the major importance given to dengue, the non satisfactory performance in the health areas (it is reported that even when they are working with the project, they do not have the expected level, because of the limitation as transportation and other prioritary diseases), iii) the 8 and 12 hour long distances between the demonstrative areas and the capital city, which limits the technical assistance, and iv) anophelines breeding sites and refugies hard to control (huge water compilantions, streams, rivers, the high vegetation around the houses) (NCI)

In Panama, the problems identified are: i) the irregularity at the meetings to coordinate activities at the beginning of the Project (because of the general elections period in the country, may 2004 and the change of the government authorities in september 2004), ii) the slow integration of other public institutions and authorities, iv) the late funds disbursement, v) the lack of transportation at local level.

In Mexico, the most important problems according to the national level are: i) difficulties in the precise register of the imformation about the tasks of the communitarian demonstrative project; ii) the effective coordination with the State, National and Regional health authorities in each of the demonstrative areas, and iii) the administrative efficiency for disbursements and the proof of the spending according to the PAHO and the PNUMA GEF rules (NCI). In the local level the problems are: the extense operative universe, the integration and the coordination of the national, state and local levels for the activities development, the efficiency and opportuneness of the payments and the proof of the financial resources for the PAHO and the donor GEF.

Table 7. Perception of limitations

VARIABLES	Costa Rica	Guatemala	Mexico	Panama
Late payments		X		X
National Operative Committee Constitution	X			
Weak public support				
Complex financial administrative management	X		X	
Other priorities: floods, epidemics (dengue)	X	X		
Slight flexibility in the Handbook	X			
Breeding sites hard to control		X		
Long distances at the demonstrative areas		X		
Lack of knowledge in entomology	X			
Lack of professionals at local level	X			
Inter institutional coordination			X	
Transportation at local level		X		X
Information system			X	

Source: Colective self administrated interviews at local and national level

For all the interviewed, the most significant learning is the importance of the communitarian work and the fast incorporation of the communities into the control activies against malaria (NCI, LCI).

For the regional coordinator the most important learnings are:

1. The extended period between the design phase and the phase of the project beginning meant the alliances desactivation and the discouragement of the principal partners of the project, which needed an special attention and reactivation with the implications that it takes.

2. To promote, to introduce and to experiment a documented model and a strategic thought have demanded high creativity from the principal managers, specially because persist a classic clinical approach to control disease.

3. It has been required an integral vision of development to movilize politic wills and resources from other sectors for the environmental abord to control malaria without using persistent insecticides.

4. The way to involve other expert institutions in specific topics have determined the success of the strategic lines introduction of the project, for example the INCAP, Universidad de León and the Gorgas Institute for the SIG/DDT/GEF; the health risk evaluation with the Universidad de San Luis de Potosí from Mexico and the IRET from Costa Rica.

5. Even malaria is a serious public health topic in Meso America, it is not a problem in the public agenda, so this is not a political problem, as dengue or AIDS can be (ER).

In Costa Rica the lessons learned are the importance of communitarian work, the alternatives and experiences from other countries, the importance of medical entomology against malaria.

In Guatemala the biggest lesson is the use of GISI, which involved the learning of using GPS, the elaboration and interpretation of geo referenced maps. It is also recognized, the project strength and performance at the health area level and demonstrative communities, the capacity to involve the community in the solution of the health problems and giving them technical training for prevention and control, as the best way to assure the sustaintability of the actions. Another lesson is the big importance to manage the project with the existent natural organizations instead of creating parallel structures, as well as the intra and inter sectorial work wich helped with the ejecution of the proposed tasks.

For the local team in Panama, the most important lessons are: the fast assimilation of strategies against malaria by the community, the perception of change by the communitarian leaders and local authorities, as well as the understanding about the importance of the community collaboration to make those changes, even with a few resources. The national team recognizes as lessons: i) the asigment of the focal points in Boca del Toro y Ngöbe Buglé which facilitated the development of the project at local level, ii) the integral approach, that at the demonstrative areas should join the consideration of other health problems so the community can accept, know and participate; iii) the need of giving special attention to malaria in the native population and the importance of the support and involvement of local authorities with the project.

According to the national and local level from Mexico, the learned lessons are: the flexibility of the program to accomplish the several needs of the transmission areas, of the local and national program and the millennium goals; the development in technical capabilities and the spaces to share technical experiences and human development. It is also valorated the fact of achieving a

feasible adjustment between the community needs and the project objectives looking forward for a communitarian change of attitudes and sustaintable preventive practices.

2.1.3. Training

The process to introduce the strategy involved a huge effort to train in all levels, specially at the communitarian level (Table 8). Mexico and Guatemala are the countries that reach the highest covers in all aspects and Panama is the lowest, because of the shortest lapse of time to execute the project. This process has been made from the regional level to the national, from the national to the local and from the local level to the communitarian.

The aspect in which were expended more training in all the countries is education about malaria, vector control and communitarian participation, as well as the Technical Handbook contents. In Costa Rica, the coverage of malaria education and vector control with the community and students, especially from elementary school, through a puppet show is big. With the exception of Mexico and Guatemala, epidemiologic surveillance is the less trained aspect. In Guatemala, 18 technicians from the demonstrative Areas, are qualified to work on GIS, epidemiological surveillance and alternative control methods.

In Mexico, Guatemala and Panama, specific materials for trainning were elaborated. In Guatemala materials about treatment, epidemiologic surveillance and malaria transmission were elaborated, as well as they elaborated socio dramas shown in schools in the demonstrative areas, with the purpose to teach about control alternative strategies and risk of chemicals. In Mexico, training materials for the introduction of control strategy have been elaborated, as well as enthomological evaluations (EHCA´s) and the program community integral training. In Panama, educative materials about prevention, communitarian participation and environmental management were created.

Table 8. Number of trained people by topics

TYPE OF TRAINING	NUMBER OF TRAINED PEOPLE								
	COSTA RICA			GUATEMALA			MEXICO	PANAMÁ	
	Nat	Loc	Co	Nat	Loc	Co	Na and Lo	Nat	Loc
About the handbook contents	5	18	50	12	22	6	150	2	5
Education and communitarian participation	5	16	1300	5	22	200	30	19	10
Methods for vector control	5	16	25	3	22	200	60	19	10
Epidemiologic surveillance	0	0	0	3	22	15	150	0	5
GIS	15	4	0	8	22	6	30	19	19
Risk evaluation (DDT)	2			3			30	0	1
Taking decisions	0	0	0	3	2	5	20	0	0
Projects management	0	0	0	2	2	5	20	0	0

Source: Colective self administrated interviews at local and national level
Nat= National Level; Loc= Local Level; Co= Communities

2.2. MODEL IMPLEMENTATION AND DEVELOPMENT

2.2.1 Structure and organization of the project

The Regional Coordination is located at the INCAP in Guatemala and the National Coordinations at the PAHO´s offices . To set the regional office of the project at the INCAP was a good choice, because it is a PAHO´s center of regional reference management that helps to conduct with most of the countries of the project DDT/GEF. Aspect that could be more difficult from the PAHO headquarters in Guatemala or another country. Also, it allows the transference of experiences and knowledge, because professionals at the INCAP can help with technical support, as epidemiology and georeference.

It is also correct to have a hired national professional (NAP) as the national coordinator for the project, because of the instability at the national focal points. The coordinator has given continuity to the project and he has a major independence, but also the coordinators have been used the PAHO´s influence and leadership with the Public Health Ministries in the Region.

In all countries, National Committee has been constituted under the leadership of the Health Ministries and PAHO. Delegates of the Ministries of Environment, Agropecuary, Migration and others are participating in the committees. As a weakness found at the previous chapter, is the slow constitution of this committee and the lack of consolidation (NCI).

The local committees are sttafed by health, laboratory and vector personnel. In some countires, as Costa Rica, Panama and Guatemala, the local governments, the private companies (banana plantation) and the national government have delegates into the commitees. The committees have a coordinator, a sub coordinator, a secretary and members. The committee´s task is to disseminate information about the project and to manage communitarian and institutional meetings (LCI).

It was found the existence of communitarian committees in all the visited areas. In Panama a health committee was constituted in Barranco Montaña Adentro and a Malaria Committee in Bisira town. In Guatemala, Health Action Group (HAG) was constituted with: president, vice president, secretary, treasurer and members; who preside, coordinate, supervise, control activities and they are the responsables of all the tools and supplies already delivered (PO).

The program orders or directions to subordinate levels are transmited by different means: telefax, e mail, telephone and through monthly planifications and supervisions. The used procedures to report to the superior level are the just mentioned. The control to the subordinate levels is made trough: reports about the activities done by all the staff and send to the central unities, through monthly meetings with the regional, local and national technical boards.

Monitoring, via phone calls, are made to follow the planned activities, especially in Guatemala (NCI, LCI).

About the autonomy level of the projects, the national level from all the countries valuate it as medium to high, but the local levels described medium levels of autonomy. The major autonomy is given by taking decisions; then, the financial resources management and programing. The lower autonomy is related to the human resources management.

Mexico has the major autonomy in all aspects, because the specialized structure of the malaria program was not affected by the health sector reform processes, as it happened in other countries. In Costa Rica, the Ministry of Health (MOH) do not have an ejecution team for the project. The functionaries have to carry out the project activities as additional task. At local level, the Area Chief does not participate at the staff hiring process and he can not hired people for the project. The PAHO administrates and ejecutes the resources requested by the local point, although there is a internal process (between MOH and PAHO) to transfer resources to make payments, this is a slow procedure. The activities are planned and the decisions taken with the participation of the MOH and PAHO´s coordinator team. The staff of Talamanca has an important role inside of the Project National Committee and they are always listened and when decisions are taken, the vision of the local level is important (LI).

In Panama, a high level of autonomy has been achieved at the human resources management area, because the MINSA staff and other national institutions participate and support the project. The decisions are taken at national level, with the regional and local levels participation, and there is an appropriate level of communication.

Table 9. Autonomy level at the human resources management and taking decisions

AREA	Costa Rica		Guatemala		Mexico		Panama		Mean (SD)
	Loc	Nat	Loc	Nat			Loc	Nat	
Human resources management	0	2	2	3	3	3	2	3	2.3 (1.0)
Finanacial resources management	2	3	2	2	3	3	2	3	2.5 (0.5)
Programing	3	2	3	2	3	3	2	2	2.5 (0.5)
Taking decisions	3	3	2	2	3	3	2	3	2.6 (0.5)
Mean (SD)	2.0 (1.4) 2.5 (0.6)		2.25 (0.5) 2.25 (0.5)		3 (0) 3 (0)		2 (0) 2.7 (0.5)		

Source: Colective self administrated interviews at local and national level
High = 3; Medium =2;Low = 1; None = 0
Loc= Local Level; Nat= National Level

In relation to the structures and organization of the places where the demonstrative areas are, the local committees have joined the Ministry of Health structures and specially at the vector control programs, taking adeventage of the technical experience and the structure that remain from the vertical elimination program. In Mexico there is still a specialized semi

autonomous structure of the program, but there is a really good integration with the general health services (PO).

In Panama, the specialized structure persist, but because of the health services descentalization process (began in 1996), the MCP (SNEM) disappeared and the old structure was weakened because the retired vector workers are not replaced. With the project, the integration of the MCP to the general health services is being reinforced. The Local Coordinator of the project in the demonstrative area of Boca del Toro is the Regional Epidemiologist; the Medical Director of the Health Center of Bisira is the local Coordinator of the Ngöbe Buglé Region, who leads the interventions of malaria control in the demonstrative areas of Kankintú and Kusapín.

An important fact is that, even with the lack of the vector staff, the Ministry of Health have hired as promoters, people who have been carried out activities of volunteers collaborators, who speak the native languages (PO). In fact, the vertical model, is been redesigned for a context with a few resources, with a native population who speaks another language. In addition, this is an inundated area so the risks are more collective than individual and there are a few resources.

In Guatemala, the vector control structure persists, they are not just in charge of the malaria control but also the rest of Vector Transmited Diseases (VTD). The control department of VTD has a head office far from the demonstrative area office, but it is under the Regional Chief´s leadership. It can be qualified as an integrated structure, but it´s not a horizontal structure yet.

In Costa Rica, the area chief, where the demonstrative project is, is the leader of the project. At this area it does not exist a parallel or independent structure for vector control, so the area chief is ,at the same time, risponsable of the preventive activities. The area counts with multidisciplinary team, with director, epidemiologists, teacher and also vector inspectors who work in the communities.

At the health model in Costa Rica, the heeling acitivities and some of the preventives are asignated to the Caja de Seguridad (Social Security), the health area has a role of regulation, supervision and control. Even though, in the case of malaria and in the case of the project, the area chief is the responsable of malaria activities (LI). There is a narrow coordination between the health general services and the health staff in the area. For example, when the health area identifies feverish patients, they take a sample, send it to the laborartory and when it is confirmed as positive, they notify the area and they make the followment and the complete radical treatment. The model of the strictly supervised malaria treatment is made by the area and the Social Security only gives malaria drugs (PO).

Costa Rica is the country with the most descentralized intervention. The local interviews report:

"At national level, it does not exist a properly malaria program. The health sector reform process and the changes that have happened, affected the former program. Today, it is necessary to modify this situation, because the action of the epidemiologic surveillance, belonging to the MOH functions, need to be strengthen with resourses at a national and operative level. The review of the national normative will help to strength the institutional risponsabilities related to malaria management" (LCI)

The activities of the health general services and malaria control, as well as the vector workers are totally integrated only to one office. In relation with the descentralization process, the former MCP structure was eliminated and all the workers at the Area are integrated. Currently, the inspectors are multipurpose for all of the VTD (dengue, malaria, chagas, etc.). In this sense, there is a profile change of the inspectors, in 2003 the inspectors were only for malaria, and they were organized as squads. At this moment, when an inspector goes to a house, look for all the information related to vectors and in some of the cases look for other health problems (LI).

The "Caja de Seguridad" has technical assitants for primary attention who administrate vaccines, control pregnant women and also support the campaigns; they also make an active search of febrish patients (PO). .

In Talamanca (one of the demonstrative areas in Costa Rica), once a month, the area director and the "Caja" manager have a meeting, and according to the area officer, this relation works really good. Even though, it has been commented that in other areas it depends on the protagonists will and when there are conflicts between the area officer and the "Caja de Seguridad" director, the coordination does not work. The normative establishes that they have to meet every fifthteen days and the meeting must be called by the area headquarters (LI).

One of the weaknesses of the project in Costa Rica is that part of the vector staff is temporary and the contracts are renewed every six months. There are ocassions when they can not be renewed the personnel trained is lost. One of the most important advances is the staff change about the way to think, they are more communitarian now (LI).

2.2.2 Control strategies and used technology

At section 1.1 of the Chapter 1, it was reported that 1000 copies of the Technical Handbook were published, even though just a small quantity of people received it: 100 in Mexico, 10 in Costa Rica, 52 in Guatemala and 5 in Panama. The number of trained people about the contents of the handbook is higher than the number of distributed handbooks, being Guatemala the country with the higher number of trained people (Table 10).

In relation with the opinion about if the Handbook replied to the policy or norms of the country and to the available resources, only the local level in Guatemala

gives a favorable opinion, in the rest of the countries it is partially favorable. In Costa Rica people say that: *"The guide was elaborated and designed in Mexico, where there is great experience in Anopheles pseudopuntipennis control and there are a lot of technical and financial resources. We have Anopheles Albimanus and we do not even have a thousandth of the advantages at the technical and financial part"* (LCI).

Table 10. Number of the people who received and were trained with the Technical Handbook and the opinion about the handbook adaptation in the country.

	COSTA RICA		GUATEMALA		MEXICO		PANAMA	
	Loc	**Nat**	**Loc**	**Nat**	**Loc**	**Nat**	**Loc**	**Nat**
Number of the people who received the handbook	10	10	12	50	100	100	0	5
Number of trained people	20	20	100	100	100	100	2	5
Does the handbook reply to the polithics or norms of the country and to the available resources	Partial	(P)	Yes	(P)	Yes Yes		Partial (P)	

Source: Colective self administrated interviews at local and national level
P = Partial

According to the collective interviews, it has presented some important changes in the strategy to control malaria, especially in Guatemala. In all countries there have been changes in the strategy of larvae control and in the training of clinical management cases. In Guatemala, where there is a high percentage of treated cases without a laboratory diagnosis, the improvement in this aspect at the demonstrative area is sustainable. With the exception of Costa Rica where there was already a great coverage and quality of diagnosis and treatment. In Guatemala and Panama there is an important change, which also affects the improvement of the accurate detection of outbreaks and epidemics.

In the ejecution of the projects, the Handbook has been adapted to every local reality and to the national normatives. Because of that, the control strategy, even it has common elements (the stratification process, the EHCA activities, the clean house and clean patio activities and the improvement in personal and family´s hygiene), there are important differences in: the clinical case management and the elimination of human breeding sites of plasmodium. The similatities and differences in the application of the control strategy are identified in Table 11, and how the strategy is applied in each one of its components is described in the rest of this section.

Table 11. Characteristics of the control strategy by components and countries

Component	Strategy description
1. Estratificación	*All the countries:* Two phases First phase: identificatiom of localities with higher APIs every three or five years period. Second phase: identification of malarious houses and repeated cases .
2.Clinical management of the cases.	*Mexico:* TDU 3x3x3 years. First dosage include primaquina in the blood smear taking of time, if is positive recive 3x3x3 squeme. *Costa Rica*: Supresive treatment in the blood smear taking of time, following by radical trearment for comfirmed cases y TDU 3x3 for one year *Guatemala and Panama*: Supresive treatment in the blood smear taking of time, following by radical trearment for comfirmed cases.
3. Case Identification Strategy	Mexico: active and passive search. Guatemala: passive search. Panama: active and passive search. Costa Rica: pasive searching (notification post) and active searching of cases in babana plantatiomn workers thorugh the malaria card.
4. Infection sources elimination	*Mexico*: TDU 3x3x3 in positive cases and fammily contacts. *Costa Rica*: TDU 3x3x1 for positive cases and family contats. *Panama*: Radical treatment to every fammily contact and neighborhood positive cases.
5. EHCA	*All the countries.* *Mexico*: Community work to cleans every 15 days or monthly and evaluation od f results pre and post intervention. Panama, Costa Rica and Guatemala: Community work every month and results pre and post intervention.
6. Home Improvements	*All the countries*: clean house, clean yard *Mexico and Costa Rica*: encalamiento de viviendas. Panama: green cars for clean house and patio, and read for dirty house and patio
7. Familiar hygiene improvement	*All the countries*
8. Biological techniques and physical control of adult larvae	*All the countries*: larvivorous fishes and breeding sites c*leaning* *Mexico*: bacillus and alcohol etoxilado. *Panama*: bacillus
9. Adult Control of adult anophelines and barriers	Mexico and Costa Rica: hpuses painted with lime *Panama*: insecticide spraying in outbreaks *Guatemala*: repelent trees

Source: Participant observation, local interviews and polls.

In relation with the control strategy, in Mexico, which is the country which proposed model, the only change in the project is the training of health staff in cases management and to improve the coverage and quality diagnosis; an operative investigation abour rapid test for malaria diagnosis was done. According to the interviewed people from the three remaining evaluated

countries, the project has caused important changes in the malaria control strategy, specially in Guatemala (Table 12). In these three countries there are changes in strategy of larvae control and training in the case management. In Guatemala, where there is a high percentage of cases treated without a laboratory diagnosis, the improvement at the demonstrative area is sustainable. In Costa Rica and Mexico where there was already a good covererage, there were no important changes in diagnosis and treatment quality. In Guatemala and Panama there is an important change, which also influences the improvement of outbreaks and epidemics detection

Table 12. Changes caused by the project in control strategy and in the model of services

DIAGNOSIS AND TREATMENT	**Costa Rica**		**Guate-mala**		**Mexico**		**Panama**	
	Loc	**Nat**	**Loc**	**Nat**	**Loc**	**Nat**	**Loc**	**Nat**
Diagnosis procedure	No	No	Yes	Yes	No	No	No	
Startegy to improve the coverage and quality of the diagnosis and the treatment	No	Yes	Yes	Yes	No	No	Yes	
Health staff training about the management of the cases	Yes	Yes	Yes	No	Yes	Yes	Yes	
Strategy and mechanisms to provide medicines and supplies	No	No	Yes	Yes	No	No	Yes	
PREVENTION								
Changes in the strategy of vector larvae control	Yes	Yes	Yes	Yes	No	No	Yes	
Reduction of vector- persons contact	No	Yes	Yes	No	No	No	No	
Epidemics and outbreaks control	No	Yes	Yes	Yes	No	No	Yes	

Source: Colective self administrated interviews at local and national level
Nat= National Level; Loc= Local Level

Related to the problems that the project has experimented during the introduction of the strategy, Mexico does not report problems and the rest of the countries most are minor problems. The interviewed people identified the next problems:

In Guatemala, the problem wich affects the diagnosis and treatment activities is the large time between the sample takes and the reading of blood smear (LCI). Another problem is "*the financial part, because there were activities planed to strengthen this component in this three months, but with the lack of resources, it has to be delayed until we have the funds"* (NCI). In Costa Rica, the existence of a lot of imported cases interferes in the control and followment of them.

In relation with the strategy to improve the coverage and quality of diagnosis and treatment, the problem in Guatemala is the difficulty to contact local people

to take samples from localities to the laboratory and the health staff training about cases management. In Costa Rica there is a limitation of the operative staff.

In the strategy of drug and supplies provision, in Guatemala the budget was not enough to obtain the necessary, and the ejecution of funds are too slow at local level. In Costa Rica there is a national regulations handled by the Social Security (Caja Costarricense del Seguro Social, CCSS) which is in revision (NCI).

Estratificación Strategy

The estratification strategy suggested by the Handbook and used by the 8 countries can be qualified as a biethapic methodology. At the first phase, localities are identified with collected APIs during the past 3 or 5 higher years, which helps to identify the localities with the major persistence of malaria (stable malaria). At the level of each locality with persistent malaria, activities as physic and biological vector control are focalized; especially the elimination of habitats of anophelines breeding sites (EHCA) (PO).

At the second phase, malarious houses are identified (houses with two or more cases or repeatd cases) from the prioritary localities. The malarious houses are focalized places where the intervention are implemented: elimination of the breeding sites of *plasmodium*, home improvement, promotion of personal hygiene and in some places impregnated bednets (used as a strategy to reduce the vector-person contact).

All the visited countries have used this stratifacation criteria; first, to select the demonstrative localities and then as part of the base line and to focalize the interventions.

Clinical management of malaria

In all the countries, blood smear is used for the diagnosis of malaria applied on feverish patients. In Guatemala is also used a clinical definition because of the lack of laboratories. Each country has adopted a different plan of treatment to adapt them to the national norms. In fact, not all the countries have adopted the strategy of treatment 3x3x3, used in Mexico.

In the demonstrative area of Talamanca (Costa Rica), the treatment squeme was modified, mixing the radical cure (seven days of primaquina in double doses) and after that, a treatment with modified TDU, which can be called 3x3x1: cloroquina and primaquina in just one monthly giving for three months, three months of rest, other three months with TDU, and other three months of rest until a year of treatment can be completed. In this country, the correction of Primaquina dosis is being revised; currently, one daily primaquina pill for 5 days for an average adult or one daily Primaquina for 14 days is normed; the new normative will be a double dose of Primaquina for 7 days or one dose 1 for 14 days (Interinstitutional Malaria Committee meeting is on hold).

Guatemala and Panama use a presuntive treatment at the same time when the the thick blood smear is taken, following by a radical cure of 7 or 14 days when it has been confirmed by the laboratories. In Guatemala, they give primaquina doses from the half of the recommended doses by PAHO. In Panama, when the treatments are for seven days, the quantity of primaquina is 180 mg, in the 14 days treatments the doses is complete (210 mg).

With the exception of Panama where the general health services are being integrated in diagnosis and treatment, in all the visited countries the volunteers have been recuperated to take samples and to distribute treatments. In Mexico where the specialized structure still persists, the general health services are considered notifying centers (PO).

In Mexico, in the Regional Hospital, there is a clinical detection of feverish. When a feverish patient is found and malaria is suspected, they take a thick blood smear sample and they notified to the vector service, which makes the control and if the sample is positive it goes to the 3x3x3 program. A similar procedure is used in Costa Rica: the clinic staff of the Caja de Seguridad takes samples when they find suspicious cases, they send the blood smear to the regional laboratory, and if the result is positive they notified to the area office for the radical treatment and following with TDU 3x3x1 (PO).

In Mexico, Guatemala and Panama there are specific laboratories for malaria, separated from the laboratories of general services. In Costa Rica they are integrated to the general services, even there is a specific malaria laboratory at the headquarters in the Talamanca Area.

In Costa Rica, where the workers from Panama cross to the Costa Rica border to work during the day, one of the most important practices to improve malaria control at the border area, is that the workers who legally live and work at the banana plantations have to do a thick blood smear sample, in order to obtain an obligatory ID card (malaria card). To be able to go and work at the Talamanca area (Costa Rica) workers must present this ID after they take (LI, PO).

This strategy works really well at the legal banana plantations, because there is an agreement with the owners so they do not hire people who does not have the malaria ID. This strategy at small or independent ranchs is not working well so there has beeen an agreement, during the evaluation visit, to reinforce this strategy in Panama (LI). To reach a high coverage, stations to the take the samples have been set in small business or restaurants next to the river.
It has been discussed with the national team the fact that, this strategy could transform in a discriminatory mechanism against workers from Panama. And also that as a consecuence, business man can hire people without ID but offering them low salaries. The answer to that was no. Eventhough, there is an agreement to make an evaluation at communities in Panama to know their opinion.

Every country has a different strategy to evaluate the impact of the treatment in positives cases. In Costa Rica there is monthly control with thick blood smear with the purpose to evaluate the TDU 3x3x1 strategy and the failing indicator is

the relapse of feber event. In Guatemala all the positive cases have to give a control sample after the radical treatment. Mexico has an information system which allows identifying the repeated cases and evaluating the impact of the therapy scheme. In Panama, the guide establish that a control has to be made fifteen days after the beginning of the treatment and, if it is *P. Vivax*, it has to be taken a monthly thick blood smear for eight months (PO).

In the case of Guatemala, at the national level, the diagnosis coverage problems are obvious, only the 15% has been confirmed by laboratory. In Panama there are problems too, because of the lack of human resources to pick up the blood smear taken by volunteers. In both countries there is an over delay in the delivery of the results of the blood smear, that can be for more than five days.

In the demonstrative areas of Guatemala the laboratory diagnosis coberage and the results delivery have been improved. At the moment of the evaluation, the 85 % of the treated cases have a parasitologic diagnosis. The use of quick test has been planned, specially at the Mexico border areas.

In Mexico, there is an active search of the cases at the communities where malaria cases were confirmed. In Panama, the malaria program normative stablishes a permanent active search in all the country endemic zones; but the vector workers in Panama say that an active surveillance is made periodically, only when the vector staff visits the communities. In Guatemala happens the same.

In Mexico, there are not cases with a exclusive clinical criteria diagnosis, all the cases are diagnosed by laboratories. In Guatemala and Costa Rica there is an increase of the diagnosis made by clinical criteria and there is a decrease in of the diagnosis made at laboratories and the total number of taken samples, between 2003 and 2005. In Guatemala it is shown that there is an increase during 2001 to 2003 (see Table 13) but there is a decrease from 2003 to 2005, because the 2005 data is partial (until october). In Panama there is an increase in the diagnosis cases by clinical criteria and in the number of observed blood smears, which reflects the improvement in the service offers, but between 2003 and 2005 there is a decrease of: cases diagnosed by laboratories, of treated cases and of people who finished the treatment. This is explained because the 2005 data is partial (until October).

In Mexico from 2003 to 2005, there is a reduction in all of the evaluated indicators. Due to this country has applied the strategy for four years, this reduction can be attributed to the transmission reduction at the demonstrative areas.

In Mexico and Guatemala, there is a reduction in the average time between taking smear blood samples and the begginig of the treatment, but in Guatemala persists really high averages.

Costa Rica did not present the 2005 data, but there is an increase of diagnosed cases by laboratory and a slight reduction of observed blood smears during

2001 to 2004, which can be explined because in this area, since 2002 an improvement strategy for diagnosis and treatment started. They did not present information about the number of people who began the treatment, confirmed treated cases, cases with a complete scheme in 2001. In this criterias there is decrease between 2003 and 2005.

Table 13. Changes at the coverage in clinical services of malaria in clinics 2001, 2003, 2005

COVERAGE	Years	COSTA RICA		GUATE-MALA		MEXICO		PANAMA	
		No	RI	No	RI	No	RI	No	RI
Number of cases diagnosis by clinical criteria without laboratory	2001			15430		0		287	
	2003			1210	0,07	0		1373	4,7
	2005			79172	7,5	0		1544	1,2
Number of cases diagnosis by laboratory	2001	1363		4097		4,996		287	
	2003	718	0,5	1932	0,47	3,663	0,7	2373	8,2
	2005	1289*	1,8	1494	0,77	3,406	0,9	1544	0,7
Number of observed blood smear	2001	43123		15756				1052723	
	2003	9622	0,2	12010	0,8			166807	1,1
	2005	9204*	0,9	9172	0,8	898,275*		188191	1,1
Number of people who started treatment	2001			ND		4,996		287	
	2003			1623		3,663	0,7	2373	8,2
	2005			1311	0,8	3,406	0,9	1544	0,7
Number of confirmed treated cases	2001			ND		4,996		287	
	2003			1623		3,663	0,7	2373	8,2
	2005			1311	0,8	3,406	0,9	1544	0,7
Number of cases with a complete scheme	2001			ND		ND		287	
	2003			1623		ND		2373	8,2
	2005			1311	0,8	ND		1544	0,7
% of repeated treated cases	2001							100	
	2003					30*		100	1,0
	2005					25	0,8	100	1,0
Mean time from blood smear taking and beginning of treatment	2001			ND		ND		5	
	2003			38		7*		5	1,0
	2005			23	0,6	5	0,7	5	1,0

Source: Colective self administrated interviews at local and national level
Data 2004

Another weackness indentified in Guatemala and Panama is the samples quality control. Eventhough all the positive blood smear and the 10% of the negative ones are sent to the laboratory of national reference, by the local teams, this activity is not being accomplished and theres is no feed back of the results to the evaluated laboratory workers.

En el área demostrativa de Costa Rica existe un laboratorio en la clínica de Talamanca y dos microscopistas. El programa de control de calidad se realiza en los laboratorios centrales del país, el seguimiento de los pacientes se hace con placas seriadas.

At demonstrative area of Costa Rica there is a laboratory and two microcopists at the Talamanca clinic. The control of the quality of the program is made at the country central laboratories; the track treatment results is made with serials blood smear.

In three of the countries that sent the information, there are no changes in the number of microscopists and still, there is not a properly blood smears quality control system.

Table 14. Changes at the quality control of the laboratories

COVERAGE	Years	GUATE-MALA No RI	MEXICO No RI	PANAMA No RI
Number of trained and microscopists licensed	2001	3	12	13
	2003	3 1,0	12	13 1,0
	2005	3 1,0	12	13 1,0
Number of the microscopists evaluated	2001	3	12	13
	2003	3 1,0	12	13 1,0
	2005	3 1,0	12	13 1,0
Number of evaluated blood smears	2001		ND	
	2003		ND	
	2005	7988	ND	
Number of fake positives	2001		ND	0
	2003		ND	0
	2005		ND	0
Concordancy by specie	2001		ND	100%
	2003		ND	100%
	2005		ND	100%

Source: Colective self administrated interviews at local and national level

Elimination of human infection sources

Based in empirical evidences and in some non published studies, Mexico has formulated as a hypothesis that the malarious houses and repeated cases are the cause of persistence of malaria at the localities. To eliminate the hostess when a case appears, they make an active search of feverish patients in the community and they treat the patients and their families with the TDU 3x3x3 scheme (PO, LI). This scheme,consists in giving a treatment with just one doses of cloroquina, primaquina for three months, then three months of resting and then the repetition of this cycles during three years.

Based on the natural history of the *plasmodium vivax*, the mexican technicians, affirm that most of the relapses (feverish repeated events in confirmed cases) happened at the first two months, at sixth and ninth month; because of that, the patients should be treated in this months to avoid the development of *plasmodium* and the transmission is also eliminated. The Mexican technicians affirm that the human hostess should be eliminated, including the family members even when there are no symptoms (NI).

In Costa Rica demonstrative area, in adition to the radical treatment a modification has been made to the TDU 3x3x3. TDU cycles are applied, for three months and three month of resting, until one year is completed (TDU 3x3x1). This scheme is used only to steady residents, because there is floating

population that lives in Panama but goes to work at the banana plantations in Costa Rica (OP, EL). The TDU 3x3x3 or its modification 3x3x1, is hard to applied in areas with a high temporary migration, that is why in Mexico and Costa Rica is used specially for residents and permanent workers.

Guatemala do not use any strategy to reduce the *plasmodium* hostess. In Panama, the case is followed with thick blood smear controls during eight months for *P. vivax* and 5 months for *P. falciparum*. The fact that Panama give the treatment to all of the family members and neighbors of a positive case, without making the thick blood smear tests, means that this is the strategy to reduce the human hostess (LI).

In Guatemala and Panama the TDU 3x3x1 have not been adopted because they argue that there are no scientific evidences to adopt the strategy, which coincides with the PAHO experts. In adition PAHO (Dr. Marquiño and Carter) support that the doses of primaquina are small and there is a risk to create resistence. To avoid this problem, Costa Rica decided to give first a treatment of radical cure and then begin the TDU 3x3x1 (LI).

2.2.3 Vector control

EHCA and biological techniques for larvae control

The application of the physic elimination of habitats of anophelines breeding places (EHCA), has been adopted by all of the visited countries and the members participate actively at demonstrative areas. In the Handbook, two patterns for the application of EHCA have been definied, related with the prevalent anopleline specie, so the strategy can be defined as a selective vector control. In Guatemala there are other prevalent anophelines, so the national team agrees that is neccesary to develop other EHCAS patterns (NI).

The Mexican technicians say that one of the essential requirements of the EHCA strategy is the pre and post evaluation. In fact, in Mexico, this requirement is strictly accomplished with the EHCA promoter participation in the community (NI). One of the weaknesses in the work, in Panama, Costa Rica and Guatemala is that in the EHCAS activities theres is no pre and post evaluation. In the case of the first two countries, the population have not been trained to evaluate, in a simple way, the result of the acitivities of vector control (PO).

In Panama, motivation methods as the competition between communities are used. They make cleaning activities every week, covering one hundred meters from the community; where they cannot clean, they filling in. They make area divitions for the cleaning at each one of the sectors (streets) in the community, the city major gives a prize to the cleanest streets and the ones that do not have red cards (see next section). In the following holidays the “cleaning queen” will be elected. People do not ask for money for them, only for some incentives as a throphy (LI).

In Guatemala the project gave hand tools to the communities, but in Panama the communities are complaining about the delivered quantity (four wheelbarrows, shovels, etc,.) (LI).

The use of larvivorous fishes (gambusia puntata) is the biological technic of larvae control used for all of the countries. The use of endemics species from the same area, which are carried from a breeding places with low larvae positivity to another one with high density, guarrante that depredator species ca not be introduced to change the local fauna. In Guatemala and Mexico, there are pre and post evaluations of the control larvae activities.

.In Central America and Mexico are previous experiences about the use of other biological technics for larvae control, as the use of bacillus spherical, the same which is used in some countries. The studies about the impact of using nematodes concluded that this technics is not applied in big scale and that´s why it has been rejected as an alternative (Galindo, 2005).

Home improvement and promotion of personal and family hygiene

The strategy of clean house and clean patio is also adopted by all the countries. The “white washing”, which consist on painting the house walls with lime (especially in the malarious houses), has been adopted by Mexico and Costa Rica. Panama and Guatemala are planning the introduction of this method (PO, NI). Honduras also reports the implementation of this strategy in the malarious houses and houses next to breeding sites.

A strategy to reinforce the intervention of clean house, clean yard, drainage and breeding sites cleaning has been created in Panama. Because of the presence of epidemic outbreaks of dengue, the Ministry of Health and the Presidency, agreed to give green and red cards after the house controls. The green cards are for clean houses, clean patios and for houses with drainages or breeding sites cleaning.This measure has been applied in demonstrative areas (Bisira and Barranco Montaña Adentro) by the the vector staff and the general medical. In the other case, when the houses are not clean, the Ministry of Health (MOH) can give fines and sometimes, by the medical version and the present inhabitants, they have to go to the police (PO, NI).

This strategy, which was a success in Bisira, became a discriminatory rule at the native area of Barranco Montaña Adentro. According to some of the young leaders of the Malaria Committee, the red cards were just delivered at the houses, without the community had recived trained about this methodology. That action was received as an aggression, because the health workers told that malaria was produced because of dirtiness and carelessness. And also because of the discrimination that exists in health services. This casuse a reaction from young people to organize the community to keep the houses and yards clean, but more as a reaction to that negative intervention. So the difference between Basira and Barranco Montaña Adentro was that in the first one, the health staff visited house by house educating the population about malaria and dengue during the base line study, and also they set a legal

framework for the fines while in Barranco Montaña Adentro that did not happen (PO).

Reduction of the contact vector-person

Even in the whole area there is experience about mosquito nets impregnanted with insecticides, only in Honduras there are mosquito nets at the malarious houses at the demonstrative areas. In Guatemala there was a project to use mosquito nets, which is used at the nearest areas of the demonstrative localities. The projects of the Global Fund, which are being ejectuted in Honduras and Guatemala, have as one of the central strategies the use of pre impregnted bednets, which reduce the need to implement a structure for the periodical impregnation.

In Honduras and Guatemala repellent trees as “nin”, cedar and eucalyptus were sown to work as barriers that decrease the contact between vector and people. Eventhough, there are no impact evaluations about this strategy, in Honduras the sown of repellent tress (Nin, Cedar, Mahogany), have been supported by the Secretary of Agriculture and Ganadería and the banana enterprise Standard F Company, that during years have used these repellent trees at their plantations. Currently, some demonstrative municipalities in Hondura are developing seedbeds and viveros, with communitarian participation to plant in the malarious localities with a major incidence.

Elimination of adult anophelines

Mexico and Costa Rica stopped the insecticides use to control malaria since three years ago. As it was described, with the exception of Panama that made a Sumithion spraying, insecticides for malaria were not used before and since the beginning of the project at the demonstrative areas (NI, LI).

According to the interviewed people *“at the beginning it was a little bit hard to change the vector staff mind about the chemical control to the ecologic control. In Guatemala, we do not use persistent chemicals, eventhough we are decreasing the quantity of organ phosphorated chemicals and used piretroides”* (LCI). In Guatemala, has been used at national level Fenthión 2%, Propoxur 40% and Deltametrina (wetter powder). In Panama Fenitrithión PH 40% is used to control malaria, but not at the demostrative areas.

At national level, there is still an extense use of insecticides to control dengue and chagas at national level. As there are no cases of dengue at the demonstrative areas insecticides have not been used to control them. In Costa Rica, Themefos (abate) and Ciflutryn is used; in Panama, Deltametrina for Chagas and dengue, and in Guatemala, Deltametrina al 5% wetter powder and liquid (2.7 gr/lt) to control changas and dengue vectors, as well granulated themefos at 1% to control dengue (NCI).

In relation with the problems to introduce the preventive activities, specially the strategy of vector larvae control (ie. selective control or the use of new control technics), in Guatemala there was no problem because the volunteers agreed to make larvae control (LCI), the communities are actively participating (NCI). In Costa Rica the staff has a lack of training and unknowlegde of enthomology (LCI), and in Panama is difficult to continue because there is no technical qualified staff, basically in entomology.

In relation with the reduction of vector-people contact, the limed house is a previliged strategy in all the countries, Only in Guatemala the use of bednets without insecticide is promoted. In Costa Rica there are problems in products availability because of the cost to white wash houses, the local government has donated lime.

Changes at the vector control coverage

While in Guatemala there is a decrease of the coverage in fumigated communities and sprayed houses; in Panama there is an increament explained by the presence of a malaria epidemic at the demonstrative area. Mexico presented intramural residual treatment and space treatment data on 2004, but during the observation the informants said that insecticides were not used during 2005, but there is a high number of communitarian cleaning activities (4643) in 2004. In Guatemala there is not an increase in the number of meetings carried out with the communities and there is a slight decrease at the sanitation activities from 2003 to 2005. In Panama the increament in both aspects is also slight. Again, the reason is that the 2005 information is only until octuber (Table 15).

The major progress, in both countries, is the number of localities with updated maps, which is requirement to plan the activities of vector control. Mexico does not report this information, but during the observation it was shown that there are maps in both of the visited communities. Costa Rica did not send this information.

From the four countries evaluated, only Guatemala and México has the information of physic control of breeding sites, clean houses, clean patios, and limed houses activities. Mexico has a high coverage of these activities (Table 16).

Table 15. Changes in the coverage of vector control activities

ACTIVITIES	Years	GUATEMALA No RI	MEXICO No RI	PANAMA No RI
Number of fumigated localities	2001	ND		260
	2003	46	206*	206 0,79
	2005	14 0,3		270 1,3
Number of sprayed houses	2001	ND		2175
	2003	4801	40,903*	2756 1,2
	2005	841 0,17		9500 3,4
Protected population	2001	ND	ND	21750
	2003	22980	ND	22570 1,03
	2005	3748 0,16	ND	95000 4,2
Number of meetings with the community	2001	ND	ND	ND
	2003	175	ND	ND
	2005	165 0,94	ND	ND
Number of communitarian sanitation activities	2001	ND		35
	2003	26	4643*[3]	37 1,05
	2005	28 1,07		41 1,11
Distributed Impregnated mosquito nets	2001	7050	ND	0
	2003	1166 0,16	ND	0
	2005	0	ND	0
Localities with updated maps	2001	ND	ND	ND
	2003	ND	ND	ND
	2005	175	ND	6

Source: Colective self administrated interviews at local and national level
* 2004 Data (First Semester)

Table 16. Activities of breeding sites, clean houses, clean yards, and limed houses control. Mexico and Guatemala 2005

ACTIVITIES OF PHYSICAL AND BIOLOGICAL CONTROL OF BREEDING SITES	Mexico	Guatemala
Lineal meters of river chanel cleaned	107.900	200
Lineal meters of breeding sites veenered	78.767	800
Square meters of breeding sites intervened with biological measures		0
Number of clean houses	6.000 (69%)	186
Number of clean yards	6.000 (69%)	186
Number of white washed houses (lime)	870	0

Source: Colective self administrated interviews at local and national level

2.2.4 Management and Resources

In relation with the improvement of management at the national and local levels, there is a perception of a major improvement at the national level than at the local level in Costa Rica, Guatemala and Panama. In Mexico there is agreement between both levels.

Guatemala and Mexico report improvement in both aspects. The only aspect, that do not present changes in Mexico is in the monitoring of the staff performance. In Guatemala, the valuated changes are: capability in management and investigation and in the management system. In the local level there is an improvement in equity, efficiency and quality. In this last aspect

the local level in Panama and in the national of Costa Rica reported improvement (Table 17). In Costa Rica there is a minor perception of improvement than in Guatemala, because their management and capacity system was possibly major before the begginig of the project.

In Panama, the national level reports that with the beginning of the project DDT/GEF, the management of the malaria program is stronger, registering an improvement at the local and national levels, with the formation of intersectorial and local committees, coordination with different levels in health services, application of new control strategies, and monitoring and surveillance.

Table 17. Changes in management, equity, efficiency and quality

CHANGES	COSTA RICA		GUATE-MALA		MEXICO		PANAMA	
	Loc	Nat	Loc	Nat	Loc	Nat	Loc	Nat
MANAGEMENT AND INVESTIGATION CAPACITY								
Improvement at the operative investigation capacity	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Training and development mechanisms to improve the management and direction.	Yes	Yes	Yes	No	Yes	Yes	No	
Information management system	No	Yes	Yes	Yes	Yes	Yes	Yes	
GESTION SYSTEM								
Resources planfication and distribution	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Financial system and financial management	No	No	Yes	Yes	Yes	Yes	No	
Staff developement monitoring or evaluation system.	No	No	Yes	Yes	No	No	No	Yes
Polithics of intersectorial coordiantion	Yes	No	Yes	Yes	No	ND	Yes	Yes
EQUITY, EFFICIENCY AND QUALITY								
Budget amount changes	Yes	No	Yes	No	Yes	Yes	No	
Budget, human resources and equipment distribution changes	Yes	No	Yes	Yes	Yes	Yes	No	
Administrative outcomes decrease	No	No	Yes	No	Yes	Yes	No	
Spraying costs, diagnosis and treatment changes	No	No	Yes	No	Yes	Yes	Yes	
Workers development changes	No	No	Yes	No	Yes	Yes	Yes	Yes
Medicines and insecticides availability changes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Quality changes (improvement or deteriorartion) of services	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Collective self administrated interviews at local and national level

All the countries have an specific plan and a written declaration of the national and local control strategy. With the exception at the local level in Panama, all the countries have a strategic plan. In all the countries and at all the levels, there is an annual plan, three month term plans and a purchase plan (LCI, NCI).

All the interviewed say that the current annual plan reflex the national policies to malaria control. In relation with annual plan contents the opinion of the interviewed is that they present all the elements: objectives, activities, logical frame, resources (budget), financial sources, schedule, risponsables and indicators (of process, products, result and impact) (LCI, NCI).

In relation with the performance level of the annual plan during 2004, Costa Rica and Mexico report a total performance at the local level and partial at the national level, the rest of the countries report a parcial performance in both levels. In relation with 2005, Mexico reports a total performance in the national and local level; the rest of the countries report a partial performance in both levels.

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About the non performed aspects, the reasons of no achiviement were: the delay on the NAPs hiring process, the late beginning at the local level and the delay in the disbursements. In Costa Rica the reasons are de lack of staff and the long procedures; in Guatemala the lack of finanacial resources because of a delay in the payments and in Panama the change of government and the floods. About the late payments in Guatemala, the national staff say: *"As I mentioned before, currently we are in a crisis with the funds which have not been delivered by the donator (by the moment there is an ejecution of the 97%)" (NCI).* Other reasons can be reviewed in Table 18.

Table 18. None performed ascpects and the reasons of non performance

COUNTRY	NON PERFORMED ASPECTS	REASON OF NON PERFORMANCE
Costa Rica	Comunication plan GIS Consolidation Biologic control Institucional development Laboratories Equipment	Lack of staff Long procedures
Mexico	Implementation of demonstrative areas	1. Delay of the payments of the GEF resources; 2. Delay in the payments for the operation; 3. Progressive coordination with the local, state and national level; 4. Adjustment in spending codes (PNUMA, PAHO) for the operative needs; 5. lack of specific local staff; 6. Extense demonstrative areas, far communities and difficult access
Guatemala	Volunteers training Short term training and experience exchanges Surveillance and vector control Basic equipments for monitoring	Lack of staff, motivation and communication Funding Funding Funding
Panama	Environmental interventions	Floods, change of president

Source: Collective self administrated interviewes at local and national level

All the interviewed think that the malaria control policy agrees with the epidemiologic situation. About if the financial resources are enough, only Mexico reports that these resources are enough in both levels, but they emphasized the need of and adjustment of materials and equipment

programmed. Costa Rica reports that the human resources are partial in both levels, Guatemala reports partial at local level and enough at national level, and Panama insufficient (Table 19).

In Panama, the lack of health officials for the accurate follow up of the work activities at the demostartive areas is emphasized. In Panama, the health staff is small, although there is a followment of the activities and evaluations at the demonstrative areas. In Costa Rica the is also emphasized the lack of trained staff to reinforce the GIS subject and the lack of health officials for the accurate follow up of the work activities at the demonstrative areas, because the involved staff can not make a full time work:

> *"The staff do not work excusively in Malaria, not even exclusively in vector control, they are not well paid, there are difficulties with the transportation and the access to most of the areas. The area is too big, 2809.51 km2 for only 16 health inspectors who does not work exclusively in Malaria" (NCI).*

Only, the local level in Costa Rica reports that the material resources are enough, the rest think that they are partilly enough. In Guatemala, the opinion is:

> *"According to the programed (the resources) are enough eventhough the third payment have not been delivered, currently we have a financial deficit and scarcity of material to continue the project" (LCI).*

About the supporting systems functioning, Costa Rica has the best perception (good, at national and local level) and Panama at the national level. There are disagreements between Guatemala and Panama about the national and local level, but those differences are not higher in a category (Table 19).

Table 19. Opinion about the adecuation of malaria control policy, the resources adequacy and the supporting systems functioning

ITEMS	**COSTA RICA**		**GUATEMALA**		**MEXICO**		**PANAMA**	
	Loc	**Nat**	**Loc**	**Nat**	**Loc**	**Nat**	**Loc**	**Nat**
Policy in accordance of epidemiological situation	Yes	(Yes)	Yes		Yes	Yes	Yes	
Resources are enough:								
Human	Partial	(P)	Partial	(Yes)	Partial	(P)	ND	
Financial	Partial	(P)	Partial	(P)	Yes	Yes	Partial	
Material	Good	(P)	Partial	(P)	Partial	Yes	Partial	
Opinion about the systems functioning:								
Logistic	Good	(G)	Regular	(G)	Good	(G)	Regular	(G)
Acquisitions	Good	(G)	Bad	(Re)	Good	(G)	Regular	(G)
Transportation	Good	(G)	Regular	(B)	Regular	(Re)	Good	(G)
Mantenance	Good	(G)	Bad	(Re)	Regular	(Re)	Good	(G)
Staff management	Regular	(Re)	Regular	(G)	Good	(G)	Good	(G)
Priority definitions	Yes		Yes		Yes		Yes	

Source: Collective self administrated interviews at local and national level
P = Partial; G = Good; Re = Regular; B = Bad

In Costa Rica the staff management system is the lowest valuated. In Guatemala there is the lowest perception about all the supporting systems, specially the acquisitions and the staff management, in Mexico the transportation and maintenance and in Panama the logistical system and acquisitions system are the lowest valuated.

The funds of all countries are administrated and the project ejecution are controlled by the PAHO´s national offices. Guatemala and Panama do not receive the funds on time. The explanation on the delay is the fact that there are countries that have delayed the ejecution, specially Mexico, so there is extra money at the PAHO in Washington, which determines that the donator do not send the funds. With the exception of Costa Rica, where the National Coordinator (NAP) was not hired, the rest of the countries spend the funds according with the budget (NCI, LCI).

In general, there are not big problems that can affect, in a significant way, the management of the project. A common fact that affects the management in all the countries is the lack of support by the superior levels. In relation with other problems, they are different for each country: in Costa Rica the lack of intersectorial and interinstitutional coordination, in Guatemala the lack of supplies and the support of the superior level and in Panama the lack of equipment and supplies and, in the beginning, the lack of support by the superior level, but at the moment of the evaluation it already improves. (Table 20).

Table 20. The most important problems of the management of the project:

PROBLEMS	COSTA RICA	GUATEMALA	MEXICO	PANAMÁ
a. Lack of planification or programming	No	No	No	No
b. Lack of leadership	No	No	No	No
c. Lack of coordination in the team and with the other levels	No	No	No	No
d. Lack of intersectorial and interinstitutional coordination	Yes	No (Sometimes)	Yes	No
e. Lack teams or supplies	No	Yes	No	Yes
f. Lack of the superior level support	Yes	Yes	No	Yes
g. Lack of training in gerencia	No	No (Yes)	No	No

Source: Collective self administrated interviews at local and national level

Supervision and follow up

Because of the staff limitations, transportation and the long distances between localities and the demonstrative areas, the number of recieved supervision visits by the local levels are just a few. Eventhough, the local and the national level teams have made an important effort to visit the localities.

Only Panama has a supervision guide at national level. All the local teams say that there is not a supervision guide and report, but at national level three of the four countries made a supervision report. Both levels in Mexico received written feed back of the supervisions and only the local level in Guatemala and the national in Panama, gave and received a written feed back.

The transportation and the supervision budget are the project fortresses, the regular follow up meetings, the agreements and their follow up. The follow up meetings are made monthly in all the countries.

Table 21. Supervision and follow up of the project activities

	COSTA RICA		GUATE-MALA		MEXICO		PANAMÁ	
	Loc	**Nat**	**Loc**	**Nat**	**Loc**	**Nat**	**Loc**	**Nat**
Number of units visited	6	3	2	6	2	2	3	15
Number of visits to localities	12	8	2	6	6	6	3	15
Number of visits received	3	0	4	1	2	2	2	15
Supervision guide	No	No	No	No	No	No	No	Yes
Supervision report	No	Yes	No	Yes	No	No	No	Yes
Writting feed back:								
Giving to supervised	No	No	Yes	No	No	No	No	Yes
Recibed by supervisors	No	No	Yes	Yes	Yes	Yes	No	Yes
Existence of the budget and transportation	Yes	Yes	Yes	Yes	No	No	No	Yes
Regular follow up meetings	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Agreements in reunions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Agreements follow up	Yes	Yes	Yes	Yes	Yes	Yes	Yes	ND

Source: Collective self administrated interviews at local and national level

Technical Assistance

In general, the perception of technical assistance is good, with the lowest average for the local level in Guatemala and both levels in Mexico (Table 22). In Costa Rica, the local level, did not report the opinion about this aspect, but at the national level they qualified as good the technical assistance received by the regional level. In Guatemala the local level perception is regular, because “it has not given in a continous way” (LCI), but the national level says that the technical assistance is good. Mexico reports that the opportunity of the technical assistance in both levels is regular. In Panama, the national and the local level qualified the technical assistance as good in all aspects.

Table 22. Opinion about the technical attendance quality, received by the local and national level

ASPECT	COSTA RICA		GUATE-MALA		MEXICO		PANAMÁ	
	Loc	Nat	Loc	Nat	Loc	Nat	Loc	Nat
Relevance	ND	2	1	3	2	2	2	2
Oportunity	ND	2	1	2	1	1	2	2
Utility	ND	2	1	2	2	2	2	2
Quality	ND	2	1	2	2	2	2	2
Mean (SD)		*2*	*1*	*2.25*	*1,75*	*1,75*	*2*	*2*

Source: Collective self administrated interviews at local and national level
Very good = 3; Good = 2; Regular = 1; Bad = 0

Comunication and Coordination

There is an accurate internal coordination in the projects. There is at least one technical meeting per month and in month before the evaluation, a meeting was carried out in all the countries. In Costa Rica there are two monthly thecnical meetings at local level. With the exception of the local level in Costa Rica, all of them inform to the superior level, pick up doubts and control agreements (Table 23).

The coordination between projects is not as satisfactory as the internal one. With the exception of Mexico that reports that they did not exchanged information between projects in both levels, the rest of the countries report that they have done it. All levels and national level in Mexico do not visit the web page, intranet, the data base or reports. With the exception of Mexico, all the national levels participates in the phono conferences, but only the local level in Costa Rica participates in it. All of them know the other countries experiences, and in exception of the local level in Guatemala, everybody has adapted the experiences from the other places and countries in the project (Table 23).

The Regional Operative Committee meetings and the technical visits to Honduras, Guatemala and Panama are the mechanisms used to know the other experiences. The team from Guatemala remarks the experience with “nin” trees (Honduras and Nicaragua), the seed fish, the communitarian participation (Honduras and Mexico), the epidemiologic surveillance sytem in Nicaragua, the work with small and big engineering environmental modification to control breeding sites in El Salvador and the puppet shows in Costa Rica. Mexico valuates the experience in Honduras, with the majors participation in the actions with the demonstrative community.

The replied aspects are: the organization and communitarian participation strategy, the puppets use, the larvae control of breeding sites (NCI, LCI), the municipality vinculation through the sensibilization, meetings or workshops to promote the project and to establish the pro-active collaboration links (Table 23).

Table 23. Evaluation of the internal and interprojects coordination

Internal	**COSTA RICA**		**GUATE-MALA**		**MEXICO**		**PANAMÁ**	
	Loc	**Nat**	**Loc**	**Nat**	**Loc**	**Nat**	**Loc**	**Nat**
Number of technical meetings per month	2	1	1	1	2	2	1	1
Number of meetings during the last month	2	1	1	2	2	2	1	1
Report to the superior level	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
To Pick up doubts	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control of agreements	Yes	Yes	Yes	Yes	Yes	Yes	Yes	ND
Interprojects								
Information exchange with other projects	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Access to the project´s web site	No	Yes	No	Yes	No	No	No	Yes
Contributions to web site	No	No	No	Yes	No	No	No	Yes
Access to the project´s Intranet	No	Yes	No	Yes	No	No	No	Yes
Access to the data base	No	No	Yes	No	No	No	No	Yes
Access to reports	No	Yes	Yes	Yes	No	No	No	Yes
Fono conferences participation	Yes	Yes	No	Yes	No	No	No	Yes
Know about the other countries experiences	Yes	ND	No	Yes	Yes	Yes	Yes	Yes
The experience information from other countries has been used	Yes	ND	No	Yes	Yes	No	Yes	Yes

Source: Collective self administrated interviews at local and national level, 2005

The coordination with some institutions from other sectors at the demonstrative areas is very ample. They coordinate activities of cases clinical management, prevention, training, information and communication. It is reported a medium high level of coordination and prevails the relation in the technical aspect. The integration mechanisms are also vary, but the meetings prevail. In the Table 24 the most important institutions are presented.

The mechanisms that have used to formalize the relations are the letters of agreement, committees and agreements (Table 25).

Table 24. Activities, coordination level, type of relation and integration mechanisms from othe institutions that work at the influence area of the project.

INSTITUTION	ACTIVITY	COORDI-NATION LEVEL	TYPE OF RELATION	INTEGRATION MECHANISMS
GUATEMALA				
Cuban Brigade ONG´s Health in Action Proyect, ASDI and Global Fund	Diagnosis and treatment chats Promotion, prevention, diagnosis and treatment	Medium Medium High	Technical, Training Technical	Committees, meeting, communitarian level coordination Meetings
PANAMA				
CSS, private health facilities	Epidemiological Surveillance and treatment suministro	High	Technical	Coordination
COSTA RICA				
Caja Seguro Social Municipy of Salamanca	People attention and epidemiological surveillance Diffusion and comunication; didatic materials; Supplies for operators and some resources	Medium Low	All Logistic and technical	All All
MEXICO				
State Secretary of Health	Operation and coordinated participation	High	Logistic and technical	Coordination to superior level

Source: Collective self administrated interviews at local and national level
Type of relation: financial support, technical, logistic, training, none, others

Table 25. Created mechanisms to formalized the relation with other institutions

INSTITUTIÓN	MECHANISM OF FORMALIZATION
GUATEMALA	
Health Action Global Fund, Médicos en Acción, ASDI y NGO´s. INCAP Plaguicides technical commitee.	Agreement letters Have not been formalized (activities invitation cards) Commitment letters Commitment letters
PANAMA	
ANAM, MIDA, ADUANAS, MIGRACION	Comités
COSTA RICA	
UNA/IRET MINAE (Envoronmental Min.)	Intention letters Agreements
MEXICO	
State Secretary of Health Universidad Autónoma de San Luis Potosí Nacional Institute of Public Health	Agreement letters Agreements Agreements

Source: Collective self administrated interviews at local and national level

Resources

In relation with the number of the health staff at the visited demonstrative areas, only in Costa Rica there is an increase in the volunteers and microcopists. But in the same country, there is discrease in the vector workers, during the five year period. In the rest of the countries, there are no changes. In Mexico there is an important increase of enthomologists and in Guatemala, even it does not present a number in the self administrated interview, during the observation visit it was shown the presence or this resource; in the rest of the countries one of the lacks at the demonstrative areas is the absence of this kind of staff.

Table 26. Health Staff changes at the demonstrative areas

	Years	COSTA RICA		GUATEMALA		MEXICO		PANAMA	
		No	RI	No	RI	No	RI	No	RI
Number of volunteers	2001	3		2		349		0	
	2003	3	1,0	2	1,0	349	1,0	0	
	2005	10	3,3	2	1,0	349	1,0	0	
Number of microscopists	2001	0				4		1	
	2003	1	1,3			4	1,0	1	1,0
	2005	2	1,5			4	1,0	1	1,0
Number of entomologys	2001	0				9		0	
	2003	0				12	1,3	0	
	2005	0				25	2,1	0	
Number of vector control workers	2001	25		1					
	2003	18	0,72	1	1,0				
	2005	16	0,88	1	1,0				

Source: Collective self administrated interviews at local and national level

In general, during the last five years there are no important increases at the health demonstrative areas of the project. In Costa Rica has been created a clinic and in Panama, a laboratory in a hospital during the ejecution of the project. It´s important to notice that there are just few hospitals or ambulatories facilities with laboratories.

Table 27. Changes in the number of health services at the demonstrative areas

Services	Years	COSTA RICA		GUATEMALA		MEXICO		PANAMA	
		No	Rl	No	Rl	No	Rl	No	Rl
Number of clinics, hospitals or "A" Health Centers	2001	2		1		ND		4	1
	2003	2	1	1	1	ND		4	1
	2005	3	1,5	1	1	ND		4	1
Number of hospital beds	2001			30		ND			
	2003			30	1	ND			
	2005			30	1	ND			
Number of clinics with laboratories	2001	1	1	1		ND		3	
	2003	1	1	1	1	ND		3	1
	2005	1	1	1	1	ND		4	1,3
Number of ambulatory services	2001	8		0		ND		16	
	2003	11		0		ND		16	1
	2005	11	1	0		ND		16	1
Number of ambulatorio services with laboratory	2001	0		0		ND		1	
	2003	0		0		ND		1	1
	2005	0		0		ND		1	1

Source: Collective self administrated interviews at local and national level
Increase reason(Rl): 2003= 2003/2001; 2005= 2005/2003
1= no variation; < 1 = reduction; > 1 = increase

2.2.5 Intersectorial coordination policy and conection with other projects

The presence of the Commission of Environmental Cooperation for America of the North (CCA) in the Steering Commitee and the Comisssion for the Environmental Cooperation for Development (CCAD), give multi sectorial presence, but there is a recommendation to integrate an environmental representant for this Committee, which is going to help to link this sector with the project. The Steering Committee and the Operative Committee are ruled by the agreement with PNUMA/GEF, eventhough it is recommended to extend the participation of other actors, specially agriculture and environmental actors, to make alliances and guarantee the sustainability (RCI).

The National Operative Committees have a much more multisectorial constitution, with the participation of the Ministry of Environment and Agriculture delegates, and also the delegates from different departments of the Ministry of Health. Eventhough in all the countries is recognized that the presence of other sectors, especially the environmental, is weak (NCI, LCI). Panama and Belize said that one of the problems is that there is no participation of the environmental national authority in the project, especially in the focal points of the Stochholm Convention (RCI).

At the demonstrative areas level, the local operative team, is constituted by health and vector staff, but in all the visited countries there is an effort to improve the coordination and participation of the municipalities, universities and other institutions related to environment and agriculture (PO).

Nicaragua has integrated the research centers of Leon University, (focal groups of Stocholm Convention) and Mexico integrated the Universidad Autónoma de San Luis de Potosí, the National Institute of Public Health, the Institute of Health and Demography and the Universidad Nacional Autonóma de Mexico (UNAM). To these efforts, is necessary to establish the roles of the different partners in the project.

The Major of Talamanca (demonstrative area in Costa Rica) was invited to the Regional Operative Committee meeting. The Major said how important is the community and municipalities participation as community representants; he affirmed that is necessary to support the malaria control strategy. He also said that the municipality can support the malaria and dengue control campaign. The major also offered to create a commission for malaria and dengue at the municipal level, and to introduce the development plan against malaria in the area, with topics as: land use regulation, legislation for the control of breeding sites which is one of the weak points identified in Mexico and also the infraestructure to allow the elimination of the breeding sites in a long time term (RCI, PO).

In Guatemala, the municipality participates in the project through the Development Municipal Council (COMUDE) meetings, the Health Municipal Comision and through the health meetings.

> *"These health meetings are integrated by the local representants of all the communities which form the municipality. It is chaired by a member of the municipal corporation and priority health problems are disscused; the communitarian leaders are incorporated at the project activities at this forum. At the local level, this project is lead by the local power, which is in charge of the prevention and vector control activities" (LCI).*

In Panama, the municipality participates in technical and operative meetings. In Costa Rica, the municipality gives the logistic support and also the educative material and some of the supplies to manage malaria at the demonstrative areas. The participation *"was small at the beginning, currently the Major is sensible with the project and with the problem of vector illnesses and we create the Council Comition Againts Malaria and Dengue" (LCI).*

In Costa Rica, the municipality have not given money, the MOH and community resources have been used; the municipality just gave money to the health fair. In Guatemala and Panama, the municipality and specially the auxiliary majors or the corregimiento representantes (RCI) are involved in the project. In Mexico, they support the prevention activities (limed, tools for communitarian work) and promotion of the participation in surveillance (they use the volunteers net to take samples), treatment (fulfillment of the treatment schemes), communitarian preventive work and in the family hygiene and house cleaning. In Honduras, the Majors have signed agreement letters to be able to transfer funds in the local level and to make environmental interventions; the funds are manage by a tripartite commission (the Major, a Representative of the Civil Society and a Representative of the Health Secretary of the local level).

One of the most important difficulties to apply the control strategy in the area and specially in Costa Rica, is that there are a high immigration flows, that according to the interviewed, it requires a coordination between the risponsable entities for agricultural development, Caja de Seguro and municipalities. With Panama is important to homoginise the treatment schemes. Honduras, at the Regional Operative Committee meeting report, says that inter programmes meetings, community meetings and agreement letters between municiaplities have been made.

In general, the participation of the private sector, specially the private companies, is minimal. Mexico says that the private sector participates at the community participation promotion (to encourage the participation in the communitarian work for the family and house transmission control). In Costa Rica there is a good participation specially of the banana business men, who are integrated to the health committees at the affected areas

> *"the banana plantations of the area make environmetal actions to control breeding sites at their water chanels and they cooperate with the Malaria Card obligatiory law" (LCI)*
> *"they will cooperate with resources (financial) and they also pay the availability of some staff to support the programs at the health areas" (NCI).*

Guatemala and Mexico, Panama and Costa Rica have border demonstrative areas. There have been made inter border meetings in Guatemala and Mexico, but they did not agreed joined activities. Between Panama and Costa Rica, exists the Technical Cooperation Proyect (TCC), agreements between health ministries of both countries, there have been made technical operative meetings and joined activities for integral control. They also give treatment supplies loans, and attention to patients in both borders without caring abouth the nationality.

From the four visited countries, only Guatemala has a Global Fund Project to control malaria, but the demonstrative area of Oaxaca is not included in the project, but Alta Verapaz is. This project began two months before the evaluation visit. The NAP is part of the technical group and part of the MCP by the PAHO. The PAHO just invited the Global Fund participate in the regional meeting made in Costa Rica.

In relation with the intersectorial coordination achievements, Costa Rica is the country wich reports more achievements. It is common for all the countries the joined programming, the consultancy and the technical and political support. (Table 28)

The most important problem about the interinstitutional coordination in Costa Rica is the lack of interest of the Ministry of Environment. In Guatemala the lack of interest of the health administrative service, the lack of leadership or iniciative, the lack of support by the superior levels and a lot of leader levels at the Ministry of Health. Mexico and Panama do not report problems (NCI, LCI).

Table 28. Achievements with intersectorial coordination

ACHIEVEMENTS	COSTA RICA	GUATE-MALA	MEXICO*	PANAMÁ
Joined programming	CCSS, PAHO, Municipio	COMUDE (Yes)	CENAVECE CCAAN UASLP	ANAM, Costoms, Migration, MIDA
Financial support	CCSS, PAHO Municipio		CENAVECE SSE	
Consultancy and technical support	PAHO, CCSS	(Yes)	CENAVECE SSE	ANAM
Supply and material help	PAHO, CCSS		Municipalities	
Political support	Municipio	(Yes)	SSE	Municipality and corregimiento represenatives
Malaria Epidemiological Surveillance	CCSS		ND	MINSA and CSS

Source: Collective self administrated interviews at local and national level
***** Centro Nacional de Vigilancia Epidemiológica y Control de Enfermedades (CENAVECE), Comisión para la Cooperación Ambiental de América del Norte (CCAAN), Univ Aut. San Luis Potosí (UASLP), Secretarias de Salud Estatales (SSE)

2.2.6 Community and Social Participation Policy

All the interviewed report that there have been changes at communitarian and social participation policy and at the volunteers, health promoters and the community training (Table 29).

Table 29. Changes the politic of communitarian and social participation

SOCIAL OR COMMUNITARIAN PARTICIPATION	COSTA RICA		GUATE-MALA		MEXICO		PANAMA	
	Loc	Nat	Loc	Nat	Loc	Nat	Loc	Nat
Polithic and strategy of communitarian and social cooperation and participation.	Yes	Yes	Yes		Yes	Yes	Yes	
Volunteer, health promoters and community training.	Yes	Yes	Yes		Yes	ND	Yes	

Source: Collective self administrated interviews at local and national level

In fact, in all the visited demonstrative areas there is an important involvement and movilization of the community in the project and an active participation in the control activities, especially at EHCA activities. The visited leaders, the teachers and the community members, say that the project has made them realized about the relation between malaria cases with the presence of breeding sites, the clean houses and patios and the cleaning habits. They are also capable to identify the malaria symptoms (LI).

As the project advances, in Panama, for example, the leaders recognize how is the malaria transmission, which are the signs and symptoms and “they have realized how to avoid malaria and they hope to have a free malaria community without using insecticides”. This perception has been created because of the quick results, reached with the developed activities (LI, PO).

In all the countries, women have a principal role at the EHCA activities. In Talamanca, Costa Rica, there was just one man participating in the cleaning of one stream (PO). In each country, the communitarian teams for malaria control have a different origin and insertion. In Panama, where the localities are mainly indigenous, the government created the Indigenous Comarca, with their own government. At the comarca, a meeting was carried out with the Regional Congress Ngöbe Buglé from the Bocas de Toro region (june 2004), all the communities attended the meeting and they made a big assembly, where a person to lead the Antimalaria Committee was designated (PO).

At the native communities there is a big quantity of committees: for education, water, the comuna president, corregimiento representants, the native congress, the health committees, the local assemblies, the environment coordinators, family representatives, etc. Most of these committees are leaded by adults. Eventhough, the malaria control committee in Barranco Montaña Adentro, is constituted by young people and leaded by a young woman (PO).

At the communities in Panama, there are also authorities with the capacity to give fines, as the “Corregiduría” which is a legal communitarian institution linked to the local government (Municipality). According to the antimalaria committee members, sometimes they do not give the fines so they are not going to create enemies. Another institution is the corregimiento representatives, who are in charge of the funds distribution to support communitarian activities (PO).

In Panama, the local point of the Comarca Ngöbe Buglé and also the present leaders at the evaluation meeting, say that they are proud because the project is always made without resources. They agree that the used strategies not only help to discrease the presence of mosquitos, the strategy also helps with the hygiene (LI). One of the problems that the communitarian leaders in Panama remark, is that because that is a community without farmers, there is a lack of: resources, health staff and communication media that difficult the job of the malaria inspectors (LI). An important aspect is the fact that communitarian leaders, even when they work in malaria control, they should support other health problems. Some of them think that there are more important problems, as lack of food and work, to solve (Panama) (LI).

The communitarian organitazation in Guatemala is strong. After the armed conflict, the demonstrative areas were strengthen with a strong legal base, which was saw during the field visit. The communitarian participation is big. There are elected auxiliar majors in each community, elected by direct vote. These majors have funds to support the most important activities in the community. The vector staff gives technical support, training and works together with the communities in the vector control activities (PO).

In Mexico, the EHCA activities are developed by the families which receive a scholarship for their children, as a part of the government program “Oportunities”. When the beneficiaries receive this scholarship, they must make communitarian work. Because of the wrong information, given by a project coordinator, about that the families did not have to work at the activities to control malaria, the communitarian participation was weak. A lot of people denied their participation at the EHCA activities because they have not received the scholarship, so they do not have the obligation to do it (PO).

There are a lot of information, education and comunication experiences (IEC) developed at the demonstrative areas. Theater plays, puppet shows, posters, brochures, t shirts with the no insecticides use promotion have been elaborated (Guatemala). Training courses and workshops have been made, too. The IEC activities have been linked to the communitarian holidays, as an example in Panama, at the Bisira locality, the “Cleaning Queen" is elected (LI).

Although there is a great creativity and enthusiasm by the sanitation workers, the health staff have not been trained at the IEC activities, to evaluate and to systematize the experiences.

In relation with the schools participation, in all the demonstrative areas and specially in Guatemala and Costa Rica there is a good participation of teachers and students. Puppet shows (Costa Rica) and theater plays have been made at the schools and also some health fairs for the children. In Panama, teachers and students heve been trained at the demonstrative area of Bisira (PO).

Tecahers and students have been trained about the malaria transmission, which are the symptoms and signs and about how to control the transmission with the houses, patio and streams cleaning at the nearest places. Until this moment, the community, teachers and students know about the relation between mosquito and malaria breeding sites, the malaria characteristics and its treatment. The result is *“even the children know that when they have fever and shiverings they should be taken to the health centers”* (LI: Communitarian leader of Guatemala)

In relation with the use of insecticides to control malaria, some communitarian leaders in Guatemala, say that they do not like the application because sometimes they have dermatologic reactions as itching. In all the visited countries, the communitarian leaders realize that the DDT and persistent insecticides use can have advers effects, so they agree with the control strategies of the project.

In all the visited localities, they have maps with information about new and repeated cases, malarious houses and positive breeding sites. The vector workers in Mexico and Panama use them at the communitarian situation rooms. It is important to remark that, thanks to the experimented development in Guatemala made by the GIS, it has been used to make a communitarian situation room. One of the communitarian leaders was capable to analyze a geo referenced map of his community.

All the interviewed (in both levels) says that there is a policy and a strategy of social and communitarian partipication. In Guatemala *"there is a strategy which involves the COCODES, COMUDES, CODEDES. That means communitarian councils from the local level to the central level, these are government policies".* The documents are available at http://www.ops.org.gt/ADS/San/san.htm (NI). In Mexico there is the Official Mexican Normative for the Vector Transmited Disseases Program.

In all countries, volunteers and communitarian leaders support the opportune diagnosis and treatment. For two of the countries, is common the organization of the Health Committees, but in Guatemala there is an important participation of the Development Community Councils (COCODE), which gives and strategic advantage, that allows to introduce the malaria policy in the communitarian development plans. There are disagreements between the national and the local level, because the local level reports that there are no volunteers and health promoters (Table 30).

In relation with the strategies to know and to answer the claims of the users involvement, the local level of Guatemala reports that it does not exist, while the national level says that it does exist. Costa Rica did not aswer these questions; Mexico and Panama had a positive answer in both levels.

In Guatemala, Mexico and Panama, both levels answer that there are strategies to evaluate the quality and to increase the community sensibility. To evaluate the quality of the services, there are indicators at the monitoring and supervision system. In Guatemala it is made every week when the situation room is updated, through the health table meetings and the social auditorium which use the user interviews to determine if the health services are qualified (Table 30). In Mexico, the training is strength (communitarian informative and educative worshops, common assemblies), increase of the field visits with support for communitarian activities, link of the teachers and other local health institutions.

The used mechanisms to know and to answer the user and patient claims of the program are: the CAP study and the SWOT analisys in the base line, in Mexico there are also polls and interviews of the services acceptance by the users. To involve the users to the program activities, there has been used the existent organizative strucutures, meetings and capacitations (Table 30).

At the national level in Costa Rica and both levels in Guatemala answer that there are mechanisms for the communitarian participation: *"When the community is concentrated to participate in the health mesa, transportation and alimentation costs are given, and sometimes lodging"* (LCI). Just the local level in Guatemala reports that they have a communitarian financial strategy:".

To increase the population sensibility toward the program, the training meetings are used. In Guatemala, Mexico and Costa Rica there has been sensibilization meetings with the population and socio dramas and puppet shows at the schools, but also at the periodical visits to the communities.

In relation with the perception of the communitarian participation level, Costa Rica and Guatemala qualified it as medium, Mexico as inter medium and Panama as high. In relation with the activities with the communitarian participation, all the interviewed answer about the participation in planification, acitivities ejecution and in the home improvement and breeding sites control. The participation in diagnosis and treatment, evaluation activities and in the guide's creation is the weakest in all the countries. A positive aspect is that because of the free services in all the countries, the communities do not support with materials, transportation or economic contributions.

Table 30. Politics, strategies and activities for social and communitarian participation

SOCIAL AND COMMUNITARIAN PARTICIPATION	COSTA RICA		GUATE-MALA		MÉXICO		PANAMÁ	
	Loc	Nat	Loc	Nat	Loc	Nat	Loc	Nat
Politic written definition politic and strategy	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Mechanism/organization								
Volunteers	Yes	Yes	Yes (302)		360		No	Yes
Communitarian agents	Yes	Yes	0		49		No	Yes
Health promoters	No	Yes	0		409		Yes	Yes
Health Committee	Yes	Yes	0		49		Yes	Yes
Notification teams			Yes					
Communitarian councils of development.			Yes					
Strategies:								
To know/answer claims	NR		No	Yes	Yes	Yes	Yes	Yes
To involve users	NR		No	Yes	Yes	Yes	Yes	Yes
To evaluate the quality	NR		Yes	Yes	Yes	Yes	Yes	Yes
To increase the sensibility	NR		Yes	Yes	Yes	Yes	Yes	Yes
Mechanisms to promote the participation	No	Yes	Yes	Yes	Yes	Yes	No	No
Communitarian Funding	No	No	Yes	No	No	No	No	No
Level of communitarian participation	Medium (M)		Medium (M)		Inter. (In)		High	High
Activities								
Guides creation	No	No	No	No	No	No	No	No
Priorities identification	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Solution identification	No	Yes	Yes	ND	Yes	Yes	Yes	Yes
Activities programming	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Activities ejecution	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diagnoss, treatment	Yes	No	No	Yes	No	No	No	No
Materials and transportation support	No	No	No	No	No	No	Yes	Yes
Economic contributions	No	No	No	No	No	No	No	No
Home improvement	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Breeding sites control work	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Communitarian education Program activities evaluation	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	No	No	No	Yes	No	No	ND	Yes

Source: Collective self administrated interviews at local and national level

The demonstrative areas of the four visited countries, have indigenous grups: in Guatemala the Q'eqchi, Uspanteco and Achí; in Costa Rica the Bribrí and Cabécar; in Mexico, at the southeast region: Mayas Lacandona, Tzotzil, Tzental in Chiapas, Zapoteco and Mixtecos in transition in Oaxaca, in the northwest region: Coras, Tarahumara in Chihuahua. In Panama, the Gnöbe Buglé. In

Costa Rica, at the demonstrative area there are indigenous groups at the high region of Talamanca, *"they are not directly affected; but the problem is the native groups of Panama because they come to work at the banana plantation area of Sixaola"* (LCI).

The services are not designed, created or modified to adapt them to each ethnical group yet. With that purpose there is going to be a workshop in Bisira, at the Panama side, on December 7 of 2005. In all the sites, the health staff speak the native languages, but just in Panama and Mexico have adapted the information, communication and educative materials to the native culture and langagues (LCI).

Although in the base line there have been included variables to identify the knowledge, actitudes and practices of the population about malaria, it does not include questions about the perception or acceptance about the insecticides use, specially the persistents insecticides (LCI).

According to the interviewed people, the most important achievements by the communitarian participation are:

> In Guatemala *"They have made the project as their project and contribute to adress in the impact of decrease malaria without chemical use"* (NCI) and *"A high level of community participation have been reached to prevent and control malaria. The population knows better the transmission ways and vector behaviour. The population begins to know the most important risk factors", "… the communitarians have learned to defend theirselves against the vector by the cleaning of breeding sites and the vegetation around the houses"* (LCI).
>
> In Panama, the *"Creation of the Communitarian Committee of work and the environmenatl interventions with the participation of the community"* (LCI).
>
> In Costa Rica *"the sensibilization achieved about that Malaria is a community problem" and "The response to organize volunteer groups" (LCI).*
>
> In Mexico "*the recognition of a wealthy and diverse culture at the rural communities deserves understanding and repect in order to achieve a shared responsibility program-community, for surveillance and prevention of the malaria transmission in Mexico"* (LCI).

The principal problems of the communitarian participation, by the interviewed, are:

> In Guatemala *"they have participated but they feel that they are loosing time of work so their economy can be affected"* (LCI) and *"the credibility, because of there have been a lot of proposed projects that never were achieved. The indifference, we have some groups which are not involved yet"* (NCI).

In Panama, *"by the moment there are not important problems about communitarian participation, they only ask for the company of the health staff"* (ECL y ECN).

In Costa Rica, *"the lack of resources and the follow up and coordination because of the lack of qualified staff. The human group at the health demonstrative area is small"* . (NCI) And *"the perseverance and continuity of the participants"* (LCI).

In Mexico *"Decrease in the disease transmission, diversity, culture, language, vertical dependence that the program keeps and the lack of a communication model suitable to the behaviours or local culture"* (NCI).

2.2.7 Base Line, Information system and Indicators

Base Line

The creation of the guide allows to standarize the base linea procedures and also to obtain information for the final evaluation of the project.

In Guatemala, the base line was made with the community representatives colaboration, and the discoveries were discussed by them. In the advance reports, the countries declared that they have used the results of the base line to guide the intervetion and the adaptation to the local reality. Eventhough, Guatemala´s and Panama´s reports do not present a discussion, a conclusion and recommendations that allows to realized how they used the base line information.

Surveillance and information system

Both levels in Mexico and the local level in Guatemala and Costa Rica, report the existence of monitoring and evalution sytems, supervision, epidemiologic surveillance and updated situation room. Mexico does not have a computer program to process data, but Costa Rica and Guatemala have it. The national levels of both countries say that they do not have the updated situation room (Costa Rica) and the surveillance system (Guatemala). In Panama, while the national level answer that they have all the elements just described, the local level says that they do not have the monitoring and evalution system and the situation room updated (Table 31).

In relation with the the computer programs, Costa Rica uses FOX base, GISEpi and Excel; Guatemala uses EpiInfo y GISEPI and Panama uses Epi-Info and GIS-Epi. In Panama and Costa Rica, data bases have been elaborated in EpiInfo or Excel, but they do not have an specific computer program to process and analyse data (NCI, LCI).

In relation with the information use, the national and local level in Costa Rica and Guatemala, the local level in Mexico and the national level in Panama report the use of it in all the investigated variables. But the local level in Panama and the national in Mexico say that they do not use the information in none of the aspects (Table 31).

All countries, in both levels, have: a methodology to divide and to identify epidemiologic risk areas, a geographic information system and they exchange the information and experiences. Only the Costa Rica national level says that they do not have the methods to indentify and to predict outbreaks or epidemics yet; at the local level, this country, does not prepare with a systematic way plans of contingency; the rest of the interviewed countries have a positive answer.

Table 31. Information and Surveillance system

VARIABLES	COSTA RICA		GUATE-MALA		MEXICO		PANAMÁ	
	Loc	Nat	Loc	Nat	Loc	Nat	Loc	Nat
EXISTENCE								
Monitoring and evaluation	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Program supervision	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Epidemiologic Surveillance	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Situation room updated	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Program of procedure	Yes	Yes	Yes	Yes	No	No	Yes	No
USE OF THE INFORMATION								
Identification of risky families or groups	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Mapeo de Riesgo	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Caracterización de nivel endémico	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Selección medidas de control vector	Yes	Yes	Yes	Yes	Yes	No	No	Yes
METHODOLOGY AND COMPONENTS								
Methodology to divide/identify risky areas	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Methodology toidentify and to predict outbreaks or epidemics	Yes	No	Yes	Yes			Yes	Yes
Geographical information system	Yes	Yes	Yes	Yes			Yes	Yes
Systematic preparation for contingence plan	No	Yes	Yes	Yes			Yes	Yes
Information and experiences exchange	Yes	Yes	Yes	Yes			Yes	Yes

Source: Collective self administrated interviews at local and national level

2.2.8 Indicators

The Handbook defined the basic indicators of reference at Anex 12. The list of indicators is exhaustive and it covers procedures, products, results and the impact. Only Mexico has developed a monitoring and surveillance system, which includes all the basic indicators of reference. In the rest of the visited

countries, they are developing the monitoring and surveillance sytems, but it does not includes all the suggested indicators. It is evident, that in all the countries, because of the lack of human resources, it is not possible to collect all the suggested information. With the exception of Mexico, all the countries have not unified the formats to collect the information, specially the ones recommended at the Anex 7 of the Handbook.

Of the proposed indicators of the guide, the ones which are being used by the visited countries are: malarious houses, repeated cases (more than one febril event in a person), positive breeding sites, controlled breeding sites, Annual Parasite Rate (API). In Mexico and Guatemala, the larvae index by larvae stage is reported before and after the intervention (PO).

One of the most important indicators which are used by the communitarian promoters of the EHCA in Mexico, are the evaluated positive breeding sites by the number of positive takings, where it is not necessary to difference between the stage and type of larvae (*anopheline, aedes o culex*). This indicator is used in the before and after evaluation of the EHCA activities carried out every two weeks or monthly (PO).

The larvaria density as a predictive indicator (API) was ratified by Nicaragua in a study which reports a strong association between density and incidence (OR=3.5; p value < 0.05). This is an easy indicator, which in Mexico is made by the community members, but mechanisms to identify the realation between larvaria density and malaria cases have not been created yet (PO). Another easy indicator, used by Mexico, is the percentage of localities and families participating at the EHCA activities, which can be associated with the before and after evaluations results and the presence of new cases.

All the base line reports the API before 2004, and in the advance reports the 2005 API is also reported. This is an important impact indicator, available in all the countries, but it is not well used, because it compares an annual API (2004), with a 7 or 8 months partial API.

In Mexico, where the strategy has been introduced since four years ago, there are free transmission communities in the last years, that is why they are working to identify indicators in order to certify free transmission areas. It has been discussed the kind of use that this indicator can have in these areas, because it is a predictive indicator, which allows to introduce the prevention concept in the communities.

Impact Indicators

Because the project began just in the last 6 months its activities at community level, it is not possible to measure the impact. Eventhough, there are some of the indicators which can be used to measure the impact and it is made by the analysis of its behavior at the demonstrative areas in Panama and Guatemala, to illustrate its importance.

In Guatemala there is a trend to decrease the non standardized API between 2001 to 2003 and 2005 (Increase reason 0,4 to 0,8). But when the standarized API is analyzed by the screening effort there is a decrease from 2001 to 2003, but there is a slight increase from 2003 to 2005. But in Panama there is an important increase of APIs from 2001 and 2003 and a slight decrease from 2003 to 2005, which is significant if hurricanes are counted during the five year period. Mexico reports an API decrease from 2001 and 2004, but analizing the standarized API there is a significant increase from 2001 to 2003 and then a slight increase from 2003 and 2004. None of them report API in children less five years old, which is important to decide the convenience of the impregnated bednets use. This increase can be explained by a remarkable rediction of the transmission reduction, but also because of an incease in the positive blood smear Index and as a result of the focalization of interventions at the communities with persistent malaria and malarious houses. It is expected a remarkable reduction of crude and standarized APIs at the end of the project (Table 32).

None of the three countries report minor API in five years, which is important to decide the convinience of using mosquito nets pre impregnated with insecticides (Table 32). From the three countries that sent the information, ther is only one dead person in 2001 and 3 in 2003 in Panama, but none in 2005, even when the *P. falciparum* increased. An important impact indicator is the absence of deaths during 2005 in the three countries. This last fact is also important, because the death and severe cases risk are increasing in Central America, as well as the possibility of resistence to cloroquina, as it happened in South America. Mexico reports a few malaria cases by *P. Falciparum* in immigrants.

Table 32. Malariometric Indicators

ACTIVITIES	Years	GUATEMALA		MEXICO		PANAMA	
		No	RI	No	RI	No	RI
Non Standarized Annual Parasite Rate (API)	2001	66,2		1,05		2,98	
	2003	28,2	0,4	0,51	0,48	14,3	4,8
	2005	21,5	0,8	0,91	1,78	10,4	0,7
Annual Parasite Rate (API) Standarized	2001	66,2		1,05		6,0	
	2003	37,1	0,6	24,87	23,6	13,2	2,2
	2005	39,5	1,1	46,67	1,8*	8,9	0,7
Annual Index of IAES	2001	23,2		3,3		4,9	
	2003	17,5	0,8	0,7	0,21	5,3	1,1
	2005	12,6	0,7	0,6	0,85*	5,7	1,1
Positive láminas Index (ILP)	2001	26,5		3,16		0,6	
	2003	16,1	0,6	7,46	2,36	2,7	4,5
	2005	17,1	1,1	14,0	1,87*	1,8	0,7
% Falciparum	2001	2,4		0,07		4,2	
	2003	5,4	2,4	1,9	26,6	13,9	3,3
	2005	52,9	5,4	0,3	0,19*	56,2	4,0
Pluviosidad annual average at demonstarive areas	2001			600 – 800		152	
	2003			600 – 800		165	1,1
	2005	300		600 – 800		165	1,1
Floods or hurricanes in demo areas	2001			No		0	
	2003			No		2	
	2005			Yes		3	

Source: Collective self administrated interviews at local and national level, * 2004 Data

Another available indicator, from two of the four countries, is the percentage of positive localities and the high risks localities (more that 10 cases). In Guatemala, the high percentage of positive localities contrast with the low percentage in Mexico. In Guatemala, the percentage of positive localities in high rik is also high, compared to Panama and Mexico, which is not higher than 10%. In Guatemala, even when there is not a decrease of the positive localities percentage, there is a slight decrease in the percentage of the high risk localities (Table 33).

Table 33. Number and percentage of positive and high risk localities of malaria transmission.

ACTIVITIES	Years	GUATEMALA		MEXICO		PANAMA	
		No	RI	No	RI	No	RI
Total of positive localities	2001	159		ND		7	
	2003	169	1,1	12,247*		7	1,0
	2005	181	1,1	ND		7	1,0
Total localities	2001	184		ND		76	
	2003	182	1,06	199,391*		76	1,0
	2005	181	1,07	ND		76	1,0
% of positive localities	2001	86,4		ND		100	1,0
	2003	92,8	1,07	6,1*		100	1,0
	2005	100	1,07	ND		100	1,0
% of high risk localities and total of positive positive localities	2001	94,3		ND		9,2	1,0
	2003	85,2	0,9	2,6*		9,2	1,0
	2005	65,2	0,7	ND		9,2	1,0

Source: Collective self administrated interviews at local and national level
High risk locality = more than ten cases per year. * 2004 Data

Cost Effectiveness Indicators

With the exception of Mexico, there is not a collection of information at the demonstrative areas to get cost effectiveness of the interventions. The information sent by Guatemala have mistakes about the number of the necessary hours per square meter of cleaning borders at breeding sites.

Based on the following basic components presented by Mexico there is a cost estimated to protect 1000 houses, comparing EHCA with indoor spraying. The established parameters are the number of hours needed to clean or to modify a linear meter of river-basin, a square meter of breeding sites and a clean house and patio. Taking in mind that the salary for a 8 hours working day in the study area is USD 4.5, the estimate cost is 0.56 per hour. This cost was multiplied by the number of meters and houses. For each house it was estimated 10 meters of linear river-beds and 10 square meters of breeding sites. To be able to protect 1000 housesit´s required USD 6900, without taking in mind the cost of human resources and transportation.

Although is necessary the study of cost effectiveness, it is evident that the investment in EHCA is much lower than the spending of intramural residual treatment and space treatment.

Table 34. Estimated cost of activities for physical and bilogical control of the breeding sites

EHCA	Hours meter	Cost hour man	Supplies by meter or house	Reached Coverage (meters or houses)	Total Cost
Clearing or modification of river-beds (linear m.)	0.1	0.56	0.056	10000	**560**
Chapeo of breeding sites borders (m3)	0.3	0.56	0.17	10000	**1700**
Clean houses and clean patios	4	0.56	2.24	1000	**2240**
Total					**4500**
INTRAMURAL RESIDUAL TREATMENT	**Kg x house**	**Cost x Kg**	**Cost x house**	**Coverage (houses)**	**Total cost**
Houses	0.125	55	6.9	1000	**6900**

Geographic information System

In all the visited countries, the communities have been maped and georeferenced, with malarious houses and cases of the last two years, specially houses with repeated cases. Mexico, at the moment of the evaluation visit, was beginning the process of GIS implementation at community level, but the field workers and the communitarian promoters have elaborated maps with the information before mentioned (PO).

The most important advances of the information system have been given at the GIS development. In Guatemala, with the INCAP support, the local staff have achieved useful applications to take decisions and to make inferences in the relation between breeding sites and malarial houses (PO). Costa Rica and Panama have also developed important applications. Panama counts with the support of a geographer from the Conmemorative Gorgas Institute that collaborates technically with the health staff at regional and local level.

These applications let see the power that the GIS has for the monitoring and evaluation. In this sense, it is evident the capability that the vector and the epidemiologic staff have reached to make epidemiologic analysis and helped by the maps made in GIS at the demonstarive areas. In Guatemala, the important advance in the GIS use has been favored by the presence of the INCAP technicians (PO).

There have not been developed the GIS applications to make the monitoring interventions (dynamic applications), but skills to introduce its use have been developed (PO).

2.2.9 Sustainability and replicability: reached sinergies

Costa Rica, Guatemala and Mexico report the existence of sustainability and replication plans in other areas. In Panama the sustainability and replicability plan is in development (ECL, ECN).

Sustainability

Budget and own resources

In Mexico, the vector control program has its own budget and even the budget has been reduced in the last years, the adoption of the strategy, which requires small investments, guarrantee its sustainabilty. There is not a reduction in the vector workers, because when a worker is retired, is replaced by a new worker, which is used to redistribute the staff according to the needs. The opposite happens in Panama and Guatemala, each year the vector staff is reduced because of the workers retirement without a replacement. In Panama volunteers have been hired in order to reduce the deficit at the demonstrative areas, but this personnel can be fired at the end of the project (PO).

In Talamanca, Costa Rica, from two of the vector workers, one has a definitive designation and the other one is hired. According to Health Area Chief, these contracts are not renewed, which can affect the continuity of the actions (LCI).

Something important is that in Costa Rica there is an universal insurance and there are cross subsidies so all the services are free, that does not happen in Panama, where there are charges in the services, wich represents an outcome for the population and it becomes a barrier of access for most of the population. In Mexico and Guatemala, all the malaria control services are free.

The biggest menace for the project sostenibility is the deflection of the funds to dengue control and the mitigation of storms and hurricanes impact (OP, ECL).

During the period from 2003 and july 2005 the national and regional counterpart contribution was USD 1´445.617, the PAHO-WHO gave USD 317800 and the countries 1´118.017. This high contribution is also a sustainability indicator.

Political support and institutional and communitarian empowerment

The four countries report that malaria is one of the three health problems or illnesses that receive more financial and political support at the demonstrative areas of the project. In Costa Rica occupy the second place next to dengue, in Guatemala the third place and in Panama the first place (LCI).

In Costa Rica there is a National Emergency Law for malaria and dengue Control that formalize the political support, but in Guatemala and Panama there is not a formalization mechanism (ECL, ECN). According to the opinion of the

interviewed people at the visited demonstrative areas, because of the quick and successful results reached and the communitarian involvement there is an important institutional support of the local and national headquarters, specially in the focal points (PO).

The relation between municipalities and their involvenment in the malaria control is still incipient, but all the majors have said that they are interested to participate actively at the project introduction (LCI).

Effort and structural limitations

According to the population and the communitarian leaders, the first intervention to clean the breeding sites, required a big effort, but not at the maintenance activities, that required a smaller effort, so these activities can be kept. The problem are the extense breeding sites, which are difficult to control, because it requires machines or infraestructura investments for chanels or permanent drenage (LI).

At the demonstrative projects in Panama and Costa Rica, the problem to control malaria is more important because of the floods, tropical storms or hurricanes, that create huge breeding sites which are difficult for a communitarian resolution. Another problem that can affect the sustainability, according with the interviewed, is the temporary immigration, because of the introduction of new cases and the difficulty to apply strategies to eliminate the human reservory of plasmodium (TDU 3x3) (NCI, LCI).

According to the interviewed in Panama and Guatemala, an element which is affecting the project sustainability and replicability, is the fact that in some of the Central American countries there are haemorrhagic dengue epidemics that deflect the attention and provoke financial and political support to this problem and malaria is disregarded. For example, in Panama, the human resources that can work in malaria, even at the demonstrative areas, ca not work regularly as they should in a demonstrative project (NCI, LCI).

Risk and impact perception

By the fact of chosing communities with persistent malaria during the past 5 or 10 years, there is a high perception of risk about malaria and its effects in the community life quality, the families and the people. In relation with the impact perception, all the project partners said that the efectivity cost of the used control strategies are better than the insecticide spraying (ECL, ECN).

Training and capability to integrate new technologies

The sanitation workers at the districts, the vector workers and the community members have been able to absorb and to integrate new technologies for control and information as the GISEPI.

Replicability

One of the mechanisms that the teams identify to reaply the strategy, is the regional support and empowerment, so it has been established the need of a regional council to define the regional guidelines and strategies, followed by the national and local councils, where the regional guides can be implemented (LI).

In the case of Mexico, the project DDT-GEF is going to reinforce the introduction of the strategy in the areas that have not been able to reduce the malaria transmission, so the replicability of the project is proved in this country. In Guatemala, the vector workers are spontaneously aplying part of the strategy in the nearest areas of the demonstrative, specially the EHCA strategy (PO).

In Guatemala and Honduras is being ejecuted theGlobal Fund Proyec to control malaria and in El Salvador was made a proposal for the five round. In Guatemala there are efforts to coordinate activities at national level, eventhough the Area Director of Alta Verapaz suspects that the Global Fund project ejecution, focused in vector control strategies, can affect the ejecution of the DDT-GEF project, and the other areas can lose the opportunity, that represent the Global Fund Project, to replicate the strategy (LI).

CHAPTER 3

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

There was an initial delay because of the preparatory activities which were not considered in the project design, these last approximately from six to eight months. Effectively, the adaptation of the project to the financial processes and mechanisms, of purchase and hiring to the realities of each country and specifically to the purchase logic and the financial management of the PAHO, took more time than the expected. For this reason, the most important recommendation to the donors is to approve the extension of the project, not to do it will make to loose the opportunity of having a model highly cost effectiveness and replicable.

In the next sections the principal findings, the conclusions and the specific recommendations are discussed.

3.1. PROJECT APPROACH

The project uses an echo system approach, with five elements that characterize to this approach (Level, 2003):

1. A control and prevention strategy based in an epidemiological model of health fields (Dever, 1991), that covers interventions on four fields: i) the biological, with the clinical management of cases and the elimination of the plasmodium human hostess, ii) the modification of lifestyles such as the clean house, clean patio and improvement of the personal hygiene, iii) environmental modification, through the EHCA interventions and the elimination of the use of persistent insecticides, iv) the improvement of the provision of diagnostic and treatment services, as well as the integration of the general services in this activity.

2. Multidisciplinary approach with the integration of several professionals from different disciplines (doctors, biologists, nurses, educators, etc). Although, there are weaknesses, there is also a multi sectorial approach in the intervention. The projects in four of the evaluated countries, coordinate with the municipalities in the demonstrative areas and carrying out inter sector works. However, the “transdisciplinary” concept (Level, 2003) is still weakly adopted because very few countries have integrated universities and investigation institutes in the project. In Nicaragua, the Universidad de León has been integrated to the investigation activities, in Panama the Gorgas Institute and at regional level the San Luis Potosí University.from Mexico There are initiatives in Guatemala and Mexico to incorporate the universities in the investigation activities, but these are not formalized.

3. Community participation. In the project the community participation is privileged as central axis of the vector control activities, but its participation in monitoring activities, evaluation and accountability is still weak.
4. Equity. Due to the areas chosen as demonstrative are the ones with persistence of malaria and most of them are rural areas with native population highly vulnerable (critical poverty), the concept of social equity is accomplished. Aditionally, the focalization of interventions at the malarious houses, allows that most need people receives major interventions. However there are no definitions, or policies of gender equity.
5. Environment protection, through the integral strategy for malaria control without using persistent toxic substances.

RECOMMENDATION

It is necessary to strength the transdisciplinary approach:

1. Integrating Universities and investigation institutes to the operative studies;

2. Designing strategies, scenarios and instruments that allow the community to participate in monitoring and evaluation of the interventions, particularly in the pre and post evaluation of EHCA, clean house and clean patio;

3. Strengthening the participation of the municipalities, to insert the fight against malaria in local development plans in the context of the Millennium Goals.

It is necessary to integrate the community in the formulation of trimester plans, monitoring and evaluation of the interventions.

3.2 STRATEGY AND CONTROL METHODS

The project uses a combination of control methods that cover all the necessary effects to control malaria, surpassing the practices of the elimination period centered in the insecticides use for the control of adult mosquitoes; in the project it has been an accurate use of this method, limiting it to control of outbreaks or epidemics. Even more, in Mexico and Costa Rica it has been introduced a method to eliminate the human hostess of *plasmodium*, which is an interesting innovation of the project, absent in the recommendations and international bibliography, as it is the TDU 3x3x3 or 3x3x1. Another innovation is the houses heating and the sowing of repellent trees as methods to reduce the vector person contact. It is important to remark the low use of impregnated materials in the project. Another aspect that should be develop, specially in extensive breeding sites is the evaluation and regulation of the development projects. In the next table it is summed up the used methods and some that should be:

Table 35. Malaria Control Measures

CONTROL MEASURE	EFFECT
1. Early diagnosis and prompt treatment, chemoprophylaxis.	Destruction of adult parasites
2. TDU 3x3x3 o 3x3x1	Elimination of the human hostess
2. Insecticide spraying: house spraying and space spraying	Destruction of adult mosquitoes
3. Limed houses, repellent trees and impregnated materials: bed nets, curtains and screening of houses	Reduction of man mosquito contact
4. Environmental management and environmental modification: mosquitoes breeding sites control.	Destruction of mosquito larvae and source reduction
5. Assessment and regulation for developing projects	Destruction of mosquito larvae and source reduction

Source: Adapted from Najera *et al* (1992:14)

The countries have made adaptations to the control strategies, in such way that in each country it is applied the control strategy for malaria adapting it to the conditions, resources and national capabilities. It could give more wealth to the project, because there will be several control models with a common strategy, that is going to help the replication in diverse scenarios. The difficulty is in control a high number of interaction and confounding variables to explain the results and reached differential impact, so it is important to strongly document the differences between countries and demonstrative areas.

The characteristics of the used control strategy, coincides with the technical elements of the Global Malaria Control Strategy (WHO, 1993) and the Roll Back Malaria initiative. These can be summarized in the following aspects:

1. Risk approach and focalization of the interventions

Through the used methodology of stratification, it was selected houses or individuals, which concentrated the major number of interventions and the interventions with the major cost effectiveness. The first stage of the stratification allowed to identify the towns with bigger index of historical transmission and persistent malaria (that were prioritized as demonstrative areas of the project). The used indicators were the API, accumulated average, of the last year and the cases repeated in the last ones 5 or 10 years. In a second step it was identified to the malarious houses (defined as houses with the presence of one or more cases or repeated cases) and the repeated cases.

The interventions directed to improve hygiene houses (clean house, clean patio, and painting houses with lime) and to the personal hygiene, have been focused on malarious houses. The treatment of cases and family contacts with TDU were also concentrated in the malarious houses. In this way a more cost-effective intervention is achieved.

This strategy of stratification is used to focalize the interventions, even it has a risk approach, it improves the efficiency and the efficacy of the control strategy. This approach is applying in all demonstrative areas, but in some sites modifications have been made, such as making massive interventions in all the houses of the community, particularly massive treatments and sprayings, as in "Barranco Montaña Adentro" town in Panama.

RECOMMENDATION

To implement a field diary or note forms in which are documented: all the executed interventions, not planned interventions (particularly those that break the risk approach and the focalization of the interventions) and the reasons of their implementation.

To homogenize the interventions and if this is not possible, to document the interventions, in order to compare the results and impact in the different areas.

2. Selective control of vectors

Selective vector control is defined as the selection and application of vector control methodologies that are: the most effective, the safest, those that have the smallest impact in the environment, the cheapest and those that are better adapting to the local situation (OPS, 1999).

As it was described in the previous chapter, the interventions applied in the project are safe, they have a low environment impact and they have been adopted by the communities. In relation to the cost effectiveness, according to the information of Mexico and the opinion of the interviewed, these are low cost and more cost effectiveness. Additionally, the interventions of clean house, clean patio and limed houses are multi purpose, because they contribute to dengue and chagas control.

RECOMMENDATION

It has not been carried out evaluations of cost effectiveness, so it is necessary to formulate an evaluation protocol of the interventions cost effectiveness to be applied in all the demonstrative areas and to compare them with the traditional methods of vector control.

In relation to the adaptation to the local reality, in the Handbook (Technical Guide) two control models has been defined for two more important types of vectors. However, there are demonstrative areas in which other vectors exist, as Guatemala and in areas where the strategies have not been adapted, neither discussed.

RECOMMENDATION

According to the opinion of the national team of Guatemala it is necessary to develop control strategies for another type of vectors and for other ecosystems.

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Although, in this inception phase of the control strategy, there is a high acceptability of the communities, the presence of persistent and larges breeding mosquito sites can reduce the motivation of community people or to make the intervention ineffective. In Panama, the cleaning activities generated, as necessity, having places and technology for garbage disposal.

RECOMMENDATION

It is necessary to study engineering alternatives to encase rivers and gulches with accessible methods that have bigger sustainability than the cleaning made by the residents. The municipalities should participate actively and to introduce, as part of the development plans, the necessary infrastructure works. For that, the experience in El Salvador should be shared with the rest of the countries.

In very extensive mosquito breading sites, the endowment of light machinery (clear machion, motosaw) can facilitate the control activities. This component, should be included in a new project or to be negotiated as a contribution from the local and national governments.

To integrate in the vector control activities mechanisms and strategies to dispose and the use of garbage and waste by the communities. For example, it can be trained how to produce "compost" using the organic waste. To determine the extension of this intervention, it is necessary to evaluate how the garbage disposal and brashest is making in other demonstrative towns.

In Guatemala and Mexico there is a great strength in the evaluation activities and entomological surveillance. Guatemala has built a national net of auxiliaries of entomology. In the other hand, in Panama and Costa Rica this activity is weak, because there is not field staff in the demonstrative areas trained in practical entomology.

RECOMMENDATION

Using the experience of Mexico and Guatemala is necessary to elaborate a specific guide of entomology and to develop teaching materials to train auxiliary of entomology. It can be organized a regional course that besides approaching practical entomology, be also good to train in selective vector control.

To facilitate the visits of the workers from Guatemala and Mexico, in order to carry out training in Panama, Costa Rica, and other countries that have a need in this field.

The strategy of "Red and Green Card", formulated to stimulate the cleaning of houses and patios that it worked well in a town of Panama, it became a stigmatizing activity. On the other hand, it has not established criteria to qualify cleaning of houses or patios, so this strategy can become a subjective evaluation that does not contribute to the control of Vector Born Desease (VBD). The interesting of the strategy is the fact that was emitted by an obligatory ministerial ordinance from the authorities of Panama and it has been transformed in a compulsory strategy.

RECOMMENDATION

The strategy of "red or green card" can be a practice to be adopted in other countries, but it requires a sensitization and previous training of the families. In order to eliminate the stigmatization, in the first evaluation, it should be managed confidentially between the appraisers and the families. It could accompanied from prizes to the towns and clean houses, as the gratuitous delivery of lime to paint the houses or T shirts.

Another alternative is to use a more positive concept, to deliver diplomas of recognition in replace of the green card and confidential cards of invitation to keep the houses and patios cleaned (red card). The recommendation should be to use the red, yellow and green card in such a way that people have a perception of improvement, passing from the red card to yellow and green card.

There should be defined standards to qualify when they should give a red card or synonymous and when green; for that, the criteria of Mexico can be used as reference to evaluate the intervened houses.

The percentage of red, yellow and green cards of each community, can become indicators of improvement, because this is an easy concept to understand for the communities. It is necessary to incorporate these indicators to the situational communitarian rooms, to look the improvements through the monitoring. An example as how it can be make, is the health ladder, that is used in the Comunnity Epidemiology Guidelines (Tognoni, 1997).

3. Rapid diagnostic and opportune treatment

There is not uniformity in the treatment outlines used among the countries for the treatment of *P. Vivax*, particularly in the doses and days of primaquina prescription. This is one of the most important weaknesses in the inception model, which has been discussion reason and it debates with PAHO and CDC and it has impeded to reach an agreement that allows homogenizing the used guidelines.

In Mexico the TDU 3x3x3 is used, for this reason the radical treatment is not carried out. In Panama and Guatemala are using lower primaquina doses than

is recommended and only for five days. PAHO recommends a treatment with primaquina with a double doses for seven days (Marquiño).

The treatment outline used by Costa Rica of radical cure and later on the TDU 3x3x1, it is an alternative that integrates both the recommendations of PAHO and the one that Mexico uses, but that it is necessary to validate the efficacy of this outline.

RECOMMENDATION

It is urgent to standardize and to update the treatment guidelines used by the countries based on the current scientific evidences and to diminish the current schemes.

According to Wilmer Marquiño from PAHO, studies of effectiveness of the primaquina application for 5 and 7 days will be carried out. The DDT-GEF Project should participate in these investigations, but also to evaluate the impact of the outline used by Mexico and Costa Rica (TDU 3x3x3 and 3x3x1).

There is an important progress in the rapid diagnosis and opportune treatment, especially in Guatemala where only 15% of treated cases has laboratory diagnostic of thick blood smear, at national level. In Mexico and Costa Rica the time among the taking of samples and the delivery of results is minor as in Guatemala and Panama, in all the countries should be implemented strategies that allow to treat the cases in the first 24 hours before the symptoms begin, which is part of the goals of the Roll Back Malaria Initiative (Alnwick, 2001:1).

In Panama and in some demonstrative areas of Guatemala, the access and opportunity is very critical for the communities, particularly the natives. In Panama, in the laboratory of the demonstrative area, there is not capacity to differentiate *P. Vivax* of *P. Falciparum*. In these two countries, it can conclude that it has been given more importance to the activities of vector control than to the improvement of the diagnostic and treatment coverage and quality. In the next interventions is necessary to surpass this misbalance.

RECOMMENDATION

To train vector workers and laboratory staff of general health services of the demonstrative areas as microscopists and to increase the number of laboratories available.

In the demonstrative area of Panama it is necessary to train microscopists in order to they can distinguish between P.vivax and P.falciparum and to introduce the use of rapid test.

In Panama and Guatemala is also important to strength the net of diagnostic through involving new voluntary collaborators, the vector workers (former sprayers) and to introduce the use of rapid test.

The strategy of Costa Rica of to take samples to all banana plantation workers (from Panama and Costa Rica) and to give the “malaria card” that enables them to work, as well as the installation of positions of taking blood smears samples and notification in the frontier steps, are not just strategies to improve the opportunity of rapid diagnosis and opportune treatment, but also for the opportune detection of outbreaks and epidemics, in a context of increase of the number of cases by *P. falciparum*. However, the impact of this strategy cannot have effectiveness and to become an exclusion mechanism, discrimination and stigmatization if it is not consulted or validated with the Panamanian communities and Panama does not participate in its execution.

RECOMMENDATION

To strength and to make official the cooperation between the border demonstrative areas of Costa Rica and Panama, in the framework of the binational relationships. Two are the high-priority agreements:

1. In order to improve the access and opportunity of diagnostic and treatment of the indigenous communities of Panama, it is recommended to establish an explicit agreement so that the blood smear taken in Panama should be deliverd in Talamanca (border notification places) for the Panamanian voluntary collaborators. For that it is necessary to establish a mechanism so that Panama returns the supplies and drugs used.

2. The malaria card should become an integral health card and it should also be emitted by the Panamanian authorities. So it should be implemented in Panama the strategy that is used by Costa Rica of taking samples to the workers who cross the frontiers to detect feverish and asymptomatic cases.

3. To evaluate if the malaria card has not become mechanism of exclusion discrimination and stigma with the rural communities.

The use of rapid tests is another alternative for Panama, Guatemala and the frontier zones of Mexico, but its cost would be bigger than the blood smear. This alternative can be implanted when the number of cases diminishes, not only in these three countries but in all the projects, especially to detect cases introduced by migration or temporary work and in the areas where malaria cases and outbreaks by P. Falciparum appear.

In the Guide, there is not a normative about follow of treated people, so each country has its own policy. In the measure that the repeated cases are under surveillance, it can have an indicator of relapses or reinfections, that should be used by all countries.

In relation to the procedure of search of feverish cases, neither there is uniformity among the countries, Mexico and Costa Rica carry out active search

when the vector workers visit the areas. This is a central aspect of the strategy to improve the opportunity and coverage of diagnostic and treatment. The active search and the follow of treated people and the TDU 3x3x3 or 3x3x1 are important activities in the strategy, but they are of difficult maintenance, especially in places of restriction of human resources and of mobilization, so it is necessary to find alternatives adapted to each reality.

RECOMMENDATION

In scenarios of restriction of human resources and mobilization, it is necessary to give a more active role, in diagnostic and treatment, patient surveillance and active search of cases to the community organizations, particularly to the voluntary collaborators.

4. Elimination of the plasmodium human host

Another important element of the model is the strategy to eliminate the *plasmodium* human host, particularly of the *P. Vivax*. Of the four evaluated countries only Mexico and Costa Rica have adopted an explicit strategy, 3x3x3 and 3x3x1, respectively. Additionally, in these two countries, this treatment is administrated to all contacts of an identified case, under the supposition that where a case appears, there will be asymptomatic people, for the predilection of the mosquito with certain houses (malarious houses). The malarious houses will be potential infection sources.

In the practice, the conception of the malaria has changed, of being considered an acute illness to a chronic infection with acute feverish accesses (illness). The hypothesis is that in the absence of treatment, the feverish events can repeat until for three years because of the persistence in hepatic forms. According to the defenders of this strategy, the primaquina would not have 100% of effectiveness to eliminate the parasite of the liver, determining frequent relapses (repeated cases). Giving TDU once a week for three months, with three months of rest by three or one year, it would prevent new febrile events, and eliminating the transmissible forms and the mature parasites, would be prevented the transmission and the appearance of repeated cases. For this reason, the repeated cases would be indicators for the elimination of the human host of *Plasmodium*.

It is very probable that the combination of EHCAs and the TDU are the determinants that explain the success reached in Mexico and that it has allowed that several areas are in a phase of certification of transmission interruption. Unfortunately, there are no studies about the effectiveness of this outline of elimination of the human hosts, particularly of the hepatic forms of *plasmodium* because there are no laboratory tests to identify the persistence of hepatic forms.

The negative of countries as Panama and Guatemala to use this strategy, is based in the fact that there is no studies about the application of this strategy

with scientific validity (randomized clinical trials) and also the PAHO recommendation of no using low and incomplete doses of *primaquina* (one pill for one day) for the risk of drug resistance. Additionally, in places with deficit of human resources and mobilization constraints, it is difficult to give treatment to all the confirmed cases and their contacts with this alternative strategy, because the health workers who visit the communities only can go every fifteen or twenty days.

Because of the difficulty of identifying the persistence in hepatic forms, it is very hard to carry out experimental studies. For that, as it has been made in other interventions, with results of operative evaluations the interventions can be adopted. For that due to Mexico has an information system and documentation of cases (in the areas where the transmission has been eliminated) and particularly of repeated cases before, during and after beginning the application of the strategy, an appropriate statistical analysis (multivariate), could offer evidences of more statistical validity and generalization capacity.

RECOMMENDATIONS

To design an study to evaluate the effectiveness of the TDU 3x3x3 and to strongly document the application of the TDU 3x3x3 outline of Mexico and radical treatment plus 3x3x1 of Costa Rica, to compare them with the results obtained in the other countries that do not adopt these strategies. The impact indicator would be the persistence of malarious houses and repeated cases.

To carry out studies of resistance of the plasmodium vivax to the primaquina in Mexico.

The countries that have not adopted the strategy 3x3x3 or 3x3x1, should discuss which is the alternative to eliminate the plasmodium human host. An alternative is to carry out universal active search of current and recent fiber cases (in the whole community) and to treat all the cases and family contacts with radical treatment.

5. Reinforcement of basic information and investigation local capacity

Another of the four elements of the global malaria control strategy is the enforcement of basic and applied investigation, to facilitate and to promote the regular analysis of the malaria situation. The absence of computer programs for processing and analysis, difficult this activity. The advances in the application of the GISEPI, with the support of PAHO and INCAP, is one of the promising elements to reach this objective. In Guatemala there is a very good example of its application with the participation of local personnel and community agents.

RECOMMENDATION

To promote internships of local personnel responsible for GISEPI in demonstrative areas and the INCAP of Guatemala.

To design a computer program to process and analyze the information, that can be modified or adapted to each local reality. Another alternative is to train the local personnel in the use of EpiInfo, so they can design in this package processing programs.

To train the local operative personnel in interpretation and application of the information and surveillance system to take decisions or about the operative investigations.

Operative studies have been carried out and in function of the evidences, hypothesis and interventions have been defined and applied, however, this it is one of model's weaker aspects. In all the demonstrative projects there are efforts to take decisions based on information or studies (administration based on evidences), but this development is still incipient and it is necessary to reinforce it.

In Mexico a study about risk transmission and another of malarious houses were carried out and they were used to support the applied strategy. The results of these studies should be replied in the other countries to better sustain the strategy of vector control and the TDU 3x3x 3 strategies. Although these studies have been presented in several events, they have not been still published in scientific journals. The authors of the study agree that it is necessary to make an effort and allocate financial resources in order to write scientific papers. A study to differentiate re infection from relapses is carrying out as part of a PhD.

About painting houses with lime, it is certain that it is an intervention very accepted by the community, because contributes to the perception of cleaning and house holding and to the good image of the community in general. There is also a traditional use applying it to the base of the trees like repellent to avoid ants or insects. But there are no recent scientific evidences of their impact in malaria control.

Although all the countries have implemented the strategy of selective vector control and they have made adaptations to the proposed Guide, all the actors coincide in the necessity of evaluating the impacts and also to systematize more the experience.

RECOMMENDATIONS

It is necessary to carry out a specific workshop to formulate multi countries study protocols. Mexico could be the axis of the work, but it should also be who finances these workshops, because they have more funds from the DDT/GEF project .

It is necessary to make alliances with the universities and investigation institutes to formulate the protocols and to drive the multi countries studies. Some of the topics to study are:

1. It is important to discuss the primaquina doses and also to carry out resistance studies to the primaquina.

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2. It is necessary to make a protocol of indicators assesment, particularly predictive indicators. An example is the study carried out in Nicaragua about the relationship between larval density and API.

3. To evaluate in a more systematic way the strategy TDU 3x3x3 or TDU 3x3x1, in the reduction of repeated cases (taking this as proxi indicator in the absence of tests of diagnostic of the presence in hepatic forms).

4. It is important to evaluate and to validate the concept of malarious houses and the risk factors or the reasons about the preference of the mosquito for these houses. The study carried out by Mexico can be replied, in other demonstrative areas.

5. To introduce evaluations pre and post intervention of all the implemented strategies, particularly of EHCAS, clean houses and patios, and whitewashed houses.

6. To allocate resources to promote the writing of scientific articles with the results of the studies and about the systemation of the experience, to gain position in academic environments.

There are efforts in the countries to incorporate to the Universities and Investigation Institutes, but there is not a clear definition of the responsibilities that they should assume. Also in the project there is not a specific objective.

RECOMMENDATION

To involve Universities settled in the places where the demonstrative areas are and defining their roles in investigation, training, insert malaria subject in regular curriculum of medicine, biology, agronomy, environment , etc..

3.3 HEALTH SYSTEM REINFORCEMENT

Roll Back Malaria (RBM) was defined as a social movement with the objective of reducing the global charge of malaria, adapting the interventions to the local needs and through to reinforce the health sector (PAHO/WHO 2000: 365). The RBM goals includes: to support the endemic countries to develop their health systems as the major strategy to control malaria (WHO/RBM, 1999:1). So, one

of the most important requirements is to guarantee the sustainability of development of the health services and to act as a way to other programs of illnesses control, as well to guarantee a new model of association (World Bank, 2001) and development and to keep the needed inter sectorial collaboration between the health sector and other sectors.

Actually, the project has developed the elements of the Global Strategy of Malaria Control, and also has developed the next elements according RBM:

Institutional strength

In all the visited countries, there is a team constituted by professionals with a high technical level and in the field workers there is a continuous improvement in the abilities for: the strategy application, the communitarian work, the GIS information and the analysis capability. The project has dotted the infrastructure and basic supplies to develop the institutional capability, particularly the Information and Surveillance System through computers, GPS, digital cameras, vehicles, etc.

A weak aspect is still the follow and supervision of the project. There are no supervision guides and the feedback in some is not systematic.

RECOMMENDATION

It is necessary to formulate supervision guides and feedback formats.

Integration to the health general services

In each one of the demonstrative projects, the control strategy has been adapted to the health system and to the specific model of attention. For example in the case of Mexico where still persists the semi vertical structure from the old MCP, a good adaptation was made and an accurate use of that control strategy was developed.

In Panama, the specialized SNEM structure was used to adapt into the new necessities, even though with a lower development than in Mexico. In relation with the decentralization model, it is evident that the health personnel of general services still see the vector workers as an independent institution. Although, this has been used so the regions (general services) do not take the resources away, specially the financial, it constitutes an obstacle to be able to integrate the health personnel of general services to the activities for malaria control. In this sense, the active participation of the project focal point in the Ngöbe Buglé Comarca and the hiring of communitarian agents to integrate them to the control activities is an experience that should be extended to other communities.

In Costa Rica, this adaptation has been interesting because the specific vector workers were entirely integrated to the health areas, under the leadership of the area director, who is in charge of the entire municipality area.

In Guatemala, the remaining SNEM structure has been integrated to the health areas, even there is still a leadership and a specific structure of vector control, this has a great integration and coordination with the area leadership, which is the one that defines, in last term, the work policies at the demonstrative areas.

In conclusion, there are three models to organize the health services and attention where the strategy to control malaria has been inserted:

1. A **semi vertical model** in Mexico and Panama, with leaderships independent from the health general services and with a very good coordination with the health general services. Mexico with enough resources and Panama with lack of resources.

2. An **integrated model** in Guatemala, with the presence of a specialized team in vector control, but under the direction of the regional headquarters.

3. A **horizontal model**, in Costa Rica.

One of the most important debates in the last years, have been the influence that the elimination of the Malaria Elimination Services and the decentralization have in the weakening of the countries response to malaria control (WHO, 2000, Schimunis and Dias 1999). The project presents the opportunity to study the effecgt of three different models of services organization with a common control strategy.

RECOMMENDATION

To characterize the services organization and care models in the rest of the non evaluated countries, to be able to include as one of the variables that can influence in the differential impacts of the strategy and in the sustainability and replication capability of the model.

One of the project weaknesses in all the countries is the transportation of the vector workers. It is important to solve this problem to improve the personnel work efficiency.

RECOMMENDATION

An alternative to improve the transportation can be the purchase of bicycles and motorcycles. This will increase the performance of the malaria workers and the continuity of the communitarian actions.

Due to the project does not contemplate the financing of transportation for the operative personnel, it is necessary to advocate funds from the Ministries of Health or to formulate an additional project, as one of the requirements to secure the continuity of the project.

3.4 SUSTAINABILITY AND REPLICATION CAPABILITY

It is evident that there is a great advance in the implantation of the control strategy, that it responds to an increasing diminution of the resources and it is well adapted to these scenarios. But it is necessary to give a qualitative jump reviewing the model in each of the scenarios. For example, at demonstrative towns with resource limitations or continuous decreasing, especially in vector workers as in Panama, is important to review the model so it can respond to these limitations. With the actual resources is not possible to accomplish the activities as: the active search of cases, the samples transportation, etc.

The use of persistent insecticides to control outbreaks or epidemics and for the agriculture in some countries, represents a weakness of the project, because of economic reasons, there can be a fall back in the use of COPs to control malaria, especially at the presence of malaria epidemics by *P. Falciparum.*

RECOMMENDATION

The model has to be redesigned in the scenes with resources limitations under the following guidelines:

To strength the community participation in the samples transportation, in the active search of cases, in the epidemiological surveillance and in the pre and post evaluation of the interventions for vector controls.

In Panama, taking as a reference the experience of Bisira, to integrate the health general services (doctors, communitarian nurses, educators, etc.) in the control activities and communitarian education.

With the national teams of the four visited countries has been discussed the problem that the success of the project can have, reducing the concerning from the health authorities, the institutional support and the reduction in the communitarian participation. So alternatives to maintain the attention of the community have been discussed, as the implementation of predictive indicators of failure as: new and repeated cases and new non controlled breeding mosquito sites. The currently discussion in Mexico about to certificate the elimination of transmission is another issue to discuss in the future.

Another positive factor, but it can affect the sustainability and replication capability of the project is the fact that the required inversions are small, it does not include important purchases of insecticides, and neither machinery nor

equipments, which in a scenario of diminution of the pressure of the insecticides companies can generate lack of interest by the politicians and the authorities in the problem and to reduce the financial contributions. The presence of organized communities and the Municipalities can reduce this risk.

The use of insecticides for outbreaks or epidemics can generate the temptation to use insecticides when outbreaks or epidemics appear because the introduction of imported cases, especially if in the dengue control the strategy of vector control without the use of insecticides it is not applied.

The municipal contribution in the funding of activities to control malaria is still weak and the funding for development infrastructure to control big breeding mosquito sites have not been identify as a priority. Which, together with the fact that malaria is concentrated in poor rural areas, with a low power of demand, it can determine that once that the project is finished; the municipalities are not going to support the control activities anymore.

The presence of dengue epidemics, floods, and tropical storms create a deflection of human resources and materials to mitigate its impact.

RECOMMENDATION:

In each area, is necessary to discuss a plan to secure the project sustainability that includes strategies to secure the human and financial resources, as well as to redesign the strategy with a high communitarian and municipal participation.

An opportunity to reply the control strategy are the Global Fund Projects (GF), but is necessary to make advocacy and coordination with the GF mangers of and principal receptors to integrate the developed control strategy into the intervention areas of the project.

In the FG projects, the improvement of the coverage, rapid diagnostic and opportune treatment have been prioritized, but also the use of pre impregnated mosquito nets. If the mosquito nets are massively use without proper evaluations of its effectiveness as a unique intervention, it will go back to the same paradigm of control as the one used in the application of insecticides and will loose the opportunity to train the health personnel in selective vector control.

It is not possible to reply the strategy if there is not a budget for: i) the training in the model of control to the vector workers, the personnel of health general services and the community and ii) resorurces for mobilization, supervition and support the communities.

Additionally, is necessary to redesign educative materials for the health personnel and communitarian agents and to insert in the educative plans for elementary and high schools information to prevent and control malaria. It can be taken as a reference the material developed for the vector workers by Mancheno, Kroeger y Alvarez, entitled: “Manual Técnico para el control de

Malaria, Dengue, Leishmaniosis y Oncocercosis" (Mancheno, 1998). Recently PAHO produced educative materials in english to control malaria, that can be useful in Guyana.

RECOMMENDATIONS:

To carry out meetings at the regional level in each country where there are projects with the cartera managers of the Global Fund and the principal receptors of the projects of malaria control, to insert the control strategy in these projects.

To begin a process of regional politic incidence with the PAHO and PNUMA support, to achieve the specific budget of the state to reply the project in other primordial areas.

To design a regional project to present it to the Global Fund to reply the model in another areas of the countries.

To design educative materials for the training of the health personnel, vector workers, communitarian agents and educators. It would be important to design material adapted to schools curriculums so the children can support these activities.

3.5 MONITORING, EVALUATION AND SYSTEMATIZATION OF THE EXPERIENCE

The Guide presents a chapter of "Demonstrative Projects Evaluation", in which four evaluation aspects are described: the impact, the process, the effectiveness, and of efficacy. (pg. 91). Even though, the following section (pg 92-93) presents proxi indicators for the project evaluation, just the process, result and impact; efficacy and effectiveness indicators are not described.

Even is stipulated that every three months the National Coordinators prepare technical and financial reports, in the reviewed reports all the recommended indicators are not used because the agreed format in the convention does not allow this level of detail. Clearly, the implantation of the monitoring and evaluation system has an important delay.

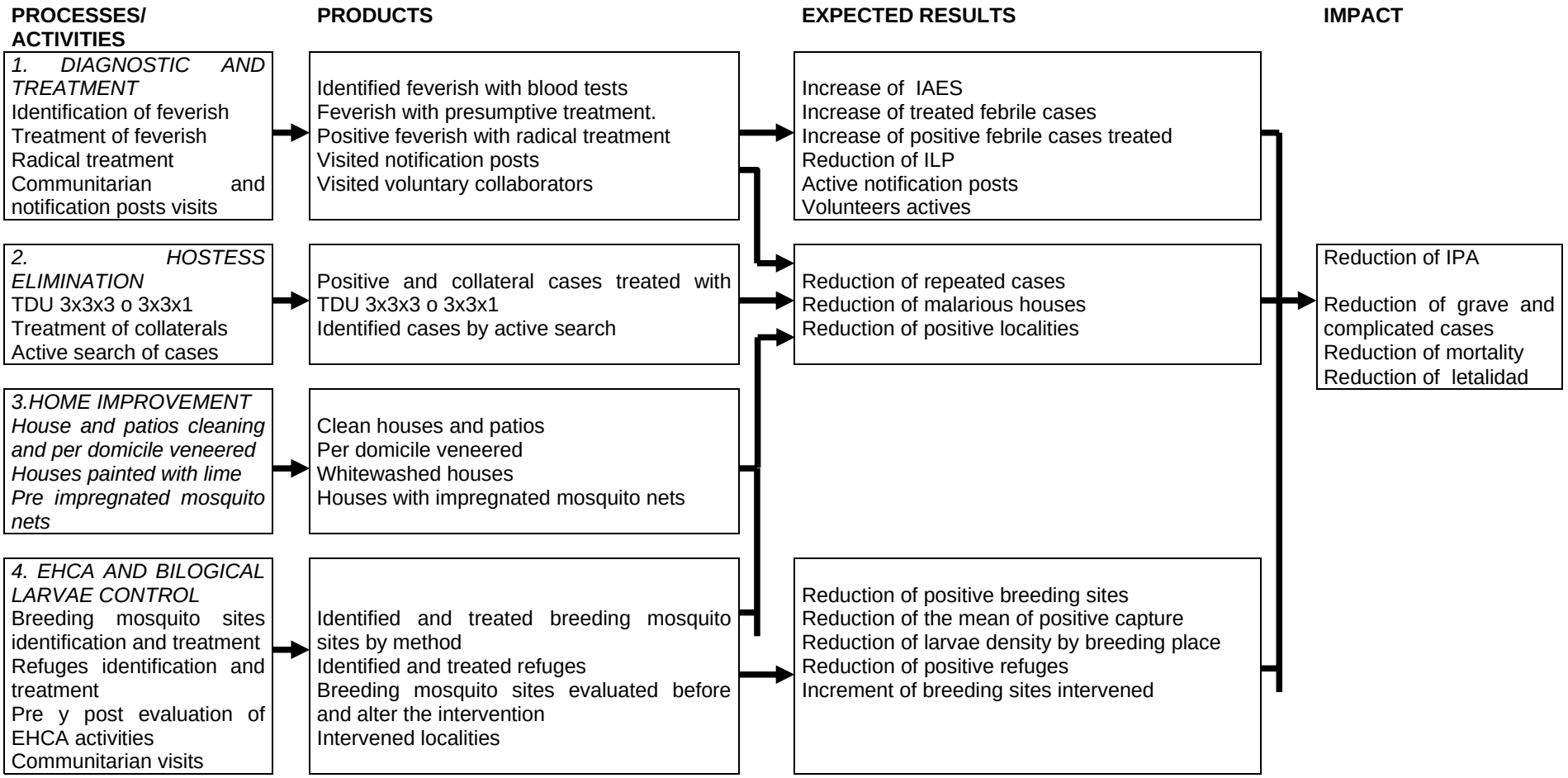
In the annex 12th of the Guide many indicators are listed, that are used in Mexico because this country disposes enough human resources. The rest of the evaluated countries are using a few indicators. Because of the fast advance of the interventions and the obtained results, to monitor a small group of key indicators will simplify the monitoring and surveillance system and will increase the acceptability.

Some of the key interventions do not have monitoring indicators, as the coverage and TDU 3x3x3 compliance. There are some listed indicators that should be redefined so they can be measurable and comparable; for example,

in the positive mosquito breeding sites, it has to be obtained the average of positive breeding sites and the percentage of the localities where an pre and post EHCA evaluation have been made.

Next, it is presented an attribution map to identify and to formulate, appropriately, the information and surveillance system:

Table 36. Attribution map of the strategy to control malaria of the DDT/GEF Project



The monitoring system suggested in the guide is incomplete, because it is not defined the periodicity, the information sources, the minimal parameters accepted and the actions to take if these parameters are not enough.

RECOMMENDATIONS

To formulate effectiveness and efficiency indicators to include them in the Guide.

For each one of the selected indicators should be defined the periodicity of report and the parameters of the minimal performance to reach. If these parameters are not reached, they should be defined which corrections should be make. The corrective activities should include a definition of what detailed information should be gathered to identify the cause of the problems. The definition of minimal parameters should be made in consensus, with the base of the reached experience until now.

Information activities have been carried out with marionette and theater plays, etc. All this initiatives have to be systematized and improved in terms of participation of experts and to identify methodology and indicators for the evaluation of the training activities, education and communication. In that sense, the experience presented in the regional conference of identification not only about knowledge, attitudes and practices, but the perception of the menace or risk compared with the perception of the intervention efficacy. An evaluation indicator is to see the decrease of the percentage of people who present a low perception of risk and a low perception of efficacy about the interventions.

Due to the areas have differences in the access to a laboratory diagnostic (number of notification points by 1000 inhabitants) and in the coverage of active search, to use the crude IPA to compare the impact between areas before and after is not an accurate indicator. This is because crude API is influenced by the rates of cases detection (ABER). For example, it is not the same an IPA from a demonstrative town in Mexico or Costa Rica with a high blood smear access and active search than in Panama or Guatemala.

Definitions and basic variables have to be unified, it is important to make these definitions with the demonstrative project of Costa Rica. Next, it is presented a suggestion of indicators which can be used, the periodicity and suggestion of minimum parameters, but they should be validated.

Table 37. Information and surveillance system

LEVEL	INDICATOR	DATA SOURCE	PERIODICITY	PARAMETER	CORRECTIVE ACTIONS
From process and product	***Surveillance***				
	% of visited localities from the total of eligible localities		Month	80%	
	Measure of blood tests by active search by evaluator day		Month	20%	
	% of the visited notification points from the total of eligible		Month	20	
	Average of treated collaterals by case				
	% of localities with CV		Month	80%	
	Communitarian Participation		Month	4	
	% of worked localities for larvae control from the total of visited		Month	90%	
	% of treated breeding mosquito sites from the total of the identified		Month	80%	
	Operatives		Month	90%	
	% of localities with updated geo indexed maps from the total of the visited			100%	
	% of intervened localities with EHCA with before and after evaluation				
	% of localities with CV or PN from the total of localities				
From results	***Surveillance***				
	Annual or trimester index of blood tests (IAES)		Year		
	Index of positive laminas (ILP)		Month		
	% of positive localities		Year		
	Rate of identify feverish by 100 inhabitants		Month		
	% de malarious houses of the total houses		Month		
	% of repeated cases from the total of the confirmed cases		Month		
	Treatment and elimination of human hosts				
	% of treated cases from the total of the confirmed		Month		
	% of collaterals (family members) of confirmed and treated cases from the total of existent family members		Month		
	% of the cases with complete treatments (radical cure x 7 days)		Month		
	% of the cases that begin TDU from the total of cases		Month		

	Adherence to TDU 3x3x3: Mean of the percents of times of taking of, from the total of taking of programmed in persons who start TDU. Average of days between the date of the day that the sample was taken and the beginning of the treatment ***Communitarian participation*** % of veneering houses from the total of eligible houses % of painted houses (whitewashed) % of houses with red, yellow or green cards (clean houses and patios) ***Entomological*** % of positive refuges % of positive breeding mosquito sites Average of the percentage of positive whitewashed by breeding mosquito sites		Annual Month Month Month Month Month Month Month		
From impact	***Surveillance*** Number and rate of crude mortality for malaria Malaria Lethality % of severe, complicated and hospitalized cases API e IPA standardized by screening effort		 Year Year Month Year		

The project is still in an insertion phase of the control strategy and there is an advance in the activities of training to the health and vector workers and the members of the community. Activities of vector control, home improvements, diagnostic and treatment of the cases and the elimination of human hosts of *plasmodium* have been carried out. The base line was completed just in the last months. Because of the delay of the implementation of activities as hiring and administrative arrangements, most of the communitarian activities do not have more than two or three months, so it is not possible to evaluate the impact that this intervention can have.

Although in the Guide there is an evaluation chapter, the methodology that will be use to evaluate the impact of the project is not clearly defined. In the evaluation design is important to take in mind that not all the countries are applying the same interventions. Currently, there are similar models about activities of larvae control, home improvement and the personal and familiar hygiene, but unlike in the aspect of treatment and elimination of the human hosts; there are localities with TDU 3x3x3 in Mexico, communities with TDU 3x3x1 and communities without TDU but treatment with radical cure for 5, 7 or days.

RECOMENDATIONS

To identify which is the contribution of the different used interventions and the influence of the social, economical and cultural facts and the organization of services in the differential impact between demonstrative towns, the following alternatives are proposed:

1. Study design: pre and post evaluation without control group

Only the demonstrative areas are taken. The base line is the pre evaluation and the final evaluation the post evaluation. To control the cofactors and confounding variables and to identify the weight and the interaction of each independent variable should use multivariate analysis.

The problem of this design is that at the time not all countries use the same control strategies and that they have different models of attention and decentralization, it would be hard to know which was the specific intervention that had a major impact or how the interventions interact. This is important to improve the final evaluation and to valid the model.

2. Study design: pre and post evaluation with control group

To compare the demonstrative localities taking them as an experimental group with other communities of similar characteristics where the old control strategy has been maintained (control group), specially where insecticides have been applied. At the time that the base line of the control communities is not available, the design would be a post evaluation without control group. Unfortunately, the control localities in some countries (Guatemala, Mexico) ca

not be close communities, with similar characteristics as the demonstratives, because the vector workers have the same areas of influence, so they cannot be taken as control localities. The selection of control communities can be constituted in a difficulty because they have to compare heterogeneous localities.

As line base has been gathered useful data to evaluate the impact before 2004, so it can be compared a period before (2001 to 2004) with a period during and after (2005 to 2007). The most important indicators to measure the impact are: the number of cases, the standardized IPA, but also the number of repeated cases. A variable that is not defined in the Guide and it is important to evaluate the impact is the rainfall rates and the presence of floods.

RECOMMENDATION

To use of standardized API by screening effort to evaluate the impact, as well as the annual index of rainfall.

Standardized API by screening effort

API was standardized using the case detection effort (ABER) for the year 2003 o 2004 (previous years for the intervention) by applying the following formula (Roberts, 1997):

APIs = (EMPSx / Population x) per 1000

APIs = Annual Parasite Rate standardized by sampling effort
x= year

EMPS= Estimate of Malaria Positive Slides

The calculations were as follows:

1. Calculate ABER for each year
   ABER = (number of slides examined/total population) per 100

2. Calculate the Slide positive rate (SPR) for each year (x).
   SPRx = (number of positive slides / number of slides examined) per 100

3. Select the year of comparison. In the present thesis, year 2000 was chosen as the comparison year, because in that year the ABER had the peak during the study period.

4. Calculate the revised estimate of the total number of slides examined for each year multiplied by the ABER of 2000 (standard year) for the population of each year (RESE)
   RESEx = (ABER2000/100) (Population x)

5. Calculate the estimated malaria positive slides (EMPSx) by multiplying the original proportion of positive slides for each year (SPRx) by the revised estimate of the total number of slides examined (RESEx):
   EMPSx = (SPRx) x (RESEx)

6. Then divide the estimate of malaria positive slides (EMPS) by the total population of Ecuador for each year in the series. These quotients, multiplied by 1,000 produced APIs standardized for sampling effort (ABER). Calculate the APIs for each year.
   APIsx = (EMPSx / Population x) per 1,000

Annual Index of Rainfall

The rainfall average will be calculated using the annual meteorological records, provided by nationals Institute of Meteorology as follows:

1. Calculate the annual rainfall of each post summing up the monthly average of rainfall of each post.

2. Calculate the total annual rainfall summed the annual rainfalls of each post.

3. Then divided the annual rainfall for the number of meteorological post.

In relation with the development of GISEPI, from the four visited countries, Guatemala and Costa Rica are the countries with a higher experimented development. In Mexico the GISEPI is in development. In Panama is required technical help to develop faster the GIS system.

The most important application of GISEPI in Costa Rica and Guatemala is the representation of the situation of malaria and the breeding mosquito sites identified in the line base, but the monitoring applications have not been developed yet. Also, each country use different indicators, data bases, and ways of representation.

The indicators used in the geo referenced maps are: new cases, repeated cases, malarious houses, breeding mosquito sites, influence radius of the hatchery and positive breeding mosquito sites.

RECOMMENDATION

To develop applications for the interventions monitoring.
To support Panama to accelerate the GISEPI development.
To unify the indicators, data base and the GIS representation ways.

In the second Regional Technical Committee were presented the results and the advances of the project, with a guide sent by the Regional Coordination. How ever, each country chose different indicators, so there was not homogeneous. These presentations are systematic instruments of the experience, but is necessary to homogenize them.

There is a diversity of experiences but is necessary to document them, for that is require to design a methodology of documentation and systematization.

RECOMMENDATION

The presentation model of the results and advances of Nicaragua can be used as a model to uniform the structure of the presentation for other countries.

It is necessary to develop a model, instruments or tools to systematized the experiences of each country and to be able to compare them. The systematization of experiences can be develop as an descriptive study of multiple cases (Yin, 1997).

3.6 DEVELOPMENT OF THE MULTI COUNTRIES NET AND EXPERIENCES EXCHANGE

The regional technical meetings have been constituted in the most important scenario to exchange experiences. Each country have develop experiences and good practices, but in all the regional technical meetings there is not enough time to present them.

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The phone conferences are a strategy of privileged communication, but it has been used more to coordinate activities than to exchange experiences. The web page and the Intranet, even they are updated with the trimester reports and with other documents, don't have a section to present the experiences and the good practices.

Exchanges about observation or transference of experiences or good practices between functionaries, workers or communitarian agents haven't been carried out yet. This is one of the requests of the local workers from all the visited countries.

RECOMMENDATIONS

To use the phone conferences as strategy of experiences exchange. To visualize the experiences can be used the Intranet so the expositors can make power point and video expositions.

To incorporate the local workers and communitarian agents in the phone conferences.

To intensify the exchanges between countries and communities, it has been suggested that the local workers and the demonstrative towns make visits or internships to see the experiences in the fields.

To assign the development of one topic to each country. For example, communitarian training or promoters training to Mexico, entomologists training to Guatemala, training in GISEPI INCAP, information system and operative studies to Mexico.

To incorporate the focal points to the Ministries of Environment, Agriculture and to local actors, specially to majors, to the meetings of the regional, local, national and malaria workers committees.

3.7 INTER SECTORIAL AND PARTNERSHIP POLICY

In all the visited demonstrative towns there is a good collaboration of the municipalities and majors. The majors have manifested their interest to participate more actively in the project, but there is not a clear definition about the responsibilities that the municipalities should have in the strategy to control malaria. Until now, they have collaborated with food or other small supplies to support the communitarian work of EHCA or to provide lime to paint the houses.

It is interesting to confirm that a high percentage of the malaria control activities can be made by the community and the municipality, with the technical help of the malaria experts.

The presence of epidemics dengue haemorrhagic in the region, have determined that the municipalities put more attention to this problem than in malaria, because there are low proportions of malaria *falciparum* and fatalities.

RECOMMENDATIONS

To integrate the responsible of the municipalities in the control strategies to design the plans of municipal development,according to the millennium golas strategies, They could plan engineering projects in order to give more sustainability to the project, because the communities can get tired of making monthly cleanings of the big and hard to control breeding mosquito sites.

It is important to sensibilize the municipalities about the effects of malaria in the social development and the obstacle that it is to reduce the poverty, because it causes great financial and laboral lost. In this sense, the major of Talamanca suggested three aspects that should be also suggested in all the municipalities of the demonstrative towns.

1. *To integrate the malaria control in the local development plans.*

2. *To constitute the municipal commission to follow malaria.*
3. *To integrate malaria control and prevention measures in the restriction of land use. For example, to regulate the permissions to build and execute public development plans, particularly at the flooding towns, where the communitarian work is not too effective.*
4. *To formulate municipal ordinances (laws) about the sanitarian, patents and companies permissions for their functioning, to improve the access of the workers to the health services and the protection measures.*

As the time that some interventions to control malaria, as clean house and clean patio, work also to control dengue and chagas, it should be integrated the municipalities to the VBD control. It was discussed with the Regional Coordination the convenience of carrying out a workshop with the majors to discuss about which is going to be the role that the municipalities should take to control malaria and dengue.

The public infrastructure plans for development and the small public plans that are carried out in the countries can have a big environmental impact and to help the spread of malaria transmission. The Municipality as the responsible of the local development should have the capability to regulate and to evaluate the potential effects of these public plans.

RECOMMENDATION

It should be, as a complementary objective of the project, to train the responsible of public plans about the environmental impact of the development plans as highways, dams, channels, etc. that can increase the breeding mosquito sites.

An important mechanism to formalize the local government's participation in Honduras, is to sign agreements with the municipalities and also with the communitarian associations, specially with native organizations.

RECOMMENDATION

The signing of agreements to formally involve the municipalities and the communitarian organizations is a mechanism that should be taken as a good practice by the rest of the municipalities.

Important advances have been carried out to integrate the Ministries of Environment, Agriculture in the project, but in some countries there is not an

accurate answer and is evident that there is not a clear definition of the institutional roles yet. For example, in Guatemala even that the Ministry of Environment have the funds to execute the Stockholm Convention, the activities have not been executed and the representative of the Ministry of Environment say that does not know how to insert it in the project. Anyway, the advance in the objectives to eliminate the DDT stocks and the studies of environmental impact, are a favorable scenario to improve the coordination with these institutions.

Although at the local level there is good participation of teachers in the project activities, at national level there is not a representation of the Ministry of Education in the Committee. This should facilitate to insert in the educational plans the risk of the persistent insecticides use in the agriculture and the alternatives of organic cultivation. This is also important to work with the Ministries of Agriculture.

RESULTS

It should be important to carry out a workshop of strategic planning where can be defined a much more inter sectorial intervention, to clearly defined the roles and the activities that each one of the institutions related with development, environment and malaria control coul asume. PNUD has developed a methodology to operate the multi sectorial approach in the strategic plans of HIV AIDS that can be adapted to the malaria control without DDT and to the reduction in the use of persistent insecticides in the agriculture.

It is necessary to link the project more with the executors of the compromises of the Stockholm Convention and to make a better pursuit of its advances. It is necessary to give a major visibility to the project and to develop a major leadership in the project to be able to make a more intense convocatory to the civil servants in charge of the Stockholm Convention.

The relation with the Ministries of Agriculture and Education has to be strength and to sign specific agreements that can clearly define their roles in the efforts to reduce the use of persistent insecticides in the agriculture.

The Global Fund malaria control projects, can be transformed in an opportunity to potentialized the project, particularly in the improvement of the coverage, opportunity and quality of diagnostic and treatment. But, if there is not an accurate coordination, can retreat the advance reached at the demonstrative towns in the vector control with the communitarian participation when the impregnated mosquito nets be introduced as the central strategy of control.

RECOMMENDATION

In relation with the Global Fund projects it is recommended to search a higher coordination with the manager officials and the principal receptors, so they can define an accurate intervention and discuss how to potentialized the projects. It would be convenient that the Regional Coordination, with the PAHO support, make a workshop at regional level with the Global Fund.

The strategy of impregnated bednets with insecticides should be introduced with a previous evaluation of the epidemiological and entomological characteristics, taking as reference the recommendations of the selective vector control.

Mexico with Guatemala and Panama with Costa Rica, have demonstrative localities in their common borders. However, there are differences in the intervention strategies particularly in the case management and the elimination of human hostess of *plasmodium*. In the Costa Rica border there is a higher institutional strengthen and a higher socio economic development, which determine a laboral migration from Panama to Costa Rica.

Without the Panama participation, the malaria card strategy, issued by Costa Rica, could be turn in a discrimination tool. Because of the deficiency of human resources and the mobilization, the improvement of the access and the opportunity of an early diagnostic in the native communities of Panama, it is not possible without the support of Costa Rica.

RECOMMENDATIONS

Costa Rica should give support to Panama to improve the opportunity and the access to diagnostic and treatment. It is suggested that should be carried out a meeting to treat the topic of malaria in the framework of the TCC agreements and should be formulated a binational plan, with the involvement of consular authorities.

In relation to the malaria card, the idea is that the people from Panama evaluate if this strategy is not a discrimination tool. To avoid that, the people from Panama should be able to issue malaria cards with binational validity and transform it into a health card.

It is necessary to unify with Panama the diagnostic, the work of the volunteer collaborators and the card.

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In the Regional Technical Committee meeting in Costa Rica it was suggested the necessity to insert the malaria control in the PAHO projects of healthy municipalities and healthy schools.

3.8 COMMUNITY PARTICIPATION

There is an important advance in the community empowerment and participation in the project and particularly in the activities of malaria control (EHCA). Even though, the approach of predominant participation in the health and vector workers is still the community collaboration.

In Guatemala, thanks to the presence of auxiliary majors, elected by direct voting, there is a permanent presence of the communities in the municipalities. This, which can be an ideal model in the relationship community-municipality can not be replied in other countries, because there are different legal frames.

In Mexico, there is a limitation in the community participation, because the presence of the "Opportunities project", dependent of the state government, has distort the community participation. The program "Opportunities" that could be an advantage have been transformed in a weakness, because is taken by the population as an obligation for families who receives. The presence of the municipalities can surpass this problem.

RECOMMENDATION

It is necessary to advance in an approach of social mobilization (REF) and communitarian co gestion, which it does not mean to abandon the communities. The inclusion of the communitarian leaders in the discussion of the Local Operative Committee, particularly in the project monitoring and evaluation, is a practice that should be invigorated.

In each demonstrative town should be discuss strategies to guaranteed the presence of communitarian leaders in the local governments.

It is necessary that the municipalities provide regulations for communitarian participation in the EHCA activities and in the public works of environmental management. The strategy of red and green cards for the houses and localities can be legislated at a municipal level as an alternative to involve all the community members.

In all the visited countries, the communitarian leaders said that even they received the training they would like to receive formal training courses about the control strategy. At the evaluation visit they could not find educative materials and explicative strategies for communitarian training.
Además, los trabajadores de campo, no han recibido de manera sistemática capacitación para el trabajo comunitario, lo que ha llevado a que el enfoque de participación comunitario predominante, sea el de colaboración y no de empoderamiento y movilización social.

Also, the field workers have not received training for communitarian work in a systematic way, which cause that health workers adopt a collaboration approach and not the one of empowerment or social mobilization.

The diffusion and the activities of information, education and communication are still weak and slightly systematized at communitarian level.

RECOMMENDATION

It is necessary for each country, to design and to validate methodologies and educative materials for communitarian training and field workers training about communitarian work. This is an essential requirement to extend the experience at national level.

The pre and post evaluation of the EHCA activities with community participation is another of the good practices that should be extended to all the demonstrative towns. This practice should be extended to other interventions, particularly to the evaluation of the active search of cases, treatment and elimination of human hostess of *plasmodium*.

RECOMMENDATION

To introduce, as an obligatory character, the pre and post evaluation of the control activities with communitarian participation: EHCA, biological control clean house and clean patio, impregnated mosquito nets in all the demonstrative projects.

The training of the communitarian leaders and agents about basic entomology is a requirement that needs the elaboration of training materials.

To involve the communities in activities as the active search of feverish and radical treatment and for the elimination of plasmodium hostess (TDU 3x3x3 or 3x3x1). In these activities the evaluation pre and post intervention should be also introduced.

The introduction of rapid tests would facilitate the communitarian participation in diagnostic and treatment. PAHO should promote the purchase of rapid tests and the inclusion of the norms in the countries, particularly in far areas.

To improve the knowledge of the community and to maintain the enthusiasm with the activities, should be developed a communitarian surveillance system. During the visit to the communities it was clear that there were some indicators that are easily understood by the communitarian leaders and members, as:

- Positive breeding mosquito sites
- Positive breeding sites in the pre and post evaluations
- Presence of new cases
- Malarious houses

- People and families who do not want to participate in the control activities and that do not want to take the antimalarial drugs.

In Guatemala, using the geo referenced maps, where is shown the presence of positive breeding mosquito sites, the radius of the mosquitoes fly, the malarious houses and the new cases, is easy for the population to relate the presence of malaria cases with the presence of breeding mosquito sites.

In the communitarian situation rooms are being used indicators, ways of graphical presentation or maps to represent the data of the line base, but it has not been validated if these indicators are understood by the community. Also, there are not systematized experiences in surveillance, monitoring and evaluation of the interventions with the communitarian participation, which is an important requirement to achieve a project sustainability.

In some communities have been documented the development of the experience with pictures, but it is not a systematic practice. Neither is a systematic practice to have a field diary, which would facilitate the systematization of the experiences. There is not a format to systematize the communitarian experiences.

RECOMMENDATIONS

To use the Communitarian Epidemiology approach to develop: scenarios of dialogue between the health workers and the community, indicators, ways of graphical representation and maps that can be easily understood by the population and the health workers.

In relation with the communitarian instruments for monitoring and evaluation is recommended the use of:

- *The change in the number and percentage of houses with red or green cards or the clean houses by locality.*
- *A dynamic mapping that identify malarious houses, repeated cases, positive breeding mosquito sites, differencing with colors the new cases (last evaluation) from the old cases. The number of repited cases per family (malarious houses), with different colors by years would allow to easily monitoring the houses that keep the transmission.*
- *To graphic the reduction of the percentage of positive breeding sites before and after the interventions.*
- *To graphic the number of houses resistant to interventions and the people who doesn't want to take the medicines and in Mexico and Guatemala the cases that abandon the TDU 3x3x3 or 3x3x1. These are predictive indicators that the community can easily understand.*

It is important to document the communitarian work trough: i) the consignment of the results before and alter the interventions with pictures, ii) to have a field daybook iii) to design a matrix of experience systematization. For this last aspect is recommended a format used in Communitarian Epidemiology (Tognoni, 1999).

In Panama was found that even the communities value the work to control malaria, there are another health and social problems (access to the services, job, alimentation) that require a solution. Because the intervention is in an introductory phase, it has not been discussed how to insert the fight against malaria in the projects of communitarian development. In the future, if the intervention is successful, this experience should help to make development projects with the communities and to support them to solve the most important problems.

3.9 PERFORMANCE VALUATION

According to the self administrated interviews, the pertinence of the objectives of the project are near to highly satisfactory, although in the formulated logical frame, there are products that are activities. Immediate effects have not been defined to be able to monitor the advances of the project. There are several results, that really are products, do not define the executors or beneficiaries performance.

As it was already explained, the period of beginning of the project lasted more that it was expected, as also the design and execution of the base line, because of this reason the evaluation of executed activities are qualified as medium satisfactory. However, because of the short time of execution of the communitarian control activities, the reached products are highly satisfactory. The major delay is in the communication component, which have different advances. This component requires a major support.

Studies about the costs effectiveness have not been made, although according to the estimation of costs is evident that the costs of integral vector control are much lower than the indoor spraying. Also, it was verified that the activities to control breeding mosquito sites (EHCAS) have been executed with the community own resources and in some countries as Guatemala, with small investments to buy the tools. The cleaning activities in houses and patios do not present an additional cost, just the whitewashing houses requires small investments that in some cases as Mexico and Costa Rica have been subsidized by the Municipalities or the State. In the first communitarian interventions it was required extend working hours to execute the activities, but in the subsequent cleanings the worked hours decreased remarkably.
Es importante recalcar que la inserción de la estrategia de control, requirió una presencia mayor de los trabajadores de vectores, lo que aunque incrementa los costos, por la reducción de los casos de malaria que ya se observa en algunas localidades requerirá en el futuro menor permanencia. Por todo lo anteriormente explicado la valoración del costo efectividad es satisfactoria.

It is important to remark that the introduction of the control strategy, required a major presence of vector workers, which increase of the initial costs; but when the reduction of malaria cases will happen (which is observed in this evaluation in some of the localities) the cost and workers presence will be reduced.

Because of all the explained, the cost effectiveness valuation of the project is satisfactory.

The interviewed people qualified the impact as near highly satisfactory, but because of the short time of the local intervention is not possible to evaluate the impact. It is possible the high evaluation from the interviewed is because they assume that the good performance of the reached results as impact.

Until the moment of the evaluation, the project sustainability is qualified as satisfactory, because: there is a great empowerment of the control activities in the visited communities. The risk and efficacy perception in the interventions in the community and the health workers is high; the costs and efforts are lower than the lost in the working days that malaria represents. The activities of vector control (EHCAS) and the home and personal hygiene improvement, if it is supervised, can have a high possibility of insertion in the people's culture and to become a daily activity.

At local level, the partner's participation, particularly the communitarian leaders and teachers, is highly satisfactory. The increasing involvement of the Majors and other municipal and governmental authorities at local level is satisfactory. There is not an involvement of ONGs in the local projects because they do not work in specific topics of vector control.

At national level, the coordination between National Coordinators (PAHO) and the focal point of the Ministry of Health is also highly satisfactory. But the involvement of other institutions is not like that, especially of the Ministries of Environment and Agropecuary that in two of the visited countries (Panama and Guatemala) is weak. With the exception of Nicaragua and Mexico, the participation of the universities is incipient. In general, the partner's participation can be evaluated as satisfactory.

The opinion of the communitarian leaders, the local health workers (of general services and vectors) and of the national civil servants about the project is highly positive. Because of the advance status of the project, the valuation about the country empowerment can be qualified as satisfactory.

The Guide defined a methodology of implementation of the project, all the countries applied in general terms these guidelines and have adapt them to time of the communities and resources of the country, the local and communitarian services. The evaluation of the implementation approach is satisfactory.

The delay of the disbursement to the countries, create uncertainty and they do not allow to compromise money, so the evaluation of the financial planning is moderately satisfactory.

The reliability of the project is qualified also as satisfactory. But the monitoring and evaluation in one of the weaker aspects, so its qualification is moderately satisfactory.

Table 38. Performance valuation of the project DDT-GEF

PERFORMANCE	SATISFACTION LEVEL				
	HS	S	MD	US	HI
Score	5	4	3	2	1
	No %	No %	No %	No %	No %
Pertinence of planed objectives and results		X			
Reached activities and products		X			
Cost effectiveness		X			
Impact (non applicable)					
Sustainability		X			
Partners participation	X				
Country empowerment		X			
Implementation approach		X			
Financial planning			X		
Reliability		X			
Monitoring and evaluation			X		

HS= Highly satisfactory; S= Satisfactory, MD= Moderately Satisfactory, US=Unsatisfactory, HI= Highly unsatisfactory

3.10 LESSONS LEARNED

3.10.1 Design and approach of the project

The delay in the implementation of the project, establishes the need to define more real times for the projects execution, particularly in the multi central projects (regional), because of the problems to adapt the project to the institutional structures of the participant partners. The time of a regional project with the actual complexity, should considerate a period of one year for the administrative and personnel hiring arrangements.

The extend period between the phase of design and the phase of beginning of the project meant the deactivation of alliances and discouragement of the principal partners of the project, that deserved special attention and reactivation with the implications that it takes.

The design and execution of the project, based in an eco systematic approach, with strategies of selective vector control, has allowed to validate a strategy of malaria control that promises to be a highly cost effective. The teams of local and national health are in a process of apprenticeship and experimentation of a new control model without persistent insecticides that will allow: to break the verticality of the programs and their uni purpose approach.

3.10.2 Base line and relevant indicators of evaluation

It was formulated in the guide a large number of indicators, most of them have a hard application in contexts of limited resources. The countries are using a few indictors.

The selection of few basic indicators will allow to evaluate the advances and the impact of the project in a satisfactory way. These indicators could be: the number of repeated cases, the reduction of malarious houses and the standardized IPA. The GIS has been transformed in a useful tool for the local workers and the communitarian agents. The geo referenced maps are an easy alternative to monitor and to evaluate the results and advances of the project, as also the community can understand the relationship between the presence of positive breeding sites and the presence of malaria.

3.10.3 Cooperation mechanisms, team work and alliances policy

The national and local teams and the community have began a process of apprenticeship to develop a model of multiple alliances and of inter institutional and inter sectorial cooperation. Creative mechanisms of cooperation have been developed and the team work between the national and local levels is breaking the jerarquic and vertical predominant model in the malaria control program.

Another lesson learned is the great importance to conduct the project with the existent natural organizations and not to create parallel structures, as well as the intra and inter sectorial work that facilitated the execution of proposed tasks.

3.10.4 Socialization and information exchange and transference of knowledge between countries.

The web page and the intranet, that were conceived as the mechanism to exchange information and to transfer knowledge between countries, did not have the expected successful. The telephone conferences and the regional meetings have been the best scenarios and mechanisms to reach this objective, because of the latin tradition of verbal communication. To promote a documented model have demanded high creativity by the principal managers.

3.10.5 Other lessons

For all the interviewed, the most important apprenticeship is the importance of communitarian work and the quick incorporation of the communities in malaria control activities (NCI, LCI).

Even malaria is a public health priority in meso America, it is not a problem that is in the agenda of the people who takes decisions at the ministries, or in the

politicy agendas, so it is not a politic problem, as it can be the dengue and HIV-AIDS.

The flexibility of the program to adapt itself to the local realities, the development of technical capabilities and about spaces to share technical experiences and about human development.

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