

**Scientific Capacity Building for Climate Impact
and Vulnerability Assessments (SCBCIA)**

FINAL REPORT

**“Capacity Development of the Scientific
Community for Assessing the Health Impacts of
Climate Change”
(CIA2009-07-LOTIA)**



APN
Asia-Pacific Network for Global Change Research
CAPaBLE



Making a Difference
Scientific Capacity Building &
Enhancement for Sustainable
Development in Developing Countries

**Leadership for Environment
& Development (LEAD)
Pakistan**

Project Reference Number: CIA2009-07-LOTIA
Final Report submitted to APN: June 18, 2011

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OVERVIEW OF PROJECT WORK AND OUTCOMES

Minimum 2pages (maximum 4 pages)

Non-technical summary < 200 words >

In Pakistan, as in other developing countries, apart from a dedicated few, health professionals have not come to the climate change debate. This project was aimed at bringing a change in the status quo by strengthening capacities for research on negative health effects of climate change.

To achieve the same, the project enlisted experts from among the health related scientific community from around the country and conducted 03 training workshops directed at building in them the ability to assess and interpret climate data, information and projections. With their knowledge about the effect of weather on the incidence and prevalence of diseases serving as baseline, this exercise enhanced their understanding of the risks and vulnerabilities posed by climate change to human health.

As an evidence of the same, these experts were divided into 4 groups, with each group investigating a certain aspect of the climate change-health relationship. The undertaken research work was compiled and published in book form for wide scale dissemination. In addition to this, findings from these papers were shared with the concerned decision makers within the Ministry of Health, Government of Pakistan with a view that these may form the essential basis for its future planning.

Objectives

The main objectives of the project were:

1. Stimulating the interest of health professionals in the relationship between the direct as well as indirect effects of global climate change on human health;
2. Building their capacities for exploring, analyzing and assessing the same;
3. Adding to the relatively meager resource of research work on the health impacts of climate change;
4. Contributing to the formation of a critical mass of trained researchers working in the climate change-health arena.

Amount received and number years supported

The Grant awarded to this project was:

US\$ 33,000 for 1½ Year i.e. from January 19, 2010 till July 18, 2011

Activity undertaken

This project was undertaken in the following phases;

Phase I: During this phase efforts were directed towards the selection of a 12-member cadre from the health related scientific community. To attract applicants, advertisement was placed in concerned institutions throughout the country. In order to ensure that a representative group is selected through objective and transparent measures, selection criteria was developed and implemented.

Phase II: In this phase capacity of the selected members was built through arrangement of 3 training workshop.

The **first workshop** was aimed at increasing trainees' understanding of the climate change phenomena at the global level; and building their capacity for analyzing and evaluating the corresponding impacts of climate change on human health;

The workshop ended with dividing the cohort into four research groups, each named after a province and comprising of members residing thereat. These groups were allocated the task of assessing a particular aspect of climate change – health relationship.

The **second workshop** was designed to assist the research groups formed in the first workshop, in conducting much-needed vulnerability and impact assessments in the under explored area of climate change and health.

The **third workshop** was organized in Port Elizabeth, South Africa from October 31 – November 06, 2010 by LEAD International in collaboration with LEAD South Africa. The workshop titled, 'Population, Climate Change and Development – Challenges and opportunities for a Sustainable Future' was directed at bringing together professionals in different areas from across the globe for learning, debating and sharing, through a combination of case studies, skills modules and interactive sessions. The relationship between climate change and health was one of the thematic areas covered therein.

For attendance in the said workshop, only group leaders of the four research groups were nominated.

Phase III: In this phase the cohort members, enriched with the insights gained from the three workshops, concentrated their efforts on finalizing their respective research work. The four research papers once completed were put together, compiled and published under the title, 'Climate Change & Health – Exploring Linkages'. A copy of the same was placed on the website for wide scale dissemination.

Phase IV: During this phase an attempt was made to take the findings of these research papers to the decision makers in the Ministry of Health. For this reason meetings were arranged with the Minister of Health, Director General Health, Director General Emergency Preparedness & Response, Ministry of Health; and Coordinator Environmental Health, World Health Organization. They were briefed about the research findings and copies of the report were provided to them for reference and record.

Results

1. Development of a 12-member group of professionals having the expertise to conduct investigations on the health impacts of climate change.
2. Finalization of a set of 04 research papers addressing climate change – health problems that will (a) contribute to the limited research resource base on the said area and (b) facilitate policy makers in concerned Ministries/Departments within the country.

Relevance to APN's Science and Policy Agenda

APN has always recognized that countries especially those in the developing world lack the scientific capacity required to undertake vulnerability assessments so as to make informed decisions on how best to reduce the risks associated with climate change. In line with the given philosophy, the present project undertook capacity-building activities to improve the ability of those from Pakistan's health related scientific community to interpret the information available about climate change and to understand climate related risks and vulnerabilities to human health. This in turn enabled these experts to conduct much-needed vulnerability and impact assessments in the said area.

Furthermore, in line with APN's mandate of encouraging science-policy interface for instilling the practice of 'informed decision making' in the policy arena, outcomes of the group's research activities were communicated to the concerned decision makers in the Ministry of Health. In this way the project served to create a bridge between the country's health related scientific community and its policy makers, by enabling the former with the necessary skills required to understand climate related risks to health, which in turn were made available to decision makers for sectoral adaptation plans.

Self evaluation

Considering that this project marked LEAD's entry into a relatively less explored territory, the organization was successful in the following areas:

- a) Achievement of the stated objectives;
- b) Producing pioneering research in the area of climate change and health in Pakistan;
- c) Developing useful, pertinent and comprehensive training material on the subject;
- d) Bringing together a group of climate change & health experts as resource persons/trainers;
- e) Developing partnerships with leading institutes in climate change and population health at both national and international level.

Potential for further work

The project was the seminal work of its kind in Pakistan and has helped paved the way for future interventions in the said area. Of particular importance and interest are:

- a) National level study for assessing the attributable burden of disease to climate change
- b) Health related climate costing

Both Pakistan Meteorological Department as well as Ministry of Health have expressed their interest in exploring these areas.

Publications (please write the complete citation)

Climate Change and Health – Exploring Linkages, 2011, LEAD Pakistan
ISBN Number: 978-969-8529-59-8

References

A detailed reference list is provided at:

- ◆ http://www.lead.org.pk/apn/reading_material.htm , as well as
- ◆ In the research publication, at the end of each research study. This publication is available at, http://www.lead.org.pk/apn/attachments/CC_Health_Exploring_Linkages.pdf

Acknowledgments

This project would not have been possible without the active participation and keen involvement of the following:

- ◆ LEAD's Team members in particular, Project Leader, Ms. Hina Lotia
- ◆ LEAD Training Team members and Resource Persons
 - a) Dr. Amir Muhammad, Rector, FAST University
 - b) Dr. Aurangzeb, Project Director, Environmental Unit, Planning Commission
 - c) Dr. Ayesha Khan, M&E Specialist, Health Services Academy
 - d) Dr. Ejaz Ahmad Khan, Associate Professor, Health Services Academy
 - e) Dr. Inayatullah Chaudhry, Regional Coordinator, International Centre for Integrated Mountain Development
 - f) Dr. Mujtaba Kamal, Deputy Director General, Ministry of Health
 - g) Dr. Qamar Zaman Chaudhry, Former Director General, Pakistan Meteorological Department
 - h) Dr. Suleman Qazi, Health Advisor, LEAD Pakistan
 - i) Dr. Yasmeen Sabeeh Qazi, Senior Country Advisor, The Packard Foundation
 - j) Dr. Zafar Fatmi, Head, Division of Health Sciences, Aga Khan University
 - k) Mr. Adnan Sattar, Training Expert, LEAD Pakistan
 - l) Mr. Ali Tauqeer Sheikh, CEO, LEAD Pakistan
 - m) Mr. Fayyaz Ahmad Khan, Country Representative, Bloomberg School of Public Health
 - n) Mr. Ghulam Rasul, Chief Meteorologist, Pakistan Meteorological Department
 - o) Mr. Kashif Jan, Senior Environmental Health Officer, World Health Organization
 - p) Mr. Momin Agha, Deputy Secretary, Climate Change, Ministry of Environment
 - q) Mr. Shahid Lutfi, Head Consultant, WMC Pvt. Ltd.
 - r) Mr. Usman Qazi, Expert Sustainable Community Development
 - s) Ms. Dina Khan, Fellow, LEAD Pakistan
 - t) Ms. Frida Khan, Fellow, LEAD Pakistan,

◆ LEAD's national & international partners

- a) Centre for Diarrhoeal Diseases, Hyderabad
- b) Children Hospital Lahore
- c) District Health Management Office, District Gawadar, Balochistan
- d) Global Change Impact Studies Centre, Islamabad
- e) National Health Management Information System (HMIS) Cell, Ministry of Health, Provincial Office Hyderabad and National Office Islamabad
- f) Pakistan Meteorological Department, Islamabad
- g) Provincial Malaria Control Programme, Department of Health, Government of Balochistan
- h) United Nations University – International Institute for Global Health (UNU-IIGH), Kuala Lumpur, Malaysia

◆ LEAD's 12-member cohort comprising of:

- a) Brigd. Dr. Maqsood ul Hassan
- b) Dr. Adil Faraz
- c) Dr. Farah Rashid Siddiqui
- d) Dr. Komel Zulfiqar
- e) Dr. Mukhtar Ali Zehri
- f) Dr. Razia Shahnawaz
- g) Dr. Saira Afzal
- h) Dr. Samina Mohsin Khan
- i) Dr. Seema Nigah-e-Mumtaz
- j) Dr. Syed Muhammad Mubeen
- k) Dr. Syed Sanower Ali Amrohi
- l) Professor Dr. Muhammad Irfan Ullah Siddiqui

TECHNICAL REPORT

Minimum 15-20 pages (excluding appendix)

Preface

Limit to 100 words

In Pakistan, as in other developing countries, apart from a dedicated few, health professionals have not come to the climate change debate. This project aimed at bringing a change in the status quo by strengthening capacities for research of public health professional from among the health related scientific community, on negative health effects of climate change. It was based on the premises that research conducted into health effects of climate change by such experts will, when communicated to the policy level decision makers, have a direct bearing in increasing or constraining the country's capacity to adapt.

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1.0 Introduction

The new public health stresses not just the direct, proximate causes of ill-health, but also the more distal, broadly defined 'determinants of health'. According to this new perspective, health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Interestingly, application of these public health principles fosters a more holistic understanding of the approach to health protection and health promotion in the face of climate change (*Global Forum Update on Research for Health: Volume 5*).

Human beings are exposed to climate change through changing weather patterns (for example more intense and frequent extreme events) and indirectly through changes in water, air, food quality and quantity, ecosystems, agriculture, livelihoods and infrastructure. These direct and indirect exposures can cause death, disability and suffering (IPCC, 2007).

Besides these somewhat known effects, climate change has the potential for effecting human health in a variety of ways. For instance, in some settings, the impacts of climate change may cause social disruption, economic decline, and displacement of populations. The health impacts associated with such socioeconomic dislocation and population displacement although substantial have not been adequately and accurately tabbed.

Climate change is projected to have some health benefits. These would include fewer cold related, cardiovascular and respiratory mortalities generally associated with low winter temperatures at higher latitudes, due to an overall increase in the world's temperature and reduction in climate suitability for vector-borne diseases in regions where temperatures or rainfall will exceed the upper threshold for vectors. However, the balance of impacts is predicted to be more negative than positive (IPCC, 2007). Besides being overwhelmingly negative, the effects of climate change are also projected to be unequally distributed with the developing countries being most vulnerable to the most severe impacts of climate change. While climate change is already contributing to the global burden of mortality and morbidity, the low income countries where the capacity to both adapt and combat is the weakest will be the hardest hit of all.

Climate change also represents an additional pressure on the world's food supply system and is expected to increase yields at higher latitudes and decrease yields at lower latitudes. This

phenomenon would increase the number of undernourished people in the low-income world, unless there was a major redistribution of food around the world.

It is a fact that health services provide a buffer against the hazards of climate variability and change. For instance, access to cheap, effective anti-malarial, insecticide-treated bed nets and indoor spray programmes will be important for future trends in malaria. Emergency medical services have a role in limiting excess mortality due to heat waves and other extreme climate events. From this it is apparent that health-service infrastructure needs to be resilient to extreme events. In this reference special and concentrated efforts are required to train health professionals and in particular health care workers to understand the threats posed by climate change (IPCC, 2007).

Health is central to the achievement of the Millennium Development Goals and to sustainable development, both directly (in the case of child mortality, maternal health, HIV/AIDS, malaria and other diseases) and indirectly (ill-health contributes to extreme poverty, hunger and lower educational achievements) (IPCC, 2007). Rapid and intense climate change is likely to delay progress towards achieving development targets in some regions. Especially more so because of the lack of focus placed on the lesser known and less visible effects of climate.

As the sixth most populous country in the world with only 0.67% of GDP being used to cater to the health of its current population of 156 million (Health Indicators of Pakistan, Gateway Paper II), Pakistan falls among the list of developing countries whose population's health is most likely to suffer harm from environmental hazards. With exhibited limited progress in reducing current health related vulnerabilities, the country's ability to respond to stresses imposed by climate variability and change on its population remains doubtful.

However, as impacts of climate change on health vary according to the geography of the area and the overall vulnerability of the local population therefore, as a first step an assessment of the nature and extent of risk that climate change poses for the health of people of Pakistan is imperative. Any definitive conclusions about the country's capabilities and recommendations for practical or policy measures need to be based on such an investigation.

More importantly, in order for the country's policy to be based on informed decision making it is essential that, findings of such assessment(s) are communicated to the concerned decision makers.

In view of the above and in line with the fact that in Pakistan the area of Climate Change and Human Health is relatively under-developed as a formal research arena therefore; the project sought to address the following:

- ④ Stimulating the interest of health professionals in the relationship between the direct as well as indirect effects of global climate change on human health;
- ④ Building their capacities for exploring, analyzing and assessing the same;
- ④ Adding to the relatively meager resource of research work on the health impacts of climate change;
- ④ Contributing to the formation of a critical mass of trained researchers working in the climate change-health arena.

2.0 Methodology

The project was undertaken in the following phases:

Phase I: Selection of a Cadre of Health Professionals

During this phase efforts were directed towards the selection of a 12-member cadre from the health related scientific community. For the purpose following activities were undertaken;

Activity 1 - Request for Nominations:

As a first step a criteria for selection of cohort members was determined. According to the given criteria an applicant to the cohort should be;

- a) A mid to senior level professional in the area of public health;
- b) Have publications in national and/or international journals; and
- c) Have preferably had prior experience of working in the area of environment and health

Following this contact was established with;

- a) Health Institutions throughout the country;
- b) Health Related Donor Community operating within the country; and
- c) Departments of Health and Population Welfare in all 4 provinces of the country

All these Institutions/Organizations/Departments were requested to nominate one male and one female candidate for the cohort.

Activity 2 - Receipt of Applications:

After rigorous follow up a total of 36 nominations were received. The brief status is as under:

Health Institutions	No. of Applicants
Baluchistan	4
AJ & K	0
Punjab	5
Sindh	9
NWFP	0
Islamabad/Rawalpindi	8
Total	26
Government Departments	No. of Applicants
Ministry of Health	3
Ministry of Population Welfare	7
Total	10
Grand Total	36

The resumes of all applicants were reviewed thoroughly and essential details of each candidate were placed in a grid form.

Activity 3 - First Short listing:

From among the applicants, only those who were Public Health Professionals were short listed. Following this telephonic contact was established with the 21 short listed candidates so as to;

- a) inform them about being short listed;
- b) assess their interest in the capacity building workshops; and
- c) check their availability for the same

Through the above mentioned process a list of 17 candidates who were interested and available was compiled.

Activity 4 - Final Selection:

For purposes of selection a 4-member Selection Committee was established. This committee comprised of the following members;

Committee Members	Ex-Officio Members
Dr. Muhammad Suleman Otho Senior Project Officer	Mr. Ali Tauqeer Sheikh CEO

Global Fund for AIDS, TB, Malaria	LEAD Pakistan
Dr. Muhammad Suleman Qazi Project Coordinator Nutrition Wing, Ministry of Health	Ms. Rafia Rauf Research Coordinator LEAD Pakistan
Mr. Saleem Ullah National Program Coordinator One UN Joint Environment Program	Ms. Isma Sana Training Coordinator LEAD Pakistan
Mr. Adnan Abdul Sattar Ex-Manager Training LEAD Pakistan	-

A meeting of the Selection Committee was held in which members were briefed about the process undertaken for cohort selection. The committee reviewed the resumes of short listed applicants and deliberated on their status. After extensive discussion and thorough consideration, the committee finalized selection of 17 members for the climate change – health cohort.

Activity 5 - Announcing Results:

Letters of congratulations were dispatched to the successful candidates whereas, letters of regret were sent to those not selected.

A request for submission of professional bio-sketch and photograph was made to the selected cohort members. Once received, these were uploaded on the project website (www.lead.org.pk/apn).

It is to be noted that of the selected cadre, 5 members (4 from Punjab and 1 from Islamabad) sent their regret due to some other commitments thereby, bringing the size of the cohort down to 12.

Phase II: Building Capacity

During this phase capacity of the selected members was built through arrangement of a comprehensive training program. For the purpose following activities were undertaken;

Activity 1 - Review of Literature:

Reliance was placed on review of relevant literature for drafting an outline of the course curriculum.

Activity 2 - Consultation with Experts:

The outline once prepared was shared with professionals in different institutes. These included;

- Global Change Impact Study Centre (GCISC), Islamabad
- Health Services Academy (HSA), Islamabad
- Population Council, Islamabad
- Bloomberg School of Public Health – John Hopkins University, Islamabad based setup
- International Institute of Global Health - United Nations University, Malaysia
- Department of Environmental Sciences - International Islamic University, Islamabad
- Faculty of Health Sciences - Linkoping University, Sweden

Their feedback played a critical role in giving final shape to the session plans for the training workshops.

Activity 3 - Identification of Resource Persons:

Following finalization of the session plans, efforts were made to identify suitable resource persons. For the purpose in addition to collaborating with specialized institutions like GCISC & PMD; LEAD also explored its existing pool of resource persons for potential names, conducted a review of relevant research literature for identifying experts in the area of interest and employed the snow ball technique.

Activity 4 - Arranging Sessions:

For the provision of trainings in the above mentioned areas LEAD arranged the following training sessions:

The **First National Level Workshop** was organized in Islamabad, Pakistan from June 12 – 15, 2010. The 4-day workshop titled, ‘Climate Change & Health – Bridging the Gap’, was designed on LEAD Pakistan’s training methodology of experiential learning and included interactive talks, presentations, group work, panel discussions, screening of documentaries and a field visit to Pakistan Meteorological Department (PMD) to acquaint the members with manner in which climate related data is recorded and interpreted.

The resource persons invited were climatologists, environmental health experts, policy makers and academics from different governmental and non governmental institutions of the country.

The workshop focused on exploring and analyzing the climate change – health relationship and comprised of the following thematic area;

- Climate Change – Its Drivers and Dynamics
- Direct and Indirect Health Effects of Climate Change
- Climate Injustice – Mapping Health Related Vulnerabilities
- Responding to Climate Change
- Climate change and Health – The Research Focus
- Climate Change – The Pakistan Scenario
- Climate Leaders – Road Map for the Future

The workshop ended with dividing the cohort into four research groups, each named after a province and comprising of members residing thereat. These groups were allocated the task of assessing a particular aspect of climate change – health relationship. These were:

Groups	Members	Group Leader	Research Area
Sindh Group	Dr. M. Irfan Ullah Siddiqui Dr. Sanower Dr. S. M. Mubeen Dr. Adil Faraz Dr. Seema Nigah-e-Mumtaz	Dr. M. Irfan Ullah Siddiqui	Is there any impact of Climate Change on Frequency of Diarrhoea among children aged 1 to 5 years in tertiary care hospitals of Karachi during last 10 years?
Punjab Group	Dr. Saira Afzal	Dr. Saira Afzal	Is there any association between climate change and respiratory problems among children up to 5 years in tertiary care hospitals?
Baluchistan Group	Dr. Mukhtar Zehri Dr. Razia Shahnawaz	Dr. Mukhtar Zehri	What are the challenges faced by public health infrastructure in coping with disasters caused by climate change?
Capital/ Islamabad Group	Dr. Sameena Mohsin Khan Dr. Maqsood Hassan Dr. Komal Zulfiqar Dr. Farah Rashid	Dr. Samina Mohsin Khan	Are there any effects of climate change on patterns and magnitude of malaria in different areas of Pakistan?

The **Second National Level Workshop** was also organized in Islamabad, Pakistan from August 05 – 06, 2010. The 2-day workshop titled, ‘Climate Change & Health – Exploring Research Avenues’, was designed to assist the research groups formed in the first workshop, in conducting much-needed vulnerability and impact assessments in the under explored area of climate change and health.

During the workshop each group presented its research synopsis, for discussion and deliberation. Feedback received from the other cohort members as well as LEAD’s 3-member Panel of Experts enabled the groups in improving and finalizing their research plans.

The **International Level Workshop** was organized in Port Elizabeth, South Africa from October 31 – November 06, 2010 by LEAD International in collaboration with LEAD South Africa. The workshop titled, ‘Population, Climate Change and Development – Challenges and opportunities for a Sustainable Future’ was directed at bringing together professionals in different areas from across the globe for learning, debating and sharing, through a combination of case studies, skills modules and interactive sessions. The relationship between climate change and health was one of the thematic areas covered therein.

For attendance in the said workshop, group leaders of the four research groups were nominated. However, the leader for Punjab Group was unable to participate due to some personal reasons. The remaining three group leaders who attended the event were: Professor Dr. Irfan Ullah (Sindh Group); Dr. Samina Mohsin Khan (Capital Group) and Dr. Mukhtar Ali Zehri (Baluchistan Group).

Participation in the workshop provided the cohort members an opportunity to network with relevant stakeholders from around the world. Most importantly, it served as a forum for showcasing their research work to a much larger audience and sharing the results of their research endeavors with a number of experts.

Enriched with the feedback received and the insights gained during the workshop, the cohort members upon their return concentrated their efforts on finalizing their respective research work.

Phase III: Exploring Climate Change & Health Relationship

During this phase the cohort members concentrated on carrying out research work in their selected area. For the purpose following activities were undertaken;

Activity 1 - Establishing Linkages:

To facilitate participants in gaining access to required climate and health related data, LP established their linkages with the following institutions:

- a) Centre for Diarrhoeal Diseases, Hyderabad
- b) Children Hospital, Lahore
- c) District Health Management Office, District Gawadar, Balochistan
- d) Global Change Impact Studies Centre, Islamabad
- e) National Health Management Information System (HMIS) Cell, Ministry of Health, Provincial Office Hyderabad and National Office Islamabad
- f) Pakistan Meteorological Department, Islamabad
- g) Provincial Malaria Control Programme, Department of Health, Government of Balochistan

Activity 2 - Review of Research Papers:

To assist each group in undertaking research a 2-member Advisory Panel¹ was constituted. For the purpose, efforts were made to enlist health professionals having a strong background in research. Interaction between the two groups (i.e. panel and cohort groups) was primarily coordinated by LEAD Pakistan.

Activity 3 - Publishing of Research Papers:

¹ Ms. Rafia Rauf, Coordinator Research, LEAD Pakistan
Dr. Suleman Qazi, Health Advisor, LEAD Pakistan

The research papers finalized by the four groups were compiled and put together in one book titled, 'Climate Change and Health – Exploring Linkages'.

Phase IV: Disseminating Findings

During this phase efforts were made to take the research findings to the larger audience. For the purpose following activities were undertaken;

Activity 1 - Dissemination through Website:

For sharing the findings with the professionals at large, a copy of the report was placed on the project website (www.lead.org.pk/apn) and may be accessed from there.

Activity 2 - Informing Decision makers:

Following publishing of the research report on Climate Change and Health, LEAD tried to take its message to the highest policy annals in Pakistan. In this respect our earlier plans were to hold a brief session with some officials at the Ministry of Health. However, due to some recent developments these plans had to be altered slightly.

First was the heavy involvement of the Ministry officials in drafting the national budget for 2011-12, due to which it was virtually impossible to get them together at the same time on the same forum.

Secondly, following approval of the 18th Amendment by the National Assembly, after June 30, 2011 Ministry of Health is to be devolved (along with other ministries) from the Federal to Provincial Level. This move will bring a significant change in the nature and role of actors involved.

In view of the above, an effort was made to hold individual one to one meetings with those senior officials at the Ministry who are the top decision makers not only at present, but will also continue to play a significant role post June 30th.

Consequently, meetings were held with the following:

- ④ Mr. Riaz Hussain Peerzada, Minister of Health
- ④ Dr. Assad Hafeez, Director General Health
- ④ Dr. Jahanzeb Orakzai, Director General Emergency Preparedness and Response
- ④ Mr. M. Magan, Coordinator Environmental Health, World Health Organization (WHO enjoys the status of being the Ministry's largest donor).

3.0 Results & Discussion

The deliverables finalized during the life of this project are listed as under and are being provided with this report as Annexure.

- ④ Annex A: CC-Health Cohort Selection Process
- ④ Annex B: Cohort Members Details
- ④ Annex C: First Progress Update Report (*After the Completion of Phase I*)
- ④ Annex D: First National Training Session Report
- ④ Annex E: Second National Training Session – Research Synopsis of 4 Cohort Groups
- ④ Annex F: Second Progress Update Report (*After the Completion of Phase II*)
- ④ Annex G: Research Study, 'Climate Change & Health – Exploring Linkages' (*After the Completion of Phase III*)
- ④ Annex H: Dissemination Related Documents (*After Completion of Phase IV*)

4.0 Conclusions

The project sought to address the following:

- ④ *Stimulating the interest of health professionals in the relationship between the direct as well as indirect effects of global climate change on human health;*

Achieved. The introduction of selected health professionals to the phenomena of climate change – health relationship has had a snow ball effect. One of our cohort members, Dr. Seema Nigah-e-Mumtaz, a professor herself commented that, awareness about the importance of this area had led her to decide that in 2011, her students would be concentrating their research work on climate change effects on population health.

On the other hand, capacity building of two health professionals from the Institute of Public Health Quetta, Dr. Mukhtar Ali Zehri & Dr. Razia Shahnawaz, helped create a ripple effect in the entire institute. The fact that the Institute has now included climate change & climate variability in its environmental health curriculum is evidence enough of the fact.

④ *Building their capacities for exploring, analyzing and assessing the same;*

Achieved. The three training workshops arranged served a number of purposes: (a) introduced them to the concept of climate change and its potential effects on human health; (b) enabled them to assess and analyze the nature, scale and dimensions of this relationship; (c) provided an opportunity for close, personal interaction with subject experts at the national and international level; (d) facilitated them in identifying gaps existing at the policy level that need to be filled through research for effectively addressing the threats posed by climate change to population health.

④ *Adding to the relatively meager resource of research work on the health impacts of climate change;*

Achieved. The four research studies carried out by the cohort members are a seminal work in this area in Pakistan. Most importantly, while these studies are small in scale and somewhat limited in focus, they are the building blocks of all future research that will be carried out in this area in the country.

④ *Contributing to the formation of a critical mass of trained researchers working in the climate change-health arena.*

Achieved. The selected cohort members were public health professionals with years of research work behind them. Their involvement in this venture has achieved two things: (a) strengthened their research and analysis skills; and (b) added climate change and climate variability to their health research portfolio.

5.0 Future Directions

The next step from here would be towards;

- c) National level study for assessing the attributable burden of disease to climate change
- d) Health related climate costing

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