# Mid-Term Review of Establishment of a Regional Flood Information System (RFIS) in the Hindu-Kush Himalaya (RFIS; aka HKH-HYCOS)

*Final Report*

**Kristiina Mikkola**
**Adarsha Pokhrel**
**Dhruba Gautam**

Impact Consulting Oy Ltd
21 December 2012

Table of Contents

ABREVIATIONS AND ACRONYMS ..... iii
EXECUTIVE SUMMARY ..... v
TIIVISTELMÄ ..... x
1 INTRODUCTION ..... 1
1.1 Purpose and objectives of the MTR ..... 1
1.2 Evaluation process, methodologies and limitations ..... 2
1.3 Structure of the Report ..... 3
2 DESCRIPTION OF THE CONTEXT AND THE PROJECT ..... 3
2.1 Regional background ..... 3
2.2 Relevant policies and actors in the region ..... 4
2.3 Other related interventions in the partner countries ..... 5
2.4 Strategic framework of ICIMOD and WMO ..... 6
2.4.1 ICIMOD Strategies and programmes ..... 6
2.4.2 WMO and WHYCOS ..... 7
2.5 Strategic priorities of Finnish Development Cooperation ..... 8
2.6 Brief description of HKH-HYCOS ..... 8
2.6.1 Evolution of HKH-HYCOS 2001-2012 ..... 8
2.6.2 Duration and objectives of HKH-HYCOS ..... 9
2.6.3 Institutional arrangements ..... 9
3 KEY FINDINGS ..... 11
3.1 Relevance ..... 11
3.2 Effectiveness (results) ..... 11
3.2.1 Capacity Building ..... 16
3.3 Impact ..... 17
3.4 Efficiency and programme management ..... 19
3.4.1 Project implementation ..... 19
3.4.2 Cost-efficiency ..... 20
3.5 Sustainability ..... 21
3.6 Cross-cutting objectives ..... 23
3.7 Aid effectiveness ..... 23
3.7.1 Ownership ..... 23
3.7.2 Use of country systems ..... 24
3.7.3 Managing for results ..... 24
3.7.4 Mutual accountability ..... 25

3.8 Coordination, Complementarity and Coherence ..... 25
3.9 Finnish value added ..... 26
3.10 Project design ..... 26
3.11 Linkages and common issues between FNEP and HKH-HYCOS ..... 26
4 CONCLUSIONS ..... 27
5 LESSONS LEARNED ..... 29
6 RECOMMENDATIONS ..... 30
Summary table of key findings, conclusions, recommendations and actors ..... 32

ANNEX 1 TERMS OF REFERENCE ..... 35
ANNEX 2 EVALUATION PROCESS, METHODOLOGIES and limitations ..... 44
ANNEX 3 FIELD MISSION PROGRAMME ..... 60
ANNEX 4 LIST OF PERSONS INTERVIEWED ..... 62
ANNEX 5 LIST OF DOCUMENTS REVIEWED ..... 66
ANNEX 6 MEMO OF THE EVALUATION WRAP-UP MEETING NOVEMBER 6TH, 2012 KATHMANDU ..... 70
ANNEX 7 RELEVANT POLICIES AND RELATED INTERVENTIONS IN PARTNER COUNTRIES ..... 73
ANNEX 8 DETAILED PROJECT PERFORMANCE ASSESSMENT OF HKH-HYCOS ..... 81
ANNEX 9 STRUCTURE OF THE RFIS ..... 97

## ABREVIATIONS AND ACRONYMS

| | |
|---|---|
| AMC | Annual Maintenance Contract |
| AWLS | Automatic Water Level Sensor |
| AWS | Automatic Weather Station |
| CAAN | Civil Aviation Authority of Nepal |
| BMD | Bangladesh Meteorological Department |
| BWDB | Bangladesh Water Development Bureau |
| CMA | China Meteorological Agency |
| CDRMP | Climate Disaster Risk Management Project |
| DED | Department of Energy Development |
| DHM | Department of Hydrology, Nepal |
| DHMS | Department of Hydro-Met Services, Bhutan |
| DWIDP | Department of Water Induced Disaster Prevention |
| EWS | Early Warning System |
| FMI | Finnish Meteorological Institute |
| FNEP | Finnish Nepalese Project for Improving Capability of Government of Nepal to respond to the increased risks related to weather related natural disasters caused by climate change |
| FR | Final Review |
| GBM | Ganges-Brahmaputra-Meghna |
| GEF | Global Environment Facility |
| GFDRR | Global Facility for Disaster Risk Reduction and Recovery |
| GoF | Government of Finland |
| GoN | Government of Nepal |
| GTS | WMO's Global Telecommunication System for Weather Watch |
| HFA | Hyogo Framework for Action |
| HKH | Hindu Kush – Himalaya |
| HYCOS | Hydrological Cycle Observation System |
| ICI | Institutional Collaboration Instrument |
| IFRC | International Federation of Red Cross and Red Crescent Societies |
| IMD | India Meteorological Department |
| ICIMOD | International Centre for Integrated Mountain Development |
| LDCF | Least Developed Countries Fund |
| LoA | Letter of Agreement |
| MEUR | Million euro |
| MFA | Ministry for Foreign Affairs |
| MoE | Ministry of Energy |
| MoHA | Ministry of Home Affairs |
| MoI | Ministry of Irrigation |
| MoSTE | Ministry of Science, Technology and Environment (previously MoEST) |
| MoU | Memorandum of Understanding |
| MTAP | Medium-Term Action Plan |
| MTR | Mid-Term Review |
| MUSD | Million USD |
| NAPA | National Adaptation Programme of Action on Climate Change |
| NARC | Nepal Agriculture Research Council |
| NEC | National Environment Commission |
| NFIS | National Flood Information System |
| NHMS | National Meteorological and Hydrological Services |
| O&M | Operation and maintenance |
| PAT | Project Advisory Team |
| PD | Project Document |
| PMD | Pakistan Meteorological Department |
| PMU | Project Management Unit |
| PPCR | Pilot Programme on Climate Resilience |
| PRC | Project Regional Centre |
| RA-II | Regional Association II-Asia |

| | |
|---|---|
| RFIS | Regional Flood Information System; also Establishment of a Regional Flood Information System in the Hindu-Kush Himalaya |
| RIMES | Regional Integrated Multi-Hazard Early Warning System for Africa and Asia |
| RSC | Regional Steering Committee |
| RTS | Real Time Solutions |
| SAARC | South Asian Association of Regional Collaboration |
| SAARC STORM | SAARC Severe Thunderstorm Observations and Regional Modeling (STORM) project |
| SFA | SAARC Framework for Action |
| SOHAM | Society of Hydrologists and Meteorologists Nepal |
| SOP | Standard Operating Procedures |
| TOR | Terms of Reference |
| ToT | Training of Trainers |
| UNDP | United Nations Development Programme |
| UNISDR | United Nations International Strategy for Disaster Reduction |
| USD | US dollar |
| WAPDA | Department of Energy, Water & Power Development |
| WB | World Bank |
| WHYCOS | World Hydrological Cycle Observation System |
| WMO | World Meteorological Organization |

## EXECUTIVE SUMMARY

The **Mid-Term Review (MTR) of the Establishment of a Regional Flood Information System (RFIS) in the Hindu-Kush Himalaya** –project was commissioned by the Ministry for Foreign Affairs, Finland (MFA) in September 2012. The project is implemented by the International Centre for Integrated Mountain Development (ICIMOD) in partnership World Meteorological Organization (WMO) and National Meteorological and Hydrological Services in the Hindu-Kush Himalaya (HKH) Region. The project partners use the acronym HKH-HYCOS which represents the Hydrological Cycle Observation System for Hindu-Kush Himalayan region. The duration of HKH-HYCOS project is now five years (December 2009-December 2014). The MTR has been implemented during September-December 2012.

The **purpose of the Mid-Term Review** of HKH-HYCOS (RFIS) in the Hindu Kush-Himalaya is to provide the Government of Finland (GoF) as well as the project implementers with an external, independent and objective analysis and assessment of the project with regard to whether it is on the right track for reaching its intended objectives and to provide recommendations for the project in order to ensure project's impact, sustainability, effectiveness and ownership.

The **evaluation process** during September-December 2012 consisted of three phases: inception phase (September 20th-October 10th, 2012), field mission to Nepal and Bhutan (October 11th-November 9th, 2012), and data analysis and reporting (November 12th-30th, 2012). The **evaluation methodologies** have consisted of collection and analysis of both primary and secondary data. The evaluation framework developed during the inception phase has guided the data analysis.

The purpose of HKH-HYCOS project is "Timely exchange of flood data and information". The project has five results: Result 1 Strengthened framework for cooperation on sharing regional flood data and information among participating member countries, Result 2 Establishment of a flood observation network in selected basins in the selected countries, Result 3 Establishment of regional and national flood information systems to share real time data and information and increase lead time, Result 4 Enhanced technical capacity of partners on flood forecasting and communication to end users and Result 5 Full-scale regional project planned and agreed among participating countries. The organization and management of the project is based on the concept that the participating countries have full ownership of the project and execute the project through their dedicated national organizations and agencies. The WMO and ICIMOD are jointly facilitating the process of planning and region-wide implementation of the project within their specific mandates in the project. Six partners in four countries that have signed Letters of Agreement regarding project implementation with ICIMOD. The partners are: Bangladesh Meteorological Department (BMD), Bangladesh Water Development Board (BWDB), Hydro-met Services Department, Bhutan (DHMS), Department of Hydrology and Meteorology, Nepal (DHM), Department of Energy, Water & Power Development Authority (WAPDA) and Pakistan Meteorological Department (PMD). Proposed partners included also hydrological and meteorological departments in India and China. They have not signed LoAs for the project and are not participating in the project as was planned.

The **main findings and conclusions** of the MTR are summarised below.

**Relevance:** The Hydrological Cycle Observation System (HYCOS) concept is relevant for the Hindu Kush-Himalayan region. The regional approach to water-induced disasters (floods) is relevant as the water-related hazards the project is addressing are interlinked across national borders. There is strong policy relevance at national level, the HYCOS does address pertinent needs in the region and there are mutually reinforcing bilateral and regional agreements, at least at SAARC level. Despite strong policy relevance and mutually reinforcing bilateral and regional agreements that are in place, the HKH-HYCOS project has not completely succeeded in building on these priorities and concerns of the participating countries.

WMO, ICIMOD and partner countries have been engaged in the HKH-HYCOS concept since 2001. After more than a decade the proposed partners in India and China are not committed to the project. There are no indications that they would participate actively in the near future either. India has expressed its interest to participate in capacity building activities. Both China and India have not shown any interest in sharing the hydrological data which is critical for a Hydrological Cycle Observation System and flood information system.

**Effectiveness**: The project has made progress in developing a framework for cooperation on sharing flood data among participating partner countries. Modern hydro-meteorological instruments have been procured, 23 stations installed and training on installation, operation and maintenance imparted for partner staff in Bhutan, Nepal and Pakistan. The stations are transmitting real time data in dual mode (to national partner database and web portal and to a regional database / web portal hosted by ICIMOD). There are concerns about the quality of installation, O&M responsibilities and the approach in developing the regional flood information system that are marring the picture. The web portal (RFIS) established at ICIMOD is a useful starting point and offers access to raw data transmitted from real time AWS and AWLS. Currently the portal does not provide any other useful information to the partners or stakeholders in the region. There is a long way to value added services and information products.

**Impact:** The project has achieved two significant positive changes: the investments in modern meteorological and hydrological stations and the regional platform for discussion. It is also working with national partners to build flood information systems through which the latter can then share flood information with their populations to prepare them for impending floods. Although the number of upgraded stations is small in a regional scale, the partners have been able to upgrade existing manual and mechanical stations at locations that are nationally critical / strategic from the viewpoint of issuing flood warnings to their own citizens. The regional element is still not well understood by them.

**Efficiency and programme management**: There have been inevitable delays in fetching agreements between ICIMOD and the proposed project partners which are not out of character keeping the geopolitical situation in the region in mind. There is evidence that the implementation pace of the project has been somewhat slow. Some of the reasons relate to the ICIMOD processes in project management and procurement. The adopted practice of presenting only half-yearly plans and progress reports for the Regional Steering Committee has contributed to the delays. The project implementation is not cost-efficient; the overall amount of resources that has been spent on ICIMOD and WMO staff and services is not proportionate with the results achieved.

**Sustainability**: Although the installation of first batch of hydrological and meteorological instruments was only completed a few months ago, there are reasons to worry that operation and maintenance (O&M) of the equipment – and hence sustainability – is going to be a problem. There is no evidence that the participating countries are committed to allocate sufficient O&M funds (one exception being BMD in Bangladesh). Unless O&M issues are readily addressed by the competent national authorities, sustainability is at risk. The Annual Maintenance Contract provided by ICIMOD should be reassessed: it may be a disincentive to the project partners to assume full ownership of their equipment. Development of in-country capacities also in operation and maintenance should be favoured.

**Cross-cutting objectives:** The project contributes to climate sustainability. As per ICIMOD strategy, gender equality is a strategic priority and has been addressed in the project.

**Aid effectiveness:** Ownership of the project is a concern as the project is perceived by partners and other stakeholders as an "ICIMOD" project. ICIMOD brand and ownership of the process was coming very strongly through. With the exception of the regional flood information system, the project applies and builds on existing country systems which is good.

To date limited capacity building activities have taken place (as a result of project delays in site selection, instrument procurement and installation). Training has been of standard content and not addressing country specific needs. Systematic training needs assessments were not conducted. The regional interactions and meetings however have contributed to South-South cooperation in a positive manner.

The RSC meetings are functioning as a regional information sharing and capacity building mechanism among the senior management of participating hydrological and meteorological institutions. The primary function of RSC as a steering mechanism has eroded as is demonstrated by the slow and uneven implementation rate of its decisions.

**Coordination, complementarity and coherence:** There are several on-going or pipeline interventions in Nepal, Bangladesh and Bhutan that directly relate to HKH-HYCOS. The project partners have acted strategically when selecting stations for upgrading from a national perspective.

**Finnish value added:** The project design has not addressed Finnish value added. This is because the document was produced by ICIMOD and regional partners without any influence from the donor. MFA decided to fund the project several years after the document had been completed. Instruments from Vaisala and expertise from Finnish Meteorological Institute have been sourced for the project implementation.

**Design of HKH-HYCOS:** For a HYCOS concept to be successful and sustainable, it needs a competent regional authority to implement the activities (such as Volta Basin Authority or Mekong River Commission, although an exception to this case seems to be the SADC HYCOS). Such authorities do not exist in the HKH region at present. The objective to develop a regional HKH-HYCOS is overly ambitious and not achievable through the present mechanisms. The project logic and objectives are unnecessarily wide and ambitious with respect to incorporating anticipated reduction of loss of lives and livelihoods of people living in the HKH in the project document. Another over-ambitious aspect is the incorporation of multiple river basins into a project that works in a geopolitically challenging region.

**Linkages between HKH-HYCOS and FNEP:** Finland has been supporting two projects that work with DHM in Nepal with partially overlapping mandates. The HKH-HYCOS has contributed mostly to the development of hydrological services. The FNEP has supported meteorological services and capacity development of DHM. There have been no overlapping activities until now.

There have been some valuable **lessons learned**. Binding letters of consent from partner institutions should be obtained before submitting proposals to donors. The involvement of national hydro-met institutions as project partners has been a right strategic choice. Steering mechanisms and implementation arrangements warrant detailed analysis at project design to support efficient project management also under difficult circumstances. Capacity building activities need to suit the local contexts and address local capacity building gaps to be truly relevant and sustainable. When planning investments on modern hydro meteorological equipment, aspects of O&M of the equipment and instruments should be important criteria influencing decisions on instrument selection. Partner responsibilities on operation and maintenance should be clearly outlined in the agreements.

The MTR has **recommendations** both for the current HKH-HYCOS project ending in 2014 and for the desired follow-on Phase. The recommendations with respect to **the remaining time period of HKH-HYCOS (until December 2014)** are:

1 Organise an extraordinary RSC meeting to discuss and agree on the MTR team findings and recommendations during the first quarter of 2013.

2 There cannot be a regional project without full and active participation of all countries. Therefore ICIMOD and WMO need to engage once more tactically and diplomatically to bring both the

hydrological and meteorological departments from China and India fully on board. Involvement of both hydrological and meteorological departments is needed for the present project to succeed in achieving its objectives. If these efforts do not lead into successful outcomes by mid-2013, WMO, ICIMOD, and the active partners in Bangladesh, Bhutan, Nepal and Pakistan need to sit together and re-discuss and clarify the concept and scope for a Hydrological Cycle Observation System in the Hindu Kush Himalayan region, and how it can be further developed in the absence of India and China.

3 Address the quality concerns that relate to the regional flood observation network, namely the selection of stations and their installation. For a regional project, regional significance should take precedence over national priorities. With respect to the selection of sites for the planned additional 12 stations (2nd batch), a meteorologist should visit the proposed AWS sites and a hydrologist the AWLS sites to assess their suitability and relevance. Furthermore, there has to be monitoring and follow-up of the quality of installation done by RTS and national partners. WMO standard needs to be scrupulously followed with any further procurement of instruments and their installation.

4 Revisit and reverse the project emphasis between regional and national flood information systems: inputs should be provided to the national partners so that they can first develop and apply data quality control protocols in data management and data entry into the respective existing or emerging national systems. The data transfer protocols should be revised: the simultaneous transmission of unchecked data (dual mode) to the RFIS should be discontinued. Any further development work by ICIMOD on RFIS should build on quality data received through NFISs only and be research oriented. Development of the flood outlook may be timely within the current project once it is approached from a research angle and it builds on quality checked data.

5 Before initiating any capacity-building exercises, a training needs assessment should be undertaken so that the project's limited time and resources are best targeted at the most profound of what is an enormous demand. Additionally, provision of Training of Trainers (TOT) needs to be included to provide training across the institutions. Local contractors in partner countries should be identified and strengthened (possibly with support from RTS) to build capacities in installation and maintenance in each country.

6 Build national capacity in selecting and procuring equipment and instruments by transferring the procurement responsibility to national partners. National compatibility in equipment selection is desirable and instruments must be country and location specific.

7 Install the pending 12 stations by December 2013 so that one additional year of experience can be generated, with an emphasis on O&M aspects of the newly established stations and capacity building of the technicians.

8 Restructure the RSC meetings into decision making sessions with a steering function and technical sessions with a capacity development and experience sharing function – core members would participate in the decision making sessions where project strategies, reports, plans and budgets would be discussed and approved. Observers and resource persons would participate in the subsequent sessions; the non-decision making sessions of the meeting should be renamed to distinguish and sharpen the steering function. Institute a systematic follow up of implementation of RSC meeting decisions by ICIMOD and partners.

9 Embrace results-based management fully in the project management and monitoring. The six-monthly activity based planning should be replaced by annual plans and budgets which are discussed and approved by the RSC. Improvements in progress monitoring and reporting are needed to move away

from activity focus and incorporate results-orientation and tracking of progress through indicators. Activity based reporting needs to be augment with monitoring and reporting of objectives and their indicators as well.

10 Develop a budget for the no-cost extension phase and approve it at the extraordinary RSC meeting and also have it agreed by MFA. Launch a performance audit in 2013 to assess the project management processes and reasons of low cost-effectiveness in detail. Analyse the MFA-ICIMOD agreement to identify key shortcomings and amend the agreement accordingly.

11 Favour development of in-country capacities also in O&M and provision of spare parts. Discontinue the Annual Maintenance Contract and concentrate on the capacity building of national partners keeping RTS and ICIMOD role as only the facilitator.

The recommendations **regarding a possible follow-on project (post 2014**) are:

12 WMO and ICIMOD need to revisit the HYCOS concept together with the national partners. The MTR team is not recommending new or additional bilateral projects, but finds that there is ample scope to take the HYCOS forward under the umbrella of the existing bilateral agreements with involvement from partner institutions. In the absence of India and China a critical redesign effort is needed in any case. The project cannot continue to be built on assumed participation of key partners.

13 Assess the new actors in the sector. There have been a number of developments in recent years in the region. New actors and interventions working with the project partners in capacity building, early warning and information systems and investments in hydro-met equipment have emerged. The partners and competent agencies need to assess the comparative advantages of each of these to identify the best possible "fit" for HYCOS.

# TIIVISTELMÄ


**Väliarviointi tulvainformaatiojärjestelmän kehittämishankkeesta Hindu Kush-Himalajan alueelle Aasiassa**

Hankkeen tavoitteena on ilmastomuutokseen sopeutuminen ja sen haitallisten vaikutusten vähentäminen. Hanke kehittää alueen maiden kansallisten säähavaintoviranomaisten (National Meteorological and Hydrological Services, NMHS) kapasiteettia ennakoida ja varautua tulviin. Hankkeella kehitetään alueellisia ja kansallisia tulvainformaatiojärjestelmiä Bangladeshissa, Bhutanissa, Nepalissa ja Pakistanissa. Hanketta toteuttaa Nepalissa sijaitseva International Centre for Integrated Mountain Development (ICIMOD) yhteistyössä Maailman ilmatieteen järjestön (WMO, Geneve) ja neljän maan säähavaintoviranomaisten kanssa. Hankkeen kesto on viisi vuotta (joulukuu 2009 – joulukuu 2014). Suomen rahoitus hankkeelle on 2 milj. EUR. Väliarvioinnin tarkoituksena oli tuottaa tuottaa riippumaton ja puolueeton arviointi hankkeen toteutuksesta sekä arvioida hankkeen tuloksia suhteessa sen tavoitteisiin. Hanketta edelsi 1. vaihe, joka päättyi vuonna 2005.

Hankkeen tarkoituksena on rakentaa käyttäjäystävällinen alueellinen ja kansallinen tulvien tarkkailujärjestelmä, jolla parannetaan sopeutumista ja ennakkovarautumista tulviin sekä vahvistetaan tulvatietojen ajantasaista välitystä jäsenvaltioiden kesken. Hankkeella on viisi tulostavoitetta:

1. parantuneet alueellisen yhteistyön puitteet alueellisen tulvadatan ja informaation jakamiseksi osallistuvien maiden kesken;
2. alueellisen tulvatarkkailujärjestelmän kehittäminen valittujen vesistöjen varrelle kohdemaissa;
3. alueellisen ja kansallisten tulvatietojärjestelmien luominen;
4. kumppaneiden parantunut kapasiteetti tosiaikaisen tulvavaroitusjärjestelmän ja varoitusten tuottamiseksi kansallisella tasolla; ja
5. hankkeen seuraavan vaiheen projektidokumentin valmistelu.

Evaluaation keskeiset **tulokset** ja **johtopäätökset** voidaan tiivistää seuraavasti:

**Tarkoituksenmukaisuus:** Hanke on alueellisella tasolla tarkoituksenmukainen, sillä rankkasateet ja tulvariskit Hindu Kush-Himalajan vuoristoalueella ovat lisääntymässä. Monien jäätiköiltä ja lumisilta alueilta lähtevien jokien virtaama on jo kasvanut ja kevään tulvahuippu aikaistunut. Hanke tukee useiden kansallisten ja alueellisten strategioiden ja politiikkojen toteutumista. Hankkeen tarkoituksenmukaisuudesta huolimatta hanketoteuttaja ICIMOD ei ole onnistunut suunnitellulla tavalla hankkeeseen kaavailtujen kumppanien sitouttamisessa.

**Tuloksellisuus:** Hanke on investoinut 23 meteorologiseen ja hydrologiseen asemaan, jotka lähettävät tosiaikaista sää- ja tulvatietoa samanaikaisesti sekä kansallisten säähavaintoviranomaisten järjestelmiin että ICIMODissa sijaitsevaan kehitteillä olevaan tietokantaan.

**Vaikuttavuus:** Kolmen toimintavuoden aikana hankkeen keskeisimpiä vaikutuksia ovat toteutuneet investoinnit moderneihin säähavainto- ja hydrologisiin asemiin sekä lisääntynyt yhteydenpito kansallisten toimijoiden kesken.

**Kustannustehokkuus ja hankkeen hallinto:** Hankkeen toteutuksessa on merkittäviä viiveitä, joiden johdosta kustannustehokkuus on heikko.

**Kestävyys:** Hankkeen kestävyydelle on useita riskejä, jotka liittyvät mm. kumppanien vähäiseen kokemukseeen ja osin alhaiseen kiinnostukseen ylläpitää ja huoltaa vaativia teknisiä laitteita. Alueellisen tulvatietojärjestelmän omistajuus on liiaksi hankkeen koordinaattorin ICIMODin harteilla.

**Läpileikkaavat tavoitteet:** Hanke toimii ilmastokestävyyden alalla ja edistää sitä suoraan. Sukupuolten tasa-arvo on huomioitu hankkeen toteutuksessa.

**Kehitysyhteistyön tuloksellisuus:** Hanke tukee kansallisia säähavaintoviranomaisia ja tukeutuu kansallisella tasolla maiden omiin järjestelmiin. Poikkeuksena on kehitteillä oleva alueellinen tulvatietojärjestelmä, jota rakennetaan ICIMODiin.

**Kapasiteetin vahvistaminen:** Hankkeen viiveistä johtuen suunnitellut koulutukset ovat alkaneet vasta vuonna 2012. Koulutukset aloitettiin ilman kyllin huolellista koulutustarveanalyysiä, mikä heijastuu koulutuksen huonona vaikuttavuutena ainakin Nepalissa ja Bhutanissa.

**Koordinointi, täydentävyys ja johdonmukaisuus:** Hankkeen kumppaneilla Nepalissa, Bhutanissa ja Bangladeshissä on käynnissä useiden toimijoiden kanssa hankkeita, joilla pyritään mm. parantamaan säähavaintovirastojen havaintoasemaverkkoa ja modernisoimaan käytäntöjä. Hankkeet täydentävät toisiaan.

**Suomalainen lisäarvo:** Hankesuunnitteluprosessi on noudattanut ICIMODin käytäntöjä ja teemoja, joihin suomalainen lisäarvo ei sisälly. Toteutuksen myötä hankkeen määrärahoilla on hankittu säähavaintoinstrumentteja Suomesta. Myös Ilmatieteen laitoksen osaamista hyödynnetään hankkeessa.

**Hankkeen suunnittelu:** Hankesuunnitelma on osoittautunut liian kunnianhimoiseksi. Tavoitteenasetanta on liian lavea samoin kuin hankkeen lähestymistapa, jonka mukaan toimitaan usean vesistön alueella (Indus, Ganges, Brahmaputra ja Meghna).

**Linkit FNEP ja HKH-HYCOS hankkeiden välillä:** FNEP on keskittynyt enemmän meteorologiaan ja HKH-HYCOS hydrologiaan, joten hankkeiden välillä on havaittavissa selkeitä synergiaetuja.

Hankkeen keskeisin **opetus** liittyy alueellisen yhteistyön valmisteluun ja sen haasteisiin geopoliittisesti haastavalla maantieteellisellä alueella: osana hankesuunnitteluprosessia tulisi neuvotella sitovat osallistumispäätökset kaikilta hankkeeseen kaavaillulta toimijoilta.

Evaluaation keskeiset **suositukset** ovat seuraavat:

1. Väliarvionnin kriittisten havaintojen ja suositusten käsittelemiseksi tulisi järjestää alueellisen ohjausryhmän (RSC) ylimääräinen kokous vuoden 2013 ensimmäisen neljänneksen aikana.

Hankkeen toteutuskautta on jäljellä kaksi vuotta, joiden kuluessa ICIMODin, WMOn ja hankkeen kumppanien tulisi:

2. pyrkiä neuvottelemaan Intian ja Kiinan viranomaisten kanssa molempien maiden meteorologisten ja hydrologisten laitosten mukaantulosta hankkeeseen. Mikäli neuvottelut eivät tuota toivottua tulosta 6/2013 mennessä, hankeessa mukana olevien tahojen olisi analysoitava hankkeen tavoitteet ja toiminnot uudelleen huomoiden vain Bangladeshin, Bhutanin, Nepalin ja Pakistanin aktiivinen osallistuminen ja kiinnostus.

3. parantaa hankkeen toimintojen laatua liittyen erityisesti säähavainto- ja hydrologisiin asemiin, niiden laitteisiin, asennukseen ja jatkuvaan kunnossapitoon sekä kunnossapitovastuisiin.

4. ensisijaisesti keskittyä kansallisen tason tulvatietojärjelmiin, datan laatuun ja laadunvarmistusmekanismeihin. Alueellisen järjestelmään datan tulisi siirtyä kansallisistä järjestelmistä, ei suoraan säähavaintoasemilta.

5. parantaa merkittävästi koulutuskomponentin sisältöjä ja lähestymistapoja huomioiden mm. eri maiden toimijoiden ja niiden henkilöstön erot osaamisessa ja kokemuksessa. Jatkossa koulutusten suunnittelun olisi

hyvä perustua systemaattiseen koulutustarveanalyysiin. Koulutuksen toteutuksessa ns. kouluttajien koulutus –lähestymistapa parantaisi tehokkuutta ja kestävyyttä.

6. rakentaa kansallista osaamista myös instrumenttien ja laitteiden valintaan sekä hankintaprosesseihin.

7. asentaa suunnitellut 12 säähavainto- ja hydrologista asemaa vuoden 2013 loppuun mennessä, jotta hankkeen kumppaneilla on aikaa kerätä kokemuksia asemien toimivuudesta ja kunnossapito- ja huoltotarpeista sekä henkilöstön lisäkoulutustarpeista.

8. parantaa alueellisen ohjausryhmän toimintaa, jotta sitoutuminen yhteisesti tehtyihin päätöksiin ja niiden toteuttaminen tehostuisi.

9. ottaa tulosperustainen lähestymistapa käyttöön hankkeen hallinnossa ja seurannassa. Hankkeen suunnittelussa, budjetoinnissa ja raportoinnissa on useita kehittämistarpeita.

10. käsitellä hankkeen pidennetyn toimintakauden (no cost extension) budjetti alueellisessa ohjausryhmässä ja hyväksyttää se erikseen UM:llä. Hankkeen huonon kustannustehokkuuden takia on perusteltua toteuttaa tilintarkastus hankkeesta vuoden 2013 aikana. UM:n ja ICIMODin välinen sopimus olisi myös hyvä arvioida uudelleen.

11. painottaa kumppanimaiden oman kapasiteetin kehittämistä myös kunnossapito- ja huoltotöissä sekä parantaa varaosien saatavuutta. Hankkeen määrärahoista maksettava huoltopalvelusopimus tulisi arvioida uudelleen.

Mahdollisen jatkohankkeen osalta keskeistä on, että:

12. WMO ja ICIMOD yhdessä hankkeeseen sitoutuneiden kansallisten kumppaneiden kanssa arvioivat hankkeen laajuuden ja sen realistiset toimintaedellytykset ja tarpeet uudelleen. Hankkeen jatkoa ei voi perustaa oletuksiin hankkeen ulkopuolelle jättäytyneiden toimijoiden mahdollisesta mukaantulosta myöhemmin.

13. osana suunnitteluprosessia tehdään tarkistettu tarvekartoitus sekä toimija- ja kumppanianalyysi. Väliarvioinnin kohteena ollut hanke suunniteltiin alunperin jo vuonna 2005. Hindu Kush – Himalajan alueella sekä laajemmin Aasiassa on uusia toimijoita, jotka voivat olla tarkoituksenmukaisia hanketoteuttajia tai kumppaneita jatkossa.

# 1 INTRODUCTION

The Mid-Term Review (MTR) of the Establishment of a Regional Flood Information System (RFIS) in the Hindu-Kush Himalaya –project was commissioned by the Ministry for Foreign Affairs, Finland (MFA) to Impact Consulting Oy Ltd in September 2012. The Final Evaluation team of Impact Consulting consisted of independent and external experts. The authors of the report bear the sole responsibility for the presented views. The report does not necessarily reflect the views of the Ministry for Foreign Affairs of Finland.

The project is implemented by the International Centre for Integrated Mountain Development (ICIMOD) in partnership with the World Meteorological Organization (WMO) and National Meteorological and Hydrological Services (NHMS) the Hindu-Kush Himalayan (HKH) Region. In mid-2012 MFA and ICIMOD had agreed to a no-cost extension of the project until December 2014. The duration of HKH-HYCOS project is now five years (December 2009-December 2014) instead of the original three years (project was supposed to be completed in December 2012). The project partners use the acronym HKH-HYCOS which is the Hydrological Cycle Observation System -project for Hindu-Kush Himalaya region. Therefore the MTR also refers to the project as HKH-HYCOS. The acronym RFIS refers to one of the project results, namely the Regional Flood Information System.

The MTR has been implemented during September-December 2012. The field mission to Nepal and Bhutan took place during October 11th -November 9th, 2012. This is the final MTR report of the team. It was submitted to the Ministry for Foreign Affairs on December 21st, 2012.

The consultant team has also conducted a Final Review (FR) of Finnish-Nepalese Project for Improving Capability of the Government of Nepal to respond to the increased risks related to weather related natural disasters caused by climate change (FNEP). A separate final review report of the FNEP was submitted to the MFA on December 21st, 2012.

## 1.1 Purpose and objectives of the MTR

The purpose of the Mid-Term Review of HKH-HYCOS (RFIS) in the Hindu Kush-Himalaya is to provide the Government of Finland (GoF) as well as the project implementers with an external, independent and objective analysis and assessment of the project with regard to whether it is on right track for reaching its intended objectives and to provide recommendations for the project in order to ensure project's impact, sustainability, effectiveness and ownership (TOR Annex 1).

The evaluation is expected to:

- Provide evidence of the performance of the project to date and likely performance in the future (is the project achieving its objectives, incl. the cross-cutting objectives?)
- Assess progress toward the project's results as outlined in the project documents, to analyse the reasons explaining success and failure (understanding why?)
- Examine the effectiveness of the approach taken (has the current scope of the project proven to be effective or would it be recommended to have a more focused approach in the project? Is the current geographical scope relevant and effective with a view to the project´s results?)
- provide recommendations on changes in the project (if needed)
- provide recommendations on continuation or closing of the project after the current phase.

The evaluation will particularly focus on the usability of the projects' products by all relevant stakeholders and the sustainability of the projects' expected results. This will include human resources and capacity building at ICIMOD, Department of Hydrology and Meteorology, Nepal (DHM) as well as in sister organizations.

## 1.2 Evaluation process, methodologies and limitations

A comprehensive description of the evaluation process, methodologies applied and limitations is provided in Annex 2. The evaluation process, methodologies and limitations are summarised below.

The **evaluation process** started in September 2012. It was divided into three phases: inception phase, field mission with stakeholder interviews, and data analysis and reporting.

The main activities during the **inception phase** of the evaluation (September 20th-October 10th) consisted of collection and review of relevant documents, logistical arrangements for mission to Nepal and Bhutan, development of evaluation tools and division of duties within team members, briefing meetings with the Ministry for Foreign Affairs and Finnish Meteorological Institute (FMI) and writing of the inception report. It culminated in the submission of an Inception Report to the MFA on October 10th, 2012.

The **field mission to Nepal and Bhutan** took place during October 11th – November 9th, 2012 (Annex 3 Field Mission Programme). The team interacted with 33 organisations and interviewed 93 persons representing project partners and stakeholders in the HKH region and in Finland either in person or electronically (Annex 4 Persons Interviewed). Views of the World Meteorological Organisation (WMO) in Geneva and the regional project partners in Bangladesh, China, India and Pakistan were sought through an email questionnaire. A field visit was conducted both in Bhutan and Nepal to inspect a sample of meteorological and hydrological stations that had been invested on by HKH-HYCOS. Relevant national and regional strategies and policies as well as HKH-HYCOS and ICIMOD documents and progress reports have been reviewed (Annex 5 Documents Reviewed).

The team conducted a preliminary analysis of findings, conclusions and recommendations and prepared a presentation for the Wrap-Up Meeting. The meeting was organised at the ICIMOD premises in Kathmandu on 6 November 2012. Memo of the comments and views expressed during the Wrap-Up Meeting has been attached as Annex 6. The field mission was completed by holding separate debriefing meetings with ICIMOD and with the Embassy of Finland on November 7th, 2012. A debriefing meeting with the MFA took place in Helsinki on November 13th, 2012.

**Comprehensive data analysis and reporting** took place during November 12th – November 30th, 2012. The Team completed the analysis of data collected during the mission, drew findings and conclusions and drafted an MTR report of the project. During this stage the team communicated with each other electronically (email, phone). The team addressed the comments provided by the quality assurance experts of Impact Consulting. Draft report was submitted to the MFA and the Embassy of Finland for collection of comments on November 30th, 2012.

**Analysis of comments and finalisation of report** was the last step of the MTR process (December 14th-21st, 2012). Written comments on the draft report from MFA, Embassy of Finland, ICIMOD, WMO, DHM, BWDB and FMI on December 14th, 2012. All comments were meticulously assessed. Some comments requested the MTR team to reconsider the findings while others suggested minor corrections or provided some additional information. The comments that contained new information, compelling arguments or additional angles to consider have led into changes and revisions in the report. Impact Consulting submitted the final report to MFA December 21st, 2012. In January 2013 the team leader will also give a presentation at the MFA on the findings, conclusions and recommendations of the MTR.

The **evaluation methodologies** have consisted of collection and analysis of both primary and secondary data. The following tools were used to collect primary data: semi-structured interviews (individual or group meetings), group work / facilitated self-evaluation, email questionnaire, and field visit. Collection and analysis of secondary data formed an important part of the evaluation methodology. The following types of documents have been reviewed and analysed: HKH-HYCOS project document, progress reports, site visit reports, procurement committee minutes, project budget and expenditure reports, minutes of the Regional

Steering Committee (RSC) meetings, other relevant project reports and email responses to the questionnaire. Relevant policies, strategies and programmes particularly for Bhutan, Nepal and ICIMOD have been reviewed; review of policies and strategies in the other partner countries' strategies and policies is, however, limited to the information the project partner's provided in their responses to the email questionnaires. The evaluation framework developed during the inception phase has guided the data analysis. The MTR team has methodically assessed the HKH-HYCOS activities and achievements and compared them against the objectives and indicators of the project document and plans in place. The team has applied Results-Based Management approach together with the "Most Significant Change" method in assessing the project and its achievements.

The scope of the assignment only permitted meetings with active project partners in Nepal, Bhutan and Finland. The team considers it a l**imitation** that the Terms of Reference of the assignment did not provide for meetings with active and planned partners in the other four counties. With a modest increase to the evaluation budget, MFA could have incorporated brief visits to Pakistan, Bangladesh, India and China in the Terms of Reference. That would have provided a more in-depth review of the project.

### 1.3 Structure of the Report

Chapter 1 provides introduction to the report and describes the evaluation objectives and methodologies. In chapter 2 the project itself and its development context is presented by providing background information, information on relevant policies and strategies and other related interventions, describing project partners, strategic priorities of Finnish development cooperation. Chapter 3 presents the findings of the evaluation and follows the logic of evaluation issues of OECD/DAC (relevance, effectiveness, impact, efficiency and sustainability). Also findings with respect to cross-cutting issues, aid effectiveness, coordination and coherence, Finnish value added, project design and linkages with HKH-HYCOS are presented there. Chapter 4 brings forward the evaluation conclusions, chapter 5 discusses lessons learned and finally recommendations of the FR are presented in Chapter 6.

The length of the main report follows the instruction of the TOR (max 30 pages). Therefore in many chapters only main issues and most relevant evidence is presented. Full details and evidence are incorporated in the report annexes which form an integral part of the report.

## 2 DESCRIPTION OF THE CONTEXT AND THE PROJECT

### 2.1 Regional background

The Hindu Kush – Himalayan region is a vast complex of high mountains, intermontane valleys, and plateaus shared by Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan. It is one of the world's largest renewable supplies of freshwater. It is also the source of ten of the world's largest rivers. Those rivers are vital for the survival and well-being of more than a billion people, most of who live in the surrounding plains.

Asia is the most disaster prone part of the world (South Asia Environment Outlook 2009). About 80% of all natural disasters strikes here and floods account for around 50% of the disasters. Nearly 23% of the world's population lives in this region, 72% in rural areas. The increasing poverty among marginalized river bank communities along the Himalayan river belts has brought to fore the intrinsic relationship between climate change, river systems, natural disasters and development work. Floods are a major natural disaster aggravating poverty in the Indus and Ganges-Brahmaputra-Meghna (GBM) basin; it is home to over 600 million people and almost half of the world's poor people.

HKH region is a hotspot of various kinds of geological and hydro-meteorological disasters. Climate change has wider impact on lives, livelihood and critical infrastructures in the region. For instance, majority of natural disasters of the region are related to climate. The number of flood disasters occurring per year is gradually

increasing. These floods often result in significant loss of life, costly damage to property and infrastructure, and severe psychological and emotional disturbance. For instance, the 2010 floods in Pakistan resulted in 1800 persons losing their lives and affected some 21 million people. The average annual costs of floods in Asia have been estimated at USD 15 billion.

Because of frequent flood events people have learned to live with these conditions and are inclined to stay with their homes trying to protect their belongings even when warned of impending high water. In many areas the warning may be received so late (if there is any warning at all) that there is inadequate time to secure belongings, save livestock, flood-proof dwellings and relocate to safer ground. An increasing number of poor communities living on marginal land along the river belt are already being adversely affected as they lack capacity to be proactive and to respond adequately to such fluctuating disaster/risk situations.

HKH region is extremely vulnerable to climate change impacts, possibly leading to an increasing incidence of flash and riverine floods, thereby necessitating the need to share information in real or near real time for flood forecasting and early warnings. Flood occurrence as such cannot be prevented but the effects can be minimized to reduce the loss of lives and property. Currently there is a dearth of real time accurate data, insufficient lead-time for flood forecasting, lack of technical capacity, and a scarcity of hydro-met stations. The trans-boundary nature of the rivers calls for a broader river basin approach to flood forecasting, warning and flood management.

The HKH region has a history of relatively few regional initiatives for cooperation and management of water resources and hazards such as regional floods and flash floods. In the past, most trans-boundary collaboration on water management has been of bilateral nature. However, in the light of climate change impact on the water resources in the region, and with several major river basins being shared by three or more countries, the requirement for regional cooperation is gradually increasing.

In this context, the value of flood forecasting increases as the lead-time increases. Flood forecasting is thus highly dependent on information communication and infrastructure capacity. Communication channels and operational early warning systems (EWS) are needed to disseminate information from national institutes to those responsible for disaster management and then directly to the people affected.

## 2.2 Relevant policies and actors in the region

There is an ample stock of policies, strategies, declarations and agreement at regional, bilateral and national level giving support to issues HKH-HYCOS works on. The Hyogo Framework of Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters is an example of an international agreement that has contributed to increased awareness on disaster risk mitigation and methods.

All countries in the region are members of WMO and in particular WMO's Regional Association II-Asia (RA-II Asia). RA-II Asia has advocated for and endorsed the development and implementation of Hindu Kush – Himalayan Hydrological Cycle Observation System –project as part of its global World Hydrological Cycle Observation System (WHYCOS) programme.

ICIMOD's mandate is to work on Hindu Kush-Himalayan region. There are eight member states, namely Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan. There are also other regional institutions working with partly overlapping geographical or technical mandates with these same countries.

Seven of the states are also members of the South Asian Association for Regional Cooperation (SAARC). China is an observer to SAARC. The relevant agreements by SAARC and its members include the SAARC Framework for Action (SFA 2006-2006), SAARC Action Plan on Climate Change (2008), SAARC Comprehensive Framework on Disaster Management (2006) and Thimphu Statement on Climate Change (2010). There are two regional SAARC centres working in related fields, namely the SAARC Disaster Management Centre in New Delhi India and SAARC Meteorological Research Centre in Dhaka, Bangladesh.

The Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES) is an international and intergovernmental institution for the generation and application of early warning information. RIMES evolved in the aftermath of the 2004 Indian Ocean tsunami. RIMES registered with the United Nations on 1 July 2009. It operates from its regional early warning centre in Thailand. The aim of RIMES is to provide regional early warning services and builds capacity of its Member States in the early warning of tsunami and hydro-meteorological hazards. RIMES works to establish a regional early warning system within a multi-hazard framework to generate and communicate early warning information, and for capacity building in terms of preparedness and response to trans-boundary hazards. Bangladesh and India are already members and other five countries Bhutan, China, Myanmar, Nepal and Pakistan are collaborating countries and in the process of becoming members of RIMES. The Council is the highest governing body of RIMES. It is composed of heads of the National Meteorological and Hydrological Services (NMHSs) and national scientific and technical agencies generating multi-hazard early warning information.

Examples of relevant national policies, strategies and programmes in the partner countries include:

- Bangladesh National Adaption Programme of Action on Climate Change (NAPA 2005), Climate Change Strategy and Action Plan (2009), National Plan for Disaster Management (2010) and Sixth Five-Year Plan (2011) in Bangladesh.
- In Bhutan the National Disaster Risk Management Framework (2010), Water Policy (2003), two NAPAs (first NAPA 2006 and NAPA 2 to be endorsed soon) and the draft 11th Five-year Plan
- National Comprehensive Disaster Reduction Plan (2007) in China
- Disaster Management Act (2005) and National Policy on Disaster Management (2005) in India
- National Strategy for Disaster Risk Management (2009), Climate Change Policy (2011), NAPA 2010, Three-Year Plan 2010/11-2012/13, National Water Plan 2005 and other policy documents in Nepal.

The latest periodic Development Plans of Bangladesh, Nepal and Bhutan show a remarkable coherence and congruence with each other. All include as priority actions upgrading of the conventional (manual) weather and hydrological stations into automatic stations and other modernization measures with the national hydro-met institutions.

There are also a number of bilateral treaties and agreements in place between different project countries capturing the main river basins (Indus, Ganges, Brahmaputra and Meghna). India has bilateral treaties and data sharing agreements with Pakistan, China, Bhutan, Bangladesh and Nepal. There is also a data sharing agreement between Bangladesh and Nepal and Bhutan and Nepal. The existing agreements would provide sufficient basis for the countries working together in the region.

A more comprehensive review of relevant regional and national policies and strategies is provided in Annex 6.

## 2.3 Other related interventions in the partner countries

In recent years the number of interventions working with the national hydro-met departments has sprung up among HKH-HYCOS partners. The interventions support the development of hydro-met departments either directly or indirectly by placing a demand on improved data and information products of the departments. The increased emphasis of development partners and national governments on issues related to climate change monitoring and adaptation and on improved disaster preparedness and e.g. setting of early warning systems (EWS) have contributed to this trend. According to the information received during the MTR, at least in Bangladesh, Bhutan and Nepal there are several on-going or pipeline interventions that are supporting the national hydro-met departments in modernizing their station network and supporting development of capacities of the departments in many ways. Some of the projects also contribute to development of early warning systems which implicitly need to work with some form of national flood information system as well.

In Bangladesh there are a number of interventions supporting the Bangladesh Meteorological Department (BMD), such as SAARC, RIMES, WMO, Japanese universities, Norwegian Meteorological Institute and others. There are projects working on establishment of numerical weather prediction system, development of human capacity on operation of weather analysis and forecasting, and upgrading of agro-meteorological services, etc. Bangladesh Water Development Bureau (BWDB) did not share information about their on-going projects.

The significant interventions in Bhutan include the upcoming NAPA project (UNDP/GEF LDCF), JICA support on capacity building of DHMS, upcoming Institutional Collaboration Instrument-project with Finnish Meteorological Institute (capacity building of DHSM) and joint support programme on clean energy with Danida.

Similarly DHM in Nepal has a growing portfolio of projects with a number of development partners. The most significant ones are two interventions with the World Bank (upcoming Pilot Programme on Climate Resilience, PPCR and the WB/Global Forum for Disaster Reduction, GFDRR project in Koshi Basin), two projects with UNDP (an on-going disaster risk management programme and an upcoming Glacier Lake Outburst Flood, GLOF project), one project with SAARC and the FNEP project with FMI.

More information about the related interventions and actors to the extent it was provided by HKH-HYCOS partners is incorporated in Annex 6.

## 2.4 Strategic framework of ICIMOD and WMO

### 2.4.1 ICIMOD Strategies and programmes

The 2007 Strategic Framework of ICIMOD provides long term-direction to the organisation. It has structured the activities under three Strategic Programmes, namely integrated water and hazard management, environmental change and ecosystem services and sustainable livelihoods and poverty reduction. Integrated knowledge management was a fourth, cross-cutting strategic area.

Gender is approached as a cross-cutting issue in ICIMOD programmes. There is a Gender and Equity policy (2008) in place. The goal of the policy is to promote gender equality in achieving sustainable and equitable mountain development. The objectives are: to promote equitable and meaningful participation of both men and women at all levels of mountain development, to promote equal rights, and equitable access to and control over resources and benefits for women and men in the HKH and to strengthen and empower women in the HKH region.

The draft Strategic Framework 2012 (for discussion at the Board meeting in June 2013) proposes to structure the activities of ICIMOD according to the following regional programmes: adaptation to change, trans-boundary landscapes, river basins, cryosphere and atmosphere and on mountain environment regional information system. Himalayan university consortium is an emerging regional programme. The Strategic Framework supports the ICIMOD vision "Men, women, and children of the greater Himalayas enjoy improved wellbeing in a healthy mountain environment" and mission "To enable sustainable and resilient mountain development for improved and equitable livelihoods through knowledge and regional cooperation."

Draft Medium-Term Action Plan (MTAP-III) for the period 2013-2017 provides a road map for the implementation of the programmes. Its major shift is its orientation towards the implementation of Regional Programmes for delivery of impacts in the greater Himalayan region. Livelihoods, ecosystem services, water and air and geospatial solutions are strategic thematic areas. Knowledge management and Communication will remain a core function of ICIMOD. Gender, governance, poverty, economic analysis, and private-sector engagement will be cross-cutting topics that will be integrated into the regional programmes.

The Regional Programmes are formulated with a view to testing, piloting, and monitoring innovative approaches; facilitating trans-boundary cooperation on landscapes and river basins; addressing common issues related to the cryosphere and atmosphere; adaptation strategies and approaches; developing a

regional information system and databases; and meeting capacity building needs in the region. The goal of the regional programme on river basin is improved integrated river basin management, to reduce physical vulnerabilities and improve food and energy security for mountain and downstream communities in the greater Himalayan region while recognizing upstream interests.

In 2011, the ICIMOD budget was 19.7 MUSD consisting of regional and non-regional core funds, other income and project co-financing. Regional core funds have increased during the past decade. In 2011 the eight member states contributed about 0.54 MUSD to ICIMOD. Non-regional core funding was about 3.46 MUSD. Project co-financing is at present provided by some twenty partners to different projects including bilateral departments, UN agencies, multilateral development banks ad research and scientific organisations. The portfolio is growing and expanding. For instance, the EU Delegation has recently signed a 10.0 MEUR "Support to rural livelihoods and climate change adaptation in the Hindu-Kush Himalayan region"-programme with ICIMOD.

### 2.4.2 WMO and WHYCOS

The World Meteorological Organization is the specialized agency of the United Nations for meteorology (weather and climate), operational hydrology and related geophysical sciences. WMO has a membership of 190 Member States and Territories. National meteorological and/or hydrological services are WMO members as is also the case with HKH. WMO provides the framework for international cooperation for the development of meteorology and operational hydrology as well as to reap the benefits from their application.

WMO promotes cooperation in the establishment of networks for making meteorological, climatological, hydrological and geophysical observations, as well as the exchange, processing and standardization of related data, and assists technology transfer, training and research. It also fosters collaboration between the National Meteorological and Hydrological Services of its Members and furthers the application of meteorology to public weather services, agriculture, aviation, shipping, the environment, water issues and the mitigation of the impacts of natural disasters.

WMO facilitates the free and unrestricted exchange of data and information, products and services in real- or near-real time on matters relating to safety and security of society, economic welfare and the protection of the environment. It contributes to policy formulation in these areas at national and international levels. In the specific case of weather-, climate and water-related hazards, WMO's programmes provide vital information for the advance warnings that save lives and reduce damage to property and the environment

The World Hydrological Cycle Observing System (WHYCOS) is a WMO programme aiming at improving the basic observation activities, strengthening the international cooperation and promoting free exchange of data in the field of hydrology. WHYCOS's ultimate objective is to promote and facilitate the collection, analysis, exchange, dissemination and use of water-related information, using modern information technologies. WHYCOS is being developed in the form of regional components, HYCOSs, independently implemented, which meet the priorities expressed by the participating countries. The HYCOS components collectively form the building blocks to constitute the WHYCOS programme where hydrological and meteorological variables are captured and transmitted to national and regional databases to support, in all parts of the world, the establishment and enhancement of information systems which can supply reliable water-related data and information to planners, decision makers, scientists and the general public. WHYCOS has also been conceived as a vehicle for technology transfer, training and capacity building.

WMO is ensuring that the individual components are implemented in agreement with the global WHYCOS concept through the establishment of standards as outlined in the WMO Technical Regulations and 'Guide to Hydrological Practices' and WHYCOS Guidelines. By providing a framework of common guidelines and standards, WHYCOS enables the use of information from the regional HYCOSs for larger scale applications,

such as research into the global hydrological cycle. There are experiences available from a number of completed and on-going HYCOS projects (e.g. Volta, Niger, Carib, Mekong, SADC II and Pacific).

## 2.5 Strategic priorities of Finnish Development Cooperation

Finland's Development Policy Programme, Government Decision-in-Principle 16 February 2012 defines GoF's development policy and provides guidance to all actors working with development interventions funded by Finland. There are four priority areas Finland emphasises in its development policy and development cooperation. These priorities are: a democratic and accountable society that promotes human rights; an inclusive green economy that promotes employment; sustainable management of natural resources and environmental protection; as well as human development.

The development policy and development cooperation are based on human rights. The aim is that everyone, including the poorest people, knows their rights and is able to act for them. It is equally important that the authorities know their human rights obligations and are capable of implementing them.

Finland is committed to improving the quality of development cooperation. Finland is committed to the Paris Declaration on Aid Effectiveness (2005), the Accra Agenda for Action (2008) and the Busan Outcome Document (2011). These principles emphasise partner country ownership, the alignment of aid with partner country priorities and systems, donor cooperation and harmonisation, development results, as well as the mutual accountability. The development programme emphasises the results and quality of development cooperation. Clear target-setting as well as systematic monitoring and reporting on activities will be enhanced. Results-orientation is stressed in planning, management, monitoring and evaluation of results as well learning from and communicating results.

Gender equality, reduction of inequality and climate sustainability are the cross-cutting objectives of Finland's development policy and development cooperation. These objectives will be promoted in all development policy and development cooperation through mainstreaming, targeted actions and policy dialogue.

Emphasis on results-based management, endorsement of Paris Declaration, and gender equality and reduction of inequality were also strongly addressed in the previous Development Policy Programme, Government-Decision-in Principle in 2007. The 2007 Decision-in-Principle also acknowledged that increased development cooperation to mitigate climate change is needed.

The 2009 Finnish Development Policy Guidelines for Environment incorporates climate as one of the important fields of activity. Finland supports the adaptation of the poorest and most vulnerable countries to the adverse consequences of climate change. Particular emphasis is placed on equality and the goal is to promote the role of women at the local level and in international climate policy.

## 2.6 Brief description of HKH-HYCOS

### 2.6.1 Evolution of HKH-HYCOS 2001-2012

The TOR of the MTR focuses on the present phase of the HKH-HYCOS programme that began in December 2009. However, the scope of HKH-HYCOS includes a number of assumptions that arise from events during 2001-2009 so it is important to summarise those in this report. The milestones of the first 12 years of cooperation are listed in Annex 8.

The conceptualization of the project began in 2001 when the first regional meeting took place under the auspices of WMO and ICIMOD. A consultative panel meeting took place in May 2002 with the objective of continuing the process to develop a regional flood information system based on the WHYCOS concept. The

meeting agreed on the regional concept of a flood information system, building on the improved implementation of existing bilateral agreements and thereby contributing to towards regional exchange of flood-related data. Development of regional information system covering multiple river basins *per se* was not anticipated by the partner countries.

The second high level meeting held in Kathmandu in March 2003 endorsed the first phase project proposal. Phase I of the project ended in 2005. It was known as "South Asian Floods" and it was funded by USAID. The present HKH-HYCOS project document was developed during that Phase. Country consultations were organized in most partner countries in 2003. A third high level meeting in late 2004 endorsed the final project document.

The demonstration/test phase for the HKH-HYCOS project began on 1 June 2005 and culminated at the end of September 2005. It used existing structure where minor upgrades were undertaken only when necessary. The aim of the demonstration phase was to test the feasibility of sharing flood related information by testing different information system components.

Years 2006-2009 were "gap years" in the activities. An agreement between ICIMOD and Ministry for Foreign Affairs, Finland on project financing was concluded in late 2009.

### 2.6.2 Duration and objectives of HKH-HYCOS

The HKH-HYCOS programme was originally planned to run December 2009 to December 2012 (3 years) with financial support from the Ministry for Foreign Affairs of Finland with a total budget allocation of 2.0 MEUR (approximately 2.7 MUSD). During the second half of 2012 ICIMOD and MFA agreed on a no-cost extension of the project to December 2014.

The purpose of HKH-HYCOS project is "Timely exchange of flood data and information". The project has five results (specific objectives). They are:

- Result 1 Strengthened framework for cooperation on sharing regional flood data and information among participating member countries
- Result 2 Establishment of a flood observation network in selected basins in the selected countries
- Result 3 Establishment of regional and national flood information systems to share real time data and information and increase lead time
- Result 4 Enhanced technical capacity of partners on flood forecasting and communication to end users
- Result 5 Full-scale regional project planned and agreed among participating countries

Summary of project activities during 2009-early November 2012 is incorporated in Annex 8.

### 2.6.3 Institutional arrangements

The organization and management of the project is based on the concept that the participating countries have full ownership of the project and execute the project through their dedicated national organizations and agencies. The WMO and ICIMOD are jointly facilitating the process of planning and region-wide implementation of the project within their specific mandates in the project.

**ICIMOD** as **Implementing and Coordinating Agency** is responsible for the day-to-day implementation and coordination of the project activities which includes the management of external project funds, tender and procurement processes and technical assistance in the establishment of components of the project (such as hydrological and meteorological stations and other data collection platforms) within the scope of the project.

In its facilitating role, ICIMOD is responsible for the coordination of the regional implementation of the project by setting up a Project Regional Centre (PRC, coined Project Management Unit, PMU during project

implementation). The **PMU** is established at ICIMOD and headed by a Project Coordinator/Manager. PMU acts as a focal point to coordinate the project activities executed in and by the participating countries, fosters regional cooperation in sharing basin-wide flood data and information, and provides a forum for exchange of expertise. Project management is guided by six-monthly project plans, against which progress reporting will be made by PMU.

**World Meteorological Organisation** (WMO) as the custodian of WHYCOS is responsible for the technical support and monitoring of the project. The role of WMO (as the Monitoring and Technical/Scientific Support Agency) is to facilitate, support and monitor the implementation of the project and provide technical and scientific backstopping. Project performance monitoring is provided by WMO in its role as a monitoring agency, in collaboration with ICIMOD and the PMU to ensure consistency in the implementation of the project.

**Regional Steering Committee** (RSC) is the superior body that reviews policies and long-term plans of the project. According to its TOR, the core composition of RSC consists of key decision makers from the hydrological and meteorological departments of the participating countries, WMO and donor representative (Government of Finland) as members, Director of Program Operation, ICIMOD as the chair and HKH-HYCOS Project Coordinator, PMU as the member secretary. The RSC meets twice a year to review project progress, revise plans, provide technical guidance and guide project implementation. RSC is responsible for ensuring project coherence and overseeing project policy, strategy, and implementation. It will decide on any changes to the project document and approve the work plans, budgets and reports.

The project has two support teams in place to provide technical backstopping: a 5-member **Project Advisory Team (PAT)** consisting of ICIMOD staff and a 4-member team of **external advisors**. Formation of the PAT was agreed in the 2nd RSC meeting in May 2011. According to the TOR of the PAT its role is to guide project implementation and help it overcome challenges. Formation of PAT with senior managers was found crucial in view of the need to recover from delays in project implementation. The team of external advisors originally consisted of WMO representative and two consultants (hydrological experts). In 2012 a representative from the Finnish Meteorological Institute was included as an external advisor.

ICIMOD has also constituted an ad hoc **technical committee** to assist with procurement of hydrological and meteorological instruments as well as technical backstopping of the project's initiatives.

The **participating countries** through their dedicated national agencies and organizations have the primary responsibility for the execution of the project. To assure project success and to help assure post-project sustainability, it will be essential to have an agreement of the participating countries to act on these responsibilities. The project document (p. 37) states that the project will be executed by relevant national institutions in six partner countries, namely Bangladesh, Bhutan, China, India, Nepal and Pakistan. In practice the project has succeeded in developing an active partnership with six executing partners in four countries, namely Bangladesh Meteorological Department (BMD) and Bangladesh Water Development Board (BWDB) in Bangladesh, Hydro-met Services Department (DHMS) in Bhutan, Department of Hydrology and Meteorology (DHM) in Nepal and Department of Energy, Water & Power Development Authority (WAPDA) and Pakistan Meteorological Department (PMD) in Pakistan. Six Letters of Agreement (LoA) have been negotiated and signed to this effect.

The agreement between MFA and ICIMOD stipulates the Ministry shall make available on grant basis a contribution amounting up to a maximum of two million Euros to support the HKH-HYCOS project. ICIMOD shall submit to MFA biannual progress reports including financial reports. Within three months from the completion of the project ICIMOD shall submit a written final report on the implementation of the project. The report shall include an audited financial report on the use of the contribution. ICIMOD shall carry out the implementation of the project in accordance of the project proposal (PD). Regarding other conditions, the

agreement states that ICIMOD will carry the activities in accordance with the Project Proposal (Project Document). The agreement implicitly builds on premise that the project planning and management procedures of ICIMOD will be applied in the project.

# 3 KEY FINDINGS

## 3.1 Relevance

The Hydrological Cycle Observation System (HYCOS) concept for Hindu Kush Himalayan is relevant for the HKH region. The regional approach to the water induced disasters is relevant as the water related hazards addressed are inter-linked across national borders. HYCOS is in line with national plans and policies of the respective countries and SAARC Disaster Policy at the regional level, which all emphasise the need to build disaster resilience. HYCOS is also equally in line with Hyogo Framework of Action, UN International Strategy for Disaster Reduction (UNISDR) and Millennium Development Goals.

The strategic priorities of WMO and ICIMOD are complementary. The current and upcoming strategy of ICIMOD incorporates thematic focus on water induced disasters and river basins. HKH-HYCOS is relevant to ICIMOD as its mandate is to collect and share data, information and knowledge at national and regional level. WHYCOS and HYCOS concepts are fully owned and supported by WMO and its partner countries.

The project contributes to the achievement of the strategic objectives and principles of Government of Finland, particularly to climate sustainability and human-rights based approach. The primary target group, namely the national hydro-met departments are all duty bearers and striving to provide improved climate and weather related services to the citizens of the country countries (right holders).

## 3.2 Effectiveness (results)

The MTR has conducted a thorough performance review of the HKH-HYCOS building on the objectives and their indicators in the logical framework of the project. The full analysis with all details is available in Annex 8. Table 1 below summarises the main achievements of the project vis-à-vis results (specific objectives).

**Table 1 Assessment of HKH-HYCOS main achievements and changes vis-à-vis project Results during December 2009-October 2012**

| MTR team assessment of project Results (Specific objectives) and Indicators achieved |
|---|
| **1. Strengthened framework for cooperation on sharing regional flood data and information among participating member countries**<br><br>**1.1Quality of tangible outcomes and adequate participation in annual Regional Steering Committee meetings:** There is a mutually agreed Terms of Reference in place for the RSC (approved in the 1st RSC meeting). 4 RSC meetings and 1 inception meeting (2010) held with active participation from 4 countries (Bangladesh, Bhutan, Nepal and Pakistan) and participation as observers from the meteorological departments / agencies from China and India; government departments representing hydrology are absent from both China and India. RSC meeting decisions are not equally respected by all partners (not fully internalized and implemented in a timely manner) resulting in some delays.<br><br>**1.2 Agreements on pilot level activities for regular information sharing:** Letter of Agreements (LoA) in 4 countries with 6 partners (BMD, BWDB, DHM, DHMS, PMD and WAPDA) signed during 2010. In Pakistan the project was presented to the Prime Minister as a regional initiative. Efforts to bring China and India on board are on-going but so far not successful. |

| MTR team assessment of project Results (Specific objectives) and Indicators achieved |
|---|
| **2. Establishment of flood observation network in selected basins in the participating countries**<br><br>**2.1 Number of upgraded hydro meteorological stations including telemetry in participating countries:** 23 out of the 24 planned stations upgraded with real time data transmission in four countries (Bangladesh, Bhutan, Nepal and Pakistan). The 24th station selected for upgrade will be installed in December 2012 (Nepal). Additional 12 stations are planned to be procured and installed in 2013. |
| **3. Establishment of regional and national flood information systems to share real time data and information and increase lead time**<br><br>**3.1 A flood information system in place:** ICIMOD has established a dedicated website (hkhhycos.icimod.org, see Annex 9). The website provides access to real time meteorological and/or hydrological data of 23 HYCOS stations. In addition, data from 5 stations from ICIMOD's Kailash network (Nepal) is posted together with meteorological data from 14 Global Telecommunication System (GTS) stations and of all the other real time Automatic Weather Stations (AWS) and Automatic Water Level Sensors (AWLS) in Nepal. Data searches can be performed on different parameters and different time spans. Annex 8 provides a map of these stations. At present the data transmitted from the stations is not quality checked. Work on quality control procedures has been started. There is not yet any link to any information products.<br><br>The project is giving inputs for development of National Flood Information System (NFIS), i.e. a web portal to be hosted by each partner institution (six portals). Initial installations are complete, but according to ICIMOD additional work is required. The degree of integration with the existing early warning systems in each country is not clear.<br><br>**3.2 % of HYCOS stations functioning properly:** 21 out of 23 stations (91.3%) functioning at the time of MTR. One station in Bhutan was damaged by floods and one station in Nepal had a solar panel stolen. Both stations are being repaired.<br><br>**3.3 % of HYCOS stations with successful data and information transmission and use by participating countries:** 21 out of 23 stations (91.3%) transmitting real time data to the NFIS and RFIS. ICIMOD and project partners in 4 countries have agreed to add value to the portal by linking data from other existing AWS and AWLS that transmit real time data in the portal. |
| **4. Enhanced technical capacity of partners on flood forecasting and communication to end users**<br><br>**4.1Partners of participating countries operating and maintaining the flood information system:** In Bangladesh, Bhutan, Nepal and Pakistan partners have staff members who have gained skills in installation, operation and maintenance of the stations. The Pakistani agencies have independently installed stations in Gupis and Kalam. |
| **5. Full-scale regional project planned and agreed among participating countries**<br><br>**Project Proposal developed and [approved by participating countries]**: The planned full-scale regional project would constitute Phase III of the HKH-HYCOS programme. It is projected to implement an up-scaled, region-wide, fully integrated flood information system. ICIMOD and WMO have started proposal preparation following the decision at the 4th RSC meeting in May 2012. The indicator leaves the number of countries to participate in the full-scale project open. The MTR team understands that a minimum of three countries committed to participate actively are needed for a "regional" project. |

The findings per each result are discussed in paragraphs below.

On **Result1 Strengthened framework for cooperation on sharing regional flood data and information among participating member countries** progress is not as anticipated: the project was designed with a scope building on and expecting active participation from all six countries. Despite efforts by ICIMOD and WMO, the participation of India and China is partial at best: the meteorological institutions from China (China Meteorological Association, CMA) and India (India Meteorological Department, IMD) attend meetings as observer. The government departments on hydrology are absent from both countries. Neither the proposed partners in India nor China have signed Letters of Agreement with ICIMOD on HKH-HYCOS project. According to WMO, it is evident that India will not fully participate in the project. Efforts are on-going with China to solve the inclusion of two hydrological stations in Tibet. Partners in Pakistan, Bangladesh, Bhutan and Nepal have expressed their concern and reluctance to continue open information sharing through the project mechanisms if the practice is not reciprocated by India (particularly) and China (preferably).

The role and functions of the Regional Steering Committee are discussed in chapter 3.4 Efficiency.

With respect to **Result 2 Establishment of flood observation network in selected basins in the participating countries** 23 out of the 24 planned stations have been upgraded with real time data transmission in four countries (details on stations in Annex 8). The 24th station will be installed in December 2012 in Nepal. The stations are transmitting real time data mostly in 15 minute intervals in dual mode, i.e. simultaneously to national partner's database and to ICIMOD's RFIS web portal. Additional 12 stations are planned for installation in 2013.

The MTR has identified a number of issues in relation to the instrument selection and applicability, adoption of WMO standards, selection of the sites for stations, location-specific issues with station as well operation & maintenance (O&M) of the AWS and AWLS.

RSC agreed upon five criteria for station selection. These included operational feasibility, suitability for testing, saving of lives and property, expansion of coverage with trans-boundary function, and accessibility. While setting the criteria for station selection, security of proposed sites was not addressed. The criteria have not incorporated the requirements set by the proposed regional flood information system, namely the value added contribution for RFIS. In practice, partner countries and agencies have been able to benefit from the investments of HKH-HYCOS by filling gaps in their national station network. E.g. in Bhutan the stations are located in the extreme east and west, because JICA and NORAD funded projects contribute to the investments in the river basins in the central parts. The hydrological stations are well-located to benefit a majority of Bhutanese living in the downstream. The stations certainly strengthen the national network of DHMS but contribute less value-added information to RFIS. DHM has followed a similar logic to their Bhutanese counterparts and proposed stations in the Koshi River Basin for upgrade. The main reason is that at the time of the site selection process the other development partners had interventions financing upgrades of hydrological and meteorological stations in several other river basins in the Central, Western and Far Western parts of the country. The MTR finding is that the project partners have been striking a balance between national and regional interests.

The site selection of the southernmost hydrological station in Koshi Basin in Nepal is another case to the point: DHM proposed Mulghat in Tamur River (one of the three tributaries of Koshi River) as a hydrological station to upgrade. From a regional flood forecasting point of view a station in Koshi Chatara in Koshi River itself in Sunsari would have been much more relevant.

The project partners have been responsible for civil works. It has been a good approach contributing to ownership both at the national as well as local (site) level. LoAs state that civil works at stations are in-kind contribution from the participating countries, while station upgrades and adequate spare parts and consumables are provided by the project.

As for operation and maintenance (O&M), this responsibility should be transferred to the concerned national agencies after project completion. Despite very recent installations, the MTR team found that the stations are not properly maintained by the hydro-met departments. For instance, Korilla AWS in Bhutan is surrounded by trees, and so doesn't measure wind speed and direction correctly. Situation is similar in the Hongtsho meteorological station in Bhutan. It has been built on a mountain slope and particularly wind readings are obstructed by the slope and nearby buildings. A PMU meteorologist was not a member of the team that conducted the pre-installation site visit.

During the visit to Mulghat hydrological station in Nepal a number of problems were evident: the quality of installation was sub-standard (shoddy wiring, radar not protected from passers-by and radar readings affected by the vibration of the passing traffic on the bridge). The data transmission cable (inside a GI pipe) passes through a busy bazaar and has not been properly protected. No data from the station was received in weeks in the middle of the monsoon when the GI pipe was damaged in August. Also the weather station with the data logger and mobile transmission unit has been built on a private person's land without any proper compensation from DHM. The latter two issues are under the direct responsibility of DHM as project partner but would have warranted attention from PMU when station was selected and plans were made. During the Wrap-Up Meeting ICIMOD informed that there were plans to relocate the station. The decision is probably right but begs an answer to the question why the original installation was not well done.

All instruments procured by the project adhere to WMO standards as such. However, all three stations that the team selected for a visit (1 in Bhutan and 2 in Nepal) suffered from such installation or O&M problems that made them not fully compliant with WMO standards or performance indicators. The adherence to the establishment of the stations on sites needs to be observed by the project partners, the national hydro-met institutions (NHMSs) responsible for site selection and installation. DHMS in Bhutan was also not entirely satisfied with the type of hydrological equipment that had been procured – their preferences on proven techniques and technologies that had worked well in Bhutan had not been adhered to. Instrument selection and procurement are issues enhancing or inhibiting with national ownership (see further discussion in chapter 3.7.1).

While procuring and installing the instruments, the seasonal calendar has not been properly observed. This has created some delays in the installation process. This issue was especially raised in Bhutan where some stations are in high altitude (difficult to work during winter months). The project needs to try to optimize the tendering and procurement process so that procurement would not be out of synch with the optimum installation season.

Regarding **Result 3 Establishment of regional and national flood information systems to share real time data and information and increase lead time**, and the dedicated website hosted by ICIMOD server, at present the data received either by the national systems or the database hosted by ICIMOD is not quality checked. RSC and PMU have however started addressing the issue (there is a task force consisting of WMO, PMU, FMI and RTS) that is expected to work on the matter together with national partners.

ICIMOD approaches this component from the activity angle – since most of the activities planned in the PD have been completed they consider that the result is 80% complete. MTR team finds that the website itself is well designed and functions well, but in its present format it hardly constitutes a regional flood **information** system. The actual information products that would provide value to the end-users are yet to be developed. Work has just started on a next step activity (basin-wide flood advisories). The project partners communicated

differently about the definition, purpose and usage of RFIS or information products that would be produced by the system – a common and clear view is missing.

The development of National Flood Information Systems (NFIS) is going on. For five of the six partners a new "hkhhycos" web portal has been developed and is hosted by the server of the respective national partner. In Nepal the information has been integrated into an existing portal. The Nepal approach reflects ownership and appears most sustainable because an existing GoN database has been upgraded. It also builds on past support from other donors in the development of hydrological services in Nepal (Danida and WB).

The installations have been completed during the first half of 2012. At least an observation cycle of 12 months is needed to make any definite assessments about their functionality. This was also reflected in some of the project partner responses. It is a cause for concern that there are already stations with transmission and operation problems.

In addition to the 23 HKH-HYCOS-sponsored station, ICIMOD and project partners have agreed to add value to the portal by linking data from other existing stations that transmit real time data in the portal. Nepal has made available data from all real time stations of DHM and also data from 14 GTS stations in Nepal is currently displayed. Similarly data from 5 stations of ICIMOD's Kailash project in Nepal are incorporated. DHMS, Bhutan and BWDB, Bangladesh have already agreed to contribute data but it is not yet displayed on the portal. There is also a plan to incorporate data from 300 meteorological stations from the entire Hindu Kush Himalayan region that is available in the GTS system. Efforts are going on to display data from other partner agencies and overlay with rainfall estimates from the Satellite Rainfall Estimate project of ICIMOD. These measures are appreciable and value adding from the point of meteorological data. However, these measures are proxy measures that ICIMOD has adopted to compensate for the missing hydrological data from India and China. It is the view of the RFIS developers that in its present form RFIS is intended to build on multiple platforms of observation as any project financed hydrological station network would not be dense enough by itself to deliver sufficient regional flood information. The inclusion of meteorological data and satellite-based precipitation information is a best-effort approach by ICIMOD and WMO to overcome insufficient hydrological data, including from India. The MTR team wishes to note that even a surplus of meteorological data cannot adequately compensate for lacking of hydrological data.

The data use function and usefulness of RFIS to the participating countries is not obvious at the moment. During discussion, none of the partners indicated any plans to incorporate the regional system into their national early warning systems during the evaluation process. The national flood information systems are being developed at present, so it is too early for the MTR to assess either the scope or relevance of the system or the partner capacity in maintaining those systems. The ownership of RFIS and NFIS and their linkage to each other should be determined. Any overlapping of existing data management systems should be avoided.

Regarding **Result 4 Enhanced technical capacity of partners on flood forecasting and communication to end users**, training activities have so far focused on regional and national training sessions on installation, operation and maintenance of the stations. Training inputs have been provided by ICIMOD staff and Real Time Solutions. In Pakistan, the agencies have independently installed two stations. The Pakistan experience presents a good example of transfer of technology and skills. The findings from Nepal are not equally positive – there was much discussion about the external support needed to maintain and operate the stations. DHMS in Bhutan requested inputs in building national capacity in spare part provision and O&M. Capacity development activities and approach are discussed in detail in Chapter 3.2.1 below.

RTS is a local IT company with offices in Nepal and India. It won the competitive contract to supply 24 stations. RTS is also the supplier of the data logger and mobile transmission technologies that are required for real time data transmission. The manufacturers offer a 2-year warranty period for the instruments. Therefore,

RTS as a representative of several internationally renowned manufacturers of hydrological and meteorological instruments and equipment is required to provide support to the hydro-met departments in trouble shooting and maintenance during the first couple of years after the installation. ICIMOD, WMO and the MTR share a concern about the partners' capability to maintain and operate the equipment. In response, ICIMOD has extended a multi-year Annual Maintenance Contract (AMC) to RTS. A tripartite Memorandum MoU to that effect has been signed with one partner (Bhutan, with validity until mid-2016). With the added two years, the partners would be supported by RTS in O&M a total of four years from the installation. With project funds external support can be maintained, but sustainability is a concern. See further discussion in Chapter 3.5 Sustainability.

The project has provided very modest inputs towards community outreach and communication to end users. Partners in Bhutan and Nepal have organised some awareness raising events in connection to international day celebrations. The investment in this as a part of the project is so small that it is not effective. It would have been probably better not to incorporate them in the project in the first place.

With respect to **Result 5 Full-scale regional project planned and agreed among participating countries**, given that there was an MTR of the project scheduled for the 2nd half of 2012, it would have been proper to wait for the outcome of the review process before any efforts to design a new phase were started.

### 3.2.1 Capacity Building

There has been very little emphasis on capacity development of the professional and technical staff of the participating hydro-met institutions so far. To a degree it is understandable because without the equipment and instruments for the stations, and without the content in national or regional flood information web portals, it is difficult to organise relevant training.

In Nepal the local staff of hydro-met departments and gauge readers do not have skills to address any technical issues with the equipment – and even the trained technical staff did not demonstrate any confidence or capacities to initiate any repairs on their own in the case of a malfunctioning instrument. While capacity development activities are on-going, it is the RTS staff in Kathmandu that is responsible for remote monitoring of the stations and of the large part of the regular O&M as provided in their Annual Maintenance Contract. Some technical problems can be fixed remotely (those related to the software), but problems with hardware require physical input at the station. The current procedure is that RTS staff will contact the gauge reader or designated technician via a mobile and give step-by-step instructions on the phone. This same procedure is applied for trouble shooting and fixing problems with instruments and stations in Bangladesh, Bhutan and Pakistan. The project is paying for an external service provider to take care of functions that can be considered core functions and activities from the sustainability point of view.

The training has been designed in a logical fashion and started from instrument installation, operation and maintenance of hydro-meteorological instruments. However, the MTR team did not find any evidence that a structured training needs assessment was conducted before the training curricula and materials (e.g. the SOP Manual) were drafted. A solid capacity assessment would take into account both existing capacity level of different staff categories and the expressed gap between the current and planned capacity level. In reality, the staff working in different hydro-met departments is different in terms of their experience and qualifications and language skills. With different capacities, it is quite a challenge to accommodate the needs of partners – particularly when they are not assessed beforehand. Partners were somewhat satisfied with the training but did also raise concerns about the content of training and applicability to different trainees. In any case the response was mixed. The best example seems to be Pakistan: it shows that properly tailored country specific training leads to independence from projects and external service provides and adds to the capacities of the organisation.

The training provided so far has been of standard content. It has addressed the needs expressed by the partner institutions, but not in an effective manner. To conduct training with similar content with six partners is not effective because the participants work in a different context, have different capacities and therefore different needs. At least with respect to O&M, the first training sessions seem to have a low impact. This assessment is based on interactions with staff of DHM and DHMS who had attended the training sessions on installation, operation and maintenance. Information provided by partners in Pakistan and Bangladesh suggest that training impact may be better there than what was observed in Nepal and Bhutan. In capacity development it is useful to keep in mind that even a high partner satisfaction without concrete training results, namely improved staff skills on the topic where training was imparted does not mean much. More emphasis is needed on assessing training impact, not just partner and participant satisfaction. Further trainings then need to build on impact and achievements of previous trainings.

The preparation of the Standard Operating Procedures Manual is a good initiative. However, looking at its contents and substance, it is still vague in its present form. To make the capacity building component really productive, learning-oriented and value based, content should be revisited and make it as simple as possible. More practical hands on training is required considering the level of education and exposure of staff involved (e.g. local gauge readers and field technicians).

The project has been highly successful in terms of generating awareness among the relevant stakeholders. However, awareness alone does not yield better results. The target-based skills and practices are more important than theoretical knowledge. The project should shift from awareness creation approach to a more concrete capacity building approach for enhancing skills, morale and confidence of the technical staff of partner organisations.

The biannual Regional Steering Committee meetings (see also discussion in chapter 3.7.4) are serving as important interaction and capacity building events targeted for the senior officials of the partner organisations. Indeed all RSC meetings have been combined with a training or workshop of one or more days on a specific subject. This is good example of efficient management and resource use by ICIMOD/PMU. HKH-HYCOS partners and other relevant organisations such as Mekong HYCOS project have been invited to share their experiences. During the meetings discussions for example on capacity building, data management, communications issues and public awareness-raising have taken place. These are all very useful from the capacity development point of view. The partners have been able share their experiences, achievements and challenges in a constructive and supportive environment, and saw them as 'social laboratories' in which to learn about and internalise good practices and lessons learnt.

MTR appreciates the regional interactions and meetings that have contributed to South-South cooperation. The project could build on more on the existing strengths among project partners. For example, China and India are well ahead in their weather forecasting capabilities. Pakistan is quite advanced in their technical capacities and Bangladesh experienced in modelling. It is excellent that partners from Bangladesh will contribute to the flood outlook development. Nepal has emerging in-house capacities in quality control. If the project would approach the partners also as providers of trainers, the ownership of the project among the national partners would improve.

## 3.3 Impact

Impacts are defined as "the Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended" (OECD/DAC 2010). The impact assessment during the MTR focuses on assessing the direction and approach of HKH-HYCOS and determining to what extent the results achieved so far have contributed to any changes among project partners (positive or negative) and if the progress towards projects results is contributing towards the project purpose.

The **purpose** of the project is "**Timely exchange of flood data and information**". The objective has only one indicator, namely "**Sharing of real time data and information through established mechanisms**". An increasing amount of real time data is becoming available to the national hydro-met services. The RFIS website is a good starting point for enhancing access to data across the region. At the time of the MTR, partners had access to real-time data from 21 out of the planned 36 hydro-meteorological stations on the regional flood information system. In the case of Nepal data from additional 19 stations is available. There is also a link to DHM's own website through which data from all real-time stations in Nepal can be viewed. The data from these additional stations in Nepal is value addition. The same data is being transmitted to national systems at respective hydrological and meteorological departments. At present it is raw data which is not yet quality checked. It is also yet to be converted into readily accessible information products for research and development purposes or in a format compatible with flood forecasting models.

Project partners have expressed that there are two significant positive changes that the HKH-HYCOS project has so far brought forward. They are the investments in modern meteorological and hydrological stations and the regional platform for discussion.

The main regional impact of HKH-HYCOS is that it has provided a regional platform for partners to discuss matters of common concern. It has increased interest among project partners on regional issues. From the information sharing and knowledge management aspect arguably the most significant positive aspect of the project is that it provides a regular platform to the senior management of meteorological and hydrological institutions to discuss issues of common concern and share information on relevant practices, approaches and lessons learned among each other (peer learning). This is a very important achievement. Partners felt that working within a programme approach had facilitated a broader understanding of disasters and risk reduction at national and regional level and also an improved understanding of micro-macro linkages.

At the national level, the main impact is produced by the upgraded stations. The 24 stations have been divided as follows by the project countries: 4 to Bangladesh, 6 to Bhutan, 9 to Nepal (8 installed) and 5 to Pakistan. They strengthen the national capacity and the investments are appreciated by all partners. In all four countries the upgraded and new stations are filling in gaps in the national station network. The number of new stations has been significant in the case of Bangladesh (the three stations installed for BWDB are their first automatic stations, 70 manual ones remain to be upgraded), in Bhutan (located in northern and central parts of the country) and in Nepal (all upgraded stations in Koshi Basin). The new stations in Pakistan are all in the North-Eastern region (see map in Annex 8). Nepal DHM decided to focus on Koshi Basin and in Bhutan the stations have been mostly installed at upstream locations providing protection to citizens of Bhutan first and foremost. The locations in Pakistan and Bangladesh reflect a similarly prudent logic by the national partners.

In the case of Bhutan, the HKH-HYCOS project – together with the interventions of other development partners in Bhutan - has contributed somewhat to the strengthened organisational status of the concerned institution: Division of Hydro-Met Services was upgraded to a Hydro-Met Services Department in late 2011.

ICIMOD as a regional intergovernmental organisation is also implementing other projects that work on flash floods, integrated water resources management and water availability. ICIMOD is able to benefit from data generated and lessons learned through HKH-HYCOS and incorporate those in its project portfolio. This means that opportunities for synergetic impacts through the other ICIMOD interventions exist.

## 3.4 Efficiency and programme management

### 3.4.1 Project implementation

Hindu Kush-Himalayan region is one of the geopolitically challenging regions. Therefore any success in regional collaboration and cooperation, particularly regarding such sensitive topic as water resources and water resource information, requires great tact and strategic efforts. Initial delays in fetching agreements between ICIMOD and project partners have been inevitable and are justified due to the project's regional character. There are also other, more current concerns related to timeliness, cost-effectiveness and quality of HKH-HYCOS implementation that are discussed in this chapter.

The project partners have shared different concerns about the current implementation pace and quality of PMU (ICIMOD) with the MTR. Some were concerned about slowness in the fund transfer process which has generated further delays. The international procurement of equipment took a long time. ICIMOD applied its own procurement rule and opted for direct short-listing procedure (16 organisations received the bidding documents). Certainly an open call for bids would have been more transparent and would have probably been a faster method of procurement too. However, some of the reasons behind the delays originate from the project planning cycle which is tied up with the RSC meeting cycle and somewhat slow implementation speed of RSC decisions, both by the PMU and by the partners (see chapter 3.7.4 on Mutual accountability below).

All RSC meetings have been organised in Nepal. It has been efficient from administrative and cost point of view. Nepal is an easy country for participants from all partner countries to travel and obtain visa. Nevertheless, this arrangement has curtailed opportunities of peer learning and understanding the strengths and best practices of each project partner even better. There is scope for considering rotation of responsibilities in hosting the RSC meetings – each partner would take a turn in hosting a meeting.

The PMU staff consists of 7 staff (two full time, one 80% input and 4 with a 5% to 40% working time input). The project management style is democratic. There is a sense of team spirit and belonging. There was an internal change in the Project Coordinator post in 2011(the ex-coordinator is now the member of the project advisory team). There is a part-time hydrologist and a meteorologist in the team. However, the expertise of the meteorologist has not been fully utilised.

PMU is supported by an internal Project Advisory Team consisting of 5 ICIMOD staff members. The inputs of the team are not clearly reflected in the project's achievements. Same applies to the functions of the External Advisors. Initially there were three advisors (WMO representative and two international consultant hydrologists). In May 2012 a staff member from the Finnish Meteorological Institute (FMI) was included as a fourth External Advisor with emphasis on data quality. According to the RSC meeting minutes, the External Advisors have given input during the RSC meetings. Otherwise the added-value of the expertise they have provided is not clearly reflected in the project achievements. The External Advisors are used to advice, comment and suggest options of future plans. The advisors are not in a position to directly influence the project inputs or outputs. The Advisors have provided expertise that flows through planning and decision preparation from specifications to tendering, the selection of station locations, development of Standard Operating Procedure, development of data management system and building blocks for RFIS. External Advisor from FMI is the leader of the Core Group of Quality Control established in 2012.

The project agreement between MFA and ICIMOD is very short, just four pages. It does not contain any detailed requirements regarding project planning and budgeting, management, monitoring and progress and financial reporting. It builds on heavily on the Project Document, the contents of which were effectively several years old at the time (initially approved by partners in 2005). Before the agreement was concluded both MFA and ICIMOD would have benefited from conducting a brief assessment of ICIMOD's project management procedures and capacities. Such an assessment could have discovered early on some of the project management issues that are a concern at this MTR. With a relatively small effort, MFA and ICIMOD could have mitigated the issues proactively together. A specific point of concern is the ICIMOD Institutional Support

Cost: 9% is well within the established norm of international organisations. Trouble is that the agreement does not specify what the Institutional Support Cost constitutes, what is included in there and what type of expenses can be charged to the other budget lines, such as Project Personnel.

### 3.4.2 Cost-efficiency

The project budget together with expenditure generated by end of October 2012 is presented in table 2 below. The budget with annual expenditure reports is available in Annex 9. The project budget is approximately 2.7 MUSD as translated from the original allocation of 2.0 MEUR in the MFA-ICIMOD agreement.

**Table 2 HKH-HYCOS Project Budget and Expenditure by 30 October 2012 (Source: Financial Expenditure Report, ICIMOD)**

| | Budget | | Expenditure Dec 2009- Oct 2012 | | | Budget balance |
|---|---|---|---|---|---|---|
| Budget line | USD | % of budget | Total exp. by 10/2012, USD | % of budget | % of exp. | USD |
| Project personnel (regional and international expert) | 754 800.00 | 28 | 598 697.10 | 79.32 | 42.02 | 156 102.90 |
| Framework for cooperation (meetings and mission travel) | 383 300.00 | 14 | 94 127.70 | 24.56 | 6.61 | 289 172.30 |
| Flood observation network (upgraded hydro-met station equipment) | 732 000.00 | 27 | 436 370.31 | 59.61 | 30.63 | 295 629.69 |
| Flood information system (computer, database, software) | 230 000.00 | 9 | 81 185.16 | 35.30 | 5.70 | 148 814.84 |
| Capacity building, training and public awareness | 155 000.00 | 6 | 52 081.33 | 33.60 | 3.66 | 102 918.67 |
| Planning for a up-scaled regional project | 40 000.00 | 1 | 0.00 | 0.00 | 0.00 | 40 000.00 |
| Project evaluation and monitoring | 34 000.00 | 1 | 0.00 | 0.00 | 0.00 | 34 000.00 |
| PMU support - miscellaneous costs | 36 000.00 | 1 | 23 946.79 | 66.52 | 1.68 | 12 053.21 |
| WMO support cost | 90 000.00 | 3 | 36 000.00 | 40.00 | 2.53 | 54 000.00 |
| ICIMOD Institutional Support Cost | 244 900.00 | 9 | 102 372.92 | 41.80 | 7.19 | 142 527.08 |
| **Total** | **2 700 000.00** | **100** | **1 424 781.31** | **52.77** | **100.00** | **1 275 218.69** |

The budget contains four budget lines which benefit project partners directly (or indirectly in the case of RFIS). They are the Framework for cooperation, Flood observation network, Flood information system (both regional and national) and Capacity building, training and awareness. The share of these budget lines is approximately 57 % of the budget. There are four budget lines that are intended to cover the costs of ICIMOD and WMO in project implementation. The planned allocation for ICIMOD (Project personnel, PMU support cost and ICIMOD Institutional Support Cost) is 38% and WMO (WMO support cost) is 3%. The total allocation of these four budget lines is 41%. Technical assistance costs over 30% are considered to be on a high side, which is the case here. The remaining 2% is allocated for Project evaluation and monitoring and for Planning for an up-scaled regional project.

Project expenditure as per 31 October 2012 is USD 1 424 781. It is almost 53% of the available budget. The total expenditure rate is well within the extended duration of the project. However, the expenditures on

Project personnel, PMU support and ICIMOD Institutional Support Cost is a total of USD 725 016. This is 50% of the project expenditure and 79% of the available budget. In addition the WMO support cost (36 000 USD) is 3%. These are direct expenditures by the Implementing and Coordinating Agency (ICIMOD) and the Monitoring and Technical / Scientific Support Agency. The WMO support costs is just 40% of the respective budget line. This is well within the allocation.

Investments on flood observation network (equipment for 24 stations procured) contribute to 30% of total project expenditure (and 56% of the available budget line). Investments on flood observation systems are about 6% of total expenditure (36% of the available budget). Capacity building activities only contribute to less than 4% of the expenditure (34% of the budget line).

The remaining budget for the period of November 2012-December 2014 is approximately 1 275 219 USD. There is an adequate balance of funds for activities supporting framework of cooperation, flood observation network, flood information system and capacity building. There is also a lot to be done with respect to each of them during the remaining two years. The activities itself will require funds but also support from PMU is necessary. PMU budget line, however, is seriously constrained by fund shortage: there is only a balance of 156 000 USD remaining. This implies that the composition of the PMU team needs to re-assessed – and probably reduced - on the basis of achievement objectives for the remaining project period. A budget revision would be required that would judiciously balance the needs of the project partners and a need to implement project more efficiently and effectively. Unfortunately there was not a no-cost extension phase budget available for the MTR team to review.

There are additional contributions by the six partner organisations to the project. They have provided both in-kind (staff time) and cash contributions (e.g. civil works, data transfer to national and regional systems, salaries for gauge readers) for the project. Because the project has not collected or calculated partner contributions those contributions cannot be assessed. Tracking partner contributions would be important from the sustainability and ownership point of view.

The MTR team acknowledges that setting up the PMU, establishing the regional coordination mechanisms and agreements with project partners has been a time consuming activity and that justifies a portion of total expenditure. The overall amount of resources that has been so far spent on or by PMU/ICIMOD is not proportionate with the results achieved. In comparison with project achievements and pace of implementation, the combined expenditure of ICIMOD's personnel, PMU support and Institutional Support Cost is high. The MTR team finds that project implementation has not been cost-effective.

## 3.5 Sustainability

The project approach to focus mostly on existing weather and hydrological stations and upgrading them is praiseworthy. There is an assumption that each country and project partner will have access to necessary funds and resources to operate and maintain the stations (and further upgrade them in the long run). The MTR process has revealed that this important assumption may not necessarily hold true.

The diversity in the instruments supported by the different donors is a problem for the project partners; HKH-HYCOS has contributed to this. Different types of instruments by multiple vendors are creating an unnecessary burden to the departments both from the skill angle as well as from the availability of spare parts. DHMS in Bhutan was keen on managing future instrument procurement processes themselves. They see value and merit in strengthening their own skills also in procurement (learning by doing). They also wanted to start building in-country capacity also in servicing and maintaining the instruments. MTR supports the approach proposed by DHMS. However, it should be noted that not all partners are eager to assume any responsibilities on procurement. Time consuming government procurement procedures were cited as one justification.

Modern instruments require much more experience and skill in their maintenance and operation than what the manual devices need. The hydro-met departments need staff with electrical and electronic as well as IT skills if

they are to assume the O&M responsibilities independently. Alternatively the departments need sufficient budget funds to purchase the services from the private sector vendors if public-private partnership concepts would be applied. According to WMO, from an O&M viewpoint, overall capacities to repair any modern equipment are limited among the project partners. Capacities in O&M are restricted to ensure the proper working conditions and maintenance of system components. Once a sensor or a logger has broken down, countries have limited or no capacity to repair them.

There is a Standard Operating Procedures (SOP) Manual in place in English language which was produced by RTS. It is expected to support O&M of the stations and instruments. The SOP is a good initiative supporting sustainability. Partners, however, have requested PMU that the SOP Manual would be translated to languages of project partners. MTR supports this request. Local language versions would be necessary: majority of the partners felt that the manual is too complicated to understand. The limited English language skills of the technical staff in some countries present an additional barrier.

The O&M responsibilities and their (inadequate) budget allocation pose a problem. It should be mentioned upfront that this is the responsibility of each national partner to work on. There is no evidence that the participating countries are fully committed to allocate sufficient funds for O&M of the stations, with the exception of one partner. For instance in Nepal, experience from the Kailash-project, also supported by ICIMOD, was that when the project ended, DHM was not providing even the very nominal funds necessary to pay for the data transfer (mobile sim card charges). This led into immediate disruption of data transfer. The discussion on the responsibilities in covering the data transfer charges during the 4th RSC meeting in 2012 reflect poor readiness by partners in this respect. Also during the MTR officials from the participating countries requested for an allocation of O&M fund from the project budget (to continue after the expiry of the project). A noteworthy exception is BMD in Bangladesh: it readily informed the MTR that necessary budgets will be applied from the Government of Bangladesh when needed.

Unless the Operation and Maintenance (O&M) issues are addressed by the competent national authorities from the onset of activities, sustainability cannot be achieved. Therefore the Annual Maintenance Contract arrangement ICIMOD has established with the external service provider (RTS) may actually be hindering sustainability, not fostering it. It should be acknowledged that this view of the MTR team is not widely supported by project partners, ICIMOD or WMO. Nevertheless, sustainability ultimately rests on the capacity of the national hydro-met departments, particularly on their financial standing. Long-term sustainability requires sufficient funds for operating and maintaining the hydro-met stations and national flood information system, adequate number of skilled and experienced staff and supportive organogram / structure of the institution. The national partners must be able to access sufficient funds for O&M annually, if not during the warranty period, then immediately after that. The key role of the HKH-HYCOS would be to provide the necessary training to the staff of national hydro-met services so that they have the skills and capacities to manage the instruments and stations and the flood information system independently.

If it is concluded that the some or any of the project partners will not have the capacity to do the maintenance and repair themselves and that outsourced maintenance contracts are the proper and economical way to resolve the O&M issues, then emphasis remains on availability of funds and the capacities of project partners to manage maintenance contracts.

The partners need to understand that they are the owners of the stations; they are not “HYCOS” or “ICIMOD” stations as they were frequently referred to in the interactions. Signs of ownership of the equipment are uneven among the partners. One possible reason is because ICIMOD and RTS are more active than the national institutions of participating countries, in procurement, installation and operation and maintenance support.

Hydrological and meteorological equipment need frequent calibration. This is part of O&M activities. The partners do not have calibration laboratories. The laboratories are costly and certainly the cost increases if

the partners have many different types and makes of instruments to maintain. The partner countries need to assess how they can best develop the instrument calibration facilities.

The project partners are concerned that they have not yet received any spare parts for the installed stations (according to the RSC minutes, fast removable parts would have been procured as part of the initial procurement). Equipment remains to be tested during the coming winter; however, the partners lack expertise to evaluate equipment performance. At present the partners rely fully on RTS.

In addition, the sustained interest and commitment of the participating counties will be a very important element towards sustainability of the whole project. This commitment could be secured by demonstrable benefits that the countries could obtain from the project. Some of these benefits include timely availability and accessibility to data for flood forecasting and warning and water resources management, training opportunities for staff and improved performance of the departments to meet the needs of their countries. However, unless quality data becomes available, quality information cannot be produced.

The Regional Flood Information System in its present format is not sustainable (see discussion in chapter 3.4 Effectiveness). This is because at present in the HKH region there is no regional actor with a sufficient mandate to provide regional flood warnings. Mandate to issue early warnings rests solely with the national governments and the respective national organisations running early warning systems. The valid niche that ICIMOD has in this realm – and where is has a proven successful track record – is on research and information products.

To summarise, to a large extent sustainability depends on the continued O&M of the instruments, sustained collection of field data, regular maintenance of the regional database and web page, availability of sufficient financial resources and logistics and continued availability of human resources within the national hydro-met departments of the participating countries.

## 3.6 Cross-cutting objectives

The project agreement between MFA and ICIMOD is silent on cross-cutting issues. The cross-cutting objectives / issues of the Finnish Government-Decisions in Principle 2007 and 2012 have not influenced the project design or project implementation.

The project, however, contributes to the development of climate change adaptation and early warning systems across the HKH region. It is at the core of project design.

Gender equality is a strategic priority for ICIMOD. The matter has been addressed in project design and implementation. The RSC members have recognized that the opportunity to engage women in data collection as gauge readers and technicians and to provide exposure and education to them is important (actions are pending). During the 2nd half of 2012 PMU has worked with the partners in Bhutan and Nepal in conducting a study on gender aspects of the national early warning systems. This is a good initiative. ICIMOD's Bhutan +10 conference on gender and sustainable development is an example of gender-related activity where ICIMOD can add value (the conference was not part of HKH-HYCOS project activities).

## 3.7 Aid effectiveness

### 3.7.1 Ownership

The Project Document presents clear and unambiguous roles and responsibilities for HKH-HYCOS implementation. WMO and ICIMOD are the facilitating organisations, ICIMOD in the function of Implementing and Coordinating Agency and WMO as Monitoring and Technical / Scientific Support Agency. The role of both facilitating organisations was supposed to consist of providing conceptual and logistical platform for planning and implementation of the project through organisation of meetings, preparation of project documentation, provision of technical advisory services, securing project funds and providing overall

coordination and supervision of the project. The role of the national hydro-met institutions was clearly coined as Executing Partners and project owners responsible for actually executing the project and its activities.

Despite the original intent and clarity, the project is now perceived by many of the partners as an "ICIMOD project". It is not just a casual choice of words by partners. This was evident in the manner the stakeholders and partners in Nepal and Bhutan discussed the project with the MTR team. There has been an oversight by ICIMOD and the national partners with respect to planned national level planning and coordination meetings. Those have not been implemented during the first three years of the project. This may have somehow contributed to the reduced national ownership.

ICIMOD brand was coming through very strongly during the field mission. This is a tricky issue that also contributes to a drift in working approaches - somehow over the years the concept of a "regional" project lending support and facilitating the participating countries to improve their capabilities and systems to forecast floods and build on the existing bilateral partnership arrangements and systems to do something together has been overcome by a strong drive by ICIMOD to do things for the region on behalf of the region. No doubt the intentions have been good but the strong ownership of ICIMOD does not compensate for the commitment of project partners (both the ones who are "in" and the ones who have opted to stay "out"). It is evident that the project leadership is in Khumaltar, Nepal when in fact it should be shared by the project partners and each of them should be assuming a forceful role in advocating and arguing for their demands and preferences, for instance at the RSC meetings.

### 3.7.2 Use of country systems

The project partners with the hydrological and meteorological institutions of four partner countries. At country level the partners apply the systems of the respective government.

As was discussed in chapter 3.5 a concern has been expressed that the types and makes of instruments, albeit of high international standard, may not be meeting the needs of all partners (e.g. high altitude instruments and some hydrological equipment). There were also concerns expressed that the instruments provided by the HKH-HYCOS are different than what the national hydro-met departments already have in place (many types of instruments provided by many development partners creates difficulties in O&M). In similar interventions in the future, there is scope for considering procurement by national institutions using their national systems.

The budgets for project partners are not reflected in the national medium-term expenditure frameworks. This is justified because the funds that are actually transferred from ICIMOD to each national partner are small during the project (in most cases to the tune of 50,000 USD; see Annex 8). This is as per the agreement between ICIMOD and national partner. The equipment for hydrological and meteorological stations is procured and paid directly by ICIMOD. Installation costs and the costs of the Annual Maintenance Contract are similarly paid directly by ICIMOD to the service provider (RTS).

### 3.7.3 Managing for results

The HKH-HYCOS has a full-fledged logical framework, but it has not been used in monitoring and reporting. The reporting is rather activity focused and lacks analysis on results. The progress against result and purpose indicators is not analysed in the reports. During the no-cost extension phase ICIMOD needs to enhance effectiveness, impact and sustainability and emphasise results-based management. Improvements in planning, monitoring and reporting practices are needed.

The project adopted a six-monthly work planning and reporting cycle, presumably to accommodate the RSC meeting schedule. Planning on activity-basis looks proficient, but can easily lead to losing track of objectives. Also planning only six months ahead is not efficient; annual plans are a common practice in multi-year development projects. The MTR finds that in the HKH-HYCOS case the short-term planning and reporting cycle has also contributed to the delays in implementation. Project would need to adopt annual (12 month) planning cycle whereby annual plan and budget would be presented to the 2nd RSC meeting of the closing year. If and

when changes and revisions would be needed, those would be discussed six months later in the 1st RSC meeting of the following year.

Besides results, indicators and activities, also budgets and expenditure reports need to be presented and approved at the RSC meetings. This is as per the RSC TOR. Details of fund utilisation, not just a total expenditure, should be provided in the progress reports.

### 3.7.4 Mutual accountability

The RSC was originally established in a manner reflecting mutual accountability between ICIMOD, WMO and project partners. However, over time the function of RSC as a steering mechanism has eroded. Decisions made in the RSC meetings are not implemented in a timely manner as agreed by all partners. This has delayed project implementation as has been reflected in the RSC minutes. Thus the project achievements are not at the optimum level.

Partners were happy, however in varying degrees, with the RSC meetings. PMU has provided a fixed agenda and meeting documents to the RSC members in advance. This has enabled the partners to prepare themselves. As to meetings, PMU has organised them well and efficiently. The RSC meetings have become more interaction and capacity building events, the steering and decision function has become diluted. True, RSC meetings have discussed programme strategies with some formulation of action plans at the end and each meeting has also made a number of decisions regarding project plans, approaches and activities. But without a meticulous follow up the decisions and plans agreed in the previous meetings, new agenda and action plans have been prepared. Even if partners have been happy – and remain so – with RSC, it is not a reason not to improve on the decision making and follow-up.

## 3.8 Coordination, Complementarity and Coherence

In Bangladesh, Bhutan and Nepal there are several on-going or pipeline interventions that directly relate to HKH-HYCOS. Therefore a risk of overlapping activities exists. The national partners with support from ICIMOD should take care that information about HKH-HYCOS activities is openly shared and discussed in the relevant national coordination mechanisms. According to information received from partners in Bangladesh, Nepal and Bhutan, all countries require significant investments from multiple partners in modernising the existing national networks of hydrological and meteorological stations. Inputs from several development partners are welcome and need to be well-coordinated by the national partners. With respect to investment activities, risk of duplication is minor. Same applies to capacity building, particularly in relation to installation, operation and maintenance of fully automated hydro-met instruments and equipment. Efforts in supporting development of national flood information systems, however, need to be more closely coordinated with relevant actors working in national early warning systems in each partner country. Again, primary responsibility rests with each national HKH-HYCOS partner. ICIMOD has a significant role in supporting the project partners with this.

According to the information received from project partners, in Nepal, Bhutan and Bangladesh the project partners (BMD, BWDB, DHM and DHMS) have acted strategically with respect to site selection. They have struck a compromise between their national interests and regional priorities. The HKH-HYCOS project has therefore complemented other existing projects and programmes. The real-time data transmitted to the databases that are run by the national hydro-met departments, will be most useful for each country in improving their response to water-induced disasters. See also discussion on the regional system in chapter 3.7.2 above.

ICIMOD sees that that real time information provided by HKH- HYCOS will be beneficial and is needed and complementary for other development programmes as well. The MTR team agrees with this in principle but finds that concrete benefits on this complementarity are available at present only at ICIMOD and its other related interventions. The comparatively low emphasis that the project has demonstrated so far towards

establishment of well-founded robust national flood information systems in partner countries acts as an inhibiting factor in this respect. It should be noted that the Project Document incorporates a more balanced plan with this respect than what has been demonstrated so far in practice by PMU.

## 3.9 Finnish value added

The original Project Document was developed as an in-house exercise by ICIMOD and the regional partners during the South Asian Floods-project that ended in 2005. The MFA contribution as a potential financing agency started several years later. Therefore assessment of Finnish value adding is of minor significance because the aspect has not been addressed at project formulation.

Two organisations from Finland have however contributed to the implementation of project. So far ICIMOD has procured 7 AWSs (compact type) from Vaisala, Finland on behalf of the project partners. At MFA's request, representative from the Finnish Meteorological Institute has started attending the RSC meetings as part of the Finnish government quota (from 3rd RSC meeting December 2011 onwards). The FMI representative was further incorporated as a Project External Adviser with a special emphasis on data quality concerns in May 2012 (4th RSC).

## 3.10 Project design

The project scope is not clearly stated and not focused enough. The project logic and objectives of HKH-HYCOS extend to reducing the risk of loss of lives and livelihoods and contributing to socio-economic development of citizens of project partner countries. There is no evidence that any impact at that level would take place anytime soon. The project design, as reflected in the Project Document, is an example of a design that has an unnecessarily wide and far reaching scope and ambitious objectives and targets. Benefits to people of HKH region will start accruing first and foremost after the national hydro-met departments have sufficient numbers of automatic hydrological and weather stations continuously transmitting reliable data to national forecasting and flood information systems. Project scope following this logic would have been more relevant and inherently more sustainable as well. Therefore, the project objectives should have focused on improved capacities of respective national hydro-met institutions to respond to water-induced natural disasters and to collaborate with each other in the region.

The Project Document also incorporates the concept of working in multiple river basins simultaneously. The MTR team finds this aspect over-ambitious. For a demonstration effect, a "mini-HYCOS" working on one of the main river basins would have been sufficient. A single river basin approach might have made it significantly easier to get all relevant partners fully on board. This is because the project could have then addressed the expressed desires of partners to build on the existing bilateral agreements between several project partner countries.

The good aspect of the project is that the current phase of the project was built in the preceding phase; hence it was not designed in isolation. However, the efforts and experience of nearly 12 years seem to be yielding only incomplete results in terms of practical regional cooperation.

The project executing partners is an important detail that is very clearly expressed in the Project Document: The respective hydrological and meteorological institutions of India and China were expected to be as full and active partners in this project as their counterparts in Bangladesh, Bhutan, Nepal and Pakistan have been. The Project Document does not refer to any restrictions on sharing of hydrological data or any other obstacles that in practice have led into the proposed partners from India and China opting out from full participation in the project.

## 3.11 Linkages and common issues between FNEP and HKH-HYCOS

Finland has been supporting two projects with partially overlapping mandates and national partners. The Institutional Collaboration Instrument -partnership between FMI and DHM (the FNEP project) has supported

meteorological service and capacity development at DHM in Nepal. The HKH-HYCOS has contributed mostly to the development of hydrological services in Nepal. There have been no overlapping activities up until now. On the contrary, it seems that there is a synergetic relationship between these two interventions.

The specialist inputs that FMI is expected to provide on data quality control will be very useful to HKH-HYCOS and ICIMOD as well. It is likely that some quality control mechanisms and protocols that FMI and DHM have already jointly developed may be applicable to other partner countries as well. Certainly they will be helpful in creating synergies and avoiding duplications particularly in the case of Nepal and Bhutan (if MFA approves pipeline ICI-project for FMI and DHMS, Bhutan).

Another common feature of both FNEP and HKH-HYCOS is that the projects are not automatically represented in the rather segregated sector and thematic coordination mechanisms in Nepal. This is not a fault of FMI or ICIMOD as such. Traditionally separate coordination mechanisms among donors, among INGOs, among NGOs and among government organisations exist in Nepal. DHM as the "project owner" of both HKH-HYCOS and FNEP has the key role in coordinating both interventions locally and ensuring that no overlaps or duplications of activities exist between these projects or any other interventions supporting the Department now or in the future. It is also responsibility of ICIMOD to be mindful of the fact that as a regional organisation it does not get automatically invited to these forums and therefore it's opportunities to discuss partnership and collaborative arrangements with other development partners are limited.

# 4 CONCLUSIONS

In this chapter the main findings are summarised together with the conclusions of the MTR.

**Relevance:** The Hydrological Cycle Observation System (HYCOS) concept is relevant for the Hindu Kush-Himalayan region. The regional approach to water-induced disasters (floods) is relevant as the water-related hazards the project is addressing are interlinked across national borders. There is strong policy relevance at national level, the HYCOS does address pertinent needs in the region and there are mutually reinforcing bilateral and regional agreements, at least at SAARC level.

However, the HKH-HYCOS project has not completely succeeded in building on these priorities and concerns of the participating countries. It is perceived too much as an "ICIMOD project", not a regional project. This is having impact on many issues that have been elaborated in the MTR.

WMO, ICIMOD and partner countries have been engaged in the HKH-HYCOS concept since 2001. After more than a decade the proposed partners in India and China are not committed to the project. There are no indications that they would participate actively in the near future either. India has expressed its interest to participate in capacity building activities. Both China and India have not shown any interest in sharing the hydrological data which is critical for a Hydrological Cycle Observation System and a flood information system and

**Effectiveness**: The project has made progress in developing a framework for cooperation on sharing flood data among participating partner countries. Modern hydro-meteorological instruments have been procured, 23 stations installed and training on installation, operation and maintenance imparted for partner staff in Bhutan, Nepal and Pakistan. The stations are transmitting real time data in dual mode (to national partner database and web portal and to a regional database / web portal hosted by ICIMOD). There are concerns about the quality of installation, O&M responsibilities and the approach in developing the regional flood information system that are marring the picture. The web portal (RFIS) established at ICIMOD is a useful starting point and offers The web portal (RFIS) established at ICIMOD is a useful starting point and offers access to raw data transmitted from real time AWS and AWLS. The portal does not yet provide any other

information that would be useful to the partners or stakeholders in the region. There is still a long way to go to value-added services and information products.

**Impact**: During the first three-years of HKH-HYCOS, the project has achieved two significant positive changes: the investments in modern meteorological and hydrological stations and the regional platform for discussion. It is also working with national partners to build flood information systems through which the latter can then share flood information with their populations to prepare them for impending floods.

Although the number of upgraded stations is small in a regional scale, the partners have been able to upgrade existing manual and mechanical stations at locations that are nationally critical / strategic from the viewpoint of issuing flood warnings to their own citizens. The regional element is still not well understood by them.

**Efficiency and programme management**: There have been inevitable delays in fetching agreements between ICIMOD and the proposed project partners which are not out of character keeping the geopolitical situation in the region in mind. There is evidence that the implementation pace of the project has been somewhat slow. Some of the reasons relate to the ICIMOD processes in project management and procurement. The adopted practice of presenting only half-yearly plans and progress reports for the Regional Steering Committee has contributed to the delays. The project implementation is not cost-efficient; the overall amount of resources that has been spent on ICIMOD and WMO staff and services is not proportionate with the results achieved.

**Sustainability**: Although the installation of first batch of hydrological and meteorological instruments was only completed a few months ago, there are already reasons to worry that O&M of the equipment – and hence sustainability – is going to be a problem. There is no evidence that the participating countries are committed to allocate sufficient O&M funds (the exception being BMD, Bangladesh). Unless O&M issues are readily addressed by the competent national authorities, sustainability is at risk. The Annual Maintenance Contract provided by ICIMOD should be reassessed: it may be a disincentive to the project partners to assume full ownership of their equipment. Development of in-country capacities also in operation and maintenance should be favoured.

**Cross-cutting objectives:** The project contributes to climate sustainability. As per ICIMOD strategy, gender equality is a strategic priority and has been addressed in the project.

**Aid effectiveness:** Ownership of the project is a concern as the project is perceived by partners and other stakeholders more as an "ICIMOD" project than their project. ICIMOD brand and ownership of the process was coming very strongly through. With the exception of the regional flood information system, the project applies and builds on existing country systems which is good.

To date limited capacity building activities have taken place. This is a result of the delays discussed above; justifiably training can only be imparted after the partner staff has access to the modern equipment and instruments. Training has been of standard content and not addressing country specific needs. Systematic training needs assessments were not conducted. The regional interactions and meetings have contributed positively to South-South cooperation; there is more scope for using the expertise and capacities of project partners for capacity building of their peers in the region.

The RSC meetings are functioning as a regional information sharing and capacity building mechanism among the senior management of participating hydrological and meteorological institutions. The primary function of RSC as a steering mechanism has eroded as is demonstrated by the slow and uneven implementation rate of its decisions.

**Coordination, complementarity and coherence:** There are several on-going or pipeline interventions in Nepal, Bangladesh and Bhutan that directly relate to HKH-HYCOS. The project partners have acted strategically when selecting hydrological and meteorological stations for upgrading (from a national perspective).

**Finnish value added:** The project design has not addressed Finnish value added. This is because the document has been produced by ICIMOD and regional partners without any influence from the donor. MFA decided to fund the project several years after the document had been completed. Instruments from Vaisala and expertise from Finnish Meteorological Institute has been sourced for the project implementation.

**Design of HKH-HYCOS:** For a HYCOS concept to be successful and sustainable, it needs a competent regional authority to implement the activities (such as Volta Basin Authority or Mekong River Commission; although an exception to this case seems to be the SADC HYCOS). Such authorities do not exist in the HKH region at present. The objective to develop a regional HKH-HYCOS instead of e.g. a single river basin HYCOS is overly ambitious and not achievable through the present mechanisms.

The project logic and objectives are unnecessarily wide and ambitious with respect to incorporating anticipated reduction of loss of lives and livelihoods of people living in the HKH in the project document. Another over-ambitious aspect is the incorporation of multiple river basins into a project that works in a region that is geopolitically challenging.

**Linkages between HKH-HYCOS and FNEP:** Finland has been supporting two projects that work with DHM in Nepal with partially overlapping mandates. The HKH-HYCOS has contributed mostly to the development of hydrological services. The FNEP has supported meteorological services and capacity development of DHM. There have been no overlapping activities until now.

# 5 LESSONS LEARNED

The major lesson that ICIMOD and project partners have learned from the HKH-HYCOS implementation is the fact that a binding letter of consent from proposed partner institutions must be obtained before submitting a proposal for any donor. The MTR team fully supports this.

The involvement of national hydro-met institutions as immediate project partners has been a right strategic choice. It has helped to boost the visibility of the partner organisations. It is further supporting trust building among the hydro-met institutions and their national counterparts through somewhat improved provision of hydro-meteorological data.

The agenda and objectives of the RSC meetings have been at least three-fold: organise a steering meeting, information sharing and knowledge / capacity building event at one go. This presents a mixed lesson: it is cost-efficient to incorporate different types of agenda items for one meeting. However, messages tend to get blurred with multiple agenda. Pure decision making sessions of the steering committee should be separate from knowledge development and capacity building sessions.

Capacity building activities need to suit the local contexts and address local capacity building gaps to be truly relevant and sustainable. The project partners may have not been articulate enough in bringing forward their genuine training needs so far. This has possibly something to do with the method the project adopted: partners were asked to submit their training needs rather than have them first assessed against the capacity gaps. Training inputs that are based on generalised needs are going to contribute to generalised impact and therefore miss the pertinent needs in each partner organisation. Training is highly effective when standard training curriculum is modified to suit the local needs and existing skills of the participants and addresses their capacity gaps. Training programmes of this magnitude need to be based on training needs assessments.

Learning is also greater when capacity building events are seen as a process, not an event. After training has been completed, a training impact needs to be assessed.

When planning investments on modern hydro-meteorological equipment, aspects of operation and maintenance of the equipment and instruments should be an important criterion influencing decisions on instrument selection (bidding documents). The Letters of Agreement between ICIMOD and respective project partners should have incorporated more precise clauses about the ownership of the equipment and the partner government's responsibilities in terms of O&M. The handing over procedures for the instruments and transition to national full O&M would need to be reviewed.

The good aspect is that the current phase of the project was built on Phase 1 (South Asian Floods); hence it is not designed in isolation. However, this factor does not seem to yield the desired fruits in practical regional cooperation.

# 6 RECOMMENDATIONS

With respect to **the remaining time period of HKH-HYCOS (until December 2014)**, the team has the following recommendations to ICIMOD and the HKH-HYCOS project partners:

1. Organise an extraordinary RSC meeting to discuss and agree on the MTR team findings and recommendations during the first quarter of 2013.

2. There cannot be a regional project without full and active participation of all countries. Therefore ICIMOD and WMO need to engage once more tactically and diplomatically to bring both the hydrological and meteorological departments from China and India fully on board. Involvement of both hydrological and meteorological departments is needed for the present project to succeed in achieving its objectives. If these efforts do not lead into successful outcomes by mid-2013, WMO, ICIMOD, and the active partners in Bangladesh, Bhutan, Nepal and Pakistan need to sit together and re-discuss and clarify the concept and scope for a Hydrological Cycle Observation System in the Hindu Kush Himalayan region, and how it can be further developed in the absence of India and China.

3. Address the quality concerns that relate to the regional flood observation network, namely the selection of stations and their installation. For a regional project, regional significance should take precedence over national priorities. With respect to the selection of sites for the planned additional 12 stations (2nd batch), a meteorologist should visit the proposed AWS sites and a hydrologist the AWLS sites to assess their suitability for proposed stations and relevance for RFIS. Furthermore, there has to be monitoring and follow-up of the quality of installation done by RTS and national partners. WMO standards need to be scrupulously followed with any further procurement of instruments and their installation.

4. Revisit and reverse the project emphasis between regional and national flood information systems: inputs should be provided to the national partners so that they can first develop and apply data quality control protocols in data management and data entry into the respective existing or emerging national systems. The data transfer protocols should be revised: the simultaneous transmission of unchecked data (dual mode) to the RFIS should be discontinued. Any further development work by ICIMOD on RFIS should build on quality data received through NFISs only and be research oriented. Development of the flood outlook may be timely within the current project once it is approached from a research angle and it builds on quality checked data.

5. Before initiating any capacity-building exercises, a training needs assessment should be undertaken so that the project's limited time and resources are best targeted at the most profound of what is an

enormous demand. Additionally provision of Training of Trainers (TOT) needs to be included to provide training across the institutions. Local contractors in partner countries should be identified and strengthened (possibly with support from RTS) to build capacities in installation and maintenance in each country.

6. Build national capacity in selecting and procuring equipment and instruments by transferring the procurement responsibility to national partners. National compatibility in equipment selection is desirable and instruments must be country and location specific.

7. Install the pending 12 stations by December 2013 so that one additional year of experience can be generated, with an emphasis on O&M aspects of the newly established stations and capacity building of the technicians.

8. Restructure the RSC meetings into decision making sessions with a steering function and technical sessions with a capacity development and experience sharing function – core members would participate in the decision making sessions where project strategies, reports, plans and budgets would be discussed and approved. Observers and resource persons would participate in the technical sessions; the non-decision making sessions of the meeting should be renamed to distinguish and sharpen the steering function. Institute a systematic follow up of implementation of RSC meeting decisions by ICIMOD and partners.

9. Embrace results-based management fully in the project management and monitoring. The six-monthly activity based planning should be replaced by annual plans and budgets which are discussed and approved by the RSC. Improvements in progress monitoring and reporting are needed to move away from activity focus and incorporate results-orientation and tracking of progress through indicators. Activity based reporting needs to be augmented with monitoring and reporting of objectives and their indicators as well.

10. Develop a budget for the no-cost extension phase and approve it at the extraordinary RSC meeting and also have it agreed by MFA. Launch a performance audit in 2013 to assess the project management processes and reasons of low cost-effectiveness in detail. Analyse the MFA-ICIMOD agreement to identify key shortcomings and amend the agreement accordingly.

11. Favour development of in-country capacities also in O&M and provision of spare parts. Discontinue the Annual Maintenance Contract and concentrate on the capacity building of national partners keeping RTS and ICIMOD role as the facilitator only.

**Recommendations regarding a possible follow-on project (post 2014):**

12. WMO and ICIMOD need to revisit the HYCOS concept together with the national partners. The MTR team is not recommending new or additional bilateral projects, but finds that there is ample scope to take the HYCOS forward under the umbrella of the existing bilateral agreements with involvement from partner institutions. In the absence of India and China a critical redesign effort is needed in any case. The project cannot continue to be built on assumed participation of key partners.

13. Assess the new and emerging actors in the sector. There have been a number of developments in recent years in the region. New actors and interventions working with the project partners in capacity building, early warning and information systems and investments in hydro-met equipment have emerged. The partners and competent agencies need to assess the comparative advantages of each of these to identify the best possible "fit" for HYCOS.

## Summary table of key findings, conclusions and recommendations

The key findings discussed in Chapter 3, Conclusions presented in Chapter 4 and Recommendations made in Chapter 5 are summarised in the table below. The first 11 recommendations relate to the remaining implementation period of HKH-HYCOS during 2013-2014. There are two additional recommendations regarding a possible follow-on project.

| Key Findings | Conclusions | Recommendations |
|---|---|---|
| **Recommendations for the remaining period of HKH-HYCOS (2013-2014)** | | |
| | | 1 Organise an extraordinary RSC meeting to discuss and agree on the MTR team findings and recommendations during the first quarter of 2013. |
| **Relevance**: The HYCOS concept is relevant for the HKH region and to the partner countries. HYCOS contributes to the achievement of development policy objectives of GoF. | There cannot be a regional project without full and active participation of all countries. Concerns regarding the HKH-HYCOS project and its conceptualised in practice exist; project has not completely succeeded in building on the priorities and concerns of the participating countries; proposed partners in India and China not committed to the project. | 2 ICIMOD and WMO need to engage once more tactically and diplomatically to bring both the hydrology and meteorology departments from China and India fully on board. Involvement of both hydrological and meteorological departments is needed for the present project to succeed in achieving its objectives. If these efforts do not lead into successful outcomes by mid-2013, WMO, ICIMOD, and the active partners in Bangladesh, Bhutan, Nepal and Pakistan need to sit together and re-discuss and clarify the concept and scope for a Hydrological Cycle Observation System in the Hindu Kush Himalayan region and how it can be further developed in the absence of India and China. |
| **Effectiveness**: Progress made in developing a framework for cooperation on sharing flood data among participating partner countries and modern hydro-meteorological instruments installed. Concerns about the quality of installation, O&M responsibilities and the approach in developing the regional flood information system mar the picture. | There are a number of quality concerns that should be addressed during 2013-2014. | 3 Regarding the various quality concerns, ICIMOD and partners should:<br>a. have regional significance to take precedence over national priorities.<br>b. ensure that a meteorologist visits the proposed AWS sites and a hydrologist the AWLS sites to assess their suitability and relevance before final selection.<br>c. monitor and follow-up of the quality of installations done by service provider(s)<br>d. adhere to WMO standards scrupulously with any further procurement of equipment and their installation. |
| **Impact**: Two significant positive changes: the investments in modern meteorological | The number of upgraded stations is small in a regional scale but valuable | 4 ICIMOD and partners to revise the emphasis between regional and national flood information system and: |

| Key Findings | Conclusions | Recommendations |
|---|---|---|
| and hydrological stations and the regional platform for discussion. The RFIS web portal is a useful starting point (access to data from other countries).<br><br>ICIMOD brand and ownership of the regional process and products was coming very strongly through. | to the partners mainly from a national angle. The regional element is still not well understood. The usefulness of regional platform of discussion has not translated into regional action by the partners. The RFIS has not yet provided any useful and quality information to the project partners.<br>With the exception of the regional flood information system, the project applies and builds on existing country systems which is good.<br>Ownership of the project is a concern as the project is perceived by partners and other stakeholders as an "ICIMOD" project. | a. support the partners in applying data quality control protocols in data management and data entry into the respective existing or emerging national systems.<br>b. revise the data transfer protocols: the simultaneous transmission of unchecked data (dual mode) to the RFIS to be discontinued. Any further development on RFIS should build on quality data received through NFISs only and be research oriented.<br>c. approach the development of the flood outlook from a research angle and build on quality checked data. |
| **Capacity building:** Limited capacity building activities have taken place; training has been of standard content and not addressing country- and partner-specific needs.<br>The regional interactions and meetings have contributed to South-South cooperation. | Systematic training needs assessments were not conducted which is contributing to generic training content. Training packages need to be tailored to address country specific needs and capacity gaps. Partners also interested in being responsible for procurement (additional benefit: instruments matching country needs to be procured) | 5 With respect to capacity building:<br>a. conduct training needs assessments and design training programmes on the basis of the assessment findings.<br>b. include provision of Training of Trainers (ToT) to impart training more widely within the participating institutions<br>c. identify and strengthen local contractors to build capacities in installation and maintenance in each country<br><br>6 Build national capacity in selecting and procuring equipment and instruments by transferring the procurement responsibility to the national partners. |
| **Efficiency and programme management:** Initial delays inevitable; project implementation proceeded at a slow pace; project has not been implemented cost-efficiently.<br><br>Regional Steering Committee meetings organised twice a year and the six partners who have signed LoA attending regularly. The RSC meetings are functioning as a regional information sharing and capacity | ICIMOD processes in project management and procurement and planning and reporting cycle with the Regional Steering Committee has contributed to the delays.<br><br>The function of RSC as a steering mechanism has eroded; demonstrated by its decisions not being implemented by all members. | 7 Install the pending HKH-HYCOS stations (12) by December 2013 to generate one additional year of experience with an emphasis on O&M aspects and capacity building of the technicians<br><br>8 Restructure the RSC meetings into distinctive sessions of decision making with a steering function and technical sessions with a knowledge sharing function; institute a systematic follow-up of RSC meeting decision implementation by ICIMOD and partners |

| Key Findings | Conclusions | Recommendations |
|---|---|---|
| building mechanism among the senior management of participating hydrological and meteorological institutions. | | 9 Embrace results-based management; prepare annual plans and budgets for RSC approval; move away from activity focus and incorporate results-orientation in progress reporting: augment activity-based reporting with monitoring and reporting on objectives and indicators as well.<br><br>10 Present a budget and work plan for the no-cost extension phase 2013-201for RSC approval (and MFA endorsement); launch a performance audit in 2013 to assess the project management processes and low cost-effectiveness; assess the MFA-ICIMOD agreement to identify shortcomings and amend the agreement accordingly |
| **Sustainability:** The participating countries are not committed to allocate sufficient O&M funds to maintain the equipment and systems | Unless O&M issues are readily addressed by the competent national authorities, sustainability is at risk. The Annual Maintenance Contract provided by ICIMOD may be a disincentive to the project partners to assume full ownership of their equipment and should be reassessed. | 11 Favour development of in-country capacities also in O&M and provision of spare parts; discontinue the AMC; concentrate the capacity building of national partners keeping RTS and ICIMOD as facilitators |
| **Recommendations regarding possible follow-on project:** | | |
| | | 12 WMO and ICIMOD to revisit the HYCOS concept together with the national partners; use the umbrella of the existing bilateral agreements between several of the current partner countries as a platform to take the HYCOS forward as a regional initiative; in the absence of India and China a critical redesign effort is needed as the project cannot continue to be built on assumed participation of key partners.<br><br>13 Assess the new and emerging actors and interventions working with the project partners in capacity building, early warning and information systems and investments in hydro-met equipment and identify comparative advantages of each of these to identify the best possible "fit" for HYCOS. |

# ANNEX 1 TERMS OF REFERENCE

**31.7.2012**

**Terms of Reference for a**

**Mid-Term Review of**

**Establishment of a Regional Flood Information System (RFIS) in the Hindu Kush-Himalaya 2009-2014**

**and**

**Final Review of**

**Finnish-Nepalese Project for Improving Capability of the Government of Nepal to respond to the increased risks related to weather related natural disasters caused by climate change (FNEP) 2010-2012**

## 1. Background

### 1.1. Project context

The Hindu Kush-Himalayan (HKH) region is a vast complex of high mountains, intermountain valleys, and plateaus shared by Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan. It produces one of the world's largest renewable supplies of freshwater and is the source of some of the world's largest rivers: the Indus, Ganges, Brahmaputra, Meghna and Irrawaddy. These rivers are vital for the survival and well-being of about a billion people, most of who live in the surrounding plains.

The pattern of runoff from the Himalaya, its timing and intensity, is governed by the quantity and distribution of precipitation, its form (rain or snow) and seasonality. The heaviest rainfall of the summer monsoon occurs in the eastern Himalaya and produces the strongest impact on such rivers as the Brahmaputra and Ganges. In contrast, towards the northwest, the predominance of high-altitude winter snowfall increases; thus the flow of the Indus is dependent mainly on snowmelt and by ablation of some of the world's largest glaciers outside of the Polar Regions.

Due to its geography and geology HKH region is extremely vulnerable to natural hazards, which will be aggravated by the effects of climate change; globally Bangladesh, India and Nepal have been ranked the 1st, 2nd and 4th place respectively in vulnerability for climate change[1].

It is widely recognized that floods in the HKH region cannot be eliminated or totally controlled and that efforts should therefore be directed towards reducing flood vulnerability and mitigating flood impact through improved flood management. At the level of an international river basin effective flood management calls for meaningful co-operation of the riparian countries. In the HKH region there has been some success in sharing historical hydrological data and bilateral agreements between countries have proven useful in flood forecasting. However, in the regional context, achievements with regard to the sharing of real-time data and information on a regional scale, so critical for flood management, have been very limited.

### 1.2. Description of the projects to be evaluated

**Establishment of a Regional Flood Information System (RFIS) in the Hindu Kush-Himalaya** is a project implemented by the International Centre for Integrated Mountain Development (ICIMOD) in close collaboration with the World Meteorological Organization (WMO) and the regional partner countries Bangladesh, Bhutan, China, India, Nepal and Pakistan. RFIS is to be part of the Hindu Kush-Himalayan Hydrological Cycle Observing System (HKH-HYCOS) and World Hydrological Cycle Observing System (WHYCOS).

[1] Maplecroft Climate Change Vulnerability Index 2011

The long-term goal of the project is to make flood information travel faster than flood water, in order to minimise loss of lives and livelihoods, and thus reduce flood vulnerability in the HKH region, particularly in the Ganges-Brahmaputra-Meghna (GBM) and Indus river basins, which hold a population of over 700 million people. The overall aim is to develop and strengthen a regional framework for cooperation on sharing of flood data and information within and among participating countries. The project will also establish a flood observation network in selected river basins, with the aim to facilitate sharing of real time or near real time data by regional and national flood information systems and thereby improve the lead time for taking risk reduction measures. The technical capacity of partner organisations on flood forecasting and communication aspects will be enhanced, and resources provided to procure the necessary equipment for rainfall and flow measurements at selected sites.

The project plan initially included 28 hydro-meteorological stations, from which real- or near-real-time rainfall, river level, and related data are planned to be measured and transmitted to national hydro-meteorological services of partner countries as well as to the regional server at ICIMOD for development of regional flood outlooks. About 216 Global Telecommunications System (GTS) stations in the region will also contribute synoptic data to the RFIS.

The project was originally planned for three years (2009-2012) but due to delays in reaching the agreements with the participating governments the project has been granted a no-cost extension until December 2014. GoF contribution to its budget is EUR 2.0 million.

**Finnish-Nepalese Project for Improved Capability of the Government of Nepal to respond to the increased risks related to weather-related natural disasters caused by climate change (FNEP)** is an Institutional Cooperation Instrument (ICI) project between the Department of Hydrology and Meteorology (DHM) of Ministry of Environment, Science and Technology (MoSTE), and the Finnish Meteorological Institute (FMI, Ilmatieteen laitos).

The overall objective of this FNEP project is to improve capability of GoN to respond to the increased risks of weather-related natural disasters caused by climate change.

The main purpose of the project is to build DHM capacity in hydro-meteorological observations, services and international data sharing to facilitate products like weather forecasts, flood warnings, hazardous weather phenomena warnings etc. with the rationale to increase the quality and level of services to support the development of the Nepalese community in different socio-economic sectors, inter alia, agriculture, energy, aviation, public health, tourism and road transport. Equally, the project aims to improve DHM capacity to participate in regional hydro-meteorological cooperation and projects, especially in the Regional Project 'Establishment of a Regional Flood Information System in the Hindu Kush-Himalaya'.

The project has organized numerous visits of FMI experts to Nepal to work together with their DHM counterparts as well as professional study tours from Nepal to Finland. The project has witnessed, inter alia, server installations at the Kathmandu airport as well as installations of database, data acquisition and quality control components of the data management system, upgrading of three existing weather stations in the Kathmandu valley, and inauguration of a new modern weather station at Pokhara airport to transmit data in near real time to the new data management system at Kathmandu airport.

The project started in February 2010 and will end in December 2012. The GoF contribution to its budget is EUR 492 610.

Establishment of a RFIS in the Hindu Kush-Himalaya and FNEP are evaluated together as they have had close collaboration and are contributing to the same goals.

## 2. Rationale, purpose and objectives of the evaluation

The purpose of the Mid-Term Review of **RFIS in the Hindu Kush-Himalaya** is to provide the Government of Finland as well as the project implementers with an external, independent and objective analysis and assessment of the project with regard to whether it is on right track for reaching its intended objectives and to provide recommendations for the project in order to ensure project's impact, sustainability, effectiveness and ownership.

Particularly the evaluation is expected to:

- provide evidence of the performance of the project to date and likely performance in the future (is the project achieving its objectives, incl. the cross-cutting objectives?)
- assess progress toward the project's results as outlined in the project documents, to analyze the reasons explaining success and failure (understanding why?)
- examine the effectiveness of the approach taken: (has the current scope of the project proven to be effective or would it be recommended to have a more focused approach in the project? Is the current geographical scope relevant and effective with a view to the project´s results?)
- provide recommendations on changes in the project (if needed)
- provide recommendations on continuation or closing of the project after the current phase

The main stakeholders in the RFIS in the Hindu Kush-Himalaya Mid-Term Review are the Ministry for Foreign Affairs of Finland, Ministry of Environment, Science and Technology, Nepal, particularly its Department of Hydrology and Meteorology (DHM), Ministry of Irrigation and its Department of Water Induced Disaster Prevention, International Centre for Integrated Mountain Development (ICIMOD), World Meteorological Organization (WMO), as well as respective national agencies and organizations in partner countries of Bangladesh, Bhutan, China, India and Pakistan. The evaluation results will be used to guide the project implementation during the rest of its duration until 2014 and for the planning of a possible new phase of the project.

With regard to **FNEP** final review the purpose of the evaluation is to provide an external, independent and objective analysis and assessment of the project, particularly to:

- provide evidence of the performance towards the end of project implementation (did the project achieve/will it achieve its objectives, incl. the cross-cutting objectives?)
- analyse likely sustainability of achievements
- analyse the reasons explaining success and failure (understanding why?)
- provide recommendations on possible follow-up actions
- document generalized lessons learned
- provide recommendations on continuation or closing of the project after the current phase

The main stakeholders in the FNEP evaluation are the Ministry for Foreign Affairs of Finland, Ministry of Environment, Science and Technology, Nepal, particularly its Department of Hydrology and Meteorology (DHM), and Finnish Meteorological Institute (FMI).

### 3. Scope of the evaluation

The evaluations will cover the duration of the projects to date: **RFIS in the Hindu Kush-Himalaya** from 2009, and **FNEP** from 2010.

The evaluations should be seen as a participatory, open and transparent learning process for all stakeholders including the final beneficiaries. The evaluation team will conduct in-depth interviews and focus group discussions with major program partners and grant recipients, stakeholders and institutional beneficiaries, including the advisory board, steering committee, and stakeholder. It will follow an approach to ensure that all the relevant stakeholder groups are heard during the mission. The stakeholders include:

- Ministry of Environment, Science and Technology, Nepal,
- Department of Hydrology and Meteorology (DHM),
- Ministry of Irrigation, Nepal,
- Department of Water Induced Disaster Prevention (DWIDP),
- Ministry of Tourism and Civil Aviation, Nepal,
- Bangladesh Water Development Board,
- Bangladesh Meteorological Department (BMD),
- Department of Energy, Ministry of Economic Affairs, Bhutan,
- Department of Energy, Water & Power Development Authority (WAPDA), Pakistan,
- Pakistan Meteorological Department (PMD)
- State authorities of Kachin, Chin, Shan and Rakhine states of Myanmar
- International Centre for Integrated Mountain Development (ICIMOD),
- World Meteorological Organization (WMO),

The evaluation will particularly focus on the usability of the projects' products by all relevant stakeholders and the sustainability of the projects' expected results. This will include human resources and capacity building at ICIMOD, DHM as well as in sister organizations.

## 4. Issues to be addressed and evaluation questions

The questions below in sections 4.1. and 4.2. should be answered for both projects unless otherwise specified.

### 4.1. Cross-cutting objectives

The cross-cutting objectives of the 2007 Finnish Development Policy included promotion of the rights of women and girls, easily excluded groups and gender and social equality as well as combating HIV/AIDS. The new development policy of 2012 highlights human rights-based approach and gender as well as climate sustainability. In view of these, the evaluations are expected to analyze following questions:

- Have cross-cutting objectives been measured and integrated into project activities and reporting and/or have planned targeted measures been achieved?
- Have adequate resources and expertise been allocated for implementation that promotes cross-cutting objectives?
- Have available information on the cross- cutting objectives been adequately and appropriately used?
- Have gender sensitive indicators been used?
- Do the projects have negative effects on cross-cutting objectives? Have measures been taken to minimize them?
- If cross-cutting objectives have not been addressed in the project, has this been explicitly justified?
- Have cross-cutting objectives been addressed in the capacity building programmes?

Please provide recommendations for better inclusion of cross-cutting objectives into the projects.

### 4.2. Evaluation criteria and evaluation questions

**Relevance**

- Has the situation changed since the approval of the project document?
- Have there been some strong shifts in the sector priorities in Nepal? Is the project consistent with the policies of Nepal and Finland?
- Is the project consistent with the needs and priorities of the final beneficiaries and other stakeholders? Are various stakeholders and interest groups satisfied with the objectives of the project?
- How is the project contributing/contributed to climate change vulnerability reduction?

**Efficiency**

- Have activities transformed available resources into intended results, as stated in the project document, in terms of quantity, quality and time? Have possible problems in implementation been adequately addressed?
- Have the contributions by Nepal and Finland been provided as planned and has the quality of technical assistance and day-to-day management been satisfactory?
- Have institutional arrangements, including cooperation and communication between stakeholders been sufficient?
- Has monitoring of progress (including the adequacy and use of indicators and management of risks) been satisfactory?
- Have the training programmes of the projects produced expected results in an efficient and sustainable manner?
- Can the costs of the project be justified by the results?

**Development effectiveness**

- How are the results/outputs applied by the beneficiaries and other intended stakeholders?

- Have behavioural patterns changed as planned in the stakeholder institutions or groups at various levels?
- To what extent do both **FNEP** and **RFIS in the Hindu Kush-Himalaya** program activities support each other?
- What tangible benefits have resulted from field visits by Finnish partners? For **FNEP**, please assess the relevance and outputs of 6 missions to Nepal and 2 study tours to Finland.

**Development impact**

- How has the project reduced poverty of the intended primary beneficiaries in practice?
- How has the project affected different socio-economic sectors (e.g. agriculture, trade, tourism, industry, and infrastructure) in Nepal and Hindu-Kush Himalayan region?
- What are the overall poverty, inequality and sustainability impacts of the project, intended and unintended, long-term and short-term, positive and negative?
- Do the indicators for the overall objectives show that the intended changes have taken place?
- Has regional cooperation been strengthened?

**Sustainability**

- What are the possible factors that enhance or inhibit sustainability, including ownership/commitment, economic/financial, institutional, technical, socio-cultural and environmental sustainability aspects? What corrective measures the project has established to address these and to enhance sustainability?
- Will the benefits produced by the project be maintained after the termination of external support?
- Who will take over the responsibility of financing the activities, or have they become self-sustaining? Is there an exit strategy and gradual handing over plan in place and will it ensure sustainability, particularly related to operational & infrastructure maintenance and human resources?
- For **FNEP**, please assess the sustainability and project contribution to the capacity of DHM (this may have to be done separately to each capacity building activity performed).

**Aid effectiveness (Effectiveness of aid management and delivery)**

*Ownership*

- Does DHM have a development strategy? Is it operational, results-oriented, and with clear strategic priorities, and do FNEP and RFIS complement DHM's development strategy?
- Is the project finance included in DHM's medium term expenditure framework and reflected in the annual budget?
- Does DHM exercise leadership in coordinating aid? Does it have an active and leading role in decision making concerning planning and implementation and in joint decision making structures of the project? What could be done to enhance DHM's role?

*Use of country's own institutions and systems*

- Is the programme day-to-day management accountable to DHM (rather than to the donor)?
- Are Terms of Reference of externally appointed staff determined by DHM (rather than by the donor)?
- Is most of the professional staff appointed by DHM?
- Is the salary structure of national staff similar to that of the civil service personnel?
- Please analyze issues related to the governance context of the projects and how the projects can possibly compensate for the deficits in the governance context.

*Capacity development*

- Is the capacity development support provided by the project based on the DHM's capacity development strategy?
- Does the project promote use of local and regional resources, including South-South cooperation?

*Managing for results*

- Has DHM established results-oriented reporting and assessment frameworks with a manageable number of indicators? Does the project rely on these frameworks?
- Does the project develop capacity and demand for results-based management?

*Mutual accountability*

- Are both Finland and DHM held accountable for commitments in the project?
- Are the risks for corruption/possible instances of corruption addressed in the project implementation and monitoring framework?

**Coordination, Complementarity, Coherence**

- How have other projects and cooperation been taken into account in implementation, including experiences of joint work with other actors?
- Does the project complement other projects/programmes? How can it be ensured that the results of this project will be most useful for other projects or programmes?

**Finnish value added**

- What are the distinctive beneficial features of Finland's support?

## 5. Methodology

The evaluation is expected to be carried out in a participatory manner and as an inclusive process involving different stakeholders including the final beneficiaries. To the extent possible, the evaluation should build on national and regional evaluation plans. The evaluation should be implemented in a way to fully utilize the existing evaluation capacity of all partners.

The evaluation will be conducted in 3 main phases:

- **Inception phase**: The evaluation team will start with studying all crucial reference documents of the project provided by the project teams. The evaluation team will prepare all necessary forms and evaluation tools in this phase. The team will be expected to liaise closely with the project teams and the Embassy of Finland during the inception phase for the preparation of the work plan and scheduling of meetings. Before the field mission the evaluation team will submit inception reports for both projects.

- **Field work**: The evaluation team has to hold a kick-off meeting with participation of at least ICIMOD, DHM and Embassy of Finland and other relevant stakeholders in the first days of the field work. The team will present their proposal on methodology and field work programme. A wrap-up meeting is expected to be held at the end of field work. The team will present key findings and recommendations to the relevant stakeholders. Field visits are carried out in Nepal and in Bhutan.

- **Reporting phase**: The evaluation team will prepare a draft report, which should incorporate comments received during the wrap-up meeting. Comments may be either accepted or rejected as an independent review mission, but the clear explanation by the team needs to be given in case of rejection.

It is expected that multiple methodologies are used, both quantitative and qualitative. Validation of results must be done through multiple sources.

The evaluation team will familiarize themselves with all the relevant material on the region and on the project before entering Nepal. The team will present its function and members in advance to all people they plan to meet and will describe the purpose of meeting. The team will be responsible for organizing the meetings with relevant agencies in collaboration and support by the project teams and Embassy.

The field work will be undertaken in Kathmandu and in one district in Nepal and in Bhutan.

## 6. The evaluation process and time schedule

The evaluation is planned to take place in September – November 2012. The duration of the assignment is maximum of 30 work days for each expert, tentatively expected to start in September 2012 and to carry out the field phase in September – October. The assignment is expected to produce two separate reports: **Mid-Term Review for RFIS** in the Hindu Kush-Himalaya and **Evaluation Report for FNEP**. Joint recommendations for both projects can be proposed. The evaluations will be completed within 20 weeks of the signing of the consultancy contract, and will be divided into three phases as described above. The outputs of the assignment are as follows:

- **An inception report** for each project will be produced within 2 weeks of the signing of the contract, before the field-mission.
- **A draft final report** for each project will be produced within 2 weeks after the field mission. The MFA will have 2 weeks in which to comment the draft reports. On the basis of comments made on the draft evaluation reports, the evaluation team will finalize the reports.
- **The final reports** will be submitted to the MFA within 1 week of the consultant receiving the comments on the first drafts by the MFA and other stakeholders. The final reports will be commented on and cleared by the MFA before printing.

There will be debriefings in the MFA both prior and after the field mission. Kick-off and wrap-up meetings are also expected to take place in Nepal in the beginning and in the end of the field mission.

## 7. Reporting

The evaluation team must submit the following deliverables as described below:

- Inception report for both RFIS the Hindu Kush-Himalaya and FNEP
  The desk study results are included in the inception report as a concise analysis of the policies, guidelines, and other documents studied for the evaluation. The desk study report must also contain a plan for the field study, i.e. what kind of questions need to be clarified by interviews, who will be interviewed in the Ministry, who will be interviewed in the partner institutions and in the field, outline of the questions to be asked in the interviews etc.

  The inception report must include detailed work methodologies, a work plan and detailed division of labour within the evaluation team, list of major meetings and interviews, detailed evaluation questions linked to the evaluation criteria in an evaluation matrix, reporting plans including proposals for tables of contents of the reports.

  The inception reports will be reviewed and approved by the MFA.

- Presentation on the field findings
  Presentation on the field findings must be given in Nepal at the end of the field mission. A PowerPoint presentation with a concise report (maximum 5 pages) is expected to be submitted to the Embassy of Finland before the wrap-up meeting.

- Draft final report
  Draft final report amalgamates the desk study and the field findings. The evaluation report presents findings, conclusions, recommendations and lessons separately and with a clear logical distinction between them and integrating the evaluation results on cross-cutting objectives. Reports can also include joint recommendations for both projects in the areas where the projects work together.

- Final report
  The final reports must follow the report outlines agreed on during the inception phase.

- Presentation on the evaluation findings
  The evaluation team is expected to give a PowerPoint supported presentation on the evaluation findings at the MFA.

The report must be prepared in a clear and concise language in English.

Each deliverable is subjected to specific approval. The evaluation team is able to move to the next phase only after receiving a written statement of acceptance by the MFA (by email or letter).

The preferred length of the **RFIS in the Hindu Kush-Himalaya** report is 15-30 pages plus annexes. The preferred length of the **FNEP** report is 10-20 pages plus annexes. The language of the documents is English. The final documents shall be submitted to the MFA in 3 printed originals and digitally on CD using latest MS-Office programs. The costs of printing shall be paid by the consultant.

**8. Expertise required**

It is expected that the evaluation team will comprise of one international and two local experts. A junior expert will be provided by the Embassy of Finland in Kathmandu. The expenses of the Junior Expert will be covered by the Embassy. The team should cover all aspects of the assignment and should have expertise in meteorology, hydrology, IT management and institutional development; and experience on integrating cross-cutting issues to development projects. Below is a table that summarises the required expertise of the evaluation team:

| **Required skills** |
|---|
| - Evaluation and reporting experience in development cooperation projects |
| - Meteorology and hydrology<br>- IT & data management,<br>- Services and products |
| - Water resource management |
| - Institutional strengthening and capacity building |
| - Human Rights Approach and cross-cutting objectives |

**9. Work plan and time-schedule**

It is anticipated that the assignment will start in September and end in November 2012, when the final drafts of the Mid-Term Review and Evaluation Report will be ready. It is anticipated that the planning team is appointed and mobilized in early September. The team would start the mission to Nepal in late September.

The Team may propose a work plan for the field period. A tentative time schedule is presented below.

Tentative Time Schedule:

| | |
|---|---|
| August 2012: | Tender announcement |
| Early September 2012: | Deadline for submission of tenders and opening of tenders |
| Early September 2012: | Notification of award decision |
| Early September 2012: | Signing of contract |
| September 2012: | Briefing at MFA |
| September 2012: | Briefing at Kathmandu Embassy and Field mission |
| September – October 2012: | Fieldwork |
| End of October 2012: | Submission of first draft of the reports to MFA and main stakeholders for comments |
| November 2012 | Submission of final draft of Mid-Term Review and Evaluation Report |

**10. Budget**

The lump sum given for the planning mission is **80 000 €**, including fees, reimbursable costs and cost-related outsourcing (commissioning of studies).

**11. Mandate**

The evaluation team is entitled and expected to discuss matters relevant to this evaluation with pertinent persons and organizations. However, it is not authorized to make any commitments on behalf of the Government of Finland.

**Annexes:**

1. OECD/DAC and EU quality standards for evaluations
2. Outline of the Evaluation Report
3. Project Document of RFIS the Hindu Kush-Himalaya
4. Project Document of FNEP

# ANNEX 2 EVALUATION PROCESS, METHODOLOGIES AND LIMITATIONS

## Evaluation team

The core evaluation team consists of Ms Kristiina Mikkola (Team Leader), Mr Adarsha Pokhrel (Senior Evaluation Expert) and Dr Dhruba Raj Gautam (Senior Evaluation Expert). Ms Kukka Korhonen was appointed by the Embassy of Finland to serve as the Junior Expert (JE) in the team. She contributed to the evaluation activities during the field mission (14 October – 6 November 2012).

## Evaluation process

The evaluation process has been divided into three phases: inception phase, field mission with stakeholder interviews, and data analysis and report writing.

The main activities during the **inception phase** (September 20th-October 10th) consisted of collection and review of relevant documents, logistics and arrangements for mission to Nepal and Bhutan, development of evaluation tools, briefing meetings with the Ministry for Foreign Affairs and Finnish Meteorological Institute and writing of the inception report (submitted to the MFA on 10 October 2012). Also clear division of duties and responsibilities were planned for the team members, including the JE.

The **field mission to Nepal and Bhutan** took place during October 11th – November 9th, 2012. The team has completed the following activities:

- October 14th-19th, 2012 and 1 November 2012: interviews with FNEP and HKH-HYCOS stakeholders in Kathmandu, Nepal (GoN: Ministry of Environment, Science and Technology, Department of Hydrology and Meteorology, Ministry of Irrigation, Department of Water Induced Disaster Prevention, Ministry of Home Affairs, Ministry of Energy, Department of Electricity Development, Civil Aviation Authority of Nepal, Nepal Agriculture Research Council; Development partners: WB, UNDP, SAARC, RIMES, ICIMOD; INGOs: IFRC, Practical Action, Plan Nepal; Civil society and academia: Society of Hydrologists and Meteorologists, Kathmandu University, Tribhuvan University, Nepal Engineers' Association; and service provider Real Time Solutions)
- October 28th-31st, 2012 Bhutan country visit: a field visit to Hongtsho automatic weather station and interviews with Department of Hydro-Met Services and National Environment Commission
- Email questionnaire circulated with the HKH-HYCOS project partners in Bangladesh, China, India and Pakistan as well as with World Meteorological Organization (WMO) (October). To date five responses received.
- November 2nd-3rd, 2012 field visit to eastern Nepal: HKH-HYCOS supported Mulghat Hydrological Station and Dhankuta Automatic Weather Station. Also a DHM operated hydrological station in Koshi Chatara was visited.
- November 4th-6th, 2012 preliminary analysis of findings, conclusions and recommendations and preparation of a wrap-up meeting presentation; Wrap-up meeting on 6 November 2012
- November 7th, 2012 two debriefing meetings (with the Embassy of Finland and ICIMOD).

**Comprehensive data analysis and reporting** took place during November 12th – November 30th, 2012. The Team completed the analysis of data collected during the mission, drew findings and conclusions and drafted an MTR report of the project. During this stage the team communicated with each other electronically (email, phone). The team addressed the comments provided by the quality assurance experts of Impact Consulting. Draft report was submitted to the MFA and the Embassy of Finland for collection of comments on November 30th, 2012.

**Analysis of comments and finalisation of report** was the last step of the MTR process (December 14th-21st, 2012). Comments were received on a timely manner. MFA, Embassy of Finland, ICIMOD, WMO, DHM, BWDB

and FMI submitted written comments. All comments were meticulously assessed. Some comments requested the MTR team to reconsider the findings while others suggested corrections to errors and mistakes or provided some additional information. The comments that contained new information, compelling arguments or additional angles to consider have led into changes and revisions in the report. Impact Consulting submitted the final report to MFA December 21st, 2012. In January 2013 the team leader will also give a presentation at the MFA on the findings, conclusions and recommendations of the MTR.

## Evaluation methodologies

The evaluation methodologies consisted of primary and secondary data collection and analysis.

The following tools were used to collect **primary data**: semi-structured interviews (individual or group meetings), group work / facilitated self-evaluation, email questionnaire, and field visit.

- Semi-structured interviews: Semi-structured interviews were the main primary data collection tool. It was used in the interviews with partner organisation and other stakeholders (government, international / donor community and I/NGOs). Both individual interviews and group interviews with stakeholder organisations were organised. The evaluation matrix in Appendix 1 served as an interview guide. All main stakeholders were approached in person in Nepal, Bhutan and Finland (as provided in the TOR). Other stakeholders, particularly in Nepal, were also contacted and interviewed for crosschecks and further validation of the data. These interviews also gave some ideas about the project visibility beyond the project actors.
- The HKH-HYCOS stakeholders in other partner countries (Bangladesh, China, India and Pakistan) as well as WMO staff in Geneva were consulted by applying an email questionnaire (Appendix 2). The team chose the active regional partners as the target group. A questionnaire was emailed to Bangladesh Water Development Board (BWDB), Bangladesh Meteorological Department (BMD), China Meteorological Agency (CMA; an observer at the RSC), India Meteorological Department (IMD; an observer at the RSC), Department of Energy, Water and Power Development Authority Pakistan (WAPDA) and Pakistan Meteorological Department (PMD). By the end of the field mission (November 7th 2012) the team had received responses from BWDB, BMD, IMD, WAPDA and WMO.
- Group work / facilitated self-evaluation: A logical framework format and a data collection format was developed and shared with PMU staff for their inputs to collect and assess information on project achievements in a concise manner. A facilitated discussion session was organised with the PMU and PAT staff and management of ICIMOD to jointly pin down and verify accomplishments, shortcomings and lessons learned.
- Field visits: HKH-HYCOS has supported upgrades of six weather stations in Bhutan and nine in Nepal. In Bhutan the project visited an Automatic Weather Station in Hongtsho. In Nepal the team visited two stations in the Koshi basin which have been upgraded with HKH-HYCOS support (Mulghat hydrological station and Dhankuta meteorological station in Dhankuta). The team also visited Koshi Chatara hydrological station in Sunsari which is purely a DHM station (not upgraded by the project). The purpose of selecting Koshi Chatara site was to collect additional information about the status of hydrological sites and to gain first-hand information on the station selection criteria applied in HKH-HYCOS programme.

**Analysis of secondary data** formed an important part of the evaluation methodology. The following types of documents have been reviewed: HKH-HYCOS project document, progress reports, site visit reports, procurement committee minutes, project budget and expenditure reports, minutes of the Regional Steering Committee (RSC) meetings, other relevant project reports and email responses to the questionnaire. Relevant policies, strategies and programmes in particularly Bhutan, Nepal and ICIMOD have been reviewed; review of policies and strategies in the other partner countries' strategies and policies is limited to the information the project partner's provided in their responses to the email questionnaires. The MTR team has methodically assessed the HKH-HYCOS activities and achievements and compared them against the objectives and

indicators of the project document and plans in place. The team has applied Results-Based Management approach together with "Most Significant Change" method.

HKH-HYCOS project achievements were assessed based on an adaptation of the 'Quick Scan' method. Attention was specifically focused on the inputs, outputs, effects (results) and impact that can be assessed within a short period of time. In addition, in assessing the effectiveness of HKH-HYCOS, the team adopted a modified version of the 'Most-Significant-Change' technique, to explore the perceptions of stakeholders and to assess impacts.

Analysis and consolidation of findings and conclusions has been done in a phase-wise manner. Preliminary analysis of main findings, conclusions, lessons learned and recommendations was done in Kathmandu before the wrap-up workshop. Detailed analysis work has continued all through report drafting.

## Cross-cutting objectives

Climate sustainability is at the core of the project so it was dealt as cross-cutting issue. The Human Rights Based Approach (HRBA) as outlined in the 'Integrating Human Rights and Gender Equality in Evaluation', produced by the United Nations Evaluation Group (UNEG 2011) strongly influenced the team in designing and implementing the evaluation process. Some of the key elements in integrating Human Rights and Gender in the review process were applied in the following way:

- Stakeholder participation: Full range of stakeholders were involved in the course of the work.
- Adequate sample: A large number of respondents, representing different stakeholder groups were interviewed. Thus findings are validated by sufficient number of people interviewed.
- Triangulation: Data was gathered from different sources and using different methods.
- Take advantage of existing data sets: Existing national or international data sets were used. This also supports aid alignment and emphasis on the use of existing country systems.
- Validation of findings: Validation of the findings is a two-step process. The first step was completed by organising a wrap-up meeting with the objective to increase accuracy and reliability. The workshop method also contributed to transparency of the evaluation process. The wrap-up meeting was arranged at ICIMOD premises in in Kathmandu for the Nepal-based stakeholders of the project (also findings on FNEP were discussed in the same meeting) on November 6th, 2012. The wrap-up meeting was organised so that the team could present preliminary findings and conclusions and to obtain initial comments from the stakeholders. A debriefing meeting was organised ICIMOD and a separate debriefing meeting with the Embassy of Finland as well. Upon Team Leader's return to Finland, she debriefed MFA. The step 2 in the validation process will take place in early December 2012, when the competent authorities and project partners will have a chance to review the draft report and give comments to the team.

## Limitations

The field mission to Nepal was launched just one week ahead of the Dashain festival, which is a major religious festival and period of holidays in the country. The team was hard pressed to interact with all key stakeholders before the holidays, but succeeded to meet all key stakeholders. Some development partners that were identified as relevant for interviews were not available for a meeting.

With respect to the regional project partners –particularly the proposed partners in India and China – would have been useful to meet. As a compensatory measure the email questionnaire was circulated among the partners (but the quality of interaction and data is not as high as face to face meeting). Given that HKH-HYCOS is a regional programme, field visits to more than two countries would have been beneficial.

The consultant supports warmly the concept of incorporating Junior Experts into the evaluation assignments. However, the arrangement where the JE was seconded by the Embassy of Finland created some confusion

among the stakeholders. In the future it would be better to task the consulting company to identify suitable JEs for the assignments.

## Appendix 1 Evaluation Framework

| Evaluation criteria / Evaluation questions as per TOR | Interview questions | To whom they will be directed | Remarks & Triangulation methods |
|---|---|---|---|
| **CROSS-CUTTING OBJECTIVES** | | | |
| 1. Have cross-cutting objectives been measured and integrated into project activities and reporting and/or have planned targeted measures been achieved? | Have cross-cutting objectives been integrated into the project design? If yes, have they been incorporated into project activities, monitoring and reporting? If yes, what measures have been achieved? At the project design stage, what requirements were set for cross-cutting issues? | ICIMOD | Review of secondary data, mainly HKH-HYCOS (RFIS) project plan and progress reports (HKH-HYCOS documents) |
| 2. Have adequate resources and expertise been allocated for implementation that promotes cross-cutting objectives? | What resources and expertise has been allocated to promote cross-cutting objectives? | ICIMOD | Review of HKH-HYCOS documents |
| 3. Have available information on the cross-cutting objectives been adequately and appropriately used? | What information is available on the cross-cutting objectives? How it has been used? | ICIMOD | Review of HKH-HYCOS documents |
| 4. Have gender sensitive indicators been used? | Have gender sensitive indicators been used? Has the project adhered to socially inclusive approach in its design and implementation? | ICIMOD | Review of HKH-HYCOS documents |
| 5. Does the project have negative effects on cross-cutting objectives? Have measures been taken to minimize them? | Has the project produced any negative effects with respect to cross-cutting objectives? If yes, what measures have been taken to minimize them? | ICIMOD | Review of HKH-HYCOS documents |
| 6. If cross-cutting objectives have not been addressed in the project, has this been explicitly justified? | If cross-cutting objectives have not been addressed in the project, has this been explicitly justified? In that case, why have they not been addressed? | ICIMOD | Review of HKH-HYCOS documents |
| 7. Have cross-cutting objectives been addressed in the capacity building programmes? | Have cross-cutting objectives been addressed in the capacity building activities? | ICIMOD | Review of HKH-HYCOS documents |
| **RELEVANCE** | | | |
| 8. Has the situation changed since the approval of the project document? Have there been some strong shifts in the sector priorities in Nepal? Is the project consistent with the policies of Nepal and | Have there been any major new policies, strategies or programmes endorsed since 2009 that would impact HKH-HYCOS and demand for its services? If yes, what strategies, policies or programmes? Have they | ICIMOD Partners in 6 countries | Review of HKH-HYCOS documents; quick scan of relevant national strategies, policies or programmes on climate change, disaster risk reduction |

| Evaluation criteria / Evaluation questions as per TOR | Interview questions | To whom they will be directed | Remarks & Triangulation methods |
|---|---|---|---|
| Finland? | influenced any shifts in the sector priorities? | | and meteorological services (emphasising Nepal and Bhutan) |
| 9. Is the project consistent with the needs and priorities of the final beneficiaries and other stakeholders? | What are the main achievements of the project that produce benefits to the final beneficiaries (right holders) and other stakeholders? | ICIMOD<br>Project partners in 6 countries<br>WMO | Review of HKH-HYCOS documents |
| 10. Are various stakeholders and interest groups satisfied with the objectives of the project? | Are you satisfied with the achievements of the project? Are the achievements in line with your anticipations? Do you know what the achievements are? If yes, please give details? | ICIMOD<br>Project partners in 6 countries<br>WMO | Review of HKH-HYCOS documents |
| 11. How is the project contributing/contributed to climate change vulnerability reduction? | How is the project contributing/contributed to climate change vulnerability reduction? Is it contributing? | ICIMOD<br>Project partners in 6 countries<br>WMO | Review of HKH-HYCOS documents |
| **EFFICIENCY** | | | |
| 12. Have activities transformed available resources into intended results, as stated in the project document, in terms of quantity, quality and time? Have possible problems in implementation been adequately addressed? | Have activities transformed available resources into intended results, as stated in the project document, in terms of quantity, quality and time? Have possible problems in implementation been adequately addressed? | ICIMOD<br>Project partners in 6 countries<br>WMO | Review of HKH-HYCOS documents |
| 13. Have the contributions by Nepal and Finland been provided as planned and has the quality of technical assistance and day-to-day management been satisfactory? | Have the contributions by your government and ICIMOD been provided as planned and has the quality of technical assistance and day-to-day management been satisfactory? | ICIMOD<br>Project partners in 6 countries<br>WMO | Review of HKH-HYCOS documents |
| 14. Have institutional arrangements, including cooperation and communication between stakeholders been sufficient? | Have institutional arrangements, including cooperation and communication between partners been sufficient? | Project partners in 6 countries<br>ICIMOD<br>WMO | Review of HKH-HYCOS documents |
| 15. Has monitoring of progress (including the adequacy and use of indicators and management of risks) been satisfactory? | Has monitoring of progress (including the adequacy and use of indicators and management of risks) been satisfactory? | ICIMOD | Review of HKH-HYCOS documents |
| 16. Have the training programmes of the projects produced expected results in an | Are the results that the project has so far produced being used and disseminated properly? How and by whom? | Project partners in 6 countries<br>ICIMOD<br>WMO | Review of HKH-HYCOS documents |

| Evaluation criteria / Evaluation questions as per TOR | Interview questions | To whom they will be directed | Remarks & Triangulation methods |
|---|---|---|---|
| efficient and sustainable manner? | | | |
| 17. Can the costs of the project be justified by the results? | Do the results achieved at your organisation justify the expenditure? Is there a good correlation between inputs and results achieved? Would there be other methods to achieve similar results? If yes, what? What has been the quality and timeliness of support received from ICIMOD? | Project partners in 6 countries ICIMOD | HKH-HYCOS documents |
| **DEVELOPMENT EFFECTIVENESS** | | | |
| 18. How are the results/outputs applied by the beneficiaries and other intended stakeholders? | What results/ outputs of HKH-HYCOS are applied by your organisation? Are there any results that are applied / replicated by other stakeholders in your country? | Project partners in 6 countries ICIMOD | Multiple interviews and interaction |
| 19. Have behavioural patterns changed as planned in the stakeholder institutions or groups at various levels? | Are there attitudinal changes among the staff? If yes, what? | Project partners in 6 countries ICIMOD | HKH-HYCOS documents; may be difficult to assess through email questionnaire |
| 20. To what extent do both FNEP and RFIS in the Hindu Kush-Himalaya program activities support each other? | To what extent do both FNEP and HKH-HYCOS program activities support each other? (at the project and programme level) | DHM, MoSTE ICIMOD FMI | FNEP and HKH-HYCOS documents |
| 21. What tangible benefits have resulted from field visits by Finnish partners? | n/a | n/a | Evaluation question targets FNEP only. |
| **DEVELOPMENT IMPACT** | | | |
| 22. How has the project reduced poverty of the intended primary beneficiaries in practice? | Has the project enhanced the operational sustainability of your organisation in any manner? If yes, how? Has it enhanced the financial sustainability? If yes, how? | Project partners in 6 countries ICIMOD WMO | Project's intended primary beneficiaries are government organisations and their staff. |
| 23. How has the project affected different socio-economic sectors (e.g. agriculture, trade, tourism, industry, and infrastructure) in Nepal and Hindu-Kush Himalayan region? | Has the project affected different socio-economic sectors (e.g. agriculture, trade, tourism, industry, and infrastructure) your country? If yes, please give examples | Project partners in 6 countries ICIMOD | HKH-HYCOS documents |
| 24. What are the overall poverty, inequality and sustainability impacts of the project, intended and unintended, long-term and short-term, positive | What are the overall impacts of the project, intended and unintended, long-term and short-term, positive and negative, that have been so far achieved? | Project partners in 6 countries ICIMOD WMO | HKH-HYCOS documents |

| Evaluation criteria / Evaluation questions as per TOR | Interview questions | To whom they will be directed | Remarks & Triangulation methods |
|---|---|---|---|
| and negative? | | | |
| 25. Do the indicators for the overall objectives show that the intended changes have taken place? | Do the indicators for the overall objectives show that the intended changes have taken place? | Project partners in 6 countries<br>ICIMOD | HKH-HYCOS documents |
| 26. Has regional cooperation been strengthened? | Has the project helped to strengthen regional cooperation? If yes, how? | Project partners in 6 countries<br>ICIMOD<br>WMO | HKH-HYCOS documents |
| **SUSTAINABILITY** | | | |
| 27. What are the possible factors that enhance or inhibit sustainability, including ownership/commitment, economic/financial, institutional, technical, socio-cultural and environmental sustainability aspects? What corrective measures the project has established to address these and to enhance sustainability? | What factors have enhanced sustainability? What factors have inhibited sustainability? Has the project taken any measures to further enhance sustainability? | Project partners in 6 countries<br>ICIMOD<br>WMO | HKH-HYCOS documents |
| 28. Will the benefits produced by the project be maintained after the termination of external support? | Will your organisation be able to maintain the benefits produced by the project after December 2014 (end of current phase)? | Project partners in 6 countries<br>ICIMOD | HKH-HYCOS documents |
| 29. Who will take over the responsibility of financing the activities, or have they become self-sustaining? Is there an exit strategy and gradual handing over plan in place and will it ensure sustainability, particularly related to operational & infrastructure maintenance and human resources? For FNEP, please assess the sustainability and project contribution to the capacity of DHM (this may have to be done separately to each capacity building activity performed). | After project expiry, what will happen with the results? Will your organisation be able to continue working on an improved manner? Would you need additional support? On what topics?<br>Are there any other on-going or pipeline interventions providing support to the development of meteorological services, early warning systems and flood information systems in your country? Please give a list. | Project partners in 6 countries<br>ICIMOD<br>WMO | HKH-HYCOS documents, other donor projects and pipeline |
| **Aid effectiveness (Effectiveness of aid management and delivery)** | | | |
| Ownership | | | |
| 30. Does DHM have a development strategy? Is | What strategies, long-term plans or other guidelines, does | Project partners in 6 countries | HKH-HYCOS documents |

| Evaluation criteria / Evaluation questions as per TOR | Interview questions | To whom they will be directed | Remarks & Triangulation methods |
|---|---|---|---|
| it operational, results-oriented, and with clear strategic priorities, and do FNEP and RFIS complement DHM's development strategy? | your organisation have? | | |
| | Does HKH-HYCOS complement your strategies? How? | Project partners in 6 countries | HKH-HYCOS documents |
| 31. Is the project finance included in DHM's medium term expenditure framework and reflected in the annual budget? | Are inputs from HKH-HYCOS reflected in the annual government expenditure or in your organisation's budget? Do you have a multi-year expenditure framework? | Project partners in 6 countries | |
| 32. Does DHM exercise leadership in coordinating aid? Does it have an active and leading role in decision making concerning planning and implementation and in joint decision making structures of the project? What could be done to enhance DHM's role? | What has the role of ICIMOD been in terms of coordinating and managing aid inputs channelled to your organisation? What has the role of your organisation been? Has the role been sufficiently strong? If necessary, how to strengthen the role? | Project partners in 6 countries<br>ICIMOD<br>WMO | FNEP documents |
| Use of country's own institutions and systems | | | |
| 33. Is the programme day-to-day management accountable to DHM (rather than to the donor)? | Which agency has managed the project, ICIMOD or your organisation? In the future, how should the management function be organized in similar projects? | Project partners in 6 countries<br>ICIMOD | HKH-HYCOS documents |
| 34. Are Terms of Reference of externally appointed staff determined by DHM (rather than by the donor)? | How much influence has your organisation had in determining the annual work plans, terms of reference for mission and all project activities? | Project partners in 6 countries<br>ICIMOD | HKH-HYCOS documents |
| 35. Is most of the professional staff appointed by DHM? | not relevant | n/a | Project staff works with ICIMOD; staff in participating countries is all government staff |
| 36. Is the salary structure of national staff similar to that of the civil service personnel? | not relevant | n/a | As above |
| 37. Please analyse issues related to the governance context of the projects and how the projects can possibly compensate for the deficits in the | Are there any other national actors that could have been incorporated in the project design or should be included in any future projects? Besides ICIMOD, are there any | Project partners in 6 countries<br>ICIMOD<br>WMO<br>SAARC, WB | |

| Evaluation criteria / Evaluation questions as per TOR | Interview questions | To whom they will be directed | Remarks & Triangulation methods |
|---|---|---|---|
| governance context. | alternative and qualified regional organisations that could implement projects like HKH-HYCOS? | | |
| Capacity development | | | |
| 38. Is the capacity development support provided by the project based on the DHM's capacity development strategy? | Was there a capacity need assessment conducted before the project was started? If yes, what were the main capacity need development areas? Has the project supported the priority areas identified for capacity development? | Project partners in Project partners in 6 countries ICIMOD | HKH-HYCOS documents |
| 39. Does the project promote use of local and regional resources, including South-South cooperation? | Does the project promote use of local and regional resources, including South-South cooperation? | Project partners in 6 countries ICIMOD WMO, SAARC | HKH-HYCOS documents |
| Managing for results | | | |
| 40. Has DHM established results-oriented reporting and assessment frameworks with a manageable number of indicators? Does the project rely on these frameworks? | Have you established results-oriented reporting and assessment frameworks with a manageable number of indicators? Does the project rely on these frameworks? Has ICIMOD requested these? Is there a monitoring system in place? Is the data used to improve the performance and carry out corrective measures? | Project partners in 6 countries ICIMOD | HKH-HYCOS documents |
| 41. Does the project develop capacity and demand for results-based management? | Has the project incorporated capacity development activities for results-based management? | ICIMOD | HKH-HYCOS documents |
| Mutual accountability | | | |
| 42. Are both Finland and DHM held accountable for commitments in the project? | Are both ICIMOD and your country held accountable for commitments in the project? | Project partners in 6 countries ICIMOD | |
| 43. Are the risks for corruption/possible instances of corruption addressed in the project implementation and monitoring framework? | Are the risks for corruption/possible instances of corruption addressed in the project implementation and monitoring framework? | Project partners in 6 countries ICIMOD | HKH-HYCOS documents |
| Coordination, Complementarity, Coherence | | | |
| 44. How have other projects and cooperation been taken into account in implementation, including experiences of joint work with other actors? | How have other projects and cooperation been taken into account in implementation, including experiences of joint work with other actors? Are there any lessons that have been learned? | Project partners in 6 countries ICIMOD | |
| 45. Does the project | Does the project complement | Project partners | |

| Evaluation criteria / Evaluation questions as per TOR | Interview questions | To whom they will be directed | Remarks & Triangulation methods |
|---|---|---|---|
| complement other projects/programmes? How can it be ensured that the results of this project will be most useful for other projects or programmes? | other projects/programmes? How can it be ensured that the results of this project will be most useful for other projects or programmes? What are the sector coordination mechanisms at present? | in 6 countries ICIMOD | |
| **Finnish value added** | | | |
| 46. What are the distinctive beneficial features of Finland's support? | Is Finnish support different from support received from other donors? If yes, how? | ICIMOD | |

## Appendix 2 Email questionnaires

**A: Evaluation questionnaire sent to the HKH-HYCOS partners and stakeholders in Bangladesh, China, India and Pakistan**

The questionnaire has been divided into seven sections. Please use the detailed questions under each main section as guiding questions when you prepare your answers. Please note that we would also need you to fill in the column "Achievements with respect to the objectives and indicators" in Annex 1.

**Question 1 Relevance of HKH-HYCOS and Aid effectiveness / Ownership**

- What are the national main policies, strategies and programmes that guide the operations and activities of your organisations activities at present? Please give a brief list.
- Are the objectives and activities of HKH-HYCOS consistent with the national policies and strategies? If so, how? If not, please suggest how to improve relevance of the programme?
- What are the main guiding documents and strategies for your organization (e.g. 5-year strategy, staff development strategy, fund-raising strategy or similar)?
- Does HKH-HYCOS programme compliment implementation of your organisation's strategies? How?

**Question 2 Efficiency of HKH-HYCOS implementation**

- Have activities transformed available programme resources into intended results? Have there been any problems with implementation? Have they been addressed and if so, how?
- Have the contributions by your government / your organization and ICIMOD been provided as planned? What has the quality of technical assistance from ICIMOD and day-to-day management of the programme been? Please make recommendations for improvements, if necessary.
- Have institutional arrangements, including cooperation and communication between partners been sufficient?
- Are inputs provided by HKH-HYCOS reflected in your organisation's annual budget? Do you apply a multi-year expenditure framework where also contributions from international partners would be included?

**Question 3 Effectiveness of HKH-HYCOS**

- Please list the main results that HKH-HYCOS has produced regionally and in your country. Are those results being used and disseminated properly? How and by whom?
- From your organisation's perspective, which HKH-HYCOS activities have been most important for you? Has there been any activities that have not been so relevant or useful? If so, what activities?
- Are any attitudinal or capacity changes taking place among your staff? If so, what? If not, please explain about the reasons.

- Is it likely that the current phase of HKH-HYCOS going to achieve its objectives by December 2014 (please see the objectives and indicators of HKH-HYCOS on pp. 3-4)? If so, please justify? If not, also please justify.

**Question 4 Emerging Impact of HKH-HYCOS**

- What are the emerging impacts (positive or negative, long-term or short-term, intended or unintended) of HKH-HYCOS in your country
- Is the programme contributing to mitigation of impact change in your country? Is there any impact emerging towards improved disaster preparedness or early warning systems?
- Has the HKH-HYCOS programme enhanced the sustainability of your organization? If so, how? Has it enhanced your financial sustainability?
- Has the project affected different socio-economic sectors (e.g. agriculture, trade, tourism, industry, and infrastructure) in any manner? If so, how?
- The logical framework of HKH-HYCOS is attached as Annex 1 to this questionnaire. Please revisit it and then use the table provided therein to assess if there is any progress towards the objectives and the indicators towards their achievement?
- Has the HKH-HYCOS helped to strengthen regional cooperation? If so, how? If not, what efforts and by whom would be needed for that?

**Question 5 Sustainability of HKH-HYCOS results**

- What factors have enhanced sustainability, regionally and nationally? What factors have inhibited sustainability? Has the HKH-HYCOS programme taken any measures to further enhance sustainability? If so, what measures?
- The project has received a no-cost extension until December 2014? After that, will your organization be able to maintain the results achieved with HKH-HYCOS and to continue working in an independent manner? Would you need additional support? If so, on what topics and themes especially?
- Are there any other on-going or pipeline interventions providing support to the development of meteorological services, early warning systems and flood information systems in your country? Please give a list.
- Does the HKH-HYCOS complement other projects and programmes? Are there any synergies between different projects?

**Question 6 Implementing arrangements of HKH-HYCOS**

- What has the role of your organization been in terms of planning for and managing project inputs channelled to your organization? Has your role been sufficient? If not, please propose improvements?
- What has been the role of ICIMOD in terms of planning for and managing project inputs vis-à-vis partner countries? Which agency has managed the project (national level), ICIMOD or your organization? In the future, how should the management function be organized in similar projects?
- Are there any other national actors that should be incorporated in any future projects like HKH-HYCOS?
- Was there a needs assessment (both with respect to technological improvements and human resources / staff capacities) conducted before the activities started? If yes, what were the main capacity development areas that were identified? Has the project supported these priority areas?
- Does the project promote use of local and regional resources, including South-South cooperation?

**Question *7* Lessons Learned and Way Forward for HKH-HYCOS**

- What are the main lessons learned during the first years of HKH-HYCOS?
- If you have any recommendations or views to share with respect to implementing HKH-HYCOS during 2013 and 2014, please share.
- Similarly, if you have any recommendations or views to share with respect to regional collaboration after 2014, please share.

**Any other issues?**

- If there are any other issues that you want to share with the MTR team, please feel free to do so. Your inputs regarding all aspects of the HKH-HYCOS programme will be much appreciated by the team.

**Annex: Logical framework of HKH-HYCOS – achievements until September 2012 (extracted from pp. 93-101 of the project document)**

Please take some time and assess and analyse the achievements of HKH-HYCOS vis-à-vis the objectives of the project using the table format below.

| **Project objectives** | **Planned indicators** | **Achievements with respect to the objectives and indicators – please assess and give your views here** |
|---|---|---|
| **Overall objective**<br>Minimised loss of lives and property by reducing flood vulnerability in the HKH region with specific reference to the Ganges-Brahmaputra-Meghna and Indus river basins | N/A | |
| **Project Purpose**<br>Timely exchange of flood data and information | Sharing of real time data and information through established mechanisms | |
| **Specific objective 1**<br>Strengthened framework for cooperation on sharing regional flood data and information among participating member countries | Annual meetings of RSC are held | |
| **Specific objective 2**<br>Establishment of flood observation network in selected basins in the participating countries | Number of upgraded hydro meteorological stations including telemetry in participating countries | |
| **Specific objective 3**<br>Establishment of regional and national flood information systems to share real time data and information and increase lead time | A flood information system in place<br>% of HYCOS stations functioning properly<br>% of HYCOS stations with successful data and information transmission and use by participating countries | |
| **Specific objective 4**<br>Enhanced technical capacity of partners on flood forecasting and communication to end users | Partners of participating countries operating and maintaining the flood information system | |
| **Specific objective 5**<br>Full-scale regional project planned and agreed among participating countries | Project Proposal developed and [approved by participating countries] | |

Please note that the activities section of the log frame has not been copied here. You are welcome to share any views regarding quality or progress (or lack of) regarding any activity here. Thank you for your valuable inputs to this MTR process!

**B MTR of HKH-HYCOS - Evaluation questionnaire to WMO (19 October 2012)**

The questionnaire has been divided into seven sections. Please use the detailed questions under each main section as guiding questions when you prepare your answers. Please note that we would also need you to fill in the column "Achievements with respect to the objectives and indicators" in Annex 1.

**Question 1 Relevance of HKH-HYCOS and Aid effectiveness / Ownership**

- What are the WMO policies, strategies and programmes that guides the initiation and operation of WHYCOS, especially the HKH-HYCOS?
- How do the activities of HKH-HYCOS contribute to achievement of WMO's policies and strategies? If so, how? If not, please suggest how to improve relevance of the programme?
- How do the activities of HKH-HYCOS contribute to strengthening of regional cooperation on flood information sharing among the HKH countries?
- What has been the response of the six participating countries to the HKH-HYCOS programme?

**Question 2 Efficiency of HKH-HYCOS implementation**

- What has the specific role (technical / financial / managerial / strategic / policy) of WMO been in practice in the implementation of the programme?
- Have the contributions by WMO been provided as planned? If so, please elaborate. If not, please make recommendations for future.
- What has the quality of technical assistance from ICIMOD and day-to-day management of the programme been? Please make recommendations for improvements, if necessary.
- In WMO's view, please assess the institutional arrangements, including cooperation and communication between partners. Has it been sufficient? If not, please suggest improvements?
- Have activities transformed available programme resources into intended results? Have there been any problems with implementation? Have they been addressed and if so, how?

**Question 3 Effectiveness of HKH-HYCOS**

- Please list the main results that HKH-HYCOS has produced regionally and per participating country. Are those results being used and disseminated properly? How and by whom?
- From WMO perspective, which HKH-HYCOS activities have been most important or critical (without which the programme would not succeed)? Have there been any activities that have not been so relevant or useful? If so, what activities?
- Are any capacity changes taking place among the six institutions participating fully in the programme (2 in Bangladesh, 1 in Bhutan, 1 in Nepal and 2 in Pakistan? If so, what? If not, please explain about the reasons.
- What are the activities that HKH-HYCOS is running in China and India?
- Similarly, are any capacity changes taking place among the institutions in China and in India?
- Is it likely that the current phase of HKH-HYCOS will achieve its objectives by December 2014 (please see the objectives and indicators of HKH-HYCOS on pp. 4-5)? If so, please justify? If not, also please justify.

**Question 4 Emerging Impact of HKH-HYCOS**

- What are the emerging impacts (positive or negative, long-term or short-term, intended or unintended) of HKH-HYCOS?
- Is the programme contributing to mitigation of impact change in the HKH region?
- Is there any impact emerging towards improved disaster preparedness or early warning systems as a regional cooperative instrument?
- Has the HKH-HYCOS programme enhanced the institutional sustainability of the programme partners in 4 countries (Bangladesh, Bhutan, Nepal, and Pakistan)? If so, how? Has it enhanced their operational and financial sustainability?

- The logical framework of HKH-HYCOS is attached as Annex 1 to this questionnaire. Please visit it and then use the table provided therein to assess if there is any progress towards the objectives and the indicators towards their achievement?
- Has the HKH-HYCOS enhancing flood management at the regional level? If so, which are those countries and how? If not, why?
- Water resource management is a challenge to this region. How HKH-HYCOS could contribute to water resource management in achieving MDGs (e.g. contributing to improved food security and poverty reduction...) and strengthening disaster responses (e.g. reducing vulnerability to disasters)?
- Among the HKH-HYCOS member states there are differences in their national policies and approaches with respect to water resources and information sharing. For instance in India, hydrological data are said to be classified. How does this affect the smooth implementation of HKH-HYCOS?

**Question 5 Sustainability of HKH-HYCOS results**

- What factors have enhanced sustainability, regionally and nationally? What factors have inhibited sustainability? Has the HKH-HYCOS programme taken any measures to further enhance sustainability? If so, what measures?
- The project has received a no-cost extension until December 2014? After that, will the partner organizations be able to maintain the results achieved with HKH-HYCOS and to continue working in an independent manner? Does WMO have any programme for additional support to them? If so, on what topics and themes especially?
- Are there any other on-going or pipeline interventions providing support to the development of hydro-meteorological services, early warning systems and flood information systems in the partner countries? Please give a list.
- Does the HKH-HYCOS complement other projects and programmes? Are there any synergies between different projects/programmes?

**Question 6 Implementing arrangements of HKH-HYCOS**

- What has the role of WMO been in terms of planning and project management? Has your role been sufficient? If not, please propose improvements?
- What has been the role of ICIMOD in terms of planning for and managing project inputs vis-à-vis partner countries? Are you satisfied with the project management inputs provided by ICOMOD? management? Please elaborate.
- Do you think that incorporation of any other actors in this project would bring synergy to the disaster risk reduction in the region? If yes, what actors should be included?
- Did WMO make a need assessment (both with respect to technological improvements and human resources / staff capacities) before the activities started? If yes, what were the main capacity development areas that were identified? Has the project supported these priority areas?
- Does the project promote use of local and regional resources, including South-South cooperation? If yes, please describe.
- Please share your views about necessity of India's active participation in the project. If relevant Indian institutions do not become active members of the HKH-HYCOS, then how can the project achieve the objectives? Please elaborate.

**Question 7 Lessons Learned and Way Forward for HKH-HYCOS**

- What are the main lessons learned during the first years of HKH-HYCOS?
- If you have any recommendations or views to share with respect to implementing HKH-HYCOS during 2013 and 2014, please share.
- Similarly, if you have any recommendations or views to share with respect to regional collaboration after 2014, please share.

**Any other issues?**

- If there are any other issues that you want to share with the MTR team, please feel free to do so. Your inputs regarding all aspects of the HKH-HYCOS programme will be much appreciated by the team.

**Annex Logical framework of HKH-HYCOS – achievements until September 2012 (extracted from pp. 93-101 of the project document)**

Please take some time and assess and analyse the achievements of HKH-HYCOS vis-à-vis the objectives of the project using the table format below.

| **Project objectives** | **Planned indicators** | **Achievements with respect to the objectives and indicators – please assess and give your views here** |
|---|---|---|
| **Overall objective**<br>Minimised loss of lives and property by reducing flood vulnerability in the HKH region with specific reference to the Ganges-Brahmaputra-Meghna and Indus river basins | N/A | |
| **Project Purpose**<br>Timely exchange of flood data and information | Sharing of real time data and information through established mechanisms | |
| **Specific objective 1**<br>Strengthened framework for cooperation on sharing regional flood data and information among participating member countries | Annual meetings of RSC are held | |
| **Specific objective 2**<br>Establishment of flood observation network in selected basins in the participating countries | Number of upgraded hydro meteorological stations including telemetry in participating countries | |
| **Specific objective 3**<br>Establishment of regional and national flood information systems to share real time data and information and increase lead time | A flood information system in place<br>% of HYCOS stations functioning properly<br>% of HYCOS stations with successful data and information transmission and use by participating countries | |
| **Specific objective 4**<br>Enhanced technical capacity of partners on flood forecasting and communication to end users | Partners of participating countries operating and maintaining the flood information system | |
| **Specific objective 5**<br>Full-scale regional project planned and agreed among participating countries | Project Proposal developed and [approved by participating countries] | |

Note that the activities section of the log frame has not been copied here. You are welcome to share any views regarding quality or progress (or lack of) regarding any activity here.

Thank you for your valuable inputs to this MTR process!

## ANNEX 3 FIELD MISSION PROGRAMME

**Field Team:** Kristiina Mikkola (KM), Adarsha Pokhrel (AP), Dhruba Gautam (DG), Kukka Korhonen (KK)

| Date | Activity |
|---|---|
| Thu 11 Oct 2012 | Departure of Team Leader (TL) from Kangasala, Finland (flight Helsinki-Delhi) |
| Fri 12 Oct 2012 | TL arrival to Nepal (flight Delhi-Kathmandu) |
| Sat 13 Oct 2012 | Day off |
| Sun 14 Oct 2012 | Internal team meeting<br>Evaluation kick-off meeting at DHM, Babar Mahal |
| Mon 15 Oct 2012 | Meetings with:<br>• ICIMOD (evaluation kick-off)<br>• Embassy of Finland (briefing)<br>• Development partners (evaluation interaction) |
| Tue 16 Oct 2012 | Day off, Ghatasthapana (GoN holiday) |
| Wed 17 Oct 2012 | Meetings with:<br>• World Bank<br>• SAARC Secretariat<br>• Department of Water Induced Disaster Prevention (DWIDP), Ministry of Irrigation<br>• Ministry of Home Affairs (MoHA) and National Emergency Operation Centre (NEOC) of MoHA<br>• Ministry of Irrigation (MoI)<br>• Ministry of Energy (MoE) |
| Thu 18 Oct 2012 | Meetings with:<br>• Department of Hydrology and Meteorology (DHM)<br>• Ministry of the Environment, Science and Technology (MoSTE)<br>• Real Time Solutions (RTS) |
| Fri 19 Oct 2012 | Meetings with:<br>• UNDP, Disaster Risk Reduction Unit<br>• Academia and CSO organisations working with meteorology and hydrology |
| Sat 20 Oct 2012 | Day off |
| Sun 21 Oct 2012 | Document review |
| Mon 22 Oct – Sat 27 2012 | Days off, Dashain festival (GoN holidays) |
| Sun 28 Oct 2012 | Travel to Bhutan (flight Kathmandu-Paro) |
| Mon 29 Oct 2012 | Kick-off meeting at Department of Hydro-Met Services (DHMS)<br>Field visit to Hongtsho automatic weather station site |
| Tue 30 Oct 2012 | Meetings with:<br>• Department of Hydro-met Services<br>• National Environment Commission (NEC) |
| Wed 31 Oct 2012 | Travel back to Nepal (flights Paro-Delhi and Delhi-Kathmandu) |
| Thu 1 Nov 2012 | Meetings with:<br>• ICIMOD HKH-HYCOS Project Management Unit (PMU) and Project Advisory Team (PAT)<br>• ICIMOD management<br>• Additional GoN ministries (group meeting)<br>• UNDP, Environment and Climate Change Unit |
| Fri 2 Nov 2012 | Flight to Biratnagar, field visit to Mulghat hydrological station and Dhankuta meteorological station, both in Dhankuta, overnight stay at Bhedetar, Morang |
| Sat 3 Nov 2012 | Field visit to Koshi Chatara station, return to Biratnagar and return flight to Kathmandu |
| Sun 4 Nov 2012 | Internal team work / data analysis |
| Mon 5 Nov 2012 | Internal team work / preparing the workshop presentation and brief report |

| Date | Activity |
|---|---|
| Tue 6 Nov 2012 | Internal team work<br>Wrap-up meeting of HKH-HYCOS MTR and FNEP final evaluation |
| Wed 7 Nov 2012 | Debriefing meetings with:<br>• ICIMOD HKH-HYCOS PMU<br>• Embassy of Finland |
| Thu 8 Nov 2012 | TL departs from Kathmandu (flight Kathmandu-Delhi) |
| Fri 9 Nov 2012 | TL arrives in Kangasala, Finland (flight Delhi-Helsinki) |

# ANNEX 4 LIST OF PERSONS INTERVIEWED

**FINLAND**
**Ministry for Foreign Affairs**
1. Ms Taru Väyrynen, Programme Officer
2. Ms Helena Kuivila, Programme Officer
3. Ms Marjaana Kokkonen, Programme Officer
4. Mr Antero Klemola, Adviser
5. Dr Matti Nummelin, Environment Adviser

**Embassy of Finland**
6. Mr Kari Leppänen, Councellor

**Finnish Meteorological Institute**
7. Ms Irma Ylikangas, Project Manager, FNEP

**BANGLADESH**
**Bangladesh Meteorological Department**
8. Mr Mohammad Sazzad Hossain, Communication Engineer, Bangladesh Meteorological Department (email)
9. Mr Ahmed Arif Rashid, Sr Mechanical Engineer and Head of Planning, Co-ordinator of the Project (email)

**Bangladesh Water Development Bureau**
10. Mr Mohammad Mosaddeque Hossain, Superintending Engineer, Processing and Flood Forecasting Circle (email)

**BHUTAN**
**Department of Hydro-met Services, Ministry of Economic Affairs**
11. Mr Karma Tsering, Director
12. Mr Chhimi Dorji, Project Manager, HKH-HYCOS
13. Mr Kingjom Sonam, Head of Metrology Division
14. Mr Karma Dupchu, Head of Hydrology Division
15. Mr Phuntsho Namgyal, Officiating Head
16. Mr Tsheucho Dorji, MD, Engineer
17. Mr Sherub Phuntshu, Deputy Engineer
18. Mr Pema Wangi, Deputy PM
19. Mr Tayba B. Tamang, Engineer
20. Mr Sonam Dorji, Meteorologist

**National Environment Commission**
21. Mr Sonam Dagay, Asst. Environment Officer, Environment Monitoring Division
22. Mr Tsering Tashi, Communication Officer

**INDIA**
**India Meteorological Department**
23. Dr R.K. Giri, Scientist 'D', Office of the Director General of Meteorology (email)

**NEPAL**
**Civil Aviation Authority of Nepal (CAAN)**
24. Mr Dinesh Prasad Shrestha, Deputy Director General

**Department of Electricity Development, MoE**
25. Dr Matrika Pd Koirala, Engineering Geologist
26. Mr Ram Gopal Kharbuja, Sr. Div. Hydrologist

**Department of Hydrology and Meteorology, MoSTE**
27. Mr Rishi Ram Sharma, Director General

28. Mr Saraju Kumar Baidya, Deputy Director General
29. Mr Kamal Prakash Budhathoki, Deputy Director General
30. Mr Gautam Rajkarnikar, Deputy Director General
31. Mr Mani Ratna Shakya, Former Deputy Director General
32. Dr KP Sharma, Former Director General
33. Mr Durga Prakash Manandhar, Senior Divisional Meteorologist
34. Mr Rocky Talchbhadel, Hydrologist Engineer
35. Mr Om Ratna Bajracharya, Former Joint Secretary
36. Mr Suresh Maskey, Hydrologist
37. Mr Kamal Raj Joshi, Senior Divisional Hydrologist
38. Mr Bijay Pokhrel, Senior Divisional Hydrologist
39. Dr Dilip Gautam, Former Deputy Director General

**DHM, Regional, District and station staff Sunsari & Dhankuta**
40. Mr Ashok Shrestha, Jr. Technician (Meteorologist)
41. Mr Bimal Pokhrel, Jr. Admin Officer
42. Mr Narayan Gautam, Store Keeper
43. Mr Suresh Shrestha, Gauze Reader, Mulghat
44. Mr Tanka Amagain, Jr. Technician
45. Mr Kedar Shrestha, Sr. Meteorology Assistant
46. Mr Hari Bahadur Karki, Gauze Reader, Koshi Chatara

**Department of Water Induced Disaster Prevention, Ministry of Irrigation**
47. Mr Prakask Poudel, Director General
48. Mr Mathura Pd. Dongol, Deputy Director General,
49. Mr Rabinath Pd Shrestha, Senior Divisional Engineer

**EU Delegation to Nepal**
50. Ms Marion Michaud, Programme Manager, EU Food Facility (email)

**ICIMOD**
51. Dr David Molden, Director General
52. Dr Eklabya Sharma, Director Programme Operations
53. Mr Farid Ahmad, Head Strategic Planning and Monitoring
54. Dr Mandira Shrestha, HKH-HYCOS Coordinator
55. Mr Vijaya Khadgi, Deputy Coordinator/Network Officer
56. Dr S. M. Wahid, Senior Hydrologist
57. Mr Hari Krishna, DRR Specialist
58. Ms Anita Karki, Gender Specialist/Consultant
59. Mr Ujol Sherchan, Senior Programme Officer
60. Mr Rajendra Shrestha, Research Analyst/IWHM
61. Mr Pradeep Mool, AA Team Leader, Cryosphere
62. Mr Vijay Khadgi, HKH-HYCOS Assistant Coordinator
63. Mr Ranjan M. Bajracharya, System Analyst/database expert
64. Mr Bikash Dongol, Database Expert
65. Mr Pradeep Dongol, Field Data Analyst
66. Mr Mohan Shrestha, Procurement Officer
67. Dr Arun Bhakta Shrestha, Climate Change Specialist
68. Ms Himaa Rai, Project Assistant

**International Federation of Red Cross**
69. Mr Sanjeev Hada, Shelter Advisor, Pakistan-Nepal

**Kathmandu University**
70. Dr Ranjan Bhakta Kyastha, Reader

**Ministry of Energy**
71. Mr Sunil B. Malla, Joint-Secretary

**Ministry of Environment, Science and Technology**
72. Mr Krishna Gyawali, Secretary
73. Mr Prakash Mathema, Joint-Secretary

**Ministry of Irrigation**
74. Mr Kamal Regmi, Joint Secretary

**Ministry of Home Affairs**
75. Mr Sagar Mani Parajuli, Joint Secretary, National Emergency Operation Centre
76. Mr Pradeep Koirala, Joint Secretary, Disaster Management

**Nepal Agricultural Research Council**
77. Mr Ananda Kumar Gautam, Chief, AEU

**Nepal Engineering Association**
78. Mr Mahendra Bdr Gurung, Chairperson

**Plan Nepal**
79. Mr Shyan Sundar Jnavaly, Disaster Risk Management Coordinator

**Practical Action**
80. Mr Gehendra Gurung, Head DRR Risk Reduction and Climate Change

**Real Time Solutions (RTS)**
81. Mr Sandeep Paudel, Chairperson
82. Mr Ranjan Shrestha, Software Specialist
83. Ms Sujata Pujari, Engineer

**SAARC**
84. Mr Singye Dorjee, Director-Bhutan

**Society for Hydrology and Meteorology**
85. Mr Jagat Kumar Bhusal, Chairperson

**Tribhuvan University**
86. Prof Dr Lochan Pd Devkota, Professor

**UNDP**
87. Ms Jenty Kirsch-Wood, DRM International Manager
88. Mr Vijaya Singh, Assistant Country Director

**The World Bank**
89. Ms Stephanie Borsbroom, Operation Officer
90. Mr Anil Pokharel, Disaster Risk Reduction Specialist

**PAKISTAN**
**Department of Energy, Water & Power Development Authority (WAPDA)**
91. Mr Mushtaq Ahmad, Chief Engineer (email)

**SWITZERLAND**
**WMO**
92. Dr Wolfgang Eric Grabs, Chief, Hydrological Forecasting and Water Resources Division (email)

**THAILAND**
**RIMES**
93. Mr Dilip Gautam, Senior Hydrologist

**List of Participants of the Final Wrap-up Meeting November 6th, 2012**

1. Mr Vijaya Khadgi, Deputy Coordinator/Network Officer, ICIMOD
2. Dr S. M. Wahid, Senior Hydrologist, ICIMOD
3. Mr Hari Krishna, DRR Specialist, ICIMOD
4. Ms Anita Karki, Gender Specialist/Consultant, ICIMOD
5. Mr Ujol Sherchan, Senior Programme Officer, ICIMOD
6. Mr Rajendra Shrestha, Research Analyst/IWHM, ICIMOD
7. Mr Pradeep Mool, AA Team Leader, Cryoshere, ICIMOD
8. Dr Mandira Shrestha, HKH-HYCOS Coordinator, ICIMOD
9. Mr Vijay Khadgi, HKH-HYCOS Assistant Coordinator, ICIMOD
10. Mr Ranjan M. Bajracharya, System Analyst/database expert, ICIMOD
11. Mr Bikash Dongol, Database Expert, ICIMOD
12. Mr Pradeep Dongol, Field Data Analyst, ICIMOD
13. Mr Mohan Shrestha, Procurement Officer, ICIMOD
14. Dr Arun Bhakta Shrestha, Climate Change Specialist, ICIMOD
15. Ms Himma Rai, Project Assistant, ICIMOD
16. Ms Kamana Gurung, Programme Officer, Finland Embassy
17. Mr Kari Leppänen, Counselor
18. Mr Rabinath Pd Shrestha, Senior Divisional Engineer, Department of water Induced Disaster Prevention
19. Mr Saraju Kumar Baidya, Deputy Director General, DHM
20. Mr Kamal Prakash Budhathoki, Deputy Director General, DHM
21. Mr Gautam Rajkarnikar, Deputy Director General, DHM
22. Ms Sharmila Manandhar, IWHM, ICIMOD
23. Mr Saroj Dhoj Joshi, Engineer, RTS
24. Ms Sujata Pujari, Engineer, RTS
25. Mr Rajan Shrestha, Engineer, RTS
26. Mr Laxmi Prasad Baskota, Section Officer, MOHA
27. Dr David Molden, DG, ICIMOD
28. Dr. Eklabya Sharma, Director, Programme/ ICIMOD
29. Mr. Farid Ahmad, M&E expert/ICIMOD

# ANNEX 5 LIST OF DOCUMENTS REVIEWED

**Government of Bangladesh**

National Water Policy 1999
National Water Management Plan 2004
National Adaptation Plan of Action 2005
Bangladesh Climate Change Strategy and Action Plan 2009
National Plan for Disaster Management 2010-2015
Sixth Five Year Plan 2011- 2015

**Government of Bhutan**

Bhutan Water Policy 2003
National Disaster Risk Management Framework 2006
National Environment Commission, Royal Government of Bhutan 2006 Bhutan National Adaptation Programme of Action
Royal Government of Bhutan 2012 Bhutan: In Pursuit of Sustainable Development, National Report for the United Nations Conference on Sustainable Development 2012
11th Five-Year Plan draft (2012), excerpts

**People's Republic of China**

National Comprehensive Disaster Reduction Plan for the Eleventh 5-year Plan Period 2007

**Government of India**

Disaster Management Act 2005
National Policy on Disaster Management 2005

**Government of Nepal**

GoN/Ministry of Water Resources (MoWR) 2001 The Hydropower Development Policy, 2001
GoN/Water and Energy Commission Secretariat (WECS) 2002 Water Resources Strategy Nepal
GoN 2002-2007 Tenth Five-year Development Plan
GoN 2002 National Water Resource Strategy
GoN 2003/2004 Irrigation Policy 2060
GoN 2003/2004 National Water Plan
GoN/ 2006 Water Induced Disaster Management Policy
GoN/2009 National Strategy for Disaster Risk Management
MoE/GoN 2009 National Adaptation Programme of Action (NAPA) to Climate Change, September 2010
GoN/NPC 2010 Three Year Plan Approach Paper (2010/11-2012/13)
GoN/MoE 2010 Draft National Strategy for Early Warning of Natural Disasters in Nepal
GoN/MoE 2010 National Adaptation Programme of Action (NAPA) Draft Report (Without Figures And Maps)
GoN/ 2010/11 – 2012/13 Three-Year Interim Plan
GoN/2011 Disaster Risk reduction In Nepal: flagship Programme. The Nepal Risk Reduction Consortium.
GoN 2011 Climate Change Policy
GoN/WECS 2011 Water Resources of Nepal in the Context of Climate Change
GoN/NPC 2012 Nepal Status Paper United Nations Conference on Sustainable Development 2012 (Rio+20) Synopsis
National Society for Earthquake Technology-Nepal (NSET) 2008 National Strategy for Disaster Risk Management in Nepal (draft)

**Government of Pakistan**

Flood Risk Management Plan 2012
National Disaster Risk Management Framework 2007

**Ministry for Foreign Affairs, Finland**

MFA 2007 Evaluation Guidelines – Between Past and Future

MFA 2009 Finnish Development Policy Guidelines for Environment

MFA 2012 Finland's Development Policy Programme Government Decision-in-Principle 16 February 2012

**ICIMOD**

ICIMOD 2006 Policy Priorities for Sustainable Mountain Development: Proceedings and Selected Papers from the ICIMOD Regional Policy Workshop

ICIMOD 2008 ICIMOD Strategic Framework 2008

ICIMOD 2008 Gender Equity Policy

ICIMOD 2012 Final Draft - A Strategy and Results Framework for ICIMOD, October 2012 (draft for Board of Governors submission)

ICIMOD 2010 Mid Term Review of the ICIMOD Strategic Framework 2007 and Medium Term Action Plan 2008 - 2012

ICIMOD 2012 MTAP-III Medium Term Action Plan 2013-2017 Draft for Board Approval, October 2012

ICIMOD 2012 ICIMOD Annual Report 2011

**HKH-HYCOS**

MFA & ICIMOD 2009 Agreement on implementation of HKH-HYCOS, December15th 2009

ICIMOD & WMO 2009 The Hindu Kush-Himalayan Hydrological Cycle Observing System (HKH-HYCOS) Establishment of a Regional Flood Information System in the Hindu Kush-Himalaya, a regional component of the World Hydrological Cycle Observing System (WHYCOS), Draft Full Project Document, April 2009

ICIMOD 2010 Establishment of a Regional Flood Information System in the HKH region (HKH-HYCOS), Progress Report Dec 09-June 2010, June 4, 2010, 4 pp.

ICIMOD 2010 Background Document, Inception Meeting on Establishment of a Regional Flood Information System in the HKH region (HKH-HYCOS), 23rd-25th June, 2010, Kathmandu, Nepal. Organized by ICIMOD in collaboration with WMO with support from MFA, Finland 4 pp

ICIMOD 2010 Inception Meeting Report, Establishment of a Regional Flood Information System in the HKH region (HKH-HYCOS), 23rd-25th June, 2010, ICIMOD, Kathmandu, Nepal.

ICIMOD 2010 First Regional Steering Committee Meeting Report, HKH-HYCOS, 7th-9th December 2010, Kathmandu, Nepal

ICIMOD 2010 Establishment of a Regional Flood Information System in the HKH region (HKH-HYCOS), Progress Report June-October 2010 – Plan of Action of for 2011, 2 pp

ICIMOD 2011 2nd Regional Steering Committee Meeting Report, HKH-HYCOS, 4-6 May 2011

ICIMOD 2011Regional Flood Information System (HKH-HYCOS) Project Half-Yearly Progress Report November 2010-June 2011, 01 June 2011

ICIMOD 2011 Meeting Document 3rd Regional Steering Committee Meeting, 1-2 December Kathmandu, Nepal

ICIMOD 2011 3rd Regional Steering Committee Meeting Report, HKH-HYCOS, 1st-2nd December 2011

ICIMOD 2011Regional Flood Information System (HKH-HYCOS) Project Half-Yearly Progress Report July-December 2011, 30 December 2011

ICIMOD 2011 4th Regional Steering Committee Meeting Report, HKH-HYCOS, 23-25 May 2012

ICIMOD 2012 Regional Flood Information System (HKH-HYCOS) Project Half-Yearly Progress Report Dec 2011-June 2012

ICIMOD 2012 Assessment of Flood EWS in Bhutan with Gender perspective – Preliminary Findings

RTS 2011 Field Visit Report (Draft) for HKH-HYCOS (Bhutan)

RTS 2011 Field Visit Report (Draft) for HKH-HYCOS (Nepal)

RTS 2011 Field Visit Report (DRAFT) for HKH-HYCOS (Bangladesh)

Powerpoint presentations by ICIMOD and DHMS; written partner responses to the email questionnaire

Letters of Agreement signed between ICIMOD and six project partners; Tripartite MoU between Government of Bhutan, ICIMOD and RTS

Procurement committee meeting minutes, TORs , bidding documents and contracts with RTS
Correspondence between ICIMOD and MFA on no-cost extension 2012

**Others**

RIMES 2012 Report of the Fifth Meeting of the Council of the Regional Integrated Multi-Hazard Early Warning System (RIMES) held in New Delhi, India, 18th June 2012
RIMES 2012 RIMES Ministerial Meeting Final Declaration 21 June 2012
SAARC 2006-2015 Framework for Action
SAARC 2006 SAARC Comprehensive Framework on Disaster Management
SAARC 2007 Council of Ministers Meeting on Climate Change
SAARC 2008 Dhaka Declaration on Climate Change
SAARC 2008 SAARC Action Plan on Climate Change
SAARC 2008 Community Based Disaster Risk Management
SAARC 2008 Climate Change Adaptation and Disaster Risk Reduction
SAARC 2008 Coastal and Marine Risk Mitigation Plan
SAARC 2008 Application of Science and Technology for Disaster Risk Reduction
SAARC 2010 Drought Management in South Asia
SAARC 2010 Urban Risk Management in South Asia
SAARC 2010 Thimphu Statement on Climate Change, SAARC/Summit.16/15, Sixteenth SAARC Summit Thimphu, 28-29 April 2010
UNEP / SAARC 2009 South Asia Environment Outlook 2009
United Nations Evaluation Group (UNEG) 2011/12 Integrating Human Rights and Gender Equality in Evaluation – Towards UNEG Guidance. Guidance Document.
Ylikangas I / FMI 2011 Report on 3rd Regional Steering Committee Meeting of Establishment of Regional Flood Information System in the Hindu Kush – Himalayan Region (HKH-HYCOS) 1st and 2nd of December 2011
Ylikangas I / FMI 2012 Report on 4th Regional Steering Committee Meeting of Establishment of Regional Flood Information System in the Hindu Kush – Himalayan Region (HKH-HYCOS)
Email responses from BMD, BWDB, WAPDA, IMD and WMO on the evaluation questionnaire
HKH-HYCOS Project Progress, Powerpoint presentation by PMU on 15 October 2012
HKH-HYCOS Project Progress in Bhutan, Powerpoint presentation by DHMS on 30 October 2012
Powerpoint presentation by DHMS on 30 October 2012

**Bilateral treaties (Nepal-India)**

The Koshi Treaty 1954
The Gandak Treaty 1959
The Indus Basin Treaty 1960
The Ganges Treaty 1996
The Mahakali Treaty 1996

**Websites**

Bangladesh Meteorological Department (BMD) http://www.bmd.gov.bd/ accessed on 19 November 2012

Department of Hydrology and Meteorology, DHM, Nepal http://www.dhm.gov.np/organizational-structure accessed on 5 October 2012

GoN/MoSTE/DHM Flood Forecasting Project http://www.hydrology.gov.np/new/bull3/index.php/hydrology/station/graph_view?stationId=70&deviceId=49&categoryId=6# accessed on 25 October 2012

HKH-HYCOS Regional Flood Information System http://hkhhycos.icimod.org/ accessed on 25 October 2012

Hydro-Met Services Division (DHMS), Bhutan http://www.nhms.gov.bt/Aboutus/aboutus.aspx accessed on 8 October 2012

ICIMOD www.icimod.org/ accessed on 8 October 2012

India Meteorological Department (IMD) http://www.imd.gov.in/ accessed on 19 November 2012

National Adaptation Programme of Action to Climate Change (NAPA) / Government of Nepal, Ministry of Environment http://www.napanepal.gov.np/ accessed on 5 October 2012

RIMES (Regional Integrated Multi-Hazard Warning System for Africa and Asia) http://www.rimes.int/ accessed on 26 October 2012

SAARC http://www.saarc-sec.org/ accessed on 8 October 2012

SAARC STORM http://www.saarc-smrc.org/STORM.html accessed on 23 November 2012

South Asian Floods Portal http://southasianfloods.icimod.org/ accessed on 25 October 2012

UNDP Country Office Bhutan http://www.undp.org.bt/ accessed on 8 October 2012

WHYCOS Portal http://www.whycos.org/rubrique.php3?id_rubrique=9 accessed on 25 October 2012

United Nations Information Platform Nepal / Nepal Risk Reduction Consortium (NRRC) http://un.org.np/coordinationmechanism/nrrc accessed on 26 October 2012

# ANNEX 6 MEMO OF THE EVALUATION WRAP-UP MEETING NOVEMBER 6TH, 2012 KATHMANDU

The meeting participants raised the following key issues and views following the MTR presentation on key findings and recommendations.

Dr David Molden, DG/ICIMOD

- Result-based monitoring: RBM approach is moving concept, hence should be emphasized within ICIMOD (agreed what the MTR said).
- Operation and maintenance: O&M is surely a challenge, a little bit difficult, however should be dealt with carefully.
- Ownership: Ownership needs to be with national partners (agreed what MTR said), however outsiders may also play a role for building the ownership as a facilitator.
- Regarding a single river basin approach proposed by the MTR, only taking Ganges River Basin would not include the concept of regionality, and working in Ganges River Basin is difficult and complex too (does not agree on this fully with the MTR ideas)
- Advocates from Flood Information System (FIS): Molden thinks the right approach would be FIS as it is a humanitarian approach and easier to collaborate on. FIS is a way to build regional cooperation rather than the other way around as suggested by the team. Sees HYCOS project as an entry point to deal with the issue and requests the team to revise the following points: other development partners should be taken account of; the project should not to be given up if India and China are not fully on board. asks the team to revise the statement on regional cooperation to say that "not yet"

Dr Mandira Shrestra, Project Coordinator/HKH-HYCOS

- Quality control issues: ICIMOD aims to maintain good quality. Says that 3rd and 4th RSC meetings have discussed on quality issues and data a lot. FMI and RTS is providing expertise on these issues, and quality control is also seen as a link between HYCOS and FNEP. Quality control guidelines and implementation into the system will be discussed also on next RSC (i.e. the 5th). Country specific assessments planned. Agrees that 'data without quality is not really data'.
- Extensive river basin selection: To promote cooperation cross the borders to have the whole region covered, not to rule out anyone from the established platform. Focus on just one river basin is rather an approach within the larger system and wider frame of cooperation (like Koshi River Basin).
- Station selection: Selected through criteria agreed between member countries (5 criteria: trans-boundary relevance, accessibility, expansion opportunities, national priorities, saving of lives and livelihoods).
- Equipment/quality/compatibility: is rather surprised with the MTR findings and quality of installations. Says that Mulghat is a bit specific (here hands on training organized) due to its location by bridge, some difficulties are there but there were no alternative because of some security of the instruments. However, agreed to quality check and monitor the station for corrective measures. The station is being relocated, finds Dhankuta Station to be one of the best.
- Sustainability: She sees RTS extension as a useful hand-over period. This is based on experience/learning from previous projects where equipment and installations have slowly died out due to weak O&M by government partners.
- Capacity building: Capacity building of government institutions and local station managers agreed on - also mentions that gender issues should be addressed in relation to this.

Dr Eklabya Sharma, Director, Programme/ ICIMOD

- Relevance of approach to implement HYCOS: Water is a difficult issue to address in the region like HKH, and flood is a good entry point (as mentioned by Molden as well). The regional value is yet to be shown as NFIS is first to be developed. It is too early to say that ICIMOD had developed RFIS as a product, but progress towards this product and demonstration of its value is on-going. This is also an approach to engage India and China.
- We are slow but it is hurry to summarise. Regional significance is still in place. Good participation from high-level officials shows interest in this (e.g. in Pakistan the value of data sharing has been realized at the government's upper level).

Mr Farid Ahmad, M&E expert/ICIMOD

- LoAs: Though LOA is a small activity in logframe but in some cases it has been gone to national security agencies and even to the cabinet for clearance and has thus taken significant amount of time. Hence, it is also too early to say that regional approach is not working and there is a need to test the waters more.

Mr Hari Krishna, DRR expert

- Result based approach: Result based approach needs to be taken more seriously - agreed. One significant aim is to prove viability and utility if regional data sharing. MTR has been timely to look at these pertinent issues such as data usages and service provision. Visibility of the regional data sharing is indeed needed for the timely weather forecasting for the benefits of people from downstream. Simulation of data sharing is more effective in this regard.
- Participation of India and China: The technical agencies like to cooperate but policies of China and India restrict them to cooperate in water resource sectors. Their cooperation is a problem, their non-cooperation is also problem. Informally China and India wish to cooperate but their policies are not allowing this - how to take advantage of policy developments should certainly be taken into account by ICIMOD in the rest of the project period.

Dr Shariar Wahid, Senior Hydrologist/ICIMOD

- Some issues to be clarified: He said that although some points have sounded negative, however taking those points as feedback positively: (i) data quality discussions have been and will be plenty as installation now completed, training on DQ to be held on 26.11; (ii) Mulghat might have been the only place where problems, but will still be taken seriously for the possible corrective measures; (iii) If data comes through national channels as planned at first, the data will no longer be real-time (as it takes 15-30 days for national agencies to perform quality check) - hence ICIMOD decided on the current approach - but fully agrees on the need to develop national capacities here without losing the real-time data.
- RTS involvement: National budgets missing - but when value of data is demonstrated budget will be allocated.
- On installation and O&M training: Sometimes trained staff says that they have not received training to avoid responsibility. Work on this should be done to motivate technical staff.
- On narrowing down to e.g. one basin: If so, regional element will be lost, and it was this regional dimension that ICIMOD aims for. Project is to demonstrate value of shared data through regional approach.
- On overlapping issues: ICIMOD is aware of PPCR/The WB and Bangladesh climate projects. Consultations are in place with both project stakeholders to avoid possible overlapping and to create synergies.

Mr Vijay Khadgi, Asst. Project Coordinator, HKH-HYCOS

- Mulghat has been one problematic station from the beginning. Location changes have taken in place, and will take place again. Discussions with DHM on-going.
- DHM capacity lacking and hence RTS engagement needed.

Dr Arun Bhakta Shrestha, Thematic Team Leader, Climate Change/ICIMOD

- Support for O&M is needed for some period of time to mature the good practices
- Both human and financial resource constraint for the effective O&M.

Mr Gautam Rajkarnikar, DDG/DHM Nepal

- Trained technicians are off course necessary to address new technology (sophisticated) installed like in Mulghat. With respect to the data gap in Mulghat, agreed with MTR.
- Capacity building of the DHM is urgent need. There is no electronic engineer to look after the sophisticated things in terms of database management and interpretation. And sustainability needs to be guaranteed whatever stations installed through appropriate means.
- Accountability needs to be developed to create ownership (change the human behaviours of the staff or trained them).
- Seeks ways from MTR to the propose for sustainability measures of the operation

Mr Kamal Prakash Budhathoki, DDG/DHM Nepal

- DHM is not only actor in the country -DHM capacity has to be assessed before accepting projects.
- O&M is really a serious issue. It needs funds, capacity and commitments.
- Before designing the project, donor agencies should think about the O&M cost (...% of approved budget for the purpose of O&M to be carried over to the post-project phase).
- HYCOS is just starting at the regional level and stations are piloting stage.
- Asked for the MTR team's recommendations on how to improve in these issues for the sustainability of the project.

Dr David Molden, DG/ICIMOD

- Flagged some of the issues related to O&M quality based on his proven experiences.

Mr Kari Leppänen, Councillor, Embassy of Finland

- Assignment has assessed two projects with a high staff cost component.
- HYCOS calculations and commitment, personnel costs is quite high, which is quite a serious issue
- Sustainability of regional programs depends on two matters both which are needed: there has to be a genuine common agenda and a legitimate organisation with a regional mandate.

# ANNEX 7 RELEVANT POLICIES AND RELATED INTERVENTIONS IN PARTNER COUNTRIES

## Relevant regional, bilateral and national policies and agreements

**SAARC**: Seven of the HKH region states are also members of the South Asian Association for Regional Cooperation (SAARC). China is an observer to SAARC. There are two regional SAARC centres working in related fields, namely the SAARC Disaster Management Centre (DMC), hosted by the National Institute for Disaster Management (NIDM) within the Ministry of Home Affairs in India and the SAARC Meteorological Research Centre in Dhaka, Bangladesh. SAARC has e.g. agreed on the following:

- ***SAARC Framework for Action (SFA) 2006-2015:*** The Heads of State or Governments in the 13th Dhaka Summit called for elaboration of a comprehensive Framework on Early Warning and Disaster Management. In view of the December 2004 Asia Tsunami and the 2005 Pakistan Earthquake, the Heads of State or Governments underscored the urgency to put in place a regional response mechanism dedicated to disaster preparedness, emergency relief and rehabilitation to ensure immediate response. They directed the concerned national authorities to coordinate their activities in the areas of disaster management such as early warning, exchange of information, training and sharing of experiences and best practices in emergency relief efforts.

- ***Declaration of Disaster and Climate Change in Thimphu (2010):*** The South Asian leaders welcomed climate change as the theme for the Summit and reaffirmed their commitment to address this challenge. In this context, they adopted the Thimphu Statement on Climate Change and directed that the recommendations contained therein be implemented in earnest. In pursuance of the recommendation contained in the SAARC Ministerial Statement on Environment on conservation of aquatic ecosystem, trans-boundary bio-diversity zones, automated network of weather stations, and regular and systematic sharing of scientific data, the Leaders called for a focus on water management and conservation and development of cooperative projects at a regional level in terms of exchange of best practices and knowledge, capacity building, and transfer of eco-friendly technology. The Leaders, concerned by the increasing frequency and intensity of natural disasters, called for effective regional programmes in early warning, preparedness, and management including response and rehabilitation while remaining within their respective national laws and procedures. They called for further negotiations and early finalisation of the SAARC Agreement on Rapid Response to Natural Disasters.

- **SAARC Comprehensive Framework on Disaster Management:** The Framework provides a platform for South Asian countries to: Establish and strengthen the regional disaster management system to reduce risks and to improve response and recovery management at all levels; Identify and elaborate country and regional priorities for action; Share best practices and lessons learnt from disaster risk reduction efforts at national levels; Establish a regional system to develop and implement regional programmes and projects for early warning; Establish a regional system of exchanging information on prevention, preparedness and management of natural disasters; Create a regional response mechanism dedicated to disaster preparedness, emergency relief and rehabilitation to ensure immediate response; and Create a regional mechanism to facilitate monitoring and evaluation of achievements towards goals and strategies.

  Strategic goals: 1. Professionalizing the disaster management system; 2. Mainstreaming disaster risk reduction; 3. Strengthening of community institutional mechanisms; 4. Empowering community at risk particularly women, the poor and the disadvantaged; 5. Expanding risk reduction programming across a broader range of hazards (all hazards approach); 6. Strengthening emergency response systems; and 7. Developing and strengthening networks of relevant national, regional and international organizations.

  Among priorities for Action 2006-2015, the following are relevant: To strongly advocate the adoption of a comprehensive approach to risk reduction and disaster management; To promote the integration of research outputs within development planning and community risk reduction strategies; To develop policy and operational frameworks for sustainable coordination, collaboration and information management across governments, and with key stakeholders; To establish and maintain strong regional partnerships and networks, and to actively contribute to national, regional and international agenda.

Under theme Regional and National Response Mechanisms establishment, strengthening and improving Regional Early Warning Systems the following is planned: a) define national and regional needs and priorities; b) identify national organizations responsible for early warning; c) identify their current procedures during normal working hours and after hours; d) identify their linkage with regional centres or of other countries; e) share real-time data relating to natural hazards, f) find out the best possible options to strengthen the national systems as well as to integrate them regionally. Establishment of a Regional Information Sharing and Develop Network of Institutions and Organizations is supported as is establishment of an effective monitoring and evaluation mechanism. All the Member States will be encouraged to apply a holistic approach and maintain consistency in programming and building multi-stakeholder partnerships at all levels, as appropriate, to contribute to the implementation of this Framework for Action. Specific considerations include that Member countries shall develop their own plan of action for implementation of this framework. · The regional cooperation components of this framework shall be implemented by the concerned regional mechanisms.

**Abu Dhabi Dialogue:** "Abu Dhabi Dialogue" is an informal high level dialogue on water resources management in the region, facilitated by the World Bank. The World Bank is currently making financial resources available under the heading South Asia Water Initiative (SAWI) to support short term regional projects on water resources management.

**RIMES**: The Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES) is an international and intergovernmental institution for the generation and application of early warning information. RIMES evolved in the aftermath of the 2004 Indian Ocean tsunami. RIMES was established on 30 April 2009, and was registered with the United Nations on 1 July 2009. RIMES operates from its regional early warning centre in Thailand. The aim of RIMES is to provide regional early warning services and builds capacity of its Member States in the early warning of tsunami and hydro-meteorological hazards. RIMES works to establish a regional early warning system within a multi-hazard framework for the generation and communication of early warning information, and capacity building for preparedness and response to trans-boundary hazards. Bangladesh and India are already members and other five countries (Bhutan, China Myanmar, Nepal and Pakistan) are collaborating countries and in the process of becoming members of RIMES. The Council is the highest governing body of RIMES. It is composed of heads of National Meteorological and Hydrological Services (NMHSs) and national scientific and technical agencies generating multi-hazard early warning information.

There are a number of **bilateral treaties and agreements** in place between different project countries in the region capturing the main river basins (Indus, Ganges, Brahmaputra and Meghna). India has bilateral treaties and data sharing agreements with Pakistan, China, Bhutan, Bangladesh and Nepal. There is also a data sharing agreement between Bangladesh and Nepal.

- Between India and Nepal: The Kosi Treaty (April 1954) is mainly for the purpose of flood control, irrigation and generation of hydroelectric power. The Gandak Treaty (December 1959) aiming for the common interest of the Nepal and India for Irrigation and Power. Flood forecasting and warning schemes between India and Nepal on Rivers Common to India and Nepal are in operation. An action plan between His Majesty's Government of Nepal (HMGN) and Government of India (GOI) in December 1993 under which the logistic problems for commissioning of sites under flood forecasting and warning system were studied. The Mahakali Treaty (in 1996) concerning the integrated development of the Mahakali Basin. The Joint Committee on Water Resources between India and Nepal, which is a meeting between the Water Resources Secretaries of the two countries, met in October 2000 and set up the bilateral Committee on Flood Forecasting which was charged with the task of drawing up the Comprehensive Flood Forecasting Master Plan (CFFMP) for India and Nepal.
- Between India and Pakistan: The Indus Basin Treaty (in September 1960) to negotiate and resolved a major conflict regarding sharing of common rivers. As part of the Indus Treaty, river flow data from Chenab, Ravi and Sutlej at Akhnoor, Madhopur, Harike and Ferozepur respectively are shared between India and Pakistan during the flood season through the courtesy of Pakistan Commissioner for Indus Water and its counterpart in India.
- India and Bangladesh: The Ganges Treaty (in December 1996) for the sharing of the Ganges waters at Farakka by ten day periods from 1 January to 31 May every year. There is also a joint India-Bangladesh agreement under which India is transmitting actual and forecast river-level data to Bangladesh from five stations: Farakka on the Ganges, Goalpara and Dhubri on the Brahmaputra,

Domohani on the Teesta, and Silchar on the Barak. In addition rainfall data from Goalpara, Dhubri, Tura, Cooch-Behar, Siliguri, Jalpaiguri, and Agartala are also transmitted from India to Bangladesh.

- Between China and India: The Chinese and Indian governments reached an agreement on information exchange / data sharing for the Yarlungzambo /Brahmaputra River in April 2002
- Between India and Bhutan: Data sharing arrangement between; Bhutan is collecting and transmitting rainfall and river-flows data from selected sites of the tributaries of the Brahmaputra originating in Bhutan. At present, data are transmitted to Cooch Bihar and Jalpaiguri in West Bengal and further data are transmitted to Barpeta/Nalbari and Guwahati in Assam using civil wireless from 14 hydro met stations in Bhutan.
- Data sharing arrangement between Bangladesh and Nepal: There is a data sharing arrangement between Nepal and Bangladesh since 1989. Data from two stations; Narayani at Narayanghat and Koshi River at Chatara is shared on a daily basis during the flood season from June through October.

**Country specific policy initiatives (examples)**

**Bangladesh**

***Bangladesh Climate Change Strategy and Action Plan (2009):*** Government of Bangladesh has enacted Bangladesh Climate Change Strategy and Action Plan (2009). It is prepared with a vision to eradicate poverty and achieve economic and social wellbeing for all the people. This aimed at achieving through a pro-poor Climate Change Strategy, which prioritizes adaptation and disaster risk reduction, and also addresses low carbon development, mitigation, technology transfer and the provision of adequate finance. It rightly weighted the linkage of the climate change and disaster potentials and appropriately taken disaster management as one of the pillar of strategy which are: Food security, Social protection and health, Comprehensive disaster management, Infrastructure, Research and knowledge management, Mitigation and low carbon development and Capacity building and institutional strengthening.

***National Plan for Disaster Management (2010-2015):*** National Plan for Disaster Management (2010-2015) has been prepared aiming at reducing vulnerability of the poor to natural, environmental and human-induced disaster to a manageable and acceptable level. The plan has been developed in line with the government mission taking into consideration the Hyogo Framework for Action 2005-2015 and adopting the SAARC Framework on disaster management. The plan has been developed on the basis of the GoB Vision and MoFDM mission to reduce the vulnerability of the poor to the effects of natural, environmental and human induced hazards to a manageable and acceptable humanitarian level by (a) bringing a paradigm shift in disaster management from conventional response and relief practice to a more comprehensive risk reduction culture and (b) Strengthening the capacity of the Bangladesh disaster management system in improving the response and recovery management at all levels.

***NAPA* (2005):** Bangladesh was among the first countries to prepare and submit its NAPA with the UNFCCC Secretariat in November 2005. The Climate Change Cell has a mandate to continue the NAPA process and facilitate implementation of NAPA. Some of the projects proposed in NAPA need to start without delay to provide vital feedback to the relevant implementing agencies and potential donors for long-term planning

***Sixth Five Year Plan* (2011- 2015)**

The strategy of the organization is to upgrade all the conventional stations into automatic weather stations with real time telemetry to issue the weather forecast in lead time and to feed digital rainfall data in advance to FFWC for flood forecasting issues. So HKH-HYCOS Project is very much compliant with the organizational strategies.

**Bangladesh Water Development Bureau** shared in detail about the policy and strategic framework guiding their operations. BWDB's operations and activities are guided by the (a) National Water Policy (NWPo)-1999 and (b) National Water Management Plan (NWMP)-2004. BWDB's activities are also enhanced by other Government Policy and Program like (1) Standing Order on Disaster, (b) Disaster Management Plan, and (c) Disaster Management Policy (d) Sixth Five Year Strategy (e) National Adaptation Programme of Action (NAPA) (f) Bangladesh Climate Change Strategy Action Plan.

The policy of the Government of Bangladesh focuses on the international cooperation in water management like working with co-riparian countries to establish a system for exchange of information and data on relevant aspects of hydrology, morphology, water pollution, ecology, changing watershed characteristics, cyclone,

drought, flood warning, etc., and to help each other understand the current and emerging problems in the management of the shared water sources, international and regional cooperation for education, training, and research in water management, etc.

BWDB has formulated 5 years strategic plan in November 2009 with the motto "Unlocking the Potentials" and "Moving Ahead" for realizing organizational goals" for a period 2009 to 2014. BWDB adopts both structural and non-structural measures for the Flood Management and in its Five year Strategic Plan importance on Modernization of hydrological data collection, archiving and improvement of early warning systems is given.

**Bhutan**
In number of policies and official documents the Government of Bhutan has acknowledged the linkages between water sector and climate related disasters.

***Bhutan's Second National Communication to the UNFCCC*** puts an emphasis on: Conduct comprehensive water resources assessment to improve understanding of water resource availability, the effects of climate change to develop appropriate adaptation measures; Increase resilience to the impacts of climate change on water resources; Water Resources Management through adoption and implementation of IWRM and eco-efficiency by using river basin framework for planning; Strengthening Climate observation on and network for early warning and forecasting of extreme events understanding climate change and Mainstream CC & WR into national plans and programme.

***NAPA*:** A weather detection, monitoring and early warning system can provide reliable and timely information to the farmers to deal with weather and climatic variability and changes. Seasonal forecasts can support long-range, strategic decisions; while weather forecasts can support short-term, tactical decisions in the agricultural production operations. Special weather forecasts provide the input to assist farmers in making decisions on planting/sowing, application of crop protection chemicals, forestry and forest fire operations, product transportation, and post-harvest operations. Bhutan, to date, does not have a proper weather or climate forecasting capability. The global forecasts provided by outside systems do not serve the needs of agriculture development in Bhutan as they cannot resolve the geophysical complexity associated with the rugged terrain. Building up the communication and computing resources together with the development of technological competence of meteorological technicians and professionals will enable Bhutan to operationalize its own forecasting and early warning system that accounts for its complex forcing systems. The forecasts will be more accurate with more frequent updates at higher spatial and temporal resolutions. In addition, the weather forecast can be customized to produce agro meteorological data for the Ministry of Agriculture and its stakeholders.

The objectives of the proposed adaptation project are: To set up a weather forecasting office (WFO) with necessary equipment and manpower to provide weather and seasonal forecasts for supporting production decisions of the farmers; To provide an agro meteorological early warning system against inclement weather conditions and provide special advisories at different production stages. One of the 8 NAPA final revised prioritized projects is: "Enhancing National Capacity for Weather and Seasonal Forecasting in Bhutan"

***National Report for the United Nations Conference on Sustainable Development 2012*:** In November 2011, Bhutan convened the "Climate Summit for a Living Himalayas", committing to the principles and provision of the UNFCCC. The Summit adopted a framework of cooperation aimed at implementing regional cooperative actions to build resilience to climate change in the southern watersheds of the Eastern Himalayas in Bangladesh, Bhutan, India, and Nepal. The key areas of cooperation included: ensuring energy security and enhancing alternative technologies; securing the national freshwater systems of the Himalayas; ensuring food security and securing livelihoods; and securing biodiversity and ensuring its sustainable use.

**Bhutan Water Policy** (2003), underlines the need to "develop a national adaptation strategy for climate change, including a national flood management and mitigation strategy" (section 35) and stresses the importance of an integrated approach in water resources management in general and in monitoring, early warning and mitigation measures in relation to GLOFs in particular.

**National Disaster Risk Management Framework (2006)**: This Framework includes all the elements of a risk management framework including: establishing the context; risk identification; risk analysis; risk evaluation;

risk communication; risk reduction (through both anticipatory and compensatory means) and continuous monitoring and evaluation. The Framework covers these elements of disaster risk management through the following distinct but inter-related components: Early warning systems (Disaster preparedness plans, Mitigation & integration of disaster risk reduction in development sectors, Public awareness and education) and Capacity development (Communication and transportation)

**China**

There is a ***National Comprehensive Disaster Reduction Plan for the Eleventh 5-year Plan Period*** (State Council, 14 August 2007) on Chinese only.

***National Emergency Response Plan for Flood and Drought Disasters*** stipulates that the Office of State Flood Control and Drought Relief headquarters, with its office hosted by the Ministry of Water Resources, is responsible for the formulation of policies, norms and regulations on flood and drought disaster mitigation and response. It has drawn up flood disaster prevention plans for major river basins and water transfer plans across provinces for mitigating drought disasters and has been coordinating flood and drought disaster mitigation plans at various levels. When a flood or drought disaster occurs, the emergency response plan will be activated at the appropriate level when corresponding criteria are reached. A field headquarters headed by the highest administration appropriate to the level of the disaster should be established to mobilize necessary resources and technical support, to take emergency response actions and to report relevant developments to the administrative body immediately above it. The response plan's prevention and early warning mechanism comprises information systems, prevention and preparation actions, early warning systems and early warning support systems.

National disaster management mechanisms: The National Master Plan considers the following six major components of disaster management: (a) Disaster prevention; (b) Early warning and alert dissemination; (c) Reporting to relevant government organs to activate emergency response plans; (d) Issuance and dissemination of information to the public; (e) Emergency response, including mitigation, rescue and relief; (f) Rehabilitation and reconstruction, including the mobilization of social donations.

**India**

***Disaster Management Act (2005) and National Policy on Disaster Management (NPDM):*** Government of India enacted Disaster Management Act (2005) and National Policy on Disaster Management (NPDM) with an approach of cooperation with agencies at national and international level. Its main objective is developing contemporary forecasting and EWS backed by responsive and failsafe communication with information technology support. As highlighted in the international cooperation "Disasters do not recognise geographical boundaries. Major disasters may often simultaneously affect several countries. It will be the national endeavour to develop close cooperation and coordination at the international level in all spheres of disaster management".

**Nepal**

***The National Strategy for Disaster Risk Management in Nepal*** (NSDRMN 2009) endeavours to facilitate the required change in order to achieve the goal of disaster resilient Nepal by providing guidance for improving the policy and legal environment, and by prioritizing the strategic interventions. The Strategy as well as the elaborate process of its development addresses Nepal's long-felt need to come up with a long term policy document and build on the enormous amount of disaster reduction planning and implementation works that have been carried out in the country in the past, especially after the commencement of the International Decade for Natural Disaster Reduction (1990-1999). The NSDRMN reflects the spirits and aspirations of the government and people of Nepal as embodied in the 10th Five-year Development Plan (2002-2007) and also the Interim National Development Plan (2008-2010). Their stipulations have been the guiding principle in the formulation of this Strategy. On the one hand, the NSDRMN addresses the need for organized approaches for DRM in Nepal and provides strategic direction to develop and implement realistic plans and programmes suitable to the needs and requirements of the country based on experiences and the capacity of the concerned national institutions.

The Priority Action 2: Identify, assess and monitor disaster risks and enhance early warning includes the following strategic activities: Strategic Activity 8: Assess the disaster risks due to different natural hazards and vulnerabilities at different levels and different scales; and develop a system to periodically update and make it publicly available; Strategic Activity 9: Establish and institutionalize an authentic, open and GIS based

Disaster Information Management System (DIMS); at the central, district and municipal levels to cover all disaster-related information; Strategic Activity 10: Establish a national system of hazard/risk monitoring and early warning to specific hazards; Strategic Activity 11: Prepare land use maps focusing on urban and urbanizing areas, and develop a system for periodically updating and using it for land use planning. Hence, the strategy for disaster risk management derives motivation, especially in international context, from the intent of the HFA, and the general outline of the HFA framework has been followed in developing this Strategy.

Issues and Gaps: Establishment /strengthening of early warning system and addressing the need to understand the impacts of climate change process as well as the hazard environment relationships, especially at the local levels is to be done on an urgent basis.

Strategic Activity: Hazard/risk monitoring and early warning to pertinent hazards

***Climate Change Polic***y, 2011 talks about the importance of climate adaptation and disaster risk reduction: Monitoring the status of glaciers and glacier lakes through studies and implement adaptation activities in priority vulnerable glaciers; Forecasting water-induced disasters and risks created from climate change and providing early warning information, developing necessary mechanism for the implementation of preventive measures and ensuring regular supervision, and enhancing capacity; Preparing and utilizing regional climate models and other models for research; Carrying out regular research and monitoring of risks related to climate change impacts; Expanding the network of climate observation centres for identifying the impacts and climate change processes in different geographical regions of the country, and developing real time data acquisition system and analysing them. Adopting a basin approach for water management through regular monitoring of water resource availability. Preparing appropriate climate forecasting models for Nepal and regularly updating it based on regional climate models;

***NRRC/Flagship (2010):*** In May 2009, the Government of Nepal launched the comprehensive Nepal Disaster Risk Reduction Consortium (NRRC). The NRRC is a unique institutional arrangement, bringing together financial institutions, development partners, the Red Cross / Red Crescent Movement, and the UN in partnership with the Government of Nepal. It bridges the spectrum of development and humanitarian partners, uniting to support the Government of Nepal in developing a long term Disaster Risk Reduction Action Plan building on the National Strategy for Disaster Risk Management (NSDRM). The founding members of the Consortium are the Asian Development Bank (ADB), the International Federation of the Red Cross and Red Crescent Societies (IFRC), United Nations Development Programme (UNDP), UN Office for the Coordination of Humanitarian Affairs (OCHA), UN International Strategy for Disaster Reduction (ISDR) and the World Bank. Based on Government priorities and discussions with multi stakeholder groups, the

Consortium members and government identified five flagship areas of immediate action for disaster risk management in Nepal: 1. School and hospital safety- structural and non-structural aspects of making schools and hospitals earthquake resilient, 2. Emergency preparedness and response capacity, 3. Flood management in the Koshi river basin, 4. Integrated community based disaster risk reduction/management, 5. Policy/Institutional support for disaster risk management. The estimated total budget of the three-year Flagship programmes is US $146.8 million.

**The National Action Programme for Adaptation to Climate Change (NAPA** 2010) puts forward nine priority programmes addressing adaptive capacity and mechanisms for climate change adaptation. They are:

- Promoting community-based adaptation through integrated management of agriculture, water, forest and biodiversity sector
- Building and enhancing adaptive capacity of vulnerable communities through improved system and access to service related to agricultural development
- Community-based disaster management for facilitating climate adaptation
- GLOF monitoring and disaster risk reduction
- Forest and ecosystem management for supporting climate-led adaptation innovations
- Adapting to climate challenges in public health
- Ecosystem management for climate change adaptation
- Empowering vulnerable communities through sustainable management of water resource and clean energy supply and

- Promoting climate smart urban settlement.

***Three-Year Plan*** (TYP) for 2010/11 – 2012/13 under environment and climate change has the following strategies: Make weather forecasting system reliable; Disaster Risk Reduction Strategy 2009 will be implemented effectively; Data collection, processing, analysis and publication will be carried out by upgrading the water and weather stations and the weather forecasting system will be made reliable.

***National Water Resource Strategy*, 2002** and ***National Water Plan*, 2005 flag out the importance to** enhance institutional capabilities for managing water-induced disasters, effective measures for better management of water induced disasters and mitigation of their adverse effects and making water-induced disaster management system fully functional, effective and responsive to people's needs

***Water Induced Disaster Management Policy* (2006)** prioritizes mitigating the loss of lives and property arising from water induced disasters like flood and landslides; preservation of rivers, river basins, and water related environment for the sustainable use of natural resources and facilities like water supply, irrigation, water navigation, road transport, etc.; reclamation of riverbanks and flood affected areas for the rehabilitation of landless people and conduct of socio-economic activities; Institutional development for the control of water induced disasters and management of flood affected areas and defining the role of local and central government institutions, NGOs, community-based organizations and private institutions

**Pakistan**

***National Disaster Risk Management (NDRM) Framework* (2007):** The principles established in the framework are: i) Promoting multi-stakeholder, multi-sectoral and multi-disciplinary approaches, ii) reducing vulnerability of most vulnerable social groups, iii) strengthening community and local level risk reduction capacities, iv) combining scientific and people's knowledge, v) developing culturally, socially, economically and environmentally relevant technologies, vi) strengthening sustainable livelihood practices, vii) acquiring specific capacities in view of the hazard-risk profile of the area and country, and viii) working with other countries, and the international community to promote disaster risk reduction.

## Related interventions by other development partners

Some key interventions supported by development partners include at the regional level the SAARC STORM Programme which is working in number of countries (see below).

In **Nepal** there are several projects to HKH-HYCOS:

- Regional HKH-HYCOS implemented by ICIMOD. In Nepal the project contributes to improved network of hydrological and meteorological stations generating real time data, capacity development of DHM and development of national flood information system.
- ICIMOD is also working with DHM in the regional Mount Kailash Sacred Landscape Conservation Initiative. It has also incorporated inputs to hydrological and meteorological equipment in Nepal.
- The regional SAARC Severe Thunderstorms Observations and Regional Modelling project (STORM) is on-going. The project plans to invest to invest on procurement and instalment of one weather radar in Nepal
- The World Bank is developing a Pilot Program for Climate Resilience (PPCR) in Nepal. It is a 31 MUSD investment programme that is expected to begin in early 2013. It incorporates e.g. DHM capacity building, investments in modern hydro-meteorological equipment and agro-meteorological component.
- WB is also working on the GFDRR supported initiative in community based disaster risk reduction in the Koshi Basin (Flagship 4 consortium of the Nepal Risk Reduction Consortium, NRRC).
- Several I/NGOs work in local level disaster risk management (DRM) and early warning system (EWS) system projects. They apply early warning data and other information products of DHM (e.g. Practical Action, Plan Nepal).
  The Council of the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES) has recently approved two programs for Nepal; Enhancement of earthquake monitoring and enhancement of flood forecasting. The flood forecasting program is for three years and mainly focuses on developing flood forecasting system for three major rivers (Koshi, Narayani and Karnali). RIMES is also looking for donor support to develop Agro-advisory system for climate risk management in Nepal and other member countries.

In **Bhutan** projects included in NAPA 1 are either on-going or completed. E.g. one glacial lake was lowered by 5 meters.

- NAPA2 includes a large project for DHMS, focusing on DHMS capacity building and installation of AWS. The proposal is being prepared for submission to UNDP/GEF (LCDF).
- Other development partners of DHMS are DANIDA (in the past) and JICA (soft components such as capacity building of DHMS)
- Finnish Meteorological Institute and DHMS are jointly developing an Institutional Collaboration Instrument –project for Bhutan (capacity building; to begin in 2013)

**Bangladesh**

- Establishment of Numerical Weather Prediction System (2nd Phase)
- Development of human capacity on Operation of Weather Analysis and Forecasting
- Establishment of Inland River port Weather Forecasting and Warning Centre for Reducing Accident of River –going Vessels (2nd Phase)
- Establishment of 1st Class Observatory at Five places ( Already existing 10 1st class and total 35 Observatory)
- Up-gradation of Agro-meteorological services(Revised)
- Website Up-gradation
- Already Established BMD's new modern conference hall
- Replacing conventional Radar in Dhaka and Rangpur by the latest Doppler Radar
- Improvement of seismological Observation System
- Modernization of groundwater hydrological network in the coastal zone under Water Management and Implementation Project (WMIP)
- A research programme of 5 days flood forecast in place of existing 3 day forecast under Comprehensive Disaster Management Programme-II
- SAARC STORM
- WMO – RIMES Severe Weather Forecast Demonstration Project (SWFDP)
- WMO-BMD Coastal Inundation Forecast Demonstration Project in Bangladesh (CIFDP-B)

# ANNEX 8 DETAILED PROJECT PERFORMANCE ASSESSMENT OF HKH-HYCOS

Timeline of main events of HKH-HYCOS since 2001

## Preparatory phase (Phase I 2001-2004) – SOUTH ASIAN FLOODS –Project

- ***May 2001:*** A high level consultative meeting was organised (among Bhutan, Bangladesh, China, India, Nepal and Pakistan) on Regional Cooperation for Flood Forecasting and Information Exchange which agreed on the need for sharing of high river flow data. The participants expressed interest in establishing a regional flood information system based on the proven concept of WHYCOS. Funding for this initiative was provided by the US Department of State (Regional Environment Office for South Asia), the US Agency for International Development, Office for US Foreign Disaster Assistance (USAID/OFDA), and the Danish International Development Agency (DANIDA).
- ***May 2002:*** Organized first meeting of the consultative panel with the objective of continuing the process to develop a regional flood information system based on the WHYCOS concept. The meeting agreed on the regional concept of a flood information system and recognized the need for existing bilateral agreements to be enhanced to contribute to the regional exchange of flood-related data. The participants also drafted a short, medium and long-term action plan to carry the process forward.
- ***March 2003:*** A consultative panel was formed comprising technical experts and governmental representatives from each of the participating countries. Also, a website (www.southasianfloods.icimod.org; the website exists but has not been updated in the past few years) was developed as a platform for sharing near real-time data and information. This effort was assisted by US Department of State (Regional Environment Office for South Asia) and USAID/OFDA.
- ***July 2003 to March 2004:*** In collaboration with ICIMOD and WMO, National Consultations were organized that served to identify national needs and priorities for timely and accurate flood forecasting and for selecting basins for the testing of a regional flood information system. US Department of State (Regional Environment Office for South Asia) and the USAID/OFDA financed for this initiative. Consultations were held in Bangladesh, Bhutan, China, Nepal and Pakistan. Consultation was not done in India.
- ***29 November to 1 December 2004:*** Organized a technical meeting on 'Country and Regional Telecommunication Strategies, Data Management and Dissemination of Regional Flood Information' which emphasised strengthening and building upon the practical applications currently being carried out in each of the countries of the region. Regional Telecom Strategy was an outcome of the meeting.
- ***May 2005:*** The meeting resulted in the decision of providing minor upgrades to a few of the selected stations, and a plan for the conduct of a High Level Meeting to discuss and endorse the project document.
- ***May 17 to 19 2005:*** The High (Secretary) Level Meeting organized at Thimphu, Bhutan. Meeting decided for preparing project document for financing and implementation.
- ***Monsoon 2005:*** Partner countries also identified and agreed to share between them important hydrological data from selected stations during a Demonstration and Testing Phase.

## PROPOSAL FINANCING PHASE (2005-2009)

- ***2005-April 2009:*** Draft Full Project Document discussed with development partners. In 2009 agreement reached with MFA.

## HKH-HYCOS IMPLEMENTATION PHASE (Phase II originally 2009-2012, extended to 2014)

- ***December 15, 2009:*** ICIMOD and the Ministry of Foreign Affairs, Government of Finland has signed an agreement to initiate a collaborative project to establish a Regional Flood Information System in the HKH region for the period of 3 years (2009-2012)
- ***December 7 to 9, 2010:*** Organized first RSC meeting.
- ***Dec 24, 2009:*** A press release about the project was made public in consultation with the donor to the global audience.
- ***January 2010:*** Immediate steps were taken to bring the partners on board the project. Letters informing partners about the project along with a copy of the project document were sent to partners.
- ***February 2010:*** Staff recruitment process initiated.
- ***February 2010:*** WMO sent out letters to all hydro meteorological representatives of WMO in the six countries.

- ***April 2010:*** A letter of agreement between ICIMOD and WMO was signed on the project.
- ***May 26 to 27, 2010:*** Participation in the Mekong Flood Forum held in Vientiane to familiarize with the flood management issues of the Mekong region and to make a presentation at the forum.
- ***From June 1, 2010:*** Mr Hari Krishna Nibanupudi, DRR Action Area Team Leader at ICIMOD's water programme recruited as interim project coordinator.
- ***June 17, 2010:*** Vaisala requested to come to make a presentation on their products/equipment.
- ***June 23 to 25, 2010:*** Organized inception meeting.
- ***October 2010:*** A three member delegation from ICIMOD and WMO held meetings with senior officials of Ministry of Water Resources and Meteorological Departments in India and China
- ***April 23, 2011:*** LOA between ICIMOD and BWDB Bangladesh.
- ***May 2011:*** Visited of Nepal country program director from the Ministry of Foreign Affairs, Government of Finland.
- ***May 2, 2011:*** LOA between ICIMOD and BMD, Bangladesh
- ***May 4 to 6 2011:*** Organized second RSC meeting.
- ***June 2011:*** Procurement process of the hydro meteorological equipment was initiated
- **June-November 2011** LoAs between ICIMOD and BWDB, WAPDA, PM, DHMS and DHM
- August 1, 2011 New Project Coordinator replaces the previous incumbent
- ***December 1 to 3, 2011:*** Organized 3rd RSC meeting
- ***December 2011:*** Meeting with the Minister of International Development, Finland
- ***April 17 to 21, 2012:*** Organized Regional Training on Operation and Maintenance of hydro-meteorological stations that was held in Nepal.
- ***May 2012:*** Agreement between ICIMOD and RTS
- ***May 2012:*** The tripartite agreement (MoU) for Bhutan has been finalized after mutual revisions and signed between ICIMOD, DHMS and RTS.
- ***May 23 to 25, 2012:*** Organized 4th RSC meeting which recommended for no-cost extension until December 2014.
- ***June 18 to 21, 2012:*** National trainings and awareness planning workshops are planned in the four participating member countries, in Bhutan.
- ***June 2012*** MFA and ICIMOD agree on a no-cost extension until December 2014.

## Performance and achievements review applying logical framework approach

The tables below present the independent assessment by the evaluation team on the achievements and progress of HKH-HYCOS by early November 2012 vis-à-vis different levels of objectives, their indicators and planned activities. The assessment builds on the re-submission of the same table by ICIMOD on November 9th, 2012 and on the submission of the "dummy table" recording some key data by ICIMOD on October 31st, 2012. Also information provided by BMD, BWDB, IMD, WAPDA and WMO in their written responses have been incorporated in the table. DHM in Nepal and DHMS in Bhutan provided information and insights during the evaluation interviews and the field visits provided important supplementary data. HKH-HYCOS project document, progress reports, other project reports and RSC meeting minutes and relevant websites of ICIMOD and project partners have also been scrutinised as part of the analysis.

The information in objective columns, planned indicators and planned activities has been copied from the HKH-HYCOS PD (pages 93-101).

| **Overall objective** | **Planned indicators** | **MTR team assessment of achievements** |
|---|---|---|
| Minimised loss of lives and property by reducing flood vulnerability in the HKH region with specific reference to | N/A | The activities in upgrading hydro-meteorological stations, initiating real time data transmission and developing flood information systems are all relevant steps towards improved preparedness and management of water-induced disasters in the HKH. However, concerted efforts over a long period of years and by many development |

| | | |
|---|---|---|
| the Ganges-Brahmaputra-Meghna and Indus river basins | | partners are needed before a real impact can be observed. The project has contributed towards increased awareness, not yet on any actual capacities created among project partners.<br>Comment on the project design: setting an overall objective at the level of addressing improved regional collaboration and coordination would have been more pertinent and given stronger guidance to the project. |

| **Project Purpose** | **Planned indicators** | **MTR team assessment of achievements)** |
|---|---|---|
| Timely exchange of flood data and information | Sharing of real time data and information through established mechanisms | 1. Real time data is yet to be converted to a format compatible for flood forecasting models<br>2. Partners have access to real-time data from 21 out of the planned 36 hydro-meteorological stations on the regional flood information system. The same data is being transmitted to national systems at respective hydrological and meteorological departments. At present it is raw data which is not yet quality checked and has not been converted into readily accessible information products for research and development purpose.<br>3. All 6 partners have reported positively on ability to receive real-time data. Partners are in the process of submitting monsoon report elaborating the experience and use of data in the first year of operation.<br>4. The project is also conducting studies on evaluating early warning systems with a gender perspective in Nepal and Bhutan (with plans to replicate the studies in Bangladesh, China, India and Pakistan).<br>5. The partners have agreed to conduct the quality control at national level |

| **Results (Specific objectives)** | **Indicators** | **MTR team assessment of achievements** |
|---|---|---|
| 1. Strengthened framework for cooperation on sharing regional flood data and information among participating member countries | 1.1 Quality of tangible outcomes and adequate participation in annual Regional Steering Committee meetings. | • Project partners have expressed that the most significant impact of the project has been through a provision of a regular platform to discuss about issues of common concern and share information on relevant practices and approaches (peer learning).<br>• 4 RSC meetings and 1 inception meeting held with active participation from 4 countries (Bangladesh, Bhutan, Nepal and Pakistan) and participation on observer status from the meteorological departments / agencies from China and India; government departments representing hydrology are absent from both China and India.<br>• Quality decisions made on the following:<br>o The RSC agreed on a web-based solution for the acquisition and dissemination of regional-wide data real time data acquisition by NHMS and ICIMOD simultaneously<br>o RSC recommended single vendor following ICIMOD procurement procedures<br>o WMO will continue to seek engagement with Bureau of Hydrology, China |

| Results (Specific objectives) | Indicators | MTR team assessment of achievements |
|---|---|---|
| | | ○ The RSC members agreed Quality control (QC) should be given priority and a core technical group formed on QC<br>○ Development of standard operating procedures for the capacity building (O&M)<br><br>However, decisions made by RSC members are not respected by the same when it comes to implementing them. |
| | 1.2 Agreements on pilot level activities for regular information sharing. | • Letter of Agreements (LoA) in 4 countries with 6 partners signed with clearance on government highest level authorities which shows ownership and trust on ICIMOD regional role by the said partners<br>• Efforts are going on to bring China and India on board. Number of meetings and discussions has been held in these two countries with different authorities. ICIMOD has expressed commitment to intensify its interactions and dialogue with these two countries through the nodal agencies and board members for better cooperation and participation in the project.<br>• In Pakistan the project was presented to the Prime Minister as a regional initiative |
| **2.** Establishment of flood observation network in selected basins in the participating countries | 2.1 Number of upgraded hydro meteorological stations including telemetry in participating countries | • 23 out of the 24 planned stations upgraded with real time data transmission in four countries Bangladesh, Bhutan, Nepal and Pakistan. The 24th station selected for upgrade will be installed in December 2012.<br>• Additional 12 stations are planned for installation in 2013. However, the division of 3 stations per country on an equitable basis does not seem realistic (rationale not clear). |
| **3.** Establishment of regional and national flood information systems to share real time data and information and increase lead time | 3.1 A flood information system in place | One regional flood information system (RFIS) has been set up and is accessible from http://hkhhycos.icimod.org. Flood Information System (NFIS) are being developed in four countries at six partner institutions receiving real time data.<br>• BWDB, Bangladesh; http://www.hkhhycos.bwdb.gov.bd: Fully installed, real time data from 3 stations received (73 manual stations). Additional work of adding institutional content and integrating data from other stations under discussion<br>• BMD, Bangladesh; http://hkhhycos.bmd.gov.bd; fully installed. Additional work of adding institutional content and integrating data from other stations under discussion<br>• DHMS, Bhutan; http://hkhhycos.nhms.gov.bt; Due to partner request, web link is displayed only through log in access. Partner wants ICIMOD to help develop full portal<br>• DHM, Nepal; http://hydrology.gov.np; Integrated into existing portal of DHM<br>• PMD,Pakistan; http://hkhhycos.pmd.gov.pk ; Fully |

| Results (Specific objectives) | Indicators | MTR team assessment of achievements |
|---|---|---|
| | | installed. Additional work of adding institutional content and integrating data from other stations under discussion<br>• WAPDA, Pakistan; http://hkhhycos.wapda.gov.pk; Fully installed. Additional work of adding institutional content and integrating data from other stations under discussion |
| | 3.2 % of HYCOS stations functioning properly | • 21 out of the installed 23 stations functioning at the time of the MTR. One station in Bhutan damaged by floods. One station in Nepal solar panel stolen. At least one other station in Nepal needed repairs in August. Stations being repaired. |
| | 3.3 % of HYCOS stations with successful data and information transmission and use by participating countries | 21 out of 23 stations transmitting real time data to the NFIS and RFIS. Value added:<br>• Data available in the RFIS from all real time stations from Nepal, Integration of other stations into the RFIS is under discussion. Bhutan and BWDB, Bangladesh have already agreed to contribute data and these will be integrated into the system in near future.<br>• Currently displaying data from 14 GTS stations (Nepal) in the RFIS and planned for more than 300 meteorological stations from the entire Hindu Kush Himalayan region<br>• 5 stations from the Kailash project implemented by ICIMOD also displayed<br>• Efforts are on-going to display data from other partner agencies and overlay with rainfall estimates from the Satellite Rainfall Estimate project of ICIMOD.<br>The data use function by participating countries is not obvious; None of the partners discussed with during the evaluation process indicated that they use the regional database in any manner. The value-added measures are also proxy measures to populate the database with meteorological data and compensate for the hydrological data not provided by India and China. |
| **4.** Enhanced technical capacity of partners on flood forecasting and communication to end users | Partners of participating countries operating and maintaining the flood information system | Partners not yet capable to operate or maintain the systems without external support. Project efforts so far include:<br>• 1 regional training with 14 participants from Bangladesh, Bhutan, Nepal and Pakistan held on installation, operation and maintenance of the stations. Following the training, the trainees were evaluated technically to test their acquired skills. In general, most participants answered 75% of the 10 questions correctly. The participants also evaluated the training highly by awarding it with 4.6 points on a scale of 5. Action plans are developed following the each training for regular follow up of the key tasks agreed in stipulated time frame.<br>• 3 national training in installation, operation and maintenance of the stations held in Bhutan (13 men), Nepal (34 men, 1 woman) and Pakistan (29 men, 1 woman). Following national training in Pakistan, the |

| Results (Specific objectives) | Indicators | MTR team assessment of achievements |
|---|---|---|
| | | agencies have independently installed stations in Gupis and Kalam. It shows the good example of "transfer of technology and skills".<br>• The participants of the national trainings also responded similarly to the regional training. Overall, participants graded the training above 4 on a scale of 5 and answered about 75% of the questions correctly in their technical evaluation. Internal resource persons are being involved for imparting the training for building confidence, sharpening the knowledge and skills, and saving the project resources. |
| **5.** Full-scale regional project planned and agreed among participating countries | Project Proposal developed and [approved by participating countries] | Yet to be achieved, under preparation. Discussed during the 4th RSC meeting and preliminary ideas presented. A first draft is under preparation for discussion during the 5th RSC meeting. The draft proposal is planned for discussion during the 6th RSC meeting in May/June 2013 and readied for endorsement by May 2014. |

| Planned activities per objective | Main activities completed by November 2012 |
|---|---|
| **Specific objective 1**<br>Strengthened framework for cooperation on sharing regional flood data and information among participating member countries | |
| 1 Establishment of a Project Regional Centre | The PMU was established during the first quarter of 2010 (on schedule). Currently it consists of the members listed below. It should be noted that information on the actual expenses accrued by each respective person in these three categories has not been available to the MTR team. This is limiting the assessment of cost-effectiveness of the project.<br><br>**PMU core team and % of salary charged from HKH-HYCOS Project:**<br>1. Dr. Mandira Shrestha (Project Coordinator since June 2011) – 80%<br>2. Mr. Vijay Khadgi (Asst. Project Coordinator) – 100%<br>3. Ms. Himaa Rai (Project Assistant) – 100%<br>4. Dr. Shariar Wahid (Senior Hydrologist) – 5% - 40% depending on contribution of time<br>5. Mr. Rajan Bajracharya (Database Expert) - 5% - 40% depending on contribution of time<br>6. Mr. Bikash Dangol (Database Expert) – 5% - 40% depending on contribution of time<br>7. Mr. Pradeep Dangol (Meteorologist) – 5% - 40% depending on contribution of time<br>**Project Advisory Team (PAT) and % of salary charged from HKH-HYCOS Project**<br>1. Dr. Arun Shrestha (Thematic Team Leader) – 5% - 40% depending on contribution of time<br>2. Dr. Hua Ouyang (Program Manager) – 5% - 40% depending on contribution of time<br>3. Dr. Eklabya Sharma (Director, Programs, also serves as RSC Chairperson) – 5% - 40% depending on contribution of time<br>4. Mr. Farid Ahmad (M&E expert) – 5% - 40% depending on contribution of time<br>5. Mr. Hari Krishna (DRR expert since August 2011, HKH-HYCOS Project Coordinator during 2010-August 2011) – 5% - 40% depending on contribution of time |

| Planned activities per objective | Main activities completed by November 2012 |
|---|---|
| | **Project External Advisors**<br>Information on the expenses and fees charged to HKH-HYCOS budget or on their actual inputs provided to the HKH-HYCOS programme has not been made available to the MTR team.<br>1. Dr. Wolfgang Grabs (WMO)<br>2. Professor Manfred Spreafico (Independent Consultant)<br>3. Dr. Guna Nidhi Paudel (DHI)<br>4. Ms. Irma Ylikangas, FMI: she had participated in the 3rd and 4th RSC meetings at the request of the Government of Finland; in the 4th RSC meeting a decision was made to incorporate her as member of the External Advisor team; inputs on data quality are expected from her. |
| 2 Establishment of a Regional Steering Committee | The Terms of Reference and composition of the RSC were agreed during the Inception meeting in June 2010. During the 1st RSC meeting some amendments to the TOR were constituted. Full members of RSC with assumed decision making power (as per the RSC meeting minutes) have been<br>1. Chair - Director of Programs, ICIMOD<br>2. Member Secretary - Project Coordinator<br>3. Member Advisor – WMO<br>4. Observer - Representative of the government of Finland<br>The heads of national hydro-met services from the following partner organisations are also full RSC members (they represent the partner organisations that have signed a Letter of Agreement with the project):<br>5. Department of HydroMet Services, Bhutan<br>6. Bangladesh Meteorological Department<br>7. Bangladesh Water Development Board<br>8. Department of Hydrology and Meteorology, Nepal<br>9. Pakistan Meteorological Department<br>10. Water and Power Development Authority, Pakistan<br><br>The following agencies were intended to be project partners and full members of RSC but have not signed LoAs to date. They have opted for an observer status in the RSC meetings. Their attendance to the Inception meeting and the four RSC meetings is provided in brackets.<br>11. China Meteorological Agency (Inception meeting, 1st, 2nd, 3rd & 4th)<br>12. Bureau of Hydrology of the Tibet Autonomous Region (absent from all meetings)<br>13. India Meteorological Department (Inception meeting, 3rd & 4th)<br>14. Central Water Commission, India (absent from all meetings) |
| 3 Organize High Level meeting for the launching of this phase of the project (Inception workshop) | The Inception meeting was organised in June 2010 in Kathmandu. The programme included presentations of the WHYCOS, HKH-HYCOS and Mekong HYCOS. Status of flood forecasting in Bangladesh, Bhutan, India, China and Nepal were presented and an introduction provided of the Asian Disaster Risk Prevention Centre. Terms of Reference and composition of RSC were provisionally agreed; criteria for the selection of meteorological and hydrological stations reviewed and was agreed that country partners would suggest an additional 20 stations (with 16 pre-selected). It was agreed that civil works of stations are in principal in-kind contribution from participating countries; station upgrades and adequate spare parts and consumables would be produced by the project. After project completion, the responsibility of operations and management should be transferred to concerned national agencies after project completion. A work plan (an action plan) for the next 6 months was agreed. |
| 4 Organize annual Regional Steering Committee (RSC) and implementation / coordination meetings | There have been four RSC meetings organised to date (every six months). The meetings have been organised on schedule. The highlights and main agreements of these meetings are presented below.<br><br>**First RSC Meeting, 7-9 December 2010 Kathmandu** |

| Planned activities per objective | Main activities completed by November 2012 |
|---|---|
| of technical experts of the participating countries | 1. Finalization of the TOR for the RSC; reported that India shall not be a member but an observer at RSC<br>2. List of stations proposed for upgrades with an agreement to provide station metadata at the earliest<br>3. Agreement to endorse ICIMOD's international competitive bidding procedures for procuring hydro-met instruments - with specific instructions to vendors to provide data management services as well to ensure interoperability of systems. Lot 1 consisted of 24 stations.<br>4. Agreement on the data parameters that will be shared from the upgraded stations and agreement to share the data on a web-based platform; Bangladesh, Nepal and China (CMA) acknowledged their willingness to share regular updates previously provided to the southasianfloods.icimod.org website that had been established during the demonstration phase of the programme (Phase I, funded by USAID), Bhutan agreed to do so as soon as it stations become operational; WAPDA and PMD in process of negotiations<br>5. Agreement on composition of training programs; development of Standard Operating Procedures, separate training for field level and other technical staff etc., and demand for modelling and forecasting training<br><br>**Second RSC Meeting, 4-6 May 2011 Kathmandu**<br>1. BMD had signed the LoA; the others were in various stages of obtaining approvals from concerned Ministries to sign the LoA.<br>2. Consensus on awarding procurement contract to a single vendor and agreement on timeline to install instruments by December 2011. Bhutan confirmed that it will apply for duty-free import<br>3. Agreement to integrate Global Telecommunication System (GTS) data into Regional Flood Information System (RFIS) and that data from HYCOS upgraded stations will flow simultaneously to the national and regional servers<br>4. Partners recommended exposure visit cum training to Mekong HYCOS<br><br>**Third RSC Meeting, 1-2 December 2011 Kathmandu**<br>1. By the RSC meeting, the other five partners (BWDB in Bangladesh, DHMS in Bhutan, DHM in Nepal and PMD and WAPDA in Pakistan) had signed the LoAs.<br>2. Agreement to conclude field visits and civil works for 24 stations by June 2012<br>3. Consensus on providing additional instruments to meteorological stations that experience snowfall<br>4. Agreement to sign 3 party MoU with ICIMOD, national partner and RTS for smooth operation and maintenance of the stations<br>5. Agreement to develop national flood information systems on the lines of RFIS<br><br>**Fourth RSC Meeting 23-25 May 2012 Kathmandu** (note: these are decisions made by the RSC, not a record of progress)<br>1. Finalized dates for completing installations by July 2012<br>2. Agreement on upgrading additional stations in the four countries (12 planned); selection of stations was planned to take place by end of June 2012 and placement of order of equipment was planned for September 2012 Agreement on dates for conducting national level trainings<br>3. National information systems (system upgraded, software installed and ready, data reception ready, transmission of real time data)<br>4. Integration of additional stations (GTS data integration, linking with other real time stations, Kailash stations)<br>5. Agreement to support study on early warning systems with a gender perspective<br>6. Piloting development of flood outlook |
| 5 Organize annual meetings of national | The national coordination meetings have not happened. The PD (page 32) stipulates that the meetings would have been "annual planning and coordination |

| Planned activities per objective | Main activities completed by November 2012 |
|---|---|
| co-operating agencies within each of the participating countries | meetings in each of the participating countries". There has been regular interaction among ICIMOD and the six project partners but not in the anticipated scope. |
| **Specific objective 2**<br>Establishment of flood observation network in selected basins in the participating countries | |
| 1 Selection of additional stations for the Regional Flood Information System | The project document had envisaged to upgrade 36 stations in the six participating countries. Twenty-four stations were selected for upgrades in the four countries of Bangladesh, Bhutan, Nepal and Pakistan. The remaining 12 stations were originally set aside for India and China but both countries have indicated that they do not need the stations. Therefore the additional stations will be installed in Bangladesh, Bhutan, Nepal and Pakistan. Selection process for 24 stations (first batch completed); process on-going for 2nd batch (12 stations) |
| 2 Assessment of status of selected stations | Field visits were conducted by a joint team consisting of ICIMOD, RTS and project partner to assess the selected stations prior to installations on the following dates: Bhutan - November 2011, Bangladesh - November 2011, Nepal - Oct 2011 and December 2011 and Pakistan - December 2011. As a result of the assessment visits, few stations were changed in order to match the criteria for selecting stations. The joint preparatory visits helped up scaling the learning and fostering the ownership. |
| 3 Procurement and delivery of equipment for hydro-meteorological stations (DPCs with sensors and peripherals) and 9 meteorological stations (upgrade with data transmission capability | Regarding the first batch of equipment (24 stations) the contract for procurement and delivery of the instruments was awarded to a single vendor. 16 manufacturers of international repute were invited to bid, of which only 2 vendors - Real Time Solutions (RTS) and Sutron bid for the project. RTS are local representatives for few of the invited manufacturers such as Ott and Vaisala; both preferred to bid through RTS. RTS was selected due to its price and technical competence of providing the required services in the HKH region. |
| 4 Upgrade and operationalize hydrological and meteorological stations | The national partners were requested to carry out the civil works in order to prepare the station for installation. Of the 24 selected stations, civil works and installations have been completed in 23 stations. The instruments for only Barabise station in Nepal remain to be installed. The station required extensive civil works which in turn necessitated long administrative procedures for approval within the institution since the big budget required special approval. 20 stations were old stations that were entirely upgraded (4 in Bangladesh, 5 in Bhutan, 6 in Nepal and 5 in Pakistan), one station was slightly modified (1 in Nepal) and two stations are completely new (1 in Bhutan and 1 in Nepal). |
| 5 Establishment of data transmission and reception procedures | As per discussion during RSC meetings, the project has employed 3 modes of transmitting data from stations that are arranged in preferred hierarchy. Each station is equipped with 2 sim cards and 1 Iridium card that can communicate with the data logger and transmit data in real time simultaneously to two servers; national and regional. The sim/Iridium cards communicate and transmit data to the servers based on assigned priority i.e. only one SIM/RIUM card transmits data by default. In the event of failure to transmit data, the system will automatically start transmitting data from the second SIM/RIUM card. In the event that both cards fail to communicate, which is likely during floods or heavy rainfall, the system has the last option of transmitting data through a satellite modem. |
| **Specific objective 3**<br>Establishment of regional and national flood information systems to share real time data and information and increase lead time | |
| 1 Conduct a detailed need analysis of a regional flood information system | A database strategy was developed, shared during RSC meetings and finalized based on comments and feedback. Need analysis conducted through a deployment plan. The RFIS is being designed as per the database strategy and the response received from partners on their needs. |
| 2 Provide / upgrade | All the national partners have been provided budget to purchase servers and |

| Planned activities per objective | Main activities completed by November 2012 |
|---|---|
| computer hardware and software for NHMSs and PRC, install databases and provide training and technical support | software to support them to receive, archive and process real time data. The server specifications were recommended by ICIMOD keeping in view the requirements for not only the HYCOS project but also to enable the partners to archive and process data from their existing networks. A deployment plan was prepared to assist the partners in determining their needs and actions. |
| 3 Design and establish a regional flood information system | The RFIS has been designed with the help of RTS under the guidance of ICIMOD database experts. The site is accessible at http://hkhhycos.icimod.org ICIMOD has chosen to establish a new dedicated website for the flood information system; the website southasianfloods.icimod.org that was established during the demonstration phase of the project has now become dormant. Contents of the website are presented in Appendix 10. |
| 4 Develop procedures for quality assurance | In the framework of LoA with each national partner, partners have committed to share data from all upgraded stations on real time basis. The national agencies remain the owners of the data and will be responsible for quality assurance. At present data transmissions from the automatic weather and hydrological stations to the ICIMOD database are not quality checked. Development of quality assurance procedures has been started in 2012 (ICIMOD, DHI, RTS and FMI in the Quality Control core group). National flood information systems are also being developed for each national partner that will be integrated with the RFIS. |
| 5 PRC operates the regional flood information system on routine daily basis | The PMU has been operating the RFIS and checking for data consistency. Some major observations on the operational reliability so far include a flood in Bhutan resulting in loss in data in one of the stations and inconsistent recharging of Sim card by national partners. In the RSC meetings the partners have complained about the cost of data transfer, which already threatens the sustainability of the project. ICIMOD considers the present website as a near complete RFIS. |
| 6 Develop and introduce procedures for basin-wide flood advisories | A flood outlook development team has started its work. Inception report is under preparation. |
| **Specific objective 4**<br>Enhanced technical capacity of partners on flood forecasting and communication to end users | |
| 1 Training of staff in the installation, operation and maintenance of the equipment | • A training strategy was developed and shared with all partners during 3rd and 4th RSC meetings. As agreed, the trainings are being conducted at local, national and regional levels. Efforts are made to tailor the learning from local to regional level training and vice versa.<br>• 23 Local Level trainings held: Field staffs have been trained during instrument installations (at each station). The major components of these trainings are to educate the field staff on basic operation and maintenance and providing hotlines for support for troubleshooting.<br>• National Trainings held : National trainings have been conducted in Bhutan, Nepal and Pakistan, The trainings are provided to officers and technicians who are responsible for maintaining the stations. The training includes installation of the instruments and basic troubleshooting, and managing the stations remotely.<br>• Regional Training held: A regional training on installation, operation and maintenance of hydro-meteorological instruments was conducted in Nepal. |
| 2 Training on database management | Programme for database management training has been developed (training scheduled to be held from 26-28 November 2012. |
| 3 Training based on assessed needs in addition to the training provided under components 1, 2 and 3 above, provide further | National partners have sought training on database commands for retrieving data as per independent needs. This need is being catered to during the database training in November 2012. A further request for an exposure visit has been sought by partners to learn how other HYCOS projects are functioning, is under consideration. There was also a demand for modelling and forecasting training which is being planned for in 2013. |

| Planned activities per objective | Main activities completed by November 2012 |
|---|---|
| training in accordance to assessed needs | |
| 4 Public awareness activities; promote awareness activities for the general public, government agencies, NGOs and decision makers on flood forecasting and warning services | • Information brochure on HKH-HYCOS developed<br>• As part of public awareness building activities, partners in Bhutan and Nepal celebrated the World Water Week in 2012 with students and several stakeholders in their respective countries. The national trainings have been planned to include a session on outreach and communications with participation from different stakeholders and users of the data on RFIS.<br>• Furthermore, ICIMOD staffs have presented the project's progress and achievements in several national, regional and international forums such as the 6th World Water Forum, International Day for Disaster Risk Reduction celebrations in Bhutan and Nepal, Bhutan +10 Summit held in Bhutan, and DP-Net forum in Nepal. |
| **Specific objective 5**<br>Full-scale regional project planned and agreed among participating countries | |
| 1 Development of a project proposal for Phase III | During the 4th RSC meeting preliminary discussions were held for the Phase III. The proposal is under preparation. |
| 2 Facilitation of agreement on Phase III | No activities |

**Project inputs and commitments vis-à-vis project partners**

Table: Instrument type, number, warrantee, repairing centre and O&M cost involved (Source: ICIMOD PMU October 2012)

| Type | No. | Warranty/guarantee | Availability of repairing centre (in case of technology failure) | O&M cost involved (tentative) |
|---|---|---|---|---|
| Radar type water level sensor, Ott Germany | 10 | All instruments have 2 years warranty after installation.<br><br>An additional Annual Maintenance Contract (AMC) is provided to ensure smooth operation until 4 years from installation date | Vendor contract covers cost to repair instruments for up to 4 years (2 years warranty + 2 AMC)<br><br>Partners provided training to conduct basic repairs | Maintenance costs covered for up to 4 years.<br><br>No direct O&M costs for partners up to 4 years. |
| Bubbler type water level sensor, Ott Germany | 7 | | | |
| Compact type Automatic Weather Station, Vaisala Finland | 7 | | | |
| Tipping bucket rain gauge, Hydrological Services, Malaysia | 17 | | | |
| Chart Recorder, Stevens, USA | 1 | | | |
| Data Collection Platform, RTS, Nepal | 24 | | | |

**Status of 24 stations**
Entirely upgraded the old stations:
Bangladesh - 4 stations
Bhutan - 5 stations
Nepal - 7 stations
Pakistan - 5 stations

Slightly modified stations:

Nepal - 1 station (Turkeghat)

Completely new stations:
Bhutan - 1 station (Hongtso)
Nepal - 1 station (Tumlingtar)

**Status of instrument/apparatus installed by type**

| SN | Name of station | Country | Project budget (in USD) | Contribution from the national partner (in USD) | Total budget (in USD) |
|---|---|---|---|---|---|
| 1 | Serajganj | Bangladesh | 13,623.75 | NA | 13,623.75 |
| 2 | Hardinge Bridge | Bangladesh | 13,182.50 | NA | 13,182.50 |
| 3 | Bhairab Bazar | Bangladesh | 13,182.50 | NA | 13,182.50 |
| 4 | Kurigram | Bangladesh | 12,950.00 | NA | 12,950.00 |
| 5 | Ghunitshawa | Bhutan | 10,406.00 | NA | 10,406.00 |
| 6 | Dungkhar | Bhutan | 10,406.00 | NA | 10,406.00 |
| 7 | Duksum | Bhutan | 10,406.00 | NA | 10,406.00 |
| 8 | Dochula | Bhutan | 10,890.00 | NA | 10,890.00 |
| 9 | Korilla | Bhutan | 10,890.00 | NA | 10,890.00 |
| 10 | Trashi Yangste | Bhutan | 10,406.00 | NA | 10,406.00 |
| 11 | Pachuwarghat | Nepal | 9,156.00 | NA | 9,156.00 |
| 12 | Turkeghat | Nepal | 11,943.00 | NA | 11,943.00 |
| 13 | Mulghat | Nepal | 10,179.00 | NA | 10,179.00 |
| 14 | Khurkot | Nepal | 10,179.00 | NA | 10,179.00 |
| 15 | Tumlingtar | Nepal | 7,218.00 | NA | 7,218.00 |
| 16 | Jiri | Nepal | 7,218.00 | NA | 7,218.00 |
| 17 | Okhaldhunga | Nepal | 9,640.00 | NA | 9,640.00 |
| 18 | Sangutar | Nepal | 9,156.00 | NA | 9,156.00 |
| 19 | Dhankuta | Nepal | 9,640.00 | NA | 9,640.00 |
| 20 | Gupis | Pakistan | 12,350.00 | NA | 12,350.00 |
| 21 | Nowshera | Pakistan | 13,373.75 | NA | 13,373.75 |
| 22 | Warsak | Pakistan | 13,373.75 | NA | 13,373.75 |
| 23 | Chakdara | Pakistan | 13,373.75 | NA | 13,373.75 |
| 24 | Kalam | Pakistan | 12,350.00 | NA | 12,350.00 |

Maps showing the location of HYCOS stations

**Stations in North Pakistan**


**Glossary:**

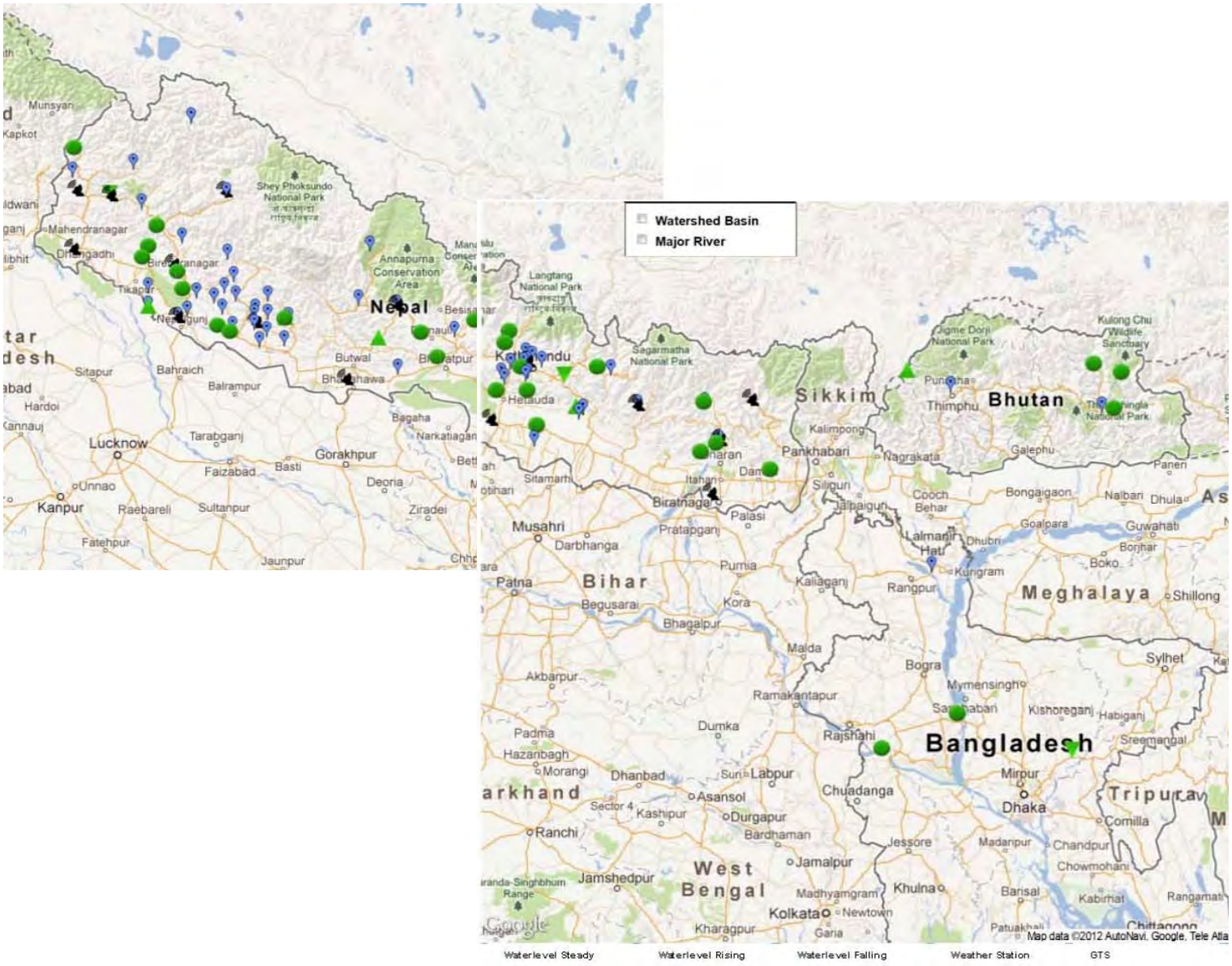
Blue drop = Automatic Weather station

Green symbols are for Automatic Water Level Stations (green dot =waterlevel steady, green triangle pointing upwards = waterlevel rising, green triangle pointing downwards = waterlevel falling)

Black radar symbols = WMO GTS stations.

Maps have been downloaded from the HKH-HYCOS website on 23 November 2012.

**Stations in Nepal, Bhutan and Bangladesh** (note: map shows all real time and automatic stations and GTS stations from Nepal, also the ones not supported by HYCOS are presented)



**HKH-HYCOS Budget and expenditure Assessment 31 October 2012 (Source: ICIMOD PMU)**

**Period 15 December 2009-31 October 2012**

| | Budget | | Expenditure | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | USD | | | | | | |
| **Budget line** | **USD** | **% of budget** | **12/2009-12/2010** | **1-12/2011** | **1-10/2012** | **Total by 10/2012** | **% of budget** | **% of expenditure** | **Balance of budget** |
| Project personnel (regional and international expert) | 754 800.00 | 27.96 | 96 287.72 | 330 918.09 | 171 491.29 | 598 697.10 | 79.32 | 42.02 | 156 102.90 |
| Framework for cooperation (meetings and mission travel) | 383 300.00 | 14.20 | 25 317.42 | 40 763.42 | 28 046.86 | 94 127.70 | 24.56 | 6.61 | 289 172.30 |
| Flood observation network (upgraded hydro-met station equipment) | 732 000.00 | 27.11 | 3 387.97 | 85 370.69 | 347 611.65 | 436 370.31 | 59.61 | 30.63 | 295 629.69 |
| Flood information system (computer, database, software) | 230 000.00 | 8.52 | 8 578.68 | 3 022.12 | 69 584.36 | 81 185.16 | 35.30 | 5.70 | 148 814.84 |
| Capacity building, training and public awareness | 155 000.00 | 5.74 | 12 277.53 | 1 182.50 | 38 621.30 | 52 081.33 | 33.60 | 3.66 | 102 918.67 |
| Planning for a up-scaled regional project | 40 000.00 | 1.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40 000.00 |
| Project evaluation and monitoring | 34 000.00 | 1.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 34 000.00 |
| PMU support - miscellaneous costs | 36 000.00 | 1.33 | 3 598.32 | 5 712.87 | 14 635.60 | 23 946.79 | 66.52 | 1.68 | 12 053.21 |
| WMO support cost | 90 000.00 | 3.33 | 8 704.00 | -8 704.00 | 36 000.00 | 36 000.00 | 40.00 | 2.53 | 54 000.00 |
| ICIMOD Institutional Support Cost | 244 900.00 | 9.07 | 15 783.03 | 45 735.42 | 40 854.47 | 102 372.92 | 41.80 | 7.19 | 142 527.08 |
| **Total** | **2 700 000.00** | **100.00** | **173 934.67** | **504 001.11** | **746 845.53** | **1 424 781.31** | **52.77** | **100.00** | **1 275 218.69** |

Commitments made to partners

There are existing commitments that have been made to WMO, partner organizations and RTS. The following balances will be released upon request by partners. They will be accounted under various budget headings, mainly Flood observation network, Flood information system, Capacity training, training and public awareness.

| **Organisation** | **Commitment, USD** |
|---|---|
| World Meteorological Organisation | 54 000.00 |
| Bangladesh Meteorological Department | 20 146.00 |
| Gross National Happiness, Bhutan (for DHMS) | 21 600.00 |
| Bangladesh Water Development Bureau | 60 000.00 |
| Pakistan Meteorological Department | 28 986.00 |
| Department of Energy, Water & Power Development, Pakistan | 5 750.00 |
| RTS / India | 66 468.60 |
| RTS / India | 26 000.00 |
| RTS / Nepal for development of regional flood information system | 18 641.50 |
| **Total** | **322 392.10** |

# ANNEX 9 STRUCTURE OF THE RFIS

The maps in annex 8 indicate both the location of the stations incorporated in the RFIS and the extent the system shares information on floods. The maps are the entry view of RFIS. The symbols with green colour are hydrological stations, green dot means water level stable, downward pointing triangle is water level increasing and upward pointing triangle is water level increasing.

The screen capture from one of the active HYCOS hydrological stations (Gunitsawa, Bhutan, accessed on 28 November 2012) shows what data is at present available in the RFIS and in what format. The parameters available from meteorological stations are: temperature, relative humidity, wind speed, wind direction, pressure and rainfall. The parameters available from hydrological stations are: water level and rainfall. Data searches can be made within stations listed in the left side panel and within the time frame of available data. There is no ready-made reporting window.