CLIMATE CHANGE
18/2013

Adaptation to climate change for peace and stability

Strengthening of approaches and instruments as well as promotion of processes to reduce the security risks posed by climate change in the context of climate change adaptation

Umwelt Bundesamt

| CLIMATE CHANGE | 18/2013

ENVIRONMENTAL RESEARCH OF THE GERMAN
FEDERAL MINISTRY OF THE ENVIRONMENT,
NATURE CONSERVATION AND NUCLEAR SAFETY

Project-no. (FKZ) 3710 41 142
Report-no. (UBA-FB) 001816/E

Adaptation to climate change for peace and stability

Strengthening of approaches and instruments as well as promotion of processes to reduce the security risks posed by climate change in the context of climate change adaptation

by

Dennis Tänzler
Till Mohns
Katherina Ziegenhagen
adelphi research, Berlin, Germany

On behalf of the German Federal Environment Agency

UMWELTBUNDESAMT

This publication is only available online. It can be downloaded from
https://www.umweltbundesamt.de/publikationen/adaptation-to-climate-change-for-peace-stability

The contents of this publication do not necessarily
reflect the official opinions.

ISSN 1862-4359

Study performed by: adelphi research
Caspar-Theyss-Str. 14a
14193

Study completed in: April 2013

Publisher: Federal Environment Agency (Umweltbundesamt)
Wörlitzer Platz 1
06844 Dessau-Roßlau
Germany
Phone: +49-340-2103-0
Fax: +49-340-2103 2285
Email: info@umweltbundesamt.de
Internet: http://www.umweltbundesamt.de
http://fuer-mensch-und-umwelt.de/

Edited by: Section I 1.2 International Environmental Protection, International Sustainability Strategies, National Focal Point of the European Environment Agency
Hans-Joachim Hermann

Dessau-Roßlau, October 2013

Kurzbeschreibung

Das Vorhaben „Entwicklung von Ansätzen und Instrumenten sowie Förderung von Prozessen zur Eindämmung der Sicherheitsrisiken des Klimawandels im Rahmen der Anpassung an den Klimawandel“ untersucht den möglichen Beitrag, den Maßnahmen zur Anpassung an den Klimawandel für Frieden und Stabilität leisten können. Kernanliegen des Vorhabens ist die Vermeidung von durch den Klimawandel erzeugten oder verstärkten Sicherheitsrisiken wie Wasserknappheit, Nahrungsmittelengpässe oder extreme Wetterereignisse. Wie die konzeptionelle Eingangsbetrachtung des Endberichts zeigt, können Anpassungsprozesse – auch in konfliktgeprägten Gebieten – einen friedensfördernden Beitrag leisten, allerdings bedarf es einer konfliktsensitiven Ausrichtung. Die systematische Betrachtung regionaler Anpassungserfordernisse und –prozesse verdeutlicht, dass auf dieser Ebene Anpassungspolitiken vielfach noch am Anfang stehen. Vor diesem Hintergrund werden drei Anpassungsroadmaps für die Andenregion, Süd- und Zentralasien entworfen, die auf der Auswertung entsprechender Politiken und Programmen sowie ausgewählten Konsultationen basieren. Um die auf diese Weise gewonnenen Erkenntnisse in nationale und internationale Politikprozess einzuspeisen und internationale Governance-Strukturen zur Förderung von Anpassungsprozessen zu unterstützen, schließt der Bericht mit einem Memorandum, das wesentliche Prinzipien für Anpassung und Frieden formuliert.

Abstract

The findings of the project ”Strengthening of approaches and instruments as well as promotion of processes to reduce the security risks posed by climate change in the context of climate change adaptation“ are summarized in this report. The main objective of the project is to outline the potential contribution of adaptation measures to avoid crisis and conflicts caused or exacerbated by water scarcity, food shortages or extreme weather events. As discussed in the conceptual chapter of the report, adaptation can contribute to peace and stability even in conflict-prone areas given that a conflict-sensitive approach is applied. On the basis of a comprehensive regional analysis, we show that adaptation is not yet a prominent element of regional cooperation. To address this gap, we design three regional adaptation roadmaps for the Andes region, Central and South Asia based on desk review of regional processes and programs as well as expert consultations. To ensure that the results of the projects can be considered in national and international policy processes and to strengthen international governance for adaptation we close with a Memorandum for action outlining major principles to support processes for adaptation and peace.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

AALS	Aydar-Arnasay Lakes system
ABD	Asian Development Bank
ADAPT	Asia-Pacific Climate Change Adaptation Project Preparation Facility
AFB	Adaptation Fund Board
AGOCA	Alliance of Central Asian Mountain Communities
AP	adaptation policy
APN	Asia-Pacific Network for Global Change Research
APWF	Asia-Pacific Water Forum
AusAID	Australian Agency for International Development
AusAID	Australian Agency for International Development
BCCRF	Bangladesh Climate Change Resilience Fund
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BMU	German Federal Ministry for the Environment
BMZ	Federal Ministry for Economic Cooperation and Development
BWAs	Water-Management Authorities
CA-CRM	Central Asian Multi-Country Programme on Climate Risk Management
CAMPJ	Central Asian Mountain Partnership
CAREC	Regional Environmental Centre for Central Asia
CAWa	Regional Research Network “Water in Central Asia”
CBA	Community-Based Adaptation
CC	Climate Change
CCA	Climate Change Adaptation
CCAFS	Climate Change, Agriculture and Food Security
CCP	Climate Change Policy
CECORE	Centre for Conflict Resolution, Uganda
CGIAR	Consultative Group on International Agricultural Research
CIS	Commonwealth of Independent States
CNA	Centre for Naval Analysis, U.S
COP	Conference of the Parties
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DFID	Department for International Development
DRM	Disaster risk management
DRR	Disaster Risk Reduction

EAEC	Eurasian Economic Community
EbA	Ecosystem-based adaptation
EC IFAS	Executive Committee of the International Fund for Saving the Aral Sea
EEWA	Enhancing Economic and Environmental Welfare in the Aral Sea Region
EnvSec	Environment and Security Initiative
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
EU	European Union
EUWI EECCA	EU Water Initiative - Eastern Europe, Caucasus and Central Asia
FAO	Food and Agriculture Organization of the United Nations
FNC	First National Communication to the United Nations Framework Convention on Climate Change
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HICAP	Himalayan Climate Change Adaptation Programme
IBA	Important Bird Areas
ICIMOD	International Centre for Integrated Mountain Development
ICRISAT	International Crop Research Institute for the Semi-Arid Tropics
ICSD	Interstate Commission on Sustainable Development
ICWC	Interstate Commission for Water Coordination
IFAD	International Fund for Agricultural Development
IFAS	International Fund for Saving the Aral Sea
IFF	Investment and Financial Flows
IGES	Institute for Global Environmental Strategies
IHNCIS	Interstate Hydrometeorological Network of the Commonwealth of Independent States
IISD	International Institute for Sustainable Development
IKI	International Climate Initiative
INCCA	Indian Network on Climate Change Assessment
IOM	International Organisation of Migration
IT	Information technology
IWRM	Integrated Water Resources Management
JMCWR	Joint Ministerial Commission on Water Resources, Nepal, India
KfW	German Development Bank
LAPA	Local Adaptation Plan for Action

LDCF	Least Developed Countries Fund
LDCs	Least Developing Countries
LEG	Least Developing Countries Expert Group
MFF	Mangroves for the Future
MoE	Ministry of Environment
NABARD	National Bank for Agriculture and Rural Development
NABU	German Society for Nature Protection
NACA	National Alliance for Climate Action
NAP	National Adaptation Programme
NAP	National Adaptation Programme
NAPA	National Adaptation Programme of Action
NAPAC	National Action Plan on Climate Change
NATO	North Atlantic Treaty Organization
NCCKMC	Nepal Climate Change Knowledge Management Centers
NCCP	National Climate Change Policy
NCS	National Conservation Strategy
NDMC	National Disaster Management Commission, Pakistan
NFP	Land Resources Management
NGO	Non-governmental organization
NHMA	National hydro-meteorological Agencies
NIE	National Implementing Entities
OECD	Organization for Economic Co-operation and Development
PCA	Peace and Conflict Assessments
PCDMB	UNEP Post-Conflict and Disaster Management Branch
PCIA	Peace and Conflict Impact Assessment
PMCCC	Prime Minister's Committee on Climate Change, Pakistan
PPCR	World Bank Pilot Programme for Climate Resilience
PWG	Project Working Group on Water and Energy Resources
REDROC	Rwenzori Development and Research Centre, Uganda
RIE	Regional Implementing Entity
RMCs	Regional Member Countries
SAARC	South Asian Association for Regional Cooperation
SAC	SAARC Agricultural Center
SAPCC	State Action Plan on Climate Change
SAWI	South Asia Water Initiative

SCCF	Special Climate Change Fund
SCO	Shanghai Cooperation Organisation
SEI	Stockholm Environment Institute
SIC ICWC	Scientific-Information Centre of Interstate Commission for Water Coordination
SIDA	Swedish International Development Cooperation Agency
SMO	System-wide management organization
SNC	Second National Communication to the United Nations Framework Convention on Climate Change
SPCR	Strategic Program for Climate Resilience
SPECA	UN Special Programme for the Economies of Central Asia
TAP-CC	Technical Advisory Panel on Climate Change Pakistan
TFCC	Task Force in Climate Change, Pakistan
TMI	The Mountain Institute
TYP	Three Year Plan
UCA	University of Central Asia
UK	United Kingdom
UN	United Nations
UN ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNCCD	UN Convention to Combat Desertification
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNFCCC	United Nations Framework Convention on Climate Change
UNISON	Civic Environmental Foundation
UNSG	United Nations Secretary-General
UNU-EHS	United Nations University Institute for Environment and Human Security
US	United States
USAID	United States Agency for International Development
USSR	Union of Soviet Socialist Republics
UWU	Union of System-wide water users
WBGU	German Advisory Council on Global Change
WCD	World Commission on Dams
WFP	World Food Programme
WMO	Intergovernmental Council on Hydrometeorology

WUGs	water user groups
WWF	World Wide Fund for Nature
ZAIAG	Central-Asian Institute of Applied Geosciences

1 Zusammenfassung

Mit dem vorliegenden Endbericht fasst adelphi die wesentlichen Ergebnisse des Vorhabens „Entwicklung von Ansätzen und Instrumenten sowie Förderung von Prozessen zur Eindämmung der Sicherheitsrisiken des Klimawandels im Rahmen der Anpassung an den Klimawandel“ zusammen. Kernanliegen des Vorhabens ist die Vermeidung von durch den Klimawandel erzeugten oder verstärkten Sicherheitsrisiken wie Wasserknappheit, Nahrungsmittelengpässe oder extreme Wetterereignisse. Auf der Grundlage eingehender Regionalbetrachtungen werden regionale Risikoprofile für sechs Regionen erstellt, drei regionale Anpassungsprozesse skizziert und Kernanforderungen an Anpassungsmaßnahmen formuliert, die Frieden und Stabilität befördern können. Durch die Zusammenfassung der Ergebnisse in Form von Roadmaps und einem Memorandum soll gewährleistet werden, dass die Ergebnisse des Vorhabens in bestehende politische Prozesse eingespeist werden können.

Zur Realisierung der Vorhabensziele sind konkret folgende Leistungen erfolgt:

- Erstellung eines Diskussionspapiers zu den Zusammenhängen zwischen Klimawandel, Sicherheitsrisiken und Anpassungsmaßnahmen;
- Erstellung von drei regionalen Roadmaps, die für Zentralasien, die Anden-Region und Südasien konkretisieren, in welcher Weise Anpassungsprozesse gezielt zu Frieden und Stabilität beitragen können;
- Erstellung eines Memorandums mit Empfehlungen für die Eindämmung der Sicherheitsrisiken des Klimawandels im Rahmen von Anpassungsprozessen;
- Durchführung eines Fachgesprächs mit nationalen Experten, eines Statusseminars sowie Konsultationen mit politischen Akteuren (UNFCCC-Rahmen, EU, OSZE);
- Präsentation der Ergebnisse des Vorhabens im Rahmen eines Side-Events einer internationalen Konferenz;
- Zusätzliche Einbringung von Zwischenergebnissen im Vorfeld und bei der 17. Vertragsstaatenkonferenz in Durban (2011) sowie bei der International Asian Security Conference „Non-Traditional Security Challenges- Today and Tomorrow” im Februar 2012.

1. Fallstudienanalysen: Regionale Konkretisierung von Risiken und Anpassungsprozessen:

Im Rahmen des Vorhabens haben wir für sechs Regionalkomplexe Risikoprofile erstellt. Diese Risikoprofile betreffen einzelne Länder in den folgenden Regionen (insgesamt 23 Länder).

- Nordafrika
- Zentralasien
- Südkaukasus
- Südasien
- Andenregion
- Ostafrika.

Hierbei wurden jeweils Kurzanalysen zu existierenden Anpassungsprozessen sowie Referenzen auf Klimasicherheit für die 23 Länder der ausgewählten 6 Regionen verfasst. Dieses „Screening“ der nationalen Anpassungspolitikansätze basiert auf einer systematischen Analyse der folgenden Primärdokumente:

Nationale Kommunikationen zur Klimarahmenkonvention

Nationale Strategien und/oder Aktionspläne zum Klimawandel (Klimaschutz und Anpassung)

National Adaptation Programmes of Action (NAPAs) (für LDCs)

Umweltstrategien und -aktionspläne, Entwicklungsstrategien und ähnliche Dokumente – soweit Anpassung einen nicht zu vernachlässigenden Anteil ausmacht

Sub-nationale Programme und Strategien zur Anpassung an Klimafolgen, Strategien zu lokaler Anpassung („community-based adaptation").

Darüber hinaus haben wir nationale und regionale Studien zu Klimafolgen und Anpassung, Webseiten von Ministerien und Konferenzdokumentationen für unsere Analyse herangezogen.

Zur Auswertung der aufgeführten Strategien und Programme werden pro Land die existierenden Anpassungsprozesse bzw. die wesentlichen Elemente bestehender Ansätze von Anpassungspolitik dargestellt. Dies umfasst die in den Strategien und Programmen adressierten Sektoren und Schwerpunkte von Anpassung ebenso wie die am Prozess beteiligten Akteure. Die Inventarisierung existierender Anpassungsprozesse in den einzelnen Ländern wird in einem zweiten Schritt im Hinblick auf Referenzen auf Klimasicherheit ergänzt. Hierzu untersuchten wir die identifizierten Strategien und Programme entlang der vier durch den WBGU herausgearbeiteten Konfliktkonstellationen (WBGU 2007) auf explizite Bezüge von Klimafolgen zu (potenziellen) Konflikten bzw. Sicherheitsaspekten. Hier wird deutlich, dass derzeit in den untersuchten Ländern die Klimasicherheitsdimension nicht systematisch in Anpassungsprozessen Berücksichtigung findet. Allerdings erfolgen Einzelverweise, z.B. auf durch den Klimawandel verstärkte Konflikte um Wasser, bei einer Vielzahl von Ländern. Ferner haben wir diesbezüglich abgeschlossene und laufende Projekte im Bereich Klimafolgen und Anpassung geprüft, wobei folgende Quellen als Grundlage dienten: BMU Internationale Klimaschutzinitiative, World Bank Project Database, GEF Project Database sowie der Adaptation Learning Mechanism (ALM) (www.adaptationlearning.net).

2. Konzeptualisierung konfliktsensitive Anpassung in regionalen Kontexten

Als Ausgangspunkt des Vorhabens haben wir Grundzüge konfliktsensitiver Anpassung konzeptionalisiert (Grundlage: Literaturstudie, Auswertung des Forschungsstandes). Das hierzu erstellte Konzept diskutierten wir u.a. bei der Konferenz des African Centre for the Constructive Resolution of Disputes (ACCORD) im September 2011 in Durban und finalisierten es auf der Grundlage weiterer Interviews während der COP 17 in Durban. Die Ergebnisse haben wir in Form eines Diskussionspapiers zu konfliktsensitiver Anpassung zusammengefasst und während eines Statusseminars im Januar 2012 präsentiert. Die konzeptionelle Diskussion dort zeigte u.a., dass für die Verankerung in politischen Dialogen zwischen zwei zeitlichen Phasen unterschieden werden muss, die wesentlich auf das vorherrschende Konfliktniveau in einer Gesellschaft Bezug nehmen.

Zum einen sind Anpassungsprozesse hinsichtlich ihrer Folgewirkungen an sich so zu konzipieren, dass es in Zukunft zu keinen konflikthaften Entwicklungen kommt, diese also antizipiert und vorab vermieden werden. Hierbei handelt es sich grundsätzlich um Länder in einer prä-Konfliktphase, also Länder, die gemeinhin als (leidlich) stabil gelten. Zum anderen erfordern Länder, die als konfliktgeprägt oder fragil gelten, die Berücksichtigung von Leitlinien zur konfliktsensitiven Gestaltung von Projekten und Programmen. Diese Maßnahmen erfordern eine gesonderte Behandlung: beispielsweise wurden im Zuge des jüngsten Konfliktes in Mali Anpassungsprozesse gestoppt oder entsprechende Projektvorschläge seitens des Adaption Funds zunächst abgelehnt.

Basierend auf den sechs Fallstudienanalysen und den Diskussionen während des Statusseminars haben wir für eine weitere Konkretisierung drei Regionalstudien erarbeitet. Südasien, Zentralasien und die Andenregion werden hierbei vor allem, deswegen analysiert, weil neben der Unterschiedlichkeit der Sicherheitssituation in den betrachteten Ländern, die Klimafolgen jeweils deutliche Sicherheitsrisiken mit sich bringen und zudem zumindest erste Ansatzpunkte regionaler Zusammenarbeit vorliegen, an die politische angeknüpft werden kann.

Die drei „Regionalroadmaps zur Adressierung möglicher Sicherheitsauswirkungen des Klimawandels im Rahmen von Anpassungsprozessen“ folgen einer im Wesentlichen einheitlichen Struktur mit folgenden Elementen

- Regionale Konkretisierung der Hotspots des Klimawandels
- Identifizierung möglicher Sicherheitsrisiken des Klimawandels
- Anpassungspolitikansätze
- Akteursmapping
- Umsetzbarkeit und Anschlussfähigkeit an Anpassungsprozesse
- Maßnahmen zur Stärkung von Frieden und Stabilität.

Dabei wird die Analyse für die regionalen Roadmaps konfliktsensitiver Anpassung insbesondere durch Akteurs-Mapping (regionale Netzwerke, Initiativen, Prozesse), Aussagen zur politischen Anschlussfähigkeit und Vorschläge für konkrete Maßnahmen für die avisierten Roadmap-Prozesse vertieft. Zielsetzung ist es, die Bundesregierung, die EU sowie internationale Organisationen mit den Roadmap-Ansätzen in die Lage zu versetzen, mit Vorschlägen zur Verankerung krisenpräventiver Perspektiven von Anpassung an den Klimawandel einen konkreten praxisbezogenen Beitrag zu leisten.

In Einzelnen lassen sich für die einzelnen Regionen folgende Aspekte festhalten: In Zentralasien werden vor dem Hintergrund nationaler und regionaler Vulnerabilitäten mögliche Schritte skizziert, um die sich abzeichnenden Energie-, Wasser, und Nahrungskrisen in der Region, die durch den Klimawandel noch verschärft werden, gemeinsam zu adressieren. Um eine regional Perspektive von Anpassung an den Klimawandel zur Adressierung möglicher Sicherheitsauswirkungen des Klimawandels zu fördern, schlagen wir für Zentralasien folgende Initiativen als erfolgversprechende Einstiegspunkte vor:

- Förderung und Erhaltung der Chu-Talas River Basin Commission und Übertragung der erfolgreichen Kooperationserfahrungen auf andere grenzüberschreitende Wassereinzugsgebiete durch die Unterstützung permanenter bilateraler und multilateraler Strukturen;
- Unterstützung technischer Kooperation im Syr Darya Becken durch hydro-meteorologische Messstationen mit dem Ziel die (wissenschaftliche) Datengrundlage zu verbessern, die von allen Anliegerländer genutzt werden kann;
- Wiederbelebung der Kooperation in den Bereichen Klimaschutz und Wasser im Ferghana Tal mit einer Fokussetzung auf einzelne Fragilitätsbrennpunkte;
- Förderung von ökosystem-basierter Anpassung im Aydar-Arnasay Seensystem im Kontext der bereits existierenden geschützten Gebiete.

In Südasien werden als erfolgversprechende Einstiegspunkte zur Förderung einer regionalen und friedensfördernden Perspektive auf Anpassung folgende Elemente vorgeschlagen:

- Unterstützung der Umsetzung verschiedener einschlägiger SAARC Abkommen und Initiativen (Joint Risk Assessment, Mountain Initiative, Food Bank etc.) und Förderung der Kooperation mit der Inter-Governmental Expert Group on Climate Change;
- Untersuchung von Optionen verbesserter und langfristiger Klimafinanzierung durch Etablierung einer Regional Implementing Entity oder verwandte Ansätze;
- Institutionalisierung des Austausches von Best Practice Beispielen (z.B. IWRM) der verschiedenen grenzüberschreitenden Flüsse Südasiens mit dem möglichen Ziel einer Himalaya River Facility;
- Ermöglichung und Erleichterung eines regionalen Dialoges zum Thema Migration und Anpassung mit dem Ziel, die Wissensgrundlage zu verbessern und durch eine integrative Perspektive andere Finanzierungsoptionen zu eruieren (in Kooperation mit der Asian Development Bank).

Zur Nutzbarmachung von Anpassung als Mittel zu Frieden und Stabilität in der Anden-Region, werden folgende Einstiegspunkte vorgeschlagen:

- Anpassungsstrategie für die Öko-Region der tropischen Anden, die eine Serie von nationalen (Politik-)Workshops und regionale Konferenzen umfasst;
- Förderung von auf gemeinschaftlich umzusetzende Ansätze ökosystem-basierte Anpassung im Amazonasbecken;
- Initiierung von Austausch und Lernprozessen hinsichtlich der Vulnerabilitäten der Küstenregionen und entsprechenden Anpassungsaktivitäten zwischen den zuständigen Abteilungen (Kolumbien, Ecuador, Peru);
- Anpassung auf Gemeindeebene in den Bereichen Wasser und Subsistenz-Landwirtschaft in ländlichen Teichsystemen in der Grenzregion Kolumbiens und Ecuadors.
- Diese Ansätze veranschaulichen exemplarisch, wie friedensfördernde Anpassungsprozesse in der Praxis entwickelt und eine regionale Identität zur gemeinsamen Bekämpfung der Folgen des Klimawandels gefördert werden können.

3. Erarbeitung eines politischen Memorandums

Aus den Erkenntnissen der Roadmap-Erstellung sowie aus den Fachkonsultationen haben wir wesentliche Erkenntnisse in einem Memorandum „Adaptation for Peace and Stability“ zusammengefasst, dessen Ziel es ist, die politische Sensibilisierung von Entscheidungsträgern wie der Bundesregierung, internationaler Organisationen, Geberinstitutionen, Zivilgesellschaft, und Wissenschaft zu befördern. Hierfür wurden zum einen 6 Prinzipien für Anpassung und Frieden formuliert.

1. Etablierung von sogenannten Peace and Conflict Assessments für Anpassungsprogramme und –projekte, die über ein rein technisches Verständnis von Anpassung hinaus gehen;
2. Das Mainstreaming von Anpassungsmaßnahmen an den Klimawandel in konfliktgeprägten Gebieten durch die Anwendung konfliktsensitiver Ansätze;
3. Die Sicherstellung partizipativer Prozesse zur Gestaltung und Umsetzung von Anpassungsmaßnahmen;
4. Der Aufbau belastbarer Strukturen der Governance, die lokale, nationale und regionale Ebenen miteinander verknüpft und zudem eine transparente und verantwortliche Verwendung von Mitteln gewährleistet;

5. Die Nutzung von Fortbildungs- und Kapazitätsbildungs-Maßnahmen, um gegenwärtige und zukünftige Konfliktlagen besser zu verstehen;
6. Die Sicherstellung von Kohärenz von Anpassungs- und weiteren Entwicklungsprozessen – national wie international.

Weiterhin skizzieren wir konkret Handlungsempfehlungen für drei Ebenen, die jeweils auch unabhängig voneinander angegangen werden können: Dies betrifft die Etablierung konfliktsensitiver Praktiken, die Unterstützung regionaler Anpassungsprozesse, da dies bislang von der internationalen Klimapolitik nicht hinreichend gefördert wird, sowie die Stärkung internationaler Anpassungs-Governance.

2 Executive Summary

In this report, adelphi summarizes the major findings of the Project "Strengthening of approaches and instruments as well as promotion of processes to reduce the security risks posed by climate change in the context of climate change adaptation".

The project's main goal is to integrate the security issues and implications of climate change into national and international adaptation processes. On the basis of extensive regional analysis, a risk profile for 6 regions has been developed, 3 regional adaptation processes were outlined, and main requirements for adaptation measures to foster peace and stability were formulated. The methods used were deliberately chosen to ensure the project's results can be easily integrated into existing political processes.

Major steps for implementation were:

- Producing a discussion paper on the climate change, security and adaptation nexus;
- Preparing three regional adaptation roadmaps for Central Asia, the Andean Region and South Asia, outlining a way for adaptation processes to contribute to peace and security;
- Generating a memorandum based on major findings, containing recommendations on how to reduce the security risks imposed by climate change in the context of adaptation processes;
- Initiating talks with national experts and conducting a status seminar, as well as a consultation process with political actors (UNFCCC, EU, OSCE);
- Presenting project results at a site-event of an international conference; and
- Making the preliminary result available during the preparation process for COP 17, as well as during the Conference itself in Durban in 2011, and furthermore presenting the findings at the International Asian Security Conference "Non-Traditional Security Challenges - Today and Tomorrow" in February 2012.

1. Case study analysis: regional concretisation of security implications and adaption processes:

Within the project's implementation, risk profiles of six regional clusters were generated. The profiles relate to particular countries in the following regions (in total 23 countries):

- North Africa
- Central Asia
- South Caucasus
- South Asia
- Andean Region
- East Africa.

Concise Documents on existing adaptation processes and climate security were prepared for the 23 countries of the six regions. The "screening" of national adaptation policies was based on a systematic analysis of the following primary documents:

- National Communications to the UNFCCC;
- National Strategies and/or Action Plans on Climate Change;
- National Adaptation Programmes of Action (NAPAs) (for LDCs);

- Environmental Strategies and Action Plans, Development Strategies and similar documents referring to adaptation; and
- Sub-national programs and strategies on adaptation to climate change, and strategies on local adaptation ("community-based adaptation").

National and regional reports on climate change impacts and adaptation, websites of relevant ministries and conference documents were then used to prepare the case studies. By analysing the above mentioned strategies and programs for each country, existing adaptation processes and crucial elements of existing approaches from adaptation policies were examined. The particular sectors and focus areas addressed in strategies and programmes as well as the stakeholders involved were analysed.

The inventory of existing adaptation processes in the individual countries was supplemented in a second step by scrutinizing the references to climate security. The four climate-induced conflict constellations established by the WBGU (2007) helped in identifying and examining explicit references to climate change impacts and (potential) conflict and security aspects.

The analysis shows that at present, adaptation processes in all researched countries fail to systematically include climate security. However, references to water conflicts can be found in a majority of countries.

Finally, projects in the field of climate change impacts and adaptation were studied, including past projects as well as those being implemented at present.

The research drew from the following sources:

- BMU (German Ministry of the Environment) International Climate Initiative
- World Bank Project Database
- African Adaptation Programme
- GEF Project Database
- Adaptation Learning Mechanism (ALM)

2. Conceptualizing conflict-sensitive adaptation in a regional context

In order to develop a concept for conflict-sensitive adaptation, existing literature was analysed. The elaborated concept was then discussed, for example at the conference of the African Centre for the Constructive Resolution of Disputes (ACCORD) in September 2011 in Durban, and was then finalised on the basis of a number of interviews conducted during COP 17 in Durban. The results were summarized in the form of a discussion paper on conflict-sensitive adaptation and presented during a status seminar in January 2012. The instructive discussion during the seminar concluded that a political dialogue should be embedded in two phases, during which references to the existing conflict level of a society have to be made.

Adaptation processes have to be designed to take into account resulting impacts, in order to prevent the emergence of future conflicts. Forthcoming conflicts need to be anticipated at an early stage. This also involves potential pre-conflict phases in countries, which are considered as "relatively stable".

Based on the six case studies and the discussion during the status seminar, the findings were further elaborated by generating three regional analyses. South Asia, Central Asia and the Andean Region were chosen as they represent diverse security concerns in the respective countries, and because climate change will pose distinct security risks in all three regions.

Moreover, entry points for regional cooperation could be identified in each region, which could be developed in the future.

The three “Roadmaps on Adaptation to Climate Change for Peace and Stability” are structured in similar ways, and include the following elements:

- Regional concretisation of vulnerability and fragility hotspots of climate change;
- Identification of potential security risks of climate change;
- Analyses of adaptation policies;
- Mapping of relevant stakeholders;
- Practicability of adaptation processes and entry points; and
- Measures to strengthen peace and stability.

The regional Roadmaps aim to reveal political entry points and suggest detailed measures for a roadmap process by mapping stakeholders (regional networks, initiatives and processes).

The aim is to create an opportunity for the German Federal Government, the EU, and other international organisations to contribute to conflict-preventive perspectives for adaption to climate change.

Taking a regional perspective on adaptation in Central Asia showed that the challenges of climate change, water security and political stability cannot be addressed independently. In the face of common regional vulnerabilities, countries should cooperate in developing responses to climate impacts. To this end, adaptation interventions need to be carefully designed not to provoke or exacerbate local tensions. In addition, tensions within societies require a better understanding as a way to help resolve them and prevent renewed violence. This can also help decrease potential tensions over changing water regimes in the future.

Against the backdrop of the national and regional vulnerabilities, regional approaches and their limitations in Central Asia are discussed and steps outlined for how to address the looming energy, food and water crises in Central Asia – aggravated by climate change - in a cooperative way.

In order to promote a regional perspective on adaptation as means of peace and stability, we suggest the following initiatives as promising starting points:

- Sustain the impact of the Chu-Talas River Basin Commission and transfer successful cooperation experiences to other transboundary watersheds by supporting permanent bilateral and multilateral structures;
- Support technical cooperation in the Syr Darya basin on hydro-meteorological stations and posts as well as information systems in order to improve the (scientific) data that is commonly trusted by the riparian countries;
- Revitalise and climate-proof water cooperation in the Ferghana valley, focusing on climate change and fragility hotspots; and
- Promote ecosystem-based adaptation in the Aydar-Arnasay Lakes system in the context of existing protected areas.

In South Asia our review of climate science suggests the following initiatives as promising starting points for promoting a regional perspective on adaptation as means of peace and stability:

- Support the implementation of various SAARC agreements and initiatives (joint risk assessment, Mountain Initiative, Food Bank etc.) and facilitate cooperation with the Inter-Governmental Expert Group on Climate Change;
- Examine the prospects for improved and long term climate financing via a Regional Implementing Entity or other approaches;
- Institutionalize the exchange on best practices (e.g. IWRM) in different South Asian transboundary rivers, leading potentially to a Himalaya River Facility; and
- Facilitate a dialogue on migration and adaptation aimed at enhancing the knowledge basis and integrating perspectives to improve, among other things, financing options (in cooperation with the Asian Development Bank).

Using adaptation as means of peace and stability in the Andean Region, the following entry points were suggested:

- Develop an adaptation strategy for the eco-region of the tropical Andes, encompassing a series of national (policy) workshops and a regional conference;
- Promote community-based and eco-system based adaptation in the Amazon basin;
- Facilitate exchanges and learning processes on coastal vulnerabilities and adaptation measures between coastal departments (Colombia, Ecuador, Peru); and
- Support community-based adaptation on water and small-scale agriculture in rural hamlets in the border region of Colombia and Ecuador
- All these approaches exemplify how pro-peace adaptation processes can work in practice and contribute to a regional identity for facing and addressing climate change challenges. In this way, they can serve as a starting point for a more comprehensive regional adaptation strategy.

3. Development of a political memorandum

On the basis of the roadmap findings and the conclusions drawn from the expert-consultation, major findings were summarized in a “Memorandum on Adaptation for Peace and Stability”, which aims to provide guidance and support advocacy efforts showing opportunities for potential action, promoting adaptation as a peaceful response to climate change.

In order to support the contribution of adaptation to peace and stability, we suggest that decision makers in the German Federal Government, international organisations, donors, civil society and academia consider six key principles for adaptation for peace that can be translated and implemented in the three main focus areas:

6 Principles for “Adaptation and Peace”

1. Establish peace and conflict assessments for adaptation programmes and projects going beyond a pure technical understanding of adaptation;
2. Mainstream climate change adaptation in conflict-prone contexts applying conflict sensitive approaches;
3. Ensure participatory processes to design and implement adaptation measures in an inclusive manner;
4. Build robust governance structures linking local, national, and regional levels to, among other things, foster transparent and accountable spending;

5. Use training/capacity building approaches to understand and address current and future conflicts; and
6. Ensure coherence of climate change adaptation and development processes nationally and internationally.

Recommendations for action were outlined on three levels, which can also be used separately, namely: the generation of conflict sensitive measures; the support of regional adaptation processes, which at present have not received sufficient attention in international climate change policy; and the strengthening of international adaptation-governance. The final report presents all of these individual fields of action in a detailed manner.

3 Discussion Paper: Perspectives on Conflict-sensitive Adaptation to Climate Change.

3.1 Executive Summary

Climate change adaptation measures can play a significant role in preventing crises and conflicts. They can have a stabilizing influence on weak or fragile states. In light of this, efforts by these states to create the necessary institutional framework and to develop – conflict-sensitive – adaptation measures should be encouraged, as should the establishment of a regional, cross-border perspective on the consequences of climate change.

- In order to comply with the specifications of conflict-sensitive policy-making, adaptation processes must involve an analysis of the consequences of activities that goes beyond merely understanding the context of the intervention. This approach aims to prevent negative consequences that may arise from an intervention and maximize positive impacts.
- It is firstly necessary to conduct peace and conflict assessments (PCAs) to analyze the potential consequences of adaptation measures and to develop recommendations on how to integrate the results of PCAs into the relevant measures in a conflict-sensitive manner. This is especially important in the case of weak and fragile states, where it is essential to ensure the involvement of marginalized communities that are particularly hard hit by climate change.
- By developing and enhancing institutional structures as repositories of knowledge, they are able to function as governance and early warning mechanisms for adaptation measures. Furthermore, it is important to examine, among other aspects, the possibility of expanding the relevant arrangements at regional level with a focus on specific problem areas.
- The process of supporting conflict-sensitive approaches to adaptation links climate and development policy issues with foreign and security policy matters. Furthermore, the field of research policy can help develop guidelines for conflict-sensitive adaptation by conducting research in parallel with the implementation of projects.
- A concept that has been consolidated in this way can be incorporated at various policy levels and make a constructive contribution to the development of the policy field of “adaptation”.
- Possible starting points include:
    - the international climate change talks on the establishment of the Adaptation Fund;
    - the OECD development committee and its climate change adaptation activities;
    - regional strategies and policy dialogues at EU level, e.g. with the African Union, Central Asia or within the scope of the European Neighbourhood Policy (if necessary, the Union for the Mediterranean);
    - the International Climate Initiative, which can provide a framework to analyze the perspective and design of the relevant guidelines for conflict-sensitive adaptation measures.

3.2 Focus of the Study

Climate change has a range of negative consequences for human security. Climate impacts, such as the reduction of the quality and quantity of available water resources, may also have an indirect and detrimental effect on political stability and fuel conflict, as they are likely to cause increased competition for resources. In addition, more frequent and more intensive extreme weather events are likely to have serious implications for social stability. Alongside the degradation of resources, rising sea levels are expected to create increased migration flows. These may worsen social tensions in transit and target regions. The greatest impact will be felt in regions where the negative effects of climate change are compounded by a range of factors that can lead to conflict, including weak governance, insufficient participation rights and underdevelopment. Situations where there are already conflicts over resources that will be aggravated by climate change pose particular challenges. In its 2007 annual report, the German Advisory Council on Global Change (WBGU) highlighted how climate change could cause an amalgamation of these factors, resulting in conflict constellations (WBGU 2007) which could spark an escalation of violence. At policy level, this security-related dimension of climate change has been addressed not only by the German federal government, the EU and the United Nations, but also by the OECD, OSCE and NATO. In his report from 2009, the UN General-Secretary took a detailed look at this problem area, identifying climate change as a "threat multiplier" and stating that climate policies (incl. adaptation policies) and other policy approaches could help contain the threat, thereby promoting peace and stability. It was not until July 2011 that the UN Security Council highlighted the potential threat of climate change in a unanimously adopted declaration and appealed to the UN Secretary-General to present regular briefings on climate change as a conflict driver.

In light of this situation, adelphi is researching the perspectives of climate change adaptation against the backdrop of the discussion concerning climate change and security. This discussion paper is a summary of the initial findings. It aims to highlight the potential role of adaptation measures, in particular in regions that are viewed as politically weak or fragile, with the aim of curbing the security risks presented by climate change. Politically fragile regions place great demands on policy initiatives: In order to avoid sparking latent conflicts, it is necessary to develop adaptation measures in a conflict-sensitive manner. On the one hand, this can involve minimizing factors that aggravate conflict in a social context. On the other hand, it is possible to strengthen factors that promote peaceful conflict resolution. The discussion on conflict-sensitive policies serves as a starting point that can provide useful insights for the field of adaptation and a basis to develop specific policies at regional level. To this end, in addition to initial discussions on concepts for conflict-sensitive adaptation measures, adelphi examined climate change-related developments that could potentially lead to conflict in six case study regions. This involved assessing existing and planned adaptation approaches in terms of political stability, existing conflicts and current and expected climate trends. The findings will subsequently be used to develop proposals on how to establish conflict-sensitive approaches to climate adaptation at various levels (international, regional, national).

3.3 Climate Change and Security

3.3.1 Environmental changes as conflict drivers

The debate on the security risks presented by climate change has its origins in the wider-ranging discussion on the role of natural resources in peace and security policy issues. Climate change as a possible conflict driver has only been examined in greater detail over the past decade or so. The WBGU particularly stands out here for its comprehensive and systematic report (WBGU 2007), which identifies a range of potential security-related impacts. While developing the report, the WBGU coined the term "conflict constellations": While climate change has a number of negative consequences for human security – such as the reduction in the quality and quantity of available water resources – it can also negatively impact political stability and lead to conflict. This is particularly the case in regions where the negative impacts of climate change are compounded by a range of factors that can lead to conflict, such as poor governance, insufficient regional cooperation or even disputes over matters concerning resources, lack of resource substitution, and a number of other factors (WBGU 2007). The WBGU describes the combination of a variety of these factors as a conflict constellation: a group of factors, which intensify the negative effects of climate change and come together to form a dynamic that can have a destabilizing effect.

The WGBU identifies a total of four conflict constellations (WBGU 2007: 81ff.):

- climate-induced degradation of freshwater resources
- climate-induced decline in food production
- climate-induced increase in storm and flood disasters
- environmentally induced migration

It cites examples of violent conflicts between pastoralists and agriculturalists in eastern Africa (Sudan, Kenya, Uganda). Following the flood disaster in Pakistan in 2010, there were also reports of local violent tensions in Sindh and Punjab, which were triggered by delays in, or lack of, necessary aid. The scope of these tensions can also go beyond national borders.

A number of other research reports and analyses were published in parallel with and following the WBGU report, covering a large spectrum, which ranges from retrospective quantitative analyses to scenario development on the basis of discussions with experts. The range of findings is equally as diverse: Whereas some experts warn of impending climate wars (e.g. Welzer 2008) and the collapse of the European Union (e.g. Dyer 2008), others point to the insufficient empirical evidence and the often eclectic approaches which lack substance and credibility (e.g. Gledtisch/Nordås 2009; Brzoska 2008).

These studies are faced with the particularly problematic nature of climate change: its impacts do not become apparent until much later, it is not possible to say with certainty exactly how they manifest themselves and it is unclear how the various climate parameters affect and intensify one another. For many years, societies were essentially able to adjust to the effects of environmental changes, such as the amount of precipitation and temperature fluctuations. Climate change threatens to drastically change these parameters within a few decades. The concept of climate change as a "threat multiplier", developed by the US research institute Centre for Naval Analysis (CNA 2007) and subsequently adopted by the political elite in the EU and the UN, illustrates how security-policy analyses initially focus on ongoing, existing conflict-related trends in order to identify climate change's potential impact on conflict. According to

this concept, climate change can further destabilize already unstable situations by creating additional challenges for those affected and exacerbating problems, such as insufficient or unjust access to resources.

3.3.2 Focus: weak or fragile states

The loss of a state or society's capacity to manage its affairs plays a major role in its destabilization, meaning that it is no longer able to guarantee the basic state functions, such as welfare, the rule of law and maintaining its monopoly on the use of force internally and externally. Extreme poverty, a lack of development and insufficient participation rights can further intensify this trend (Tänzler et al. 2008). "Fragile states" with histories of frequent conflict and polarized societies are viewed as particularly at risk (cf. Buhaug et al. 2008). These countries are often afflicted by severe poverty and the impacts of climate change threaten to create further obstacles to social and economic development (cf. Collier 2008). A state that is weak or fragile in this way often also lacks governance capacities, which affects its ability to deal with climate-induced problems and damages the chances for peaceful conflict resolution. States can be divided into three text-book categories (Schneckener 2004):

1. Consolidated states, which are fully capable of managing their affairs and performing basic state functions.
2. Weak states, which are capable of managing their affairs to a certain extent, but lack the ability to fully perform basic state functions.
3. Fragile states, which are barely able to perform key state functions and have very limited governance capacities. An extreme case of a fragile state is the failed or collapsed state, which in effect lacks any state structures or order.

From a crisis and conflict-prevention perspective, the second and third categories are of particular interest, yet in reality it is often very difficult to distinguish the two types of state. A society's categorization also depends on whether it is in a conflict or post-conflict context. Furthermore, a state's capacity to act is limited depending on its initial situation and, as a result of past conflicts and mistrust of state institutions, violence can seem an effective means for various actors to achieve their goals. At this point, it is important to note that weak or fragile states should not automatically be placed in the same category as those in post-conflict or crisis situations (BMZ 2007). A fragility assessment should, therefore, take into account various criteria. Globally, there are a range of assessment methods (going beyond detailed case studies or conflict analyses) that can be applied here (for a discussion, cf. Schneckener 2007; Tänzler et al. 2008; Carius et al. 2008). The following approaches can help provide a comprehensive comparative classification of states according to their vulnerability to conflict.

- Failed States Index (Fund for Peace): Since 2005 the Fund for Peace has published the Failed States Index in cooperation with the magazine Foreign Policy, with the aim of identifying the risk of state failure across the world. The index is based on twelve different indicators (including internal refugees, economic decline, violation of human rights, delegitimization of state governance and external interventions), categorized into five groups for evaluation. The stability of the states ranges from "critical" and "in danger" (which applied to a total of 39 states in 2011) to "borderline" and "sustainable".
- Human Development Index (UNDP): The Human Development Index is a prosperity indicator which aims to rate a country's level of development. It not only accounts for income per capita, but also life expectancy and level of education in order to reflect basic human needs. Life expectancy is a key indicator of healthcare and nutrition. A

country's level of education also illustrates the degree of participation in public and political life and access to a suitable standard of living.

- World Bank Governance Index: "Voice & Accountability" is one of six indicators used by the World Bank to rate state governance capacities. It identifies the degree of influence a state's citizens have in the process of selecting their government and examines freedom of opinion, assembly and press. The rating is based on a range of indicator sets, including the Bertelsmann Transformation Index.

Using the example of South Asia in 2010/2011, the regional overview illustrates the degree of weakness and fragility of various states on the basis of these approaches. The following diagram demonstrates the spectrum of potential political crises in neighbouring states that all share natural resources and living environments affected by climate change, as well as the critical status of individual states such as Pakistan with regard to stability:

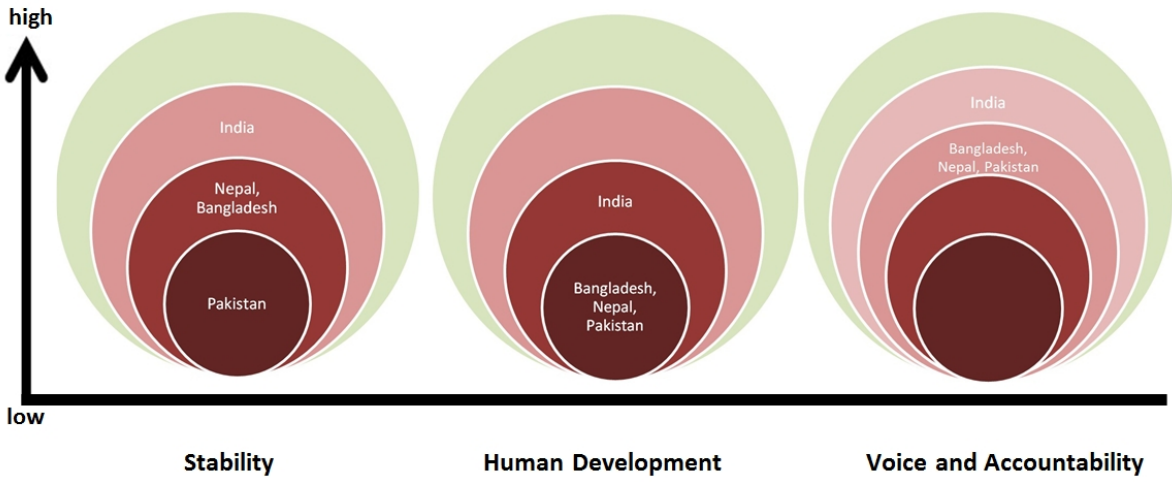

Figure 1: Degrees of State Fragility in South Asia

These deficits in the fields of governance and development can result in a range of violent tensions if they are compounded by environmental and resource degradation, as illustrated by the following examples (cf. Carius et al. 2007 inter alia):

- Kenya: Tensions between the Turkana and other groups of pastoralists: access to water and grazing land is becoming ever scarcer due to an increase in climate-induced droughts and weaker or irregular rainfall. Since 2005 the struggle for land and water has led to numerous violations of borders, theft of livestock and brutal armed attacks and murders.
- Ethiopia: Droughts are causing floods of refugees and worsening resource shortages and conflicts over land between Somalia and Ethiopia, which sparked violent protests between 1986 and 1991.
- Bolivia: Residents of the Andes took to the streets in 2000 to protest against water privatization, resulting in the deployment of the army nationwide and fatalities.
- India: Conflict between the states of Tamil Nadu and Karnataka over access to the River Cauvery. A judgement passed by a court of arbitration failed to resolve the conflict which began in 1974. Failure of monsoons has exacerbated the situation and led to violent demonstrations and fatalities.

- India: Conflict over the Sardar Sarovar Dam in the Narmada River Valley in India, dating back to 1985. The government wants to build the dam for the purpose of irrigation and energy generation. There is concern that it will only benefit large-scale farmers. 150,000 people are resettled and lose both their living environment and their cultural roots. The re-settled populations lose their legal battle and police crush demonstrations.
- Pakistan: Overuse of soil and unfair distribution of renewable resources have resulted in a general shortage of resources. Urban and rural conflicts are creating fertile breeding grounds for organized crime. This situation has led to systematic and collective violence since 1995.
- Central Asia: Allocation conflicts between the upstream and downstream riparians in the Syr Darya Basin (Kazakhstan, Uzbekistan, on the one hand, and mainly Kyrgyzstan, on the other), as well as conflict constellations in the Amu Darya Basin (disputes between Uzbekistan and Turkmenistan, who accuse each other of exceeding their respective water quotas from the Amu Darya, as well as upstream-downstream riparian disputes between Uzbekistan and Turkmenistan, on the one hand, and Tajikistan, on the other).

3.4 Using Adaptation to prevent crises and conflicts

Minimizing the potential threat that climate change poses to social stability requires a "prospective outlook" which anticipates possible climate change-related developments and incorporates them into crisis-prevention strategies. The "threat minimizer" is the counterpart to the threat multiplier. This term was coined by UN Secretary-General Ban Ki-Moon (UNSG 2009) and describes policy approaches which, individually or collaboratively, counteract the potentially security-relevant impacts of climate change and also generate added value for the societies concerned. An improved and more efficient water management system not only helps combat climate-induced shortages, but also fosters social development and boosts economic productivity. These climate change adaptation measures are of vital importance to developing countries. In global terms, most developing countries contribute very little to GHG emissions, yet are often hardest hit by climate change due to their low human development levels, lack of financial resources and geographical location.

In order to promote peace and stability, adaptation measures must be developed in a way that enables the prevention of future climate-induced crises without compromising political stability (cf. Smith/Vivekanda 2009; Carius et al. 2008) The rapid industrialization of Africa, for example, is advocated by a number of experts, such as Paul Collier, as the best way to combat the effects of climate change on the continent (cf. Collier 2010): Industrialization would expand the financial and technological resources that African states need to meet the challenges of climate change. However, if African states develop hydropower into a central source of electricity as is happening in the Horn of Africa, this may lead to an escalation in cross-border conflicts if, for example, it reduces the available water resources for downstream riparians. This can lead to both local and international usage conflicts (cf. Houdret et al. 2009).

The impacts of climate change may also hinder this development strategy if there is a reduction in the amount of available water resources, which is further exacerbated by increasing demand, population growth and accelerated industrialization (cf. Carius et al. 2008). This also has particular implications for the sustainability of hydroelectric power production. Furthermore, these development processes generally also result in a redistribution of resources and spheres of influence in societies, which can lead to social and political friction (Jung et al.

2003). This can also be the case with regard to the distributive effects of climate protection measures in the field of adaptation and beyond: The flow of funds from the Green Climate Fund, which was proposed at the 2009 Copenhagen Summit and is set to channel 100 billion US dollars each year into mitigation and adaptation measures from 2020 onwards, poses great challenges to many countries with weak governance structures, particularly when it comes to preventing misuse of these funds as a result of corruption (Transparency International 2010).

3.5 Interrelations between conflict and adaptation processes

There are a number of different interrelationships between conflict and adaptation:

1. Climate change can spark or exacerbate conflicts. Adaptation strategies, plans or programmes can address potential conflict drivers, such as water and food shortages, extreme weather events and climate-induced migration (in the region of origin/as a result of migration in the receiving region) (see table below and ICI project example in the annex on regional analyses).

Table 1: Possible Adaptation Strategies to Tackle Conflict Drivers

Water	Food	Disasters
• expanding reservoirs • setting up sea and groundwater desalination plants • integrated water resource management	• modernizing irrigation systems • planting drought-resistant crops • developing measures to reduce erosion	• strengthening flood protection infrastructure • creating storm-surge protection zones in high-risk coastal areas • expanding existing emergency plans

2. Following on from point (1), adaptation projects can have a positive impact by fostering cooperation, particularly in conflict-affected areas. When planning adaptation projects, this may even require prioritizing measures in conflict-affected areas (taking into account the considerable prerequisites for implementation) in order to prevent further destabilization and promote sustainable development and peace-building. To this end, it is necessary to create structures that facilitate the development and realization of adaptation measures, similar to National Implementing Entities (NIE) at regional level and ideally within the scope of existing arrangements and organizations.
3. Ultimately, climate adaptation projects may even create or exacerbate tensions and conflict (demonstrated by the example of Uganda below). The preparatory phase of adaptation projects should, therefore, involve a policy impact assessment based on a peace and conflict analysis. This applies both to projects aimed at increasing access to water from transboundary waterways and investment in rural areas in other countries to safeguard food security (also known as land grabbing).

Can adaptation aggravate crises? An example from Uganda

Although the area is not suffering from a basic shortage of water, the distribution of water resources in the Kasese district of western Uganda is a highly contentious issue. This is especially true in mountain areas where access to water is causing conflict between local communities located up and downstream, e.g. between Mahango and Rukoki. Access to water is limited, meaning that women from both communities must travel long distances and then wait for several hours to collect water. In 2006, after the communities had drawn attention to the issue for many years, the local government approved funds to help make water more accessible. However, the implementation of these funds only resulted in new infrastructure in Rukoki, which angered the Mahango community and increased tensions between the two communities. In order to defuse this situation, Saferworld and the local organizations REDROC and CECORE organized consultation meetings between the communities and the local water authority, which looked at issues of land ownership and the location of the taps and designated responsibility for maintaining the pipes.

(Saferworld 2008)

The design and implementation of adaptation measures therefore requires a level of understanding that goes beyond the merely technical dimension. It is important to focus both on the challenges of national climate change adaptation and the possible consequences of these measures for other countries or individual social groups – especially in conflict-prone environments. These concerns have led to calls to develop conflict-sensitive adaptation measures.

3.6 A conflict-sensitive approach to adaptation

A major guiding force in the primarily development-policy focused discussion on conflict sensitivity is the principle of "do no harm" (cf. Brown et al. 2009; Barbolet et al. 2005; OECD 2001). According to this principle, it is possible to aim for varying degrees of conflict sensitivity with regard to policies and practices (cf. Conflict Sensitivity Consortium 2005, inter alia), as demonstrated by the following methods used to achieve a conflict-sensitive approach:

1. Analyze and understand the context of the activity or intervention
2. Understand and anticipate the interplay of the intervention and the context
3. Develop capacities to act on the basis of this understanding in a way that minimizes the negative impacts and maximizes the positive impacts of the intervention.

Conflict-sensitive approaches have much in common with conflict analyses, such as the "Peace and Conflict Impact Assessment" (PCIA) (Spelten 2006). Ideally, prudent policies and measures will not only adopt problem-solving approaches that aim to prevent potential negative impacts, but will also target latent and acute conflicts. The aim of this approach is to anticipate possible conflict dynamics and draw conclusions, which can be incorporated into the development of the programme and project. This also places particular demands on monitoring and assessment.

There is no single tool that simultaneously fits all problem contexts. Instead, there are a range of measures, similar to a menu of options, which can be adapted to the needs of the case at hand (Barbolet et al. 2005). There are already a range of proposals, resources packs and compilations on how to integrate conflict sensitivity into activities (cf. World Bank 2005; Deutsche Welthungerhilfe 2007, inter alia). The most important steps include:

- taking into account crisis prevention and conflict management when developing (e.g. national/sectoral) strategies;
- examining whether the adopted approach has a positive impact on crisis prevention and conflict management and how it can be coordinated with other approaches to enable policy coherence;
- referring to 'problems of' or 'challenges to' conflict-related developments instead of "securitizing" the context;
- creating hypothetical impact analyses of a project/programme on the conflict context, which also account for the individual dialogue structures with partner organizations;
- raising awareness of the conflict dimension of activities among programme/project staff and partners;
- embedding activities in institutional arrangements that safeguard transparency and inclusion in the development and implementation of programmes/projects;
- developing and implementing accompanying measures that result from the consideration of these factors.
- In a discussion on the role of conflict sensitivity in the fight against poverty, the World Bank (2006) also made the following proposals to donors:
- give precedence to participation in the countries affected over the priorities of the donor countries, and
- enhance the harmonization of donor programmes and establish formal coordination mechanisms in order to benefit from comparable approaches and prevent duplicate funding or avoid the creation of conflicting incentives.

In principle, these operational proposals can also be applied to the field of climate change adaptation. Initial discussions on the perspectives of conflict-sensitive adaptation (see, for example, Yanda/Bronkhorst 2011; Vivekanada 2010; Tänzler et al. 2010; Saferworld 2010) and the regional assessments of selected adaptation processes conducted by the authors (see annex) raise various questions on how to implement the concept of a conflict-sensitive approach to adaptation measures.

a) Effectiveness of adaptation measures

To what extent are problem-area-specific tools such as climate adaptation meas¬ures also capable of having a positive impact on peace-building above and beyond the specific problem area (Brown et al. 2009: 11)? This kind of question can, on the one hand, easily overburden the already challenging concept of climate change adaptation with expectations; on the other hand, the introduction of this new policy framework facilitates a more integrative and holistic approach than is currently possible in established policy contexts: "Conflict-sensitivity is, therefore, a holistic, or multidisciplinary, multi-scaled and multi-sectored approach to adaptation," (Yanda/Bronkhorst 2011: 3f.) according to the findings of a seminar on conflict-sensitive adaptation measures held in South Africa in September 2011. A look at the status of adaptation processes in selected regions across the world illustrates that, at national level, there is a deal of awareness of the potential of changes in the natural landscape to aggravate conflict. By contrast, very little attention is given to developments that could lead to conflicts or to a systematic examination of how to integrate different social interest groups into the process of designing and implementing adaptation measures. More detailed information on developments that could lead to conflicts and on the additional benefits of adaptation

measures for peace and sustainable development can help planners and decision-makers address vulnerability to climate change and establish development priorities more effectively and with a long-term perspective.

b) Focus: local – national – transboundary

Which geographical dimension of adaptation is most relevant to the principles of conflict sensitivity? Adaptation programmes and plans are a topic of discussion in both national and local contexts. Actual development and implementation is primarily taking place at local level. The distribution of potentially available programme funding for adaptation measures can create considerable conflicts of interest going beyond a narrow local context if, for example, already marginalized regions are not granted funding based on the assumption that there are insufficient governance capacities to absorb and utilize the funds, among other reasons. An exclusively local and national perspective can present an additional challenge insofar as it may overlook the destabilizing side effects of climate change beyond national borders. In living environments where freshwater resources, fish resources or fertile land are shared across borders, this can trigger violent conflicts.

The challenge here is firstly to improve the knowledge base concerning developments at local level/ in communities and prepare local narratives in a way that makes them accessible to decision-makers, researchers and specialized staff as they implement specific projects. This will make it possible to identify regions that are particularly prone to crises. Part of the task at hand is to recognize particularly vulnerable groups (women, nomads, communities, provinces, countries) and gear adaptation planning towards strengthening their coping capacities – also by additional implementing measures to enhance the management of natural resources (e.g. with regard to land, water or coastal zones). These types of approaches can also be tested within the scope of transboundary regional cooperation in order to account for features of the natural landscape, which are often not confined to national borders.

c) Institutional governance

Beyond the context of the conflict, another question that arises in the field of adaptation concerns how institutions support strategies, programmes and plans in order to coordinate the various initiatives, exchange experiences and promote coherence with other policy fields, such as poverty alleviation, good financial governance or sectoral policies (water, energy etc.). The challenges of multi-level coordination and a vast range of different actors can hinder the ability to identify existing or emerging conflict dynamics, (further) marginalizing those affected. Adaptation strategies that exacerbate inequalities or even create competition between different groups (e.g. following the reorganization of access to natural resources) may fuel conflicts of interest and can also undermine the legitimacy of decision-making processes. Countries like Bangladesh also demonstrate how having an international body as a trustee for adaptation funds (the World Bank) can spark considerable resistance in that country: Bangladesh's government reacted by setting up its own national fund for adaptation (Hedger 2011).

To date, there is at best minimal alignment between national institutions to coordinate and ensure the coherence of measures and to manage the allocation of funds. Efforts by international climate policy-makers to ensure direct access of national implementing entities to the Adaptation Fund can fundamentally enhance the participation and ownership of communities in projects and programmes. The Fund also strives to place a particular focus on vulnerable communities, as is demonstrated by the first disbursement of funding to a proposal in a concept paper from Senegal that clearly illustrated its vulnerability (cf. Harmeling/Kaloga 2010). The Fund is above all relevant to the group of least developing countries, which also includes a large number of fragile states. At the same time, its demanding conditions for

accreditation ultimately exclude groups with insufficient experience of budget management. Furthermore, an examination of various world regions shows that it is not only many national governments that lack the necessary structures to implement adaptation measures when faced, for example, with the task of creating specific strategies on the basis of an analysis of adaptation requirements. At regional level, the issue also rarely features on the agendas of the relevant organizations or networks.

d) International support

All of the aforementioned areas – enhancing the effectiveness of adaptation measures, developing the necessary knowledge capacities and examining the potential conflict dynamics of climate change in the context of fragile or weak states, embedding the discussion on adaptation in institutions at national and regional level and establishing inclusive processes to enhance the participation of affected countries – can benefit considerably from international support. Action can be taken on a large number of different levels. In addition to adopting a climate and conflict-sensitive approach to development cooperation, targeted action at bilateral level can also help build the aforementioned capacities. The cooperative approach of the German federal government's International Climate Initiative links the adaptation requirements of its partner countries at national and often at regional level (India, for example) and supports participatory project development and implementation processes. This provides an opportunity to integrate and enhance guidelines on conflict sensitivity at these levels. These "bottom-up" processes can be supported by "top-down" activities if recommendations/guidelines on conflict-sensitive adaptation measures are introduced by the OECD Development Committee and the boards of initiatives such as the Environment & Security Initiative "EnvSec", which was established by the UNEP, UNDP and other organizations (Central Asia, Caucasus and other regions). The Adaptation Fund Board, established within the scope of the international climate protection process, also offers a potential platform to propose a concept of this kind. At the same time, it is important to complement these activities by developing the necessary capacities to conduct Peace and Conflict Assessments. UN committees, such as the UNEP (with its Post-Conflict and Disaster Management Branch, PCDMB) can provide expert support in this regard. In addition, it is also essential to harmonize the donor programmes and establish formal coordination mechanisms to support adaptation measures in partner countries – not least as this prevents duplicate funding and avoids the creation of conflicting incentives.

3.7 Conceptual Conclusions

From these observations, the following points can be concluded for future conceptual and policy considerations:

- Adaptation processes can have a stabilizing influence on weak or fragile states. In light of this, efforts by these states to create the necessary institutional framework and to develop – conflict-sensitive – adaptation measures should be encouraged, as should the establishment of a regional, cross-border perspective on the consequences of climate change.
- In order to comply with the specifications of conflict-sensitive policy-making, adaptation processes must involve an analysis of the consequences of activities that goes beyond merely understanding the context of the intervention. It is therefore important to build the capacities of partners in the adaptation process in a way that minimizes the negative impacts and maximizes the positive impacts of intervention.

- It is firstly necessary to conduct peace and conflict assessments to analyze the potential consequences of adaptation measures and to develop recommendations on how to design adaptation measures in a conflict-sensitive manner. This is especially important for measures in weak and fragile states, where it is essential to ensure the involvement of marginalized communities that are particularly hard hit by climate change in the planning and implementation of adaptation measures.
- It is also important to place a greater focus on the institutional dimension: How can institutions at regional level be developed and strengthened in a way that makes them repositories of knowledge, enabling them to function as governance and early warning mechanisms for adaptation measures? In this regard, it is necessary to discuss the option of using existing institutions (planning authorities) for reasons of coherence and coordination. Furthermore, it is important to review the possibility of expanding the relevant arrangements at regional level with a focus on specific problem areas.

3.8 Appendix: Regional Analysis

The Annex presents a summary of the analysis of the six regional case studies and gives examples of potential links between climate change, security and adaptation. The following sources served as a basis for analysis:

1. Indices for weak or fragile states (2010/2011, Sources: Funds for Peace, UNDP, Welt Bank)
2. National Policy Documents regarding Climate Change and Adaptation (e.g. National communication to the UNFCCC, NAPAs)
3. Regional strategies, regional cooperation, projects BMU International Climate Initiative

I. Egypt, Algeria, Libya , Morocco, Tunisia

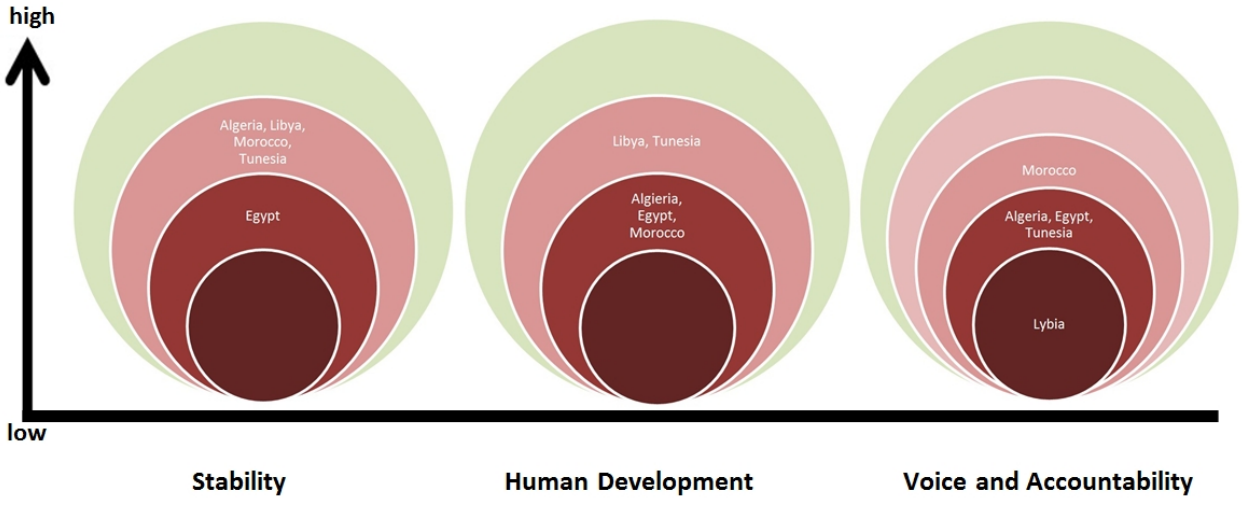

Figure 2: Degrees of State Fragility in North Africa

1. State of Analysis of Adaptation Needs / Progress of Adaptation Policies

Both Egypt and Morocco produced Action Plans on Climate Change, referring to Impacts of Climate Change as well as to adaptation. Egypt, Algeria and Morocco already submitted their second National Communication to the UNFCCC. For Tunisia only the First National

Communication, prepared in 2001, exists so far. Libya has neither prepared a National Communication to the UNFCCC nor any other form of climate strategy.

There are vast differences in the way the four countries address adaptation. The overall progress regarding national Adaptation Policies is furthest developed in Egypt, followed by Morocco and Algeria. The National Communication of Morocco includes a detailed Catalogue of Actions for Capacity Building including budget, measures and projects to be implemented between 2010 and 2024.

2. Consideration of selected climate-induced conflict constellations

The four climate-induced conflict constellations are relevant for the region, whilst the main driver of conflict is water. Especially Egypt and Morocco reflect on potential climate change and security concerns in their approaches to adaptation.

Water: the Region is severely affected by desertification, a high risk of drought and salinization of ground water. Availability of water is constantly decreasing while at the same time the demand for water and measures to exploit water resources reach their limits. National Communications of Egypt and Morocco specifically mention potential conflicts between water users as security threat.

Food: negative impacts of climate change on agriculture due to predicted rise of temperature, water scarcity, desertification, pests/ diseases as well as salinization of fertile soils. Especially Tunisia's and Egypt's agriculture will be threatened by sea level rise. Egypt specifically links negative impact of climate change to agriculture and stability.

Disaster: Sea level rise, increase of frequency and intensity of cyclones and sand storms as risks for North Africa. Particularly threated by sea level rise and flooding as result of cyclones are the Tunisian coast and the Nile delta in Egypt as well as the Benghazi lowlands and the Algerian coastline. In Morocco, river valleys are portrayed as highly vulnerable to climate-induced flooding. Especially in Tunisia and Egypt, flood-prone areas are comparatively densely populated, which poses a high risk.

Migration: Occasional references to climate change and migration in Adaptation Policies/ National Communications. Egypt refers in her SNC to the link, predicting that 6-7 million people are potentially under threat. National Communications of Morocco and Tunisia indirectly refer to climate-induced migration. Overall, it is assumed for North Africa that climate change will push rural to urban migration. Internally displaced persons are marked as a group most vulnerable to climate change.

3. Degree of participation of groups within society

The substantial integration of all groups of society in the further development of adaptation activities is often mentioned as an overall aim, the degree of current participation however remains low.

4. Sub-national and regional approaches to adaptation

There are sub-national approaches to adaptation in Morocco (2007, Community-Based Adaptation - Morocco County Programme Strategy, Programme de développement territorial durable des provinces de Guelmim, Tan Tan, Tata, Assa-Zag et Tarfaya (2010-2013)). The importance of a stronger regional coordination and cooperation in the area of water is stressed for Egypt. Transnational initiatives are among others:

- North African Regional Framework for Action and Cooperation, North Africa office of the United Nations Economic Commission for Africa (UNECA 2011).

- Since 2011: Initiative arabe sur la résilience au climat (UNDP Regional Office) to support Arab countries in coping with the impacts of climate change

II. Kenya und Ethiopia

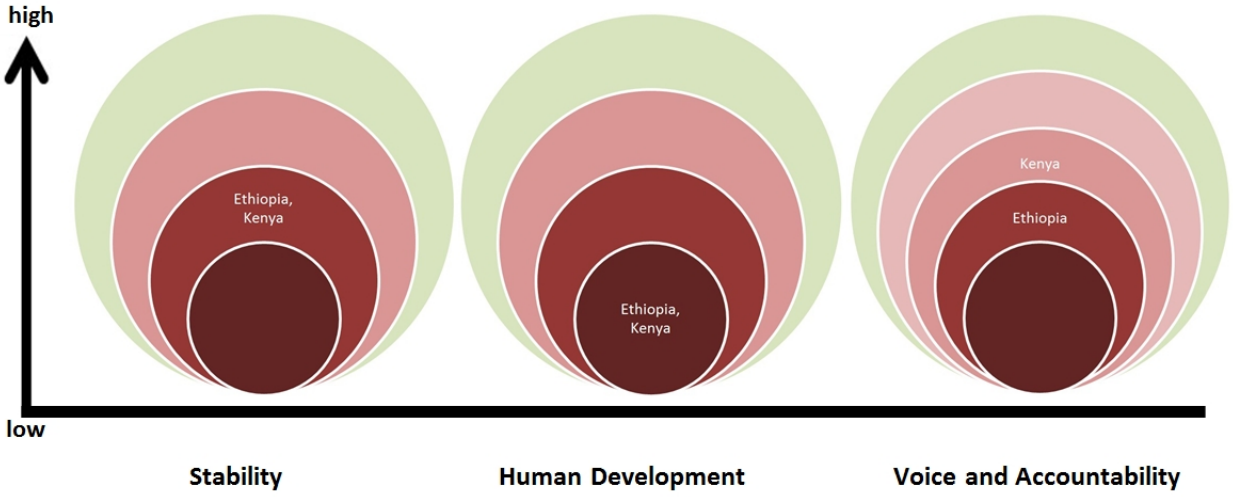

Figure 3: Degrees of State Fragility in East Africa

1. State of Analysis of Adaptation Needs / Progress of Adaptation Policies

Ethiopia and Kenya developed not only National Communications but also Adaptation Strategies (Ethiopia: NAPA 2007, Kenya: National Climate Change Response Strategy (NCCRS) 2010). Furthermore, Ethiopia published National Regional State - Program of Plan on Adaptation to Climate Change in 2010 and 2011for 3 States respectively. The overall objective to mainstream adaptation, however, lacks a legislative framework, financial resources and necessary data.

2. Consideration of selected climate-induced conflict constellations

Of the four climate-induced conflict constellations, water and food insecurity are highlighted in the overall discourse. Ethiopia fears, that climate change will be a ”threat multiplier“ for regional conflicts. Specific references to conflicts are made in all three regional strategies developed by Ethiopia.

Water: Although Ethiopia possesses considerable water resources (”Water tower of East Africa“), access to water is often difficult and unevenly distributed (only 13 percent of rural population has access). Increasing water stress, e.g. at river Awash is feared. Dam construction projects are planned which will also affect neighbouring states. The water stress already existing today is expected to double in intensity until 2025. Increasing rainfall around Lake Victoria has been forecasted.

Food: In Ethiopia variability of the rainy season is expected to increase the pressure on insufficient food production (longer periods of drought are expected). The North East and the South have been identified as most vulnerable. In Kenya, arable land is already scarce (83% of area arid/ semiarid) especially with regards to demographic growth. However, an increase in maize cultivation due to Climate Change is expected.

Disaster: Both Countries expect an increase of extreme weather events like droughts and floods.

Migration: The predicted droughts especially in the Northeast and South will trigger migration (60-70 per cent of Ethiopians could be migrating). At the moment, there are around 300,000 internally displaced persons already. Also in Kenya, climate-induced migration will increase in the future (e.g. in Mombasa due to a rising sea level). Around 200,000 people could be affected.

3. Degree of participation of groups within society

Participation of marginalized groups is firmly underlined by the two governments, e.g. by focusing on the issue of gender equality during planning and implantation.

4. Sub-national and regional approaches to adaptation

On a sub-national level, Ethiopia has developed the National Regional State - Program of Plan on Adaptation to Climate Change. Initiatives to foster regional cooperation in the field of adaptation could not be identified.

5. ICI-Projects:

Ethiopia: "V Adapting to Climate Change by Improving Water Resources Management." Partner: giz, Ministry of Agriculture and Rural Development (MoARD), Addis Ababa. (BMU Grant: 1,.500,000.00 €; Duration: 05/2009 - 04/2012)

Kenya: "Risk management strategies for adaptation to climate change in Kenya", Partner: giz; International Livestock Research Institute (ILRI), Ministry of Agriculture (MoA), Ministry of Environment und Mineral Resources (MEMR), Kenya Rainwater Association, Sustainet, Equity Bank, World Agroforestry Centre (ICRAF), (BMU Grant: 2,250,000 €; Duration: 12/2010 - 02/2014)

III. Bangladesh, India, Nepal, Pakistan

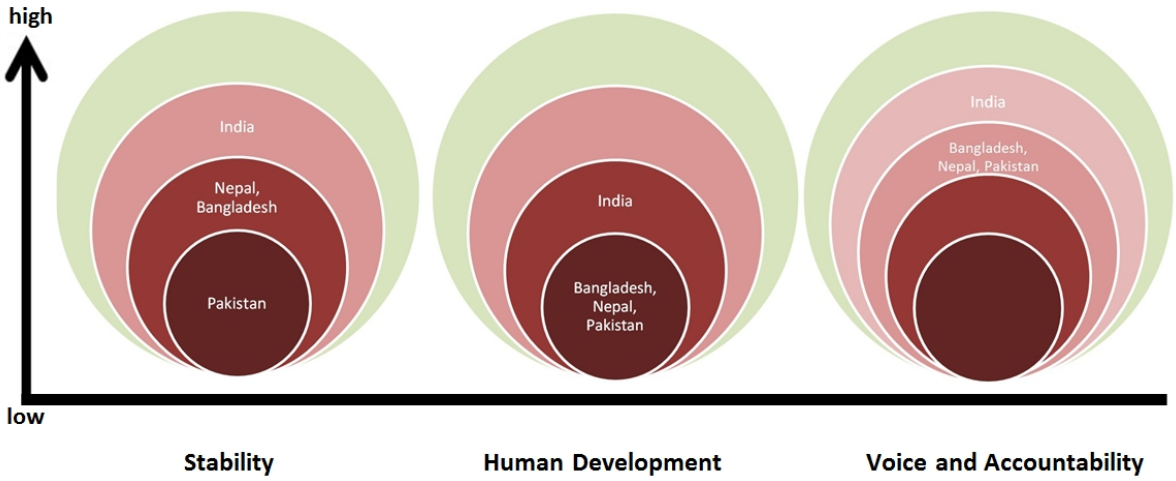

Figure 4: Degrees of State Fragility in South Asia

1. State of Analysis of Adaptation Needs / Progress of Adaptation Policies

All four countries underlined the need for a concise climate and adaptation policy and started developing and implementing adequate policies. Especially Bangladesh and India, took a leading role in adaptation. All Countries prepared their First National Communication and an Adaptation Strategy: Bangladesh and Nepal published their National Adaptation Programmes of Action (NAPAs) in 2005 and 2010. The most important strategy documents of the region next to the two NAPAs are the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009, the National Action Plan on Climate Change (NAPAC) of India developed in 2008, the

Strategic Program for Climate Resilience (SPCR) produced by Nepal, as well as the Nepali Climate Change Policy (CCP) 2011 and the Pakistani National Climate Change Policy (NCCP) 2011.

2. Consideration of selected climate-induced conflict constellations

It is expected, that a progressing climate change will lead to water and food scarcity. Moreover the frequency and intensity of extreme weather events will increase dramatically. Furthermore, sea-level rise and melting glacier will increase the danger of floods. The Bangladeshi and the Nepali NAPA predict resource-related conflicts as a direct result of climate change.

Water: Already, water conflicts exist on all levels of governance evolving around water management issues at the inter-state, intra-state and the grassroots level and between different water users.

Food: Food conflicts are expected as changes in monsoon patterns will have severe impact on the majority of people living in South Asia, whose livelihoods depend on subsistence.

Disaster: The coastlines are highly vulnerable to an increase in the frequency and intensity of tropical storms and an increase in the intensity and frequency of extreme weather events. In Bangladesh, 60 percent of the country is already considered flood prone. Sea-level rise is a particular concern to low-lying coastal belts of India and Bangladesh, where a great share of population is concentrated.

Migration: Due to various factors mentioned above, huge parts of the south Asian population may be forced to adopted migration as a livelihood strategy increasing existing conflicts. The Bangladeshi NAPA announced that up to 20 million people could be forced to migrate, calling for not only a national but an international solution. Reference to seasonal migration can be found in the Nepali NAPA.

3. Degree of participation of groups within society

Participation of marginalized groups is declared important by all countries, e.g. by stressing the importance of gender equality and mainstreaming. NGOs in Bangladesh are almost as active in developing adaptation measures as the government.

4. Sub-national and regional approaches to adaptation

All countries but Pakistan developed initiatives on the sub-national level: Bangladesh summited a CBA Country Programme Strategy on a local level, all 25 Indian states and Union Territories are expected to submit State Action Plans on Climate Change (SAPCCs) to the Indian government (supported by giz), first SAPCCs have already been completed. Nepal started the implementation of local adaptation measures required by the NAPA by executing Local Adaptation Plans of Action (LAPAs).

Transnational Initiatives:

- Thimphu Statement on Climate Change (April 2010), South Asian Association for Regional Cooperation
- Sustainable Policy Initiatives in the Management of Natural Resources in the Hindu Kush Himalayas by the International Centre for Integrated Mountain Development (ICIMOD) (German involvement)

5. ICI-Projects

India: ”Increasing resilience to climate impacts of vulnerable communities and critical ecosystems in the Eastern Himalayas of India“ Partner: Diakonie Katastrophenhilfe, Stuttgart, Navdanya Trust, New Delhi. (BMU grant: 134,000 €; Duration: 12/2008 - 12/2009)

Nepal: ”Improving the Resilience of Vulnerable Population Groups to Climate Change (Nepal)“ Partner: The Mountain Institute (TMI), Humla Conservation and Development Association (BMU grant: 190,406.00 €; Duration: 02/2011 - 01/2014)

IV. Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan

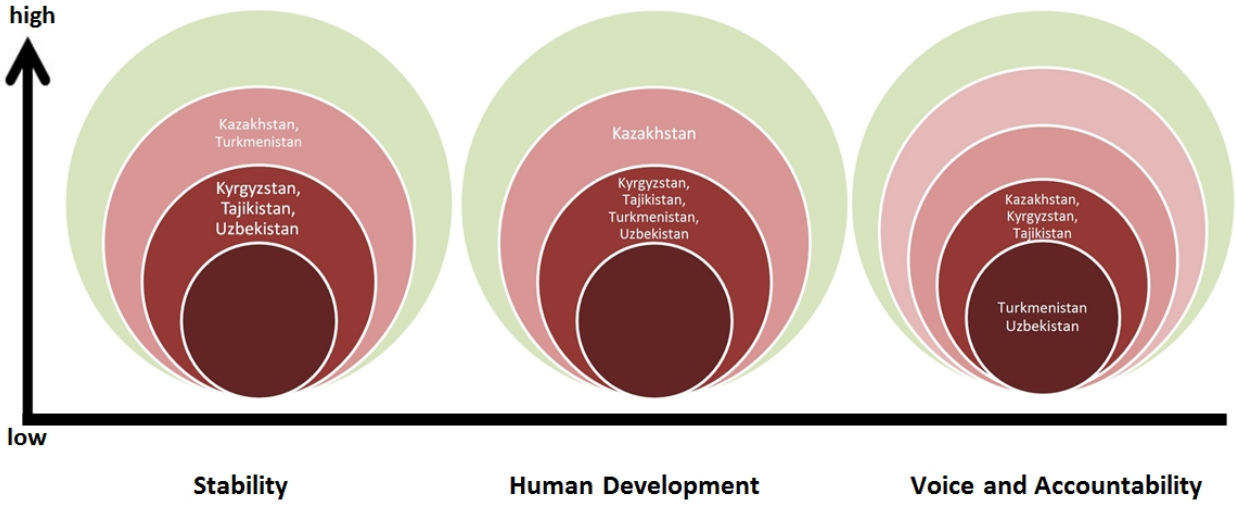

Figure 5: Degrees of State Fragility in Central Asia

1. State of Analysis of Adaptation Needs / Progress of Adaptation Policies

All five countries have submitted two National Communications to the UNFCCC. Independently developed Adaptation Strategies, however, are unknown. Tajikistan and Turkmenistan developed the most comprehensive adaptation policies in the region. Kazakhstan and Kyrgyzstan are currently working on National Adaptation Strategies and Plans.

2. Consideration of selected climate-induced conflict constellations

It is expected, that a progressing climate change will lead to water and food scarcity and economic loss while at the same time worsening the regional and national conflicts. However, specific references to conflict are rarely made, only in policy documents of Kazakhstan.

Water: Water scarcity, substantial temperature rise and an increase in periods of drought have been identified as major problems within the region. There are increasing tensions in Kazakhstan due to glacier melting. Uzbekistan reports increasing tensions between agriculture water users and other groups. All in all many regional studies mention climate-induced water conflicts – especially during and after droughts or floods, particularly on a communal level and between neighbouring countries.

Food: Impacts of climate change are linked to decreasing productivity in the agriculture sector and to food insecurity in all countries. The potential need for an increased import of food has been mentioned by Kazakhstan.

Disaster: All Countries mention a potential increase in storms and floods. An increase of disasters like rock falls, landslides and mud avalanches is predicted for Kazakhstan. For Uzbekistan, the danger of bursting dams has been forecasted. Tajikistan identifies melting

glaciers as posing a high risks for flooding. In Turkmenistan, vulnerability to sea-level rise is discussed.

Migration: Kazakhstan and Kyrgyzstan fear that climate change will impact the already fragile rural economy, which depends largely on harvest yields. This could lead to an increase of rural-urban migration. Kyrgyzstan already accounts for a high number of internal displaced persons due to climate-induced risks to mud slides and landslides. In Kazakhstan, increasing desertification could trigger migration.

3. Degree of participation of groups within society

National Communications of all countries examine participation of local and regional stakeholders presenting various interests within the field of adaptation. Kazakhstan and Uzbekistan aims at fostering participation through education and awareness.

4. Sub-national and regional approaches to adaptation

Individual subnational adaptation strategies remain unknown. However, the UNDP initiated the Kazakhstan Community Based Adaptation Country Programme Strategy in 2008. The ”Regional Environmental Centre for Central Asia“ (CAREC) exemplifies a transnational approaches to adaptation to climate change and is active in all countries. The OSCE conducted a scenario-workshop on climate change and security in Central Asia in 2011. Moreover, a number of projects involving German partners are currently being implemented (e.g. on transboundary water management in Central Asia).

5. ICI-Projects

Kazakhstan: “Protecting Health from Climate Change“ Partner: World Health Organization (WHO), Regional Office for Europe, Copenhagen, Denmark, Kazakhstan Scientific Centre of Quarantine and Zoonotic Infections, Republican Sanitary and Epidemiology Station Kazakhstan, Ministry of Environment Protection (BMU grant: 1,009,744.00 €; Duration: 12/2008 - 08/2012).

Kyrgyzstan: “Protecting Health from Climate Change“ Partner: World Health Organization (WHO), Regional Office for Europe, Copenhagen, Denmark, Agency for Environment and Forestry of Kyrgyzstan, Institute for Preventive Medicine, Centre for Health, The Village Health Committees network (BMU grant: 1,004,443.00 €; Duration: 12/2008 - 12/2011)

Tadzhikistan: ““Protecting Health from Climate Change“ Partner: : World Health Organization (WHO), Regional Office for Europe, Copenhagen, Denmark, Ministry of Health, Ministry of Agriculture and Environmental Protection, State Committee of Emergency Situation Control (BMU grant: 1,057,642.00 €; Duration: 12/2008 - 08/2012).

Uzbekistan: “Protecting Health from Climate Change“ Partner: World Health Organization (WHO), Regional Office for Europe, Copenhagen, Denmark, Ministry of Health, State Committee for Nature Protection, Hydromet Ministry of Health of Republic of Karakalpakstan (BMU grant: 998,679.00 €; Duration: 12/2008 - 12/2011)

V. Armenia, Azerbaijan, Georgia

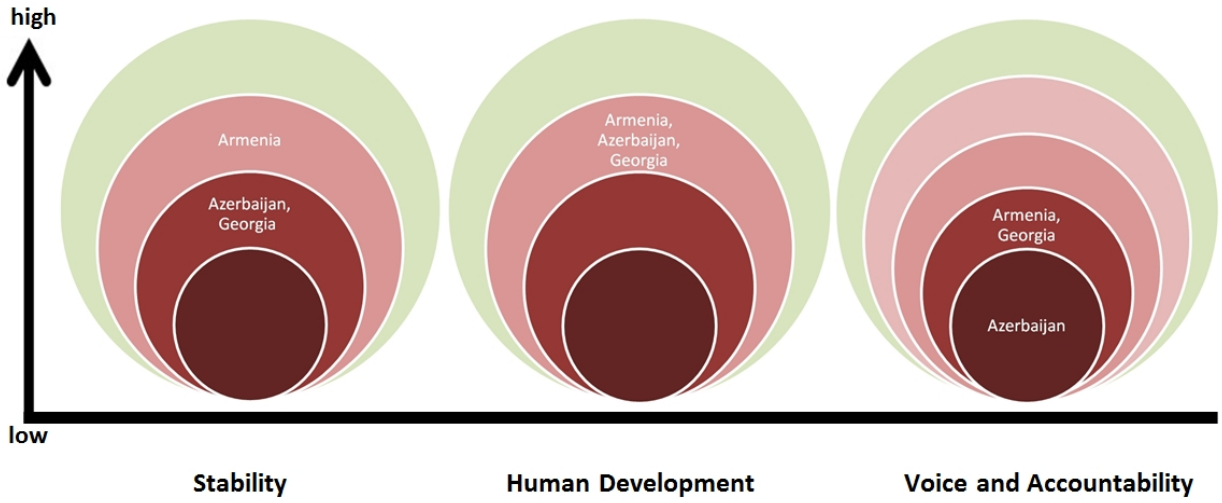

Figure 6: Degrees of State Fragility in the South Caucasus

1. State of Analysis of Adaptation Needs / Progress of Adaptation Policies

The need to adapt to Climate Change has been acknowledged by all three countries particularly with regard to water resources, agriculture and ecosystems. However, fully developed adaptation approaches are still rather limited. Currently, no specific adaptation strategies have been published in the region, but two National Communications per country have been submitted to UNFCCC. Only Azerbaijan developed basic approaches to an independent adaptation strategy so far. Environmental Strategies, which raise the issue of adaptation, were developed in Armenia and Georgia.

2. Consideration of selected climate-induced conflict constellations

Degradation of Water Resources as well as a decline in food production and an increase in storms and floods play an important role. Migration as induced by climate change is only mentioned for Georgia. Whilst security aspects of climate change in the South Caucasus are being acknowledged in a number of publications focusing on water and food security, the national communications fail to discuss the issue.

Water: Water scarcity and drought pose problems for different areas within the whole region. Conflicts between water user groups in Azerbaijan and Georgia due to increasing water scarcity- also transnational- could get worse due to climate change.

Food: All three countries mention the climate change-food nexus fearing a negative impact of climate change on agricultural productivity. Droughts and desertification have been identified as problems in all three countries. Regional studies see Georgia, and especially the Kakheti Region, as particularly vulnerable to water stress, recognizing the danger of water scarcity for the irrigation agriculture and the associated risk of conflict between water user groups.

Disaster: The focal points of concern are hydro-meteorological disasters in mountain areas and coastal zones- especially floods and mud- and rock-slides in the mountains.

Migration: Georgia is the only country recognizing the link between climate change and migration. Already during the last 15-20 years, extreme weather events (especially heavy rain events) could be observed, being one of the main reasons for increasing migration especially to Dedoplistskaro and Lentekhi. Along the Black Sea Coast (in particular Adlia), flooding and

coastal erosion are drivers for migration. Publications acknowledge the link between climate change and migration in Azerbaijan - however it is not been mentioned in Azerbaijan's last National Communication.

3. Degree of participation of groups within society

All countries underline the need for participation within the adaption process. However especially in Azerbaijan, participation does not play a major role in existing approaches - or in other policy areas. In general, the highly centralized political system allows very little participation. In Georgia though, stakeholder and local actors are involved in decision-making processes.

4. Sub-national and regional approaches to adaptation

Subnational approaches to adaptation are unknown. However, there are a number of regional adaptation projects, funded by various international Donors.

5. ICI-Projects

Georgia: "Climate-Tolerant Restoration of Degraded Bioregions" Partner: GIZ, Georgian Ministry of Environment Protection and Natural Resources, Tiflis (BMU-grant: 1,680,999.11 €; Duration: 11/2008 - 10/2011)

VI. Bolivia, Ecuador, Columbia, Peru

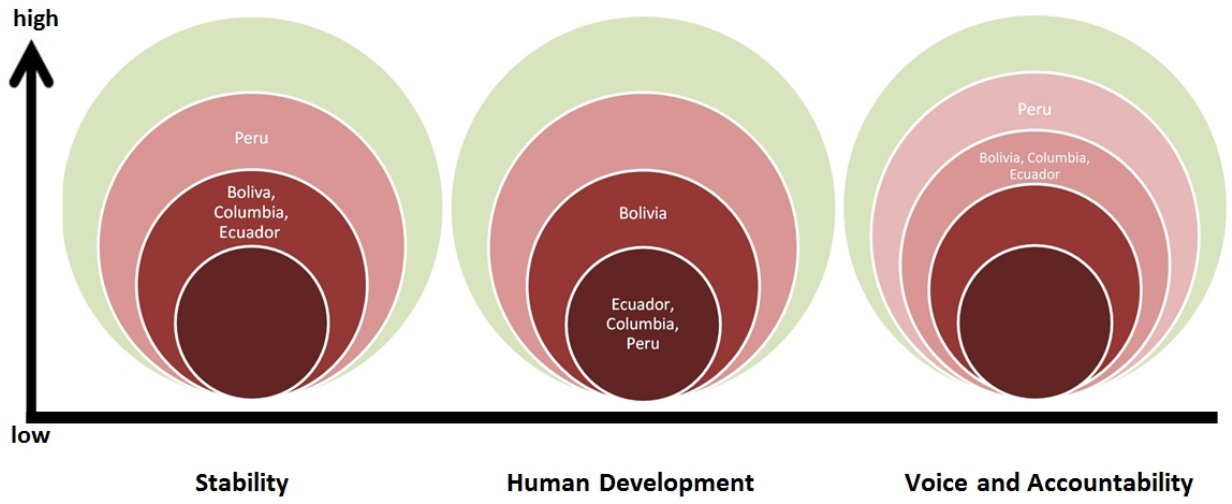

Figure 7: Degrees of State Fragility in the Andean Region

1. State of Analysis of Adaptation Needs / Progress of Adaptation Policies

All countries but Ecuador submitted two National Communication, designating adaptation needs. Bolivia (2007) and Colombia (2008) already presented Adaptation Plans. Ecuador and Peru announced Adaptation Policies for 2012 in addition to the already existing adaptation programs and projects currently being implemented.

2. Consideration of selected climate-induced conflict constellations

The need to protect ecosystems as main adaptation goal has been identified in the Andean Region with a stronger emphasis than anywhere else. Beyond that, risks for water and food security have been highlighted. In Bolivia, vulnerability assessments were carried out on national and local level. Strategies for rural development underlined the negative impacts of climate change.

Water: Questions of sustainable usage of water resources and management are raised especially in Bolivia and Peru. The retreats of both the Condoriri and the Tuni Glacier until 2045 and 2050 respectively pose a danger to water security leading to water scarcity especially in arid and semiarid regions. Increasing precipitation is, however, forecasted for the lowlands. Similar tendencies are mentioned in the National Communication of Peru.

Food: Food security and the negative impacts of climate change on agriculture are portrayed in various degrees of detail for the different countries. The government of Ecuador expects the rice yields to drop up to 60 per cent and the potato yields up to 43 per cent due to climate change until 2030. The Colombian Government assumes that 23 per cent of arable land is threatened by sea-level rise.

Disaster: The Colombian Government observed an increased frequency and intensity of floods. Between 2000 and 2010, the historic flood mark of all major rivers has been exceeded. Also Peru states an increase in El Niño and consequently an increase in frequency of flooding.

Migration: Neither of the countries governments mentions the climate change-migration nexus. Migration already takes place due to internal conflict, e.g. in Colombia.

3. Degree of participation of groups within society

All countries underline the need and importance for participation within the adaption process. Stakeholders are actively integrated into the planning process and implementation of activities. Bolivia highlights the importance of environmental education and access to information as well as the inclusion of indigenous knowledge into planning.

4. Sub-national and regional approaches to adaptation

The GIZ is currently implementing some programmes in all four countries. In the time period 2010-2013, a project on training in the agricultural and water sector and disaster prevention is being implemented in Bolivia, Colombia, Ecuador and Peru. Moreover, a programme on food security in Bolivia, Colombia, Ecuador and Peru has been started in 2011, running until 2017.

5. ICI-Projects

Peru: “Adapting public investment to climate change in Peru” Partner: GIZ, Ministry of Economy and Finance, Ministry of Environment, two Regional Governments (BMU-grant: 3,000,000 €, Duration: 11/2011 - 10/2014)

Peru: “Insuring Agricultural Microloans for Adaptation to Climate Chang “ Partner: GIZ, (BMU-grant: 2,000,000 €; Duration: 11/2010 - 10/2013)

3.9 References

Aliow, Mohamed 2010: Understanding the Context with Sensitivity: Through Our Processes and Actions. Kenya Conflict Sensitivity Consortium.

Barbolet, Adam, Rachel Goldwyn, Hesta Groenewald und Andrew Sherriff 2005: The utility and dilemmas of conflict sensitivity. Berghof Research Center for Constructive Conflict Management.
http://www.berghof-handbook.net/documents/publications/dialogue4_barbolet_etal.pdf

BMZ 2007: Klimakonzept konkret. Aktionsprogramm “Klima und Entwicklung”. Bonn/Berlin: Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung.

Brown, Oli, Anne Hammill und Robert McLeman 2007: Climate change as the ‘new’ security threat: implications for Africa. In: International Affairs 83(6), 1141-1154.

Brown, Oli und Alec Crawford 2009: Rising Temperatures, Rising Tensions. Climate change and the risk of violent conflict in the Middle East. Winnipeg: IISD.

Brown, Sarah, Rachel Goldwyn, Hesta Groenewald und Joan McGregor 2009: Conflict Sensitivity Consortium Benchmarking Paper. http://www.conflictsensitivity.org/sites/default/files/CSA%20Benchmarking%20paper-full.pdf

Brzoska, Michael 2008: Der konfliktträchtige Klimawandel – ein Sicherheitsproblem? In: Andreas Heinemann-Grüder, Jochen Hippler, Markus Weingardt, Reinhard Mutz und Bruno Schoch (Hrsg.) 2008: Friedensgutachten 2008. Münster: LIT, pp. 195-206.

Buhaug, Halvard, Nils Petter Gleditsch and Ole Magnus Theisen, 2008: Implications of Climate Change for Armed Conflict. Washington, DC: World Bank.

Carius, Alexander, Dennis Tänzler und Achim Maas 2008: Klimawandel und Sicherheit - Herausforderungen für die deutsche Entwicklungszusammenarbeit. Eschborn: Gesellschaft für technische Zusammenarbeit (gtz).

Conservation Development Centre, International Institute for Sustainable Development und Saferworld 2009: Climate change and conflict: Lessons from community conservancies in northern Kenya.

CNA 2007: National Security and the Threat of Climate Change. Available at http://securityandclimate.cna.org/ (30 July 2007).

Collier, Paul 2010: The Plundered Planet. How to Reconcile Prosperity and Nature. London: Penguin.

Collier, Paul 2008: The Bottom Billion: Why the Poorest Countries are Failing and What Can be Done About it. Oxford und New York: Oxford University Press.

Conflict Sensitivity Consortium 2005: Conflict-Sensitive Approaches to Development, Humanitarian Assistance and Peacebuilding: Resource pack.

Deutsche Welthungerhilfe 2007: Conflict-Sensitive Approach in Overseas Co-operation. Orientation Framework. Bonn: Deutsche Welthungerhilfe e.V.: http://www.welthungerhilfe.de/fileadmin/media/pdf/Fachkonzepte/Orientierungsrahmen_konfliktsensibles__Handeln_en.pdf

Dyer, Gwynne 2008: Climate Wars, Toronto: Random House Canada.

Gleditsch, Nils Petter und Ragnhild Nordås 2009: Climate Change and Conflict. A Critical Overview. In: Die Friedenswarte 84:2.

Harmeling, Sven und Kaloga, Alpha Oumar 2010: Bestandsaufnahme des Adaptation Fund, In: E+Z, 2010/09, 324-326.

Hedger, Merylyn 2011: Climate Finance in Bangladesh: Lessons for Development Cooperation and Climate Finance at National Level. Bonn: EDC 2020.

Houdret, Annabelle, Annika Kramer und Alexander Carius 2009: Water and Security. Challenges and Opportunities for Development Cooperation. Eschborn: German Technical Cooperation, Sector Programme “International Water Policy and Infrastructure“. Eschborn: GTZ.

Jung, Dietrich, Klaus Schlichte und Jens Siegelberg 2003: Kriege in der Weltgesellschaft. Strukturgeschichtliche Erklärung kriegerischer Gewalt (1945-2002). Wiesbaden: VS Verlag.

OECD 2001: The DAC Guidelines: Helping Prevent Violent Conflict. Paris: OECD.

Saferworld 2008: Conflict-sensitive Development. Briefing. London: Saferworld. http://www.peacecenter.sciences-po.fr/pdf/French_cycle/Sem_7/Sem_7_Safeworld.pdf

Saferworld 2010: Climate change and conflict. A framework for analysis and action.Working Paper. London: Saferworld.

Schneckener, Ulrich 2007: Rankings und Indizes: Welche Staaten gelten als fragil? Berlin: Stiftung Wissenschaft und Politik.

Schneckener, Ulrich (Hrsg.) 2004: States at Risk. Fragile Staatlichkeit als Sicherheits- und Entwicklungsproblem. Berlin: Stiftung Wissenschaft und Politik.

Smith, Dan und Janani Vivekananda 2007: A Climate of Conflict. The links between climate change, peace and war. London: International Alert.

Smith, Dan und Janani Vivekananda 2009: Climate Change, Conflict and Fragility. Understanding the linkages, shaping effective responses. London: International Alert.

Spelten, Angelika 2006: Kurzeinführung: Peace and Conflict Impact Assessment. Frient Leitfaden. Bonn: Gruppe Friedensentwicklung (FriEnt).

Tänzler, Dennis, Achim Maas und Alexander Carius 2010: Climate change adaptation and peace. In: Wiley Interdisciplinary Reviews Climate Change, DOI:10.1002/wcc.66.

Tänzler, Dennis, Alexander Carius und Achim Maas 2008: Assessing the susceptibility of societies to droughts: a political science perspective. In: Regional Environmental Change, Vol. 8, No. 4 (Dezember 2008), 161-172.

Transparency International 2011: Global Corruption Report. Climate Change. London, Washington, D.C.: Earthscan.

UNSG 2009: Climate Change and its Possible Security Implications. Report by the Un Secretary General. New York

Vivekananda, Janani 2010: Climate Change, Governance and Fragility: Rethinking Adaptation. Lessons from Nepal.Initiative for Peacebuilding Democratisation and Transitional Justice Cluster. London: International Alert.

World Bank 2005: Toward a Conflict-Sensitive Poverty Reduction Strategy. Lessons from a Retrospective Analysis. Washington DC: World Bank.

WBGU 2007: Welt im Wandel. Sicherheitsrisiko Klimawandel. Berlin: Springer.

Welzer, Harald 2008: Klimakriege. Wofür im 21. Jahrhundert getötet wird. Berlin: Fischer.

Yanda, Pius und Salomé Bronkhorst 2011: Climate change and conflict. Conflict-sensitive climate change adaptation in Africa. Policy & Practice Brief 14 ISSUE # 014 November 2011.

4 Adaptation to Climate Change for Peace and Stability

Towards a Regional Roadmap for Central Asia

4.1 Executive Summary

Climate change will negatively affect human security and development across the world. This may lead to political instability – especially in fragile areas. Adaptation can be a "threat minimizer" according to an analysis by the UN General Secretary. The Federal Environmental Agency tasked adelphi to analyse the interlinkages of climate change, adaptation, peace and stability in different regions severly affected by climate change. By analysing the role of adaptation in preventing climate-induced risks, this project also is to support the political discussions at the EU, UN and OSCE level.

In order to analyze current adaptation strategies and needs in the respective countries, a desk study was conducted, analyzing existing national policies and strategies, reports, documents and other relevant data as well as current and completed adaptation measures, organisations and initiatives. The entry points identified and the initiatives proposed were then verified by interviews and consultations with relevant experts at regional, national and local level.

In the following, we suggest a regional perspective on adaptation in Central Asia including the countries Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. Our review of climate science shows that the challenges of climate change, water security and political stability cannot be addressed independently. In the face of common regional vulnerabilities, countries should cooperate in developing responses to climate impacts. To this end, adaptation interventions need to be carefully designed not to provoke or exacerbate local tensions. In addition, tensions within societies ask for a better understanding as a way to help resolve them and prevent renewed violence. This can also help to decrease potential tensions over changing water regimes in the future.

Against the backdrop of the national and regional vulnerabilities, regional approaches and their limitations in Central Asia are discussed and steps outlined how to address the looming energy, food and water crises in Central Asia – aggravated by climate change - in a cooperative way.

In order to promote a regional perspective on adaptation as means of peace and stability we suggest the following initiative as promising starting points:

- Sustaining the impact of the Chu-Talas River Basin Commission and transferring successful cooperation experiences to other transboundary watersheds by supporting permanent bilateral and multilateral structures
- Supporting technical cooperation in the Syr Darya basin on hydro-meteorological stations and posts as well as information systems in order to improve a (scientific) data basis that is commonly trusted by the riparian countries
- Revitalising and climate proofing water cooperation in the Ferghana valley, focussing on climate change and fragility hotspots
- Promoting ecosystem-based adaptation in the Aydar-Arnasay Lakes system in the context of existing protected areas.

These approaches can prove how pro-peace adaptation processes can work in practice and contribute to a regional identity of facing and addressing climate change challenges. In this way they can serve as a starting point for a more comprehensive regional adaptation strategy.

4.2 Climate Change, Peace and Stability

As Central Asia is warming faster than the global average, climate change will hit the region sooner and harder than other areas. If action is delayed, climate change impacts will converge with resource exhaustion and growing regional and global demands for water, food and energy. Given the high poverty levels and poor response capacities, the people and governments of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan are vulnerable to the impact of these changes (UNDP 2009). Social and political structures can become fragile, and events such as severe drought and other natural disasters can catalyse tension and crisis.

4.2.1 Climate Change Related Risks

Although uncertainty remains, current trends suggest that Central Asia will continue to experience an increase in temperatures, more variable precipitation patterns, continued melting of glaciers and permafrost, and likely greater risk of extreme weather events such as floods and droughts (Genina et al. 2011: 21). Global Circulation Models suggest that Central Asia will experience an increase in mean annual temperatures of between 2.6 and 5.2 °C, with a median projection of 3.7 °C, by the period 2080-2099 (Christensen et al 2007: 883). Precipitation levels from December to February are projected to experience a median increase of four percent, rainfall from June to August could decline by a median amount of 13 percent (ibid: 887).

Major vulnerabilities arise in the **water sector**, due to changes in rainfall patterns, changes in inter-annual distribution of river flows and the reduction in lake levels. A decline in precipitation and rising temperatures will lead to a significant reduction in river flows in the long run (SNC Tajikistan 2008). Turkmenistan expects a decline by 5-15 percent in the case of the Amu Darya (SNC Turkmenistan 2010: 45). Uzbekistan assesses the Amu Darya and small rivers of the region to be most vulnerable to climate change. In Kyrgyzstan the predicted increased aridity and evapotranspiration in the region are expected to lead to increased irrigation requirements, which would have severe implications in the Amu Darya. (UNECE 2011) Turkmenistan's Second National Communication states, that the average Caspian Sea level is projected to rise by 9-88cm by 2100 with a maximum rise of 5 m (SNC Turkmenistan 2010: 64).

The countries of Central Asia are facing the climate-induced risk of greater water scarcity. Should temperatures increase by 2 to 4 °C, studies suggest that the number of people in the region experiencing water stress could increase by up to 137 million (IFAD 2009). As reflected in the concerns expressed by Central Asian governments regarding the vulnerability of their **agriculture** sectors to climate change, the risk of greater water scarcity is a concern for many countries. The higher temperatures and greater aridity resulting from climate change will likely translate into reduced food production as less water will be available for irrigation. The root causes of irrigable land degradation are secondary salinization and desertification; climate change will intensify these processes. (Turkmenistan's National Climate Change Strategy 2012: 12). Climate related reduction of agricultural productivity and food security are issues in all five countries. Kazakhstan, for instance, anticipates a productivity reduction in agriculture of 60-90 percent in some of its regions, and lists food imports as one potential adaptation measure (SNC Kazakhstan 2009: 101). Turkmenistan, too, in its Second National Communication, highlights the links between climate and food security. Increasing water demand and changing growing seasons are expected to lead to a reduction in the productivity of both, the agricultural and processing industries' (SNC Turkmenistan 2010). According to studies in Uzbekistan, climate

change exacerbates existing vulnerabilities of the food sector as a result of natural hazards such as drought. At the same time, climate change will most likely extend the vegetation period in the northern regions (SNC Uzbekistan 2008).

Natural hazards could increase due to climate change. All countries expect an increase in storms and floods. While extreme weather events such as droughts, floods and heavy rains will exacerbate the adverse impact of climate change on agriculture, water, health, forestry and biodiversity, national governments have also identified as a further cause for concern. Many countries in the region are already vulnerable to extreme weather events; for example, more than 95 percent of settlements in Kyrgyzstan are located near water bodies, primarily along riverbeds that are susceptible to landslides, mudflows and floods, which are anticipated to increase with the impacts of climate change (SNC Kyrgyzstan 2009: 144). Uzbekistan expects an increase in mudflows and floods for its rivers of up to 24 percent by 2050 (SNC Uzbekistan 2008: 12). The Kazakh Second National Communication also projects a climate related increase in natural hazards like mudflows, landslides and floods. Communities that are situated on riverbeds in the mountains are identified as especially vulnerable (SNC Kazakhstan 2009). Uzbekistan points at the specific danger regarding river plain floods and low river terraces, with potential bank destruction, stream-way deformation, mudflow mass deposit, block appearance and increase of the flood level (SNC Uzbekistan 2008: 100).

Tajikistan identifies accelerating **melting glaciers** as a growing risk for floods, especially in densely populated valleys (SNC Tajikistan: 46). In the long-term (i.e. over the next 20 years), the decline in glacier volumes in the region is predicted to reduce the flow of the Amu-Darya River and certain tributaries of the Syr-Darya and Zarafshan Rivers by 25-30 percent. Reductions will be particularly severe in hot, dry years when it is predicted that there will be up to a 70 percent reduction in river flows. (UNDP 2010: CA-CRM Project Document: 5) According to Kyrgyzstan's Second National Communication, the reduction of glaciation area between 2000 and 2100 is projected at 64 percent up to 95 percent, depending on the accepted variant of climatic scenario. This will lead to an increase in river flows by 2025, followed by a reduction, also affecting the size of reservoirs (SNC Kyrgyzstan 2008: 126, 129). Climate change impacts on the water sector will also affect the energy supply of Central Asia, where hydropower production meets 27.3 percent of the energy needs (Granit et al. 2012: 20).

4.2.2 Climate Change as a Driver of Crises, Tensions and Conflicts

Central Asia consists of newly independent states (re-)emerging after the fall of the former Soviet Union. The aftermath of the fall was riddled with both conflicts between the states as well as civil war e.g. in the 1990s in Tajikistan, whose legacies continue to this day. In Central Asia, inter- and intra-state disputes over access to resources and tensions between governments and opposition continue to exist (Giese/Sehring 2006; HIIK 2008). The states are still in the process of consolidation and have experienced repeated political crises over the past years, including post-election tensions in Kyrgystan and violent extremism (see Wittich/Maas 2009; WBGU 2007). One example of fragility can be seen in Kyrgyzstan, where problems in the energy sector combined with rising food and energy prices were one important factor in the popular protests that led to the ousting of former president Bakiyev in 2010 (Kraak 2011).

Central Asia is considered geo-strategically important due to its role as both source and transit corridor for fossil fuels. The close proximity of global conflict hot spots in Afghanistan and the Middle East contribute to the overall sensitivity of the region (Maas/Tänzler 2009). Central Asia's border regions will also be severely affected by climate change. This includes in particular Afghanistan, which is currently highly unstable and may in addition also face

negative impacts of climate change (see Carius et al. 2009). China's territory bordering Central Asia has faced instability and local conflicts, which may become aggravated if neighbouring countries destabilise (WBGU 2007: 143, cf. Haas 2007).

The water-energy-nexus

Climate related risks can have implications on peace and stability as they are potential drivers for national and inter-state tensions and conflicts. Water is a major topic when discussing climate change and regional stability in Central Asia. Many of Central Asia's water resources traverse political borders, establishing a direct link between changes in hydrological regimes, water availability and regional security (IISD 2011: 21). In the face of increasing water scarcity in the region it can be expected that climate change could act as "threat multiplier". Water is one of the conflict factors in inter-state conflicts in Central Asia and is a matter of national security. The contested links between water, energy, agriculture and political independence have been described as the water-energy-agriculture nexus (CAREC 2009: 9, Bichsel 2011: 25, Granit et al. 2010).

During Soviet times an integrated system and infrastructure for the management of shared water and energy resources between the Central Asian states was created. Huge reservoirs with hydro-electrical power plants were built in the upstream countries of Kyrgyzstan and Tajikistan. They stored water for the downstream countries of Kazakhstan, Turkmenistan and Uzbekistan, which in turn developed immense irrigation systems for the production of cotton. To compensate Kyrgyzstan and Tajikistan for not using water for hydropower during winter, the resource rich downstream countries provided fossil fuels. With the end of the Soviet Union this system of resource sharing broke down (EnvSec 2005; World Bank 2004).

Today two groups of countries with different economic and development priorities and different challenges exist. On the one side are Kazakhstan, Turkmenistan and Uzbekistan with large fossil fuel and mineral reserves and still sizable agricultural sectors that are dependent on the upstream countries for their water supply. On the other side are Tajikistan and Kyrgyzstan, which are striving to develop their untapped hydropower potential.

Kyrgyzstan, the most upstream country of the Syr Darya River, is now heavily dependent on neighbouring countries for its energy supply and is demanding the possibility to explore the hydropower potential within its borders. Uzbekistan, lying downstream from Kyrgyzstan but upstream from Tajikistan, has access to cheaper energy production with its own fossil fuel but depends on Kyrgyzstan to release water at the right time to irrigate its cotton fields. Kazakhstan, the most downstream country, which receives a reduced quantity of water at lowered quality, has pressured the upper riparian states to increase quantity and improve quality. Uzbekistan also claims ownership over pieces of land along the Uzbek-Tajik border, where a majority of the inhabitants are Uzbeks. The Uzbek-Tajik border conflict however is only one of many border disputes within Central Asia. Even if there are legal agreements in place for the sharing of waters between the states, these agreements are not fully kept (Björklund, 2005, Libert, 2008, Granit et al. 2010).

Tajikistan is facing an energy crisis that could have further destabilising effects. Tajikistan is almost 100 percent reliant on hydropower for its electricity generation (ADB 2009). The extent of the energy crisis became evident in 2008 when an extremely cold winter led to a breakdown of Tajikistan's power sector while at the same time damaging winter crops and livestock. With global food prices peaking in 2008, these effects combined into a compound crisis characterised by both energy and food insecurity, especially affecting vulnerable population groups (Granit et al. 2010).

There are examples in which the conflict around water-energy-agriculture has led to small-scale violence and economic hardship, as in the case of Uzbekistan and Tajikistan. For example, the plans and actions of the Tajik government to build the giant 3.6 billion KWh Rogun dam (which was already planned during Soviet times) has led to a deterioration in relations with Uzbekistan. Uzbekistan has used the closing of vital border check points as well as export stops of natural gas and electricity to underline its opposition to the project (adelphi 2012 (unpublished)).

The example of Kyrgyzstan, too, shows strong interdependencies that might be negatively affected by climate change. 20-25 percent of river flow is used for domestic water consumption while the rest of river flow goes to the territories of neighbouring states: Uzbekistan, Kazakhstan, Tajikistan and China (SNC Kyrgyzstan 2009: 39). A significant reduction in flows will most likely aggravate already existing interstate tensions regarding access to and the use of cross-border water resources, putting additional pressure on the already defunct management institutions (adelphi 2012 (unpublished)).

Climate, peace and stability – all countries studied reference the interconnectedness of these issues in their UNFCCC communications:

Uzbekistan, considering the increasing water demand for irrigation, is expecting that utilization of more than 40 percent of all renewable fresh water sources for irrigation causes tensions between agriculture and other users (SNC Uzbekistan 2008: 72).

In **Kazakhstan** water dependency on neighbours, food security and migration are discussed as the main security implications of climate change. [...] Tensions may arise for Kazakhstan in the mid-term due to melting glaciers and the resulting water flow that will increase in the next years and then decrease dramatically, for example in the area of the lake Balhash (SNC Kazakhstan 2009: 115). “Food security in the light of climate change is an increasingly important and priority policy question for Kazakhstan. [...] Consecutive years of poor harvests may have the potential to lead to food insecurity, while yield variability can destabilize the rural economy, which is already facing significant urban migration.” Kazakhstan highlights that growing desertification exacerbates existing migration trends (SCN Kazakhstan 2009, Kazakhstan CBA CPS 2008: 5).

Kazakhstan and **Kyrgyzstan** are expecting that climate change will affect harvest variability and will have destabilizing effects on the weak rural economy which is already driving migration into urban areas (SCN Kazakhstan 2009, SNC Kyrgyzstan 2008).

The risk of food security-related conflicts within **Kyrgyzstan** is rather low as, for example, the grain production is expected to meet demand (FNC Kyrgyzstan 2003). However, more recent projections for the productivity of the major agricultural products (grain, melons, wine and potatoes) differ significantly between regions. For Chui and Batken, productivity trends are negative (SNC Kyrgyzstan 2008).

In its Second National Communication, **Tajikistan** refers to a climate change-related increase in the number and magnitude of droughts and hot days and stresses that “droughts associated with increasing poverty and reduction of agricultural sector's efficiency, extremely intensified the food security problem.” (SNC Tajikistan 2003: 150)

Syr Darya Basin

The Aral Sea Basin is one hotspot of central Asia’s transboundary water issues in the water-energy-agriculture nexus. “The riparian countries of the Aral Sea basin have experienced international disputes over water allocation ever since the USSR collapsed and, with it, existing

water management institutions and funding. The worst such dispute concerns the Syr Darya, one of the two largest rivers in Central Asia. [...] In the absence of an effective international water allocation mechanism, climate change is likely to make existing international tensions over water allocation worse" (Bernauer/Siegfried 2012: 227). Water user conflicts, for example between agriculture and forest, are frequent on the Syr Darya, flowing from Kyrgyzstan through Uzbekistan and Kazakhstan to the Aral Sea (adelphi 2012 (unpublished)). In the Syr Darya catchment, regional water conflicts are especially likely to arise between Uzbekistan and its neighbours Kyrgyzstan and Tajikistan. "A climate change-induced militarized interstate dispute over water resources in Central Asia is unlikely." [...] Nevertheless, "Kyrgyz–Uzbek relations, which could deteriorate further because the Uzbek population and agriculture in the Syr Darya catchment are particularly vulnerable to climate change-induced shifts in runoff." (Bernauer/Siegfried 2012: 237).

Ferghana Valley

In the Syr Darya basin, the Ferghana is considered to be a particularly conflict-prone region. Climate change will further aggravate local disputes over natural resources, especially where tensions already exist and pressure on natural resources is high (Bernauer/Siegfried 2012, WBGU 2007: 143). Conflicts in the multi-ethnic valley threaten the stability of the entire extended region (Gunya: ECC-Newsletter, Oct 2007, UNDP 2010). The Ferghana Valley provides an example of how water shortages can contribute significantly to low-intensity conflicts between communities. The effects of glacial melting are likely to exacerbate such conflicts (UNDP 2010 CA-CRM-Project Document). Conflicts over scarce natural resources, (especially land and water) between different (in some cases marginalised) user groups are already common in the Ferghana Valley that has a long conflict history. Being one of the most densely populated areas in Central Asia, Ferghana Valley is especially prone to further resource degradation due to increased population pressure. Heavy degradation and pollution of decreasing land and water resources, as well as an increasing possibility of avalanches and mud-flows will increase the risks and most likely aggravate these conflict dynamics (Giese/Sehring 2007, EnvSec 2005).

Food Security, Natural Hazards and Migration

Not only in relation to the water-energy-agriculture nexus is food security a major topic when discussing climate change impacts in Central Asia. The higher temperatures and greater aridity resulting from climate change will likely translate into reduced food production as less water will be available for irrigation. This is reflected in national reports as well as international regional studies where economic losses are expected, particularly in agriculture and drinking water, possibly leading to conflicts at the national and regional level (UNECE 2008: 59). While the impacts of hydro-meteorological catastrophes have more immediate destabilising effects, deteriorating livelihoods may further increase migration movements in the long-term. Kyrgyzstan for example, points at the large number of relocations from landslide zones (SNC Kyrgyzstan 2008) whereas Kazakhstan sees the need to adapt to climate-related water scarcity and degradation of land by supporting people to relocate from desertification regions to new localities (SNC Kazakhstan: 124).

4.3 Adaptation as a Means of Peace and Stability

Adaptation measures can help to strengthen peace and stability. To this end, the design and development of conflict-sensitive adaptation is considered a meaningful tool. On a basic level, conflict sensitivity means being aware of the causes of potential conflict in a given location; it involves understanding the operational context and the effects of working there, and on that

basis, developing a capacity to avoid negative impacts and maximise positive ones. Conflict-sensitive adaptation is not just ensuring that specific activities are designed with awareness of the context but, more ambitiously, working out how to address the context to offer options to support peace and stability. Conflict-sensitive adaptation aims at reducing risks of future crises[1] triggered or exacerbated by:

1. **adverse climate change impacts** (e.g. water scarcity, reduced agricultural yields, climate-related natural disasters)
2. **maladaptation** (measures to adapt to environmental stressors that can lead to tension or conflicts - e.g. uncoordinated realisation of existing water infrastructure development plans and adaptation measures in the riparian states could negatively affect water availability downstream and harm water-dependent ecosystems).

Conflict-sensitive adaptation means preventively mitigating risks for human security that arise from adverse climate change impacts or maladaptation. The concept aims at highlighting the positive effects adaptation can have with regard to existing or looming conflict and regional stability. Conflict-sensitive adaptation is not working "on conflict" – conflict-sensitive adaptation measures do not explicitly aim to resolve an existing conflict. Neither is conflict-sensitive necessarily working "in conflict" but the concept focuses on fragile regions and on regional and sub-regional climate change and vulnerability hotspots.

As there is a risk that discussing climate change within a security perspective will be politicised in an inflammatory way, conflict-sensitive adaptation needs to be reflected upon in terms of how it is framed. Depending on the circumstances in the target region, alarmism and securitisation that hinder cooperation on adaptation should be avoided. Furthermore, rather than using the term "conflict-sensitive", more subtle terminologies such as "adaptation co-benefits", "stabilizing effects of adaptation", "peace-positive adaptation interventions", "avoid maladaptation", "climate-sensitive development" might be more appropriate to use in the target region.

To put conflict-sensitive adaptation in concrete terms, the following table summarises possible entry points for interventions. Depending on the circumstances in a given region or country, different starting points (and combinations thereof) might be appropriate for conflict-sensitive adaptation:

Table 2: Possible Entry Points for Policy Interventions

Level	Entry Points
Regional	Regional, multilateral political adaptation process (declaration, strategy)
Neighbouring countries	Bi- or multilateral cooperation / agreements (e.g. on water, energy, environment) Regional adaptation programs and projects

[1] In this context "crisis" is used in a broad sense and encompasses disputes, tensions, low-intensity conflicts, violent and non-violent conflicts at different levels (inter-state, national, provincial, local).

National	Mainstreaming of climate change adaptation into existing national policies and regulations (e.g. (economic) development and security as well as foreign- and neighbourhood-policies) National climate and adaptation strategies and projects
Sub-national / provinces Local	Building institutions and capacities Sub-national strategies and activities Community-based adaptation projects and pilot projects

Climate change adaptation, regional cooperation and stability

Climate change is taking place across national borders. Adverse impacts are naturally of a transboundary nature, leading to similar climate-related risks in neighbouring countries. Thus, regional answers need to be developed to cope with adverse regional impacts. Common vulnerabilities and similar adaptation needs seen by neighbouring countries hold a vast potential of dialogue, coordination and cooperation. When dialogue and the exchange of experiences helps to build trust among neighbours, this can have stabilising effects on a region. Such climate adaptation-related initiatives could potentially lead to the development of a common perspective towards adaptation, serve as a starting point for broader cooperation in the region and, for example, help to prevent controversy on the use of transboundary water resources. Supporting regional cooperation on adaptation in this sense is conflict-sensitive adaptation. The international climate negotiations have so far focused primarily on the national and local support to design and implement policies and measures for adaptation (e.g. through the assistance to prepare NAPAs and, more recently, NAPs). However, climate change impacts are often transboundary – calling for an adaptation perspective that crosses borders.

Aspects for adaptation programmes and projects

Adaptation needs to follow the "do no harm" principle. Care needs to be taken not to provoke or exacerbate local tensions. Therefore, adaptation programmes and projects need to identify crisis and conflict risks in the region that may be exacerbated by climate changes. The focus should be on fragility hotspots within a country and within the region. Specific conflict dynamics will have to be considered, as they will play a decisive role in either increasing or decreasing the security risks of climate change. Approaches need to reflect upon the roles that the adaptation programme or project target groups play in current disputes or conflicts. Peace and conflict assessments can be used to reduce the risk of maladaptation.

Programmes and projects need to support the participation of all relevant stakeholders by strengthening participatory processes that explicitly include marginal and vulnerable groups and consider existing asymmetrical power relations and inequalities among the parties potentially involved in adaptation measures.

Adaptation should be guided by long-term planning as climate change and regional stability both demand long-term answers, e.g. in water resource management. Spill-over effects and the structural changes that are necessary to contribute to regional stability take a long time to manifest.

Aspects for the national level of partner countries

Awareness-raising on climate change, impacts and adaptation needs should be intensified. Adaptation needs to be mainstreamed into different sector policies on the national and sub-national level. National adaptation strategies and action plans need to reflect upon human security and links to the management of disaster risks. When planning national adaptation

measures, transboundary effects need to be considered (e.g. impacts of constructing a water reservoir on riparian countries).

4.4 Adaptation to Climate Change – Status Quo

The following chapters summarise existing adaptation approaches in Central Asia that are potentially relevant for addressing negative implications of climate change on peace and stability:

- Regional, national and sub-national adaptation policies and processes (National Communications under the UNFCCC, NAPAs, LAPAs, NAPs, CC, CCA and CBA strategies as well as relevant environment- and development strategies and programs)
- Government and non-governmental organisations, policy and project-based initiatives and networks concerned with adaptation on the national, regional or international level
- International, regional and national programmes and projects related to climate change adaptation.

4.4.1 National Policies and Processes

The Central Asian countries of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan are in the early stages of developing policies to respond to the climate risks presented above. Even though climate change adaptation is on the political agenda and, for instance, Kazakhstan and Tajikistan started discussing the issue years ago, substantial adaptation processes are rare in all countries. Nevertheless, the awareness regarding climate change impacts and adaptation needs is growing – mostly due to internationally funded projects in the area and National Communications. As Non-Annex I countries until 2011 all Central Asian countries have published two National Communications under the UNFCCC. Although these documents comprise information on adaptation (e.g. adaptation priorities) as well as mitigation and fulfil primarily reporting purposes, they nevertheless form the major body of official information available on adaptation plans and activities for the respective countries.

Stand-alone national adaptation processes, strategies or policies are in preliminary phases and remain vague. Tajikistan (2003, 233 pages) and Turkmenistan (2012, 15 pages) have developed national plans or strategies. Kazakhstan, Kyrgyzstan and Uzbekistan are in the process of developing adaptation strategies. With the exception of the UNDP Community Based Adaptation Programme in Kazakhstan, sub-national strategies are unknown. All Central Asian countries, with the exception of Turkmenistan, have launched processes to develop integrated water resources management (IWRM) policies (Granit et al. 2010).

The following table lists the main national policies relevant to adaptation.

Table 3: National Policies and Processes in Central Asia

Kazakhstan	
• First National UNFCCC Communication (1998) • Second National UNFCCC Communication (2009)	also relevant: Potable Water Program 2002-2010, Conception of Ecological Security of the Republic of Kazakhstan for 2004-2015, State Program of Rural Territory Development 2004-2015, Concept of Transition of the Republic of Kazakhstan to Sustainable Development 2006-2024, Program to Fight Desertification 2007-2017, 2007 Ecological Code for 2010-2014, National Integrated Water Resources Management (IWRM) and Water Efficiency Plan
Kyrgyzstan	
• First National UNFCCC Communication (2003) • Second National UNFCCC Communication (2008)	also relevant: 2001 decree "On the Execution Measures of the Framework Climate Change Convention of the UN"(2007), The Environmental Security Concept of the Kyrgyz Republic, Country Development Strategy (2007-2010), National Framework Program on Land Resources Management for 2006-2016 (NFP)
Tajikistan	
• First National UNFCCC Communication (2002) • National Action Plan of the Republic of Tajikistan for Climate Change Mitigation (2003) (includes adaptation strategy) • Second National UNFCCC Communication (2008)	also relevant: 2006 Water Sector Development Strategy, The Strategy of Environmental Protection and Rational Use of Natural Resources of the Republic of Tajikistan (till 2015)
Turkmenistan	
• First National UNFCCC Communication (2000, finalized 2006) • Second National UNFCCC Communication (2010) • National Climate Change Strategy (2012)	also relevant: 2002 National Environmental Action Plan, 2002 National Review "Sustainable development of Turkmenistan, Rio+10" , Water Management Development Conception of Turkmenistan 2030
Uzbekistan	
• First National UNFCCC Communication (1999) • Second National UNFCCC Communication (2008)	also relevant: 1999 The National Strategy of Sustainable Development, The Water Saving and Rational Water Use in Irrigated Land Tenure Strategy

As is the case in many developing and emerging economies, reporting requirements under the UNFCCC and the financial support of the UNDP and UNEP were the driving forces behind national approaches towards adaptation. The relevant documents have a scientific-technical focus and a relatively limited political weight. Neither government offices, nor ministries for economy, finance or similar ministries are driving the adaptation developments.

There is very little evidence of adaptation mainstreaming and policy integration in Central Asia. Links to climate change, impacts and adaptation needs are rarely integrated into other policies. Looking at the National Communications under the UNFCCC as well as existing adaptation strategies, participation of local and regional representatives of different groups are mentioned. Nevertheless, specific evidence of substantial participation is rare.

With regard to security implications of climate change, official government documents such as the afore-mentioned National Communications only rarely contain explicit links between climate change and security (e.g. impacts on existing tensions or conflicts). The exception is the National Communication of Kazakhstan, in which references have been made between climate change, water, food, migration, natural hazards and human security in a broader context.

4.4.2 Institutions, Initiatives and Networks

4.4.2.1 National level

A range of different government and non-government institutions are driving the existing adaptation approaches, strategies and plans. As National Communications form the main body of information relevant to adaptation, the departments responsible for the reporting commitments are leading the discussions around adaptation in most countries. As can be expected, for all Central Asian countries studied, adaptation approaches are closely linked to projects funded by UNDP/GEF under the National Communications Support Programme. For example, the Second National Communication of Kazakhstan was based on studies that were granted financial support by the UNDP/GEF. The same applies to Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, where adaptation efforts are mainly driven by external financial and technical support from multilateral institutions under the United Nations. At this stage, none of the countries has an accredited National Implementing Entity for the Adaptation Fund (October 2012).

As a result, the existing adaptation processes have limited political weight and are only partly linked to the agendas of governments or major ministries. In **Kazakhstan**, for example, the development of the Second National Communication took place under the auspices of the Ministry of Environmental Protection. Four other ministries, through an advisory board, provided “comments and useful information”. In **Kyrgyzstan** the process of developing the latest National Communication was driven by the State Agency for the Environment Protection and Forestry under the Government of the Kyrgyz Republic and a UNDP senior adviser. The ”consultative board“ included representatives from Parliament, Government Office, Ministry of Economic Development and Trade, Ministry of Agriculture, Water Resources and Processing Industry, Ministry of Industry, Energy and Fuel Resources, Ministry of Foreign Affairs, as well as a representative from the National Statistical Committee. The national institution responsible for preparation of the Second National Communication in **Tajikistan** was the State Agency for Hydrometeorology of the Committee for Environmental Protection under the Government of the Republic of Tajikistan, in coordination with key ministries and agencies. **Turkmenistan’s** national climate change strategy mainly goes back to a UNDP initiative, supporting an inter-ministerial dialogue of various ministries and departments that finally presented the climate strategy in mid-2012. The Centre of Hydrometeorological Service under the Cabinet of Ministers of the Republic of **Uzbekistan** was in charge of developing their Second National Communication. A range of national institutions, agencies and bodies assisted in the preparation of the report. This included the Ministry of Economy as well as the Ministry of Finance. **Uzbekistan** acted as an exception in the region by involving the Ministry of Finance in its adaptation approach.

Adaptation is, however, not perceived as a high-priority issue at the political level. Existing state policies and sectoral programmes do not yet seem to integrate adaptation imperatives (CAREC 2009). However, hydro-meteorological institutions of all countries are increasingly looking at climate change. While some progress has been made by research institutions and academia, gaps remain in terms of capacity, and adaptation is still a non-urgent issue on the political level.

The following table lists the institutions responsible and/or involved in adaptation approaches (institution in charge in bold). The list of institutions is not exhaustive.

Table 4: Institutions, Initiatives and Networks at the National Level

	state institutions	other institutions
Kazakhstan	• Ministry of Environmental Protection • Ministry of Agriculture, Ministry of Energy and Natural Resources, Ministry of Economy and Budget Planning, Agency for Statistics • Committee of ecological regulation and control • National Hydrological and Meteorological Service • Kazakh State Climate and Ecology Research Institute • Committee for Water Resources, River Basin Inspections	Coordination Centre on Climate Change, Scientific Research Institute of Ecology and Climate, OSCE Office Astana, Green Bridge, Environmental Centre for Information and Analysis
Kyrgyzstan	• State Agency for the Protection of the Environment and Forestry • Department for Water Resources and Land Reclamation at the Ministry of Agriculture and Land Reclamation, Ministry of Industry and Energy, Ministry of Economic Development, Ministry of Natural Recourses • National Committee on Climate Change Consequences, Expert Council • Water Resources Committee (Ministry of Agriculture) • Kyrgyz National Hydromet Service	Aarhus Centre in Osh, Azon Centre, Kyrgyz-Russian University, Civic Environmental Foundation UNISON
Tajikistan	• State Agency for Hydrometeorology of the Committee for Environmental Protection under the Government of the Republic of Tajikistan • Ministry of Land Reclamation and Water Resources, Ministry of Agriculture, Ministry of Energy and Industry, Ministry of Transport and Communications, Ministry of Economic Development, Ministry for Nature Protection • Governmental Committee on Emergency • State Organisation for Hydrometereology	Aarhus Centre in Khujand and Kurgan Tubae, Academy of Sciences, International Alert, OSCE Office Tajikistan, Taj. Ecological NGO Club, NGOs Climate Change, For the Earth and Youth EcoCentre among others, NGO Depas

Turkmenistan	• Inter-ministerial dialogue: Ministry of Nature Protection, Ministry of Agriculture, Ministry of Water Resources, Ministry of Economy and Development and further ministries and Institutes • National Hydrometeorology Committee under Cabinet of Ministers • Centre for Ecological Monitoring • State Commission for ensuring implementation of Turkmenistan's commitments emanating from UN environmental conventions and programs	Turkmen State University, Turkmen State Agricultural University
Uzbekistan	• Centre of Hydrometeorological Service under the Cabinet of Ministers of the Republic of Uzbekistan (Uzhydromet) • Ministry of Economy, Ministry of Agriculture and Water Resources, Ministry of Finance and others • State Committee for Nature Protection • Centre for Social and Economic Research of the Republic of Uzbekistan	Armon, OSCE Project Coodrination Office Uzbekistan, Ecoforum, Ecoforum Council, Ekomaktab

4.4.2.2 Transnational

A large number of transnational institutions, initiatives and networks have been identified that are involved with adaptation in Central Asia in one way or another. The overview table below lists international and regional bodies and commissions, institutions and initiatives, as well as international economic organisations. The transnational institutions named below are responsible for dealing with issues closely related to climate change adaptation, such as water management. Further institutions are implementing programmes and projects relevant to adaptation and/or are referred to in the National Communications / adaptation plans and strategies.

The institutions identified take on different roles, ranging from intergovernmental fora like the Interstate Commission for Water Coordination to knowledge hubs and process facilitators like the Regional Environmental Centre for Central Asia. Those institutions are bundling knowledge about the technical as well as the political dimensions of adaptation.

The engagement of regional governance bodies in the field of climate change appears to be rather limited, although growing. So far, none of Central Asia's regional organisations is taking a leadership role in promoting adaptation to climate change as part of their mandated activities (IISD 2011: 24). As in other world regions, most of the institutions and networks active in the field of adaptation are focused on water issues. Although closely linked to the water sector, there seem to be fewer institutions and initiatives working on agriculture / food.

The following institutions are of particular interest when thinking about steps to substantiate discussions around the security dimension of adaptation and benefits for regional stability in Central Asia:

Commonwealth of Independent States (CIS): Formed by the former Soviet republics in 1991 the CIS comprises Azerbaijan, Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Uzbekistan and Ukraine. Originating from the CIS, the Eurasian Economic Community (EAEC) was founded in 1996 with Belarus, Kazakhstan, Kyrgyzstan, Russia, Tajikistan and Uzbekistan as members. In 2009, the UN Industrial Development Organization and EAEC signed a Memorandum of Cooperation providing prospects for new

cooperation between the two organisations on energy and climate change in areas including environment, water management, agro-industries, trade capacity building, and private sector development (IISD Reporting Service 2009).

International Fund for Saving the Aral Sea (IFAS): Given the severe degradation of the Aral Sea and its socio-economic impact on the region, the IFAS was established in 1993 by the heads of the Central Asian states. IFAS is tasked with attracting funds from regional and international donors for projects aimed at ameliorating the environmental situation and rehabilitating the Aral Sea, as well as at improving water and land management in the Aral Sea Basin. The IFAS Aral Sea Basin Program 3 has been signed by all countries as members of IFAS: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. IFAS brings together representatives from different countries to discuss and reduce risks (e.g. security risks related to the construction of dams).

Interstate Commission for Water Coordination (ICWC): In 1992, the Ministers of Water Resources of the five Central Asian republics signed the Almaty Agreement on cooperation in the joint management, use and protection of interstate sources of water resources, creating the ICWC. Aside from coordinating and improving the management of trans-boundary water resources, the ICWC addresses environmental challenges arising from the exhaustion of the Aral Sea. The current focus of the ICWC is on determining annual volumes of water supply to river deltas and the Aral Sea, estimating annual releases into rivers and canals, and dealing with water conflicts (IISD 2011: 24). The ICWC comprises the Scientific-Information Centre (SIC ICWC) - an information and analytical body, which develops methods and approaches of prospective development, improvement of water management and ecological situation in the basin – including guidance documents on adaptation. The SIC ICWC supports water management institutions at all levels – such as river commission, provinces, communities, enterprises – with advice and transfer of know-how. The ICWC is supported by the Regional Environmental Centre for Central Asia and integrated into the International Fund for Saving the Aral Sea.

Interstate Commission on Sustainable Development (ICSD): The ICSD was established in March 1993 in accordance with Article 2 of the "Agreement on joint actions to address the problems of the Aral Sea and Aral, environmental rehabilitation and socio-economic development of the Aral Sea region", signed by the Central Asian heads of states. The work of ICSD is guided by decisions of the heads of the commissions of sustainable development of the member states, the IFAS (see above), and the UN Conference on Environment and Development. The main goal of ISCD is to coordinate and manage regional cooperation in the field of the environment and sustainable development in Central Asia

Regional Environmental Centre for Central Asia (CAREC): Established in 2001 as an inter-governmental, non-profit organisation, CAREC is an independent partnership of countries (among them Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) and multilateral institutions with the mission to "promote multi-sector cooperation in addressing environmental problems in Central Asia at the local, national and regional levels". The European Commission started out as the main donor. Now CAREC is a project based organization and the projects are being sponsored by various institutions within the EU, as well as USAID, IGES and DiwEcon. The topics of climate and water have gained importance in CAREC's work during recent years. Within the Project, CAREC as sub-regional node of Asia-Pacific Adaptation Network, funded by the IGES, CAREC aims at facilitating the regional dialogue and cooperation in the field of adaptation (www.carecnet.org).

United Nations Economic Commission for Europe (UNECE): In its mission to promote pan-European economic integration, UNECE brings together 56 countries located in the European Union, non-EU Western and Eastern Europe, South-East Europe and the Commonwealth of Independent States (CIS). As a multilateral platform, UNECE hosts five environmental conventions that enhance regional co-operation on environmental protection and thereby contribute to greater security. UNECE is an active member of the Environment and Security Initiative. Among other environmental treaties, UNECE has negotiated the Convention on the Protection and Use of Transboundary Watercourses and International Lakes. The governing body is serviced by the UNECE secretariat, which also helps to monitor the implementation of the treaty. The Water Convention and its Task Force on Water and Climate support countries in developing transboundary adaptation strategies through guidance, projects on the ground and exchange of experience. UNECE runs the Information Portal for Water and Environmental Issues in Central Asia and implements several projects in Central Asia (e.g. Transboundary Chu-Talas River Project, Capacity for Water Cooperation Project, Capacity building for cooperation on dam safety in Central Asia). Between 2007 and 2009, the Task Force prepared a guidebook titled, "Guidance on Water and Adaptation to Climate Change", which provides governments with strategic recommendations on how to implement adaptation in the water sector and throughout water-related policy sectors by addressing transboundary aspects in particular. Furthermore, there is the UN Special Programme for the Economies of Central Asia (SPECA) , including the Project Working Group (PWG) on Water and Energy Resources.

In addition, the Central Asian states are members of a number of other regional initiatives that have been launched in recent years to enhance water cooperation in Central Asia, such as the Shanghai Cooperation Organisation, the German-funded Water Initiative "Water Unites" and the EU Water Initiative.

The table below presents a non-exhaustive list of major transnational organisations, commissions and initiatives involved in adaptation in Central Asia.

Table 5: Institutions, Initiatives and Networks at the Transnational Level

Government
• Aral-Syrdarya Basin Organisation, Amu-Darya Basin Water Organization • Commonwealth of Independent States (CIS) (http://www.cis.minsk.by/) • Eurasian Economic Community (EAEC), includes Central Asian Cooperation Organization (CACO) • Intergovernmental Council on Hydrometeorology (WMO) (http://www.wmo.int/pages/prog/wcp/wcasp/wcasp_home_en.html) • International Fund for Saving the Aral Sea (IFAS), Executive Committee of the International Fund for Saving the Aral Sea (EC IFAS) (http://www.ec-ifas.org/) • International Network of Basin Organizations (http://www.inbo-news.org, http://www.eecca-water.net/index.php?lang=english) • Interstate Commission for Water Coordination (ICWC), Scientific-Information Centre (SIC ICWC) (http://sic.icwc-aral.uz) • Interstate Commission on Sustainable Development (ICSD) • Interstate Hydrometeorological Network of the Commonwealth of Independent States (IHNCIS) (http://www.meteo.md/newen/cis.htm) • Organization for Security and Co-operation in Europe (OSCE) (http://www.osce.org/) • Shanghai Cooperation Organisation (SCO) (http://www.sectsco.org/EN/)

- United Nations Economic Commission for Europe (UNECE) (http://www.unece.org/env/water/water_and_climate.html), UN Special Programme for the Economies of Central Asia (SPECA)
- United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (http://unescap.org/)
- World Commission on Dams (WCD) (http://www.internationalrivers.org/campaigns/the-world-commission-on-dams)

Government – Research, Practitioners

- Asia Pacific Adaptation Network (http://www.apan-gan.net)
- CACENA Regional Water Partnership Central Asia and Caucasus under the Global Water Partnership (GWP) (http://www.gwp.org/en/CACENA/)
- Environment and Security Initiative (EnvSec) (http://www.envsec.org)
- EU Water Initiative - Eastern Europe, Caucasus and Central Asia (EUWI EECCA) (http://www.euwi.net/wg/eecca)
- Regional Environmental Centre for Central Asia (CAREC) (www.carecnet.org), Central Asian Initiative on Sustainable Development (CAI, http://www.carecnet.org/international-processes/central-asian-initiative-on-sd/?lang=en)
- Water Unites - The Berlin Process (http://www.auswaertiges-amt.de/EN/Aussenpolitik/GlobaleFragen/ForumGF/22-GF/Wasser_node.html)

Non-Governmental - Research, Practitioners & Civil Society

- Alliance of Central Asian Mountain Communities (AGOCA) / Central Asian Mountain Partnership (CAMPJ) Network (http://camp.kg/?lang=en)
- Central-Asian Institute of Applied Geosciences (ZAIAG) (http://www.caiag.kg/us/)
- Regional Research Network "Water in Central Asia" (CAWa) (http://www.cawa-project.net/)
- University of Central Asia (UCA) (www.ucentralasia.org/)
- NGOs, e.g. Ferghana "Valley of Peace", NGO Network "Dolina Mira"

The success of existing initiatives has been limited. Thus far, for example, IFAS and ICWC have been unable to meet their goals. The reasons are complex and encompass institutional problems such as lacking competences and inadequate legal regulations; technical problems such as insufficient information flows and poor technical equipment; and on a more general level mistrust among the states, different interests, power differences and an overall unwillingness to cooperate. This has also led to a shortfall of funding. Neither the transfer of formal decision-making authority to the executive council of IFAS nor the establishment of effective monitoring and sanctioning mechanisms seems likely in the near future (Weinthal 2006, Eschment 2011). Basic problems regarding the organisation's design further hamper successful cooperation. First, IFAS only focuses on water management issues, thereby not taking into consideration the close links to energy (Eschment 2011). Second, Afghanistan as a crucial actor in the regions is not yet included, although negotiations have been started to slowly integrate Afghanistan.

However, when considering fragile regions such as the Ferghana valley, limited statehood, uncertain government and administrative institutional capacities to deal with climate change adaptation in Central Asia, and also considering the fact that adaptation processes are only in preliminary phases, the institutions presented here play a major role in the agenda setting and

implementation of adaptation in the region. In many cases, they are key partners for the implementation of the adaptation programmes and projects discussed below.

4.4.3 Programmes and Projects Related to Adaptation

With a strong increase in the last five years, a considerable number of adaptation projects exist, at both the national and regional level.

4.4.3.1 National

Adaptation projects identified for engagement at the national level focus on capacity development in water and land management, agriculture and biodiversity. However, there are some projects being implemented in the region, which nominally do not address adaptation, but per se do have adaptation effects among other outcomes.

The following three projects are in the process of implementation and can be considered innovative approaches to climate change adaptation at the national level due to their potential contribution to addressing climate change related impacts on peace and stability:

Tajikistan: The World Bank Pilot Programme for Climate Resilience (PPCR) started in 2010. It is composed of two phases, the first of which consists of support by technical assistance activities for capacity building. Phase two commenced at the end of 2010 and includes the implementation of investments with a focus on, for instance, improving the Weather, Climate and Hydrological Service Delivery and Agriculture and Sustainable Land Management (Tajikistan: Strategic Programme for Climate Resilience 2011: 4).

Turkmenistan: The project "Addressing climate change risks to farming systems in Turkmenistan at national and community level" started in 2010 and will continue through 2016. Financed under the Adaptation Fund, the implementing entity is the UNDP and the Executing Entity is the Ministry of Nature Protection of Tajikistan. The project aims at the reduction of wasteful water consumption in order to address the risk of water scarcity resultant from climate change. Investments in policy and institutional capacity, community-based adaptation initiatives and the dissemination of best practice examples are foreseen (Adaptation Fund Board 2010).

Uzbekistan: The World Bank and the Environmentally and Socially Sustainable Development Department implement a regional programme on reducing vulnerability to climate change in Europe and Central Asia's agricultural systems. The programme started in Uzbekistan in 2010. The Country Note analyses the different risks that the agricultural sector has to face as a result of climate change. Additionally, conferences and workshops are part of the project to raise national awareness on the topic and to discuss different adaptation options (World Bank 2012).

The overview table below lists selected projects with a national focus that have been implemented or are still being implemented in the countries concerned.

Table 6: Programmes and Projects Related to Adaptation with a National Focus

Kazakhstan	• GIZ: Sustainable Pasture Management in Kazakhstan, Contracting entity: BMZ, Duration: 2008-2011, Adaptation to the growing climate aridization through the climatically sustainable pastoral management arrangements (GIZ, 2009-2011) • GIZ: Regional project to support the implementation of the UN Convention to Combat Desertification (UNCCD) in Central Asia, Contracting entity: BMZ; Duration: 2000-2009 (also conducted on a regional basis in Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) • GIZ: Enhancing Economic and Environmental Welfare in the Aral Sea Region (EEWA), Since 2010 partner of EC IFAS • IFAS: The second phase of the Northern Aral Sea and Syrdarya Control project (2010-current) Government of Kazakhstan &World Bank. • Program in agricultural training, rural development, Contracting Entity: BMZ, Duration: 2005-2010 • CAREC: Clean drinking water for rural communities in Kazakhstan, Duration: 2003-2010 (CAREC) • UNECE: Workshop on transboundary water management in Central Asia, (Duration: 13-15.10.2010) • Community-based Adaptation Country Programme (UNEP), Duration 2008-2012
Kyrgyzstan	• GIZ: Sustainable Pasture Management in Kyrgyzstan, Contracting Entity BMZ, Duration: 2008 -2011 • Preparedness for Climate Change (Red Cross/Red Crescent Climate Centre) (since 2007), Health Vulnerability and Climate Change Adaptation Assessments (WHO) • Community-based Adaptation Programme UNDP (GEF, Strategic Priority on Adaptation)
Tajikistan	• World Bank Pilot Program for Climate Resilience (PPCR):Tajikistan (since 2010) • GIZ: Sustainable management of natural resources in Gorno-Badakhshan, Duration: 2008-2010 • GIZ: Early warning and disaster preparedness in the Zeravshan Valley, Duration: 2007-2010 • GIZ: Enhancing Economic and Environmental Welfare in the Aral Sea Region (EEWA), Since 2010 partner of EC IFAS
Turkmenistan	• Addressing climate change risks to farming systems in Turkmenistan at national and community level (Adaptation Fund/ UNDP) (2010-2016) • GIZ: Sustainable management of forest resources in Turkmenistan Investment and Financial Flows (IFF) project for Climate Change Mitigation and Adaptation 2011 • Conservation and Sustainable Use of Globally Significant Biological Diversity in Hazar Nature Reserve on the Caspian Sea Coast (UNDP) (2006-2010) • Capacity Development for Policy Makers: Addressing climate change in key sectors (UNDP) (2008-2010)
Uzbekistan	• Reducing Vulnerability to Climate Change in Agricultural Systems in Europe and Central Asia (World Bank) (Since 2010) • Preparedness for Climate Change (Red Cross/Red Crescent Climate Centre); Piloting Climate Change Adaptation to Protect Human Health (i.e. WHO) (2010-2014)

4.4.3.2 Transnational

There are also a number of projects with a transnational focus that can help to address climate change challenges by initiating a regional dialogue on the need for climate change adaptation. Examples include projects of German international cooperation as well as international approaches and initiatives:

Table 7: Programmes and Projects Related to Adaptation with a Transnational Focus

German Programmes/Projects
• Sustainable use of natural resources in Central Asia (funded by BMZ, implemented by GIZ). 2002-2015 (www.giz.de/themen/en/13434.htm) • Transboundary Water Management in Central Asia (funded by Foreign Office, implemented by GIZ, UNECE). 2009-2014 (www.waterca.org) • Adaptation Strategies to Climate Change and Sustainable Land Use in Central Asia (Turkmenistan and Xinjiang, China) (funded by German Foundation Bauer-Hollmann and Foundation Rudolf and Helene Glaser/Deutsches Stiftungszentrum, implemented by Universität Greifswald Germany, Xinjiang Universität China, National Institute Desert, Flora, Fauna, Turkmenistan). 2009-2011 (www.botanik.uni-greifswald.de/central_asia.html?L=1) • Transboundary cooperation between communities in the Ferghana Valley in the context of sustainable development (Environment and Security Initiative EnvSec, funded by German Federal Environment Ministry, implemented by UNDP Tajikistan). 2007-2009
International Programmes/Projects
• Aral Sea Basin Programme ASBP-3 (EC-IFAS)[2] (funded by World Bank, European Union, USAID, GTZ, SDC, cooperation with the governments of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and the civil society). 2011-2015 • Central Asian Multi-Country Programme on Climate Risk Management (CA-CRM) (UNDP). 2010-2014 • CAREC as sub-regional node of Asia- Pacific Adaptation Network[3] (funded by IGES, implemented by CAREC). 2010-current • Pilot Program for Climate Resilience (PPCR)[4] (World Bank, Climate Investment Funds) 2009-current • Integrated Water Resources Management in the Ferghana Valley[5] (funded by Swiss Agency for Development and Cooperation, implemented by IWRM). 2001-current • Capacity Building for Scenario Development: Climate Change and Water-Food-Energy Security in Central Asia[6] (OSCE, adelphi). 2011-2012

[2] http://www.ec-ifas.org/about/activities/pbam-3/91-aral-sea-basin-program-3-document.html

[3] http://www.carecnet.org/programmes-and-activities/environmental-management-and-policy/asia-pacific-network-on-climate-change-adaptation-carec-unep-iges-ait-sei/?lang=en

[4] https://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/PPCR_Tajikistan.pdf

[5] http://centralasia.iwmi.org/integrated-water-resources-management-in-the-ferghana-valley.aspx

- Water and Adaptation Interventions in Central and West Asia (Aral Sea)[7]; (Asian Development Bank, Finnish Consulting Group, Finnish Meteorological Institute). 2011-2012
- Promoting Cooperation to Adapt to Climate Change in the Chu-Talas Transboundary Basin[8] (supported by Finland Environment and Security Initiative 2010–2012, implemented by UNDP, UNECE, OSCE). 2010-2012
- Promoting Integrated Water Resources Management (IWRM) and Fostering Transboundary Dialogue in Central Asia[9] (European Commission, Norway, UNDP, and Governments of Kazakhstan, Kyrgyzstan, Tajikistan). 2009-2012
- Water quality in Central Asia[10] (UNECE, CAREC). 2009-2012 (follow up of the project "Harmonization and Approximation of Water Standards and Norms in Central Asia")
- Developing cooperation on the Chu and Talas Rivers (Chu-Talas II)/ Integrated Water Resources Management in the Chu-Talas Basin as part of the Pilot project on water and climate change adaptation in the Chu Talas River[11] (UNECE, OSCE). 2008-2011
- Vulnerability to Climate Change in Agricultural Systems in Europe and Central Asia[12] (World Bank, FutureWater, supported by Industrial Economics Inc., Universidad Politecnica de Madrid, University of Colorado, Boulder, and Massachusetts Institute of Technology, Warsaw University of Technology, Oregon State University, London School of Economics). 2010- 2011
- Enhancing regional exchange of water resource information (CAREWIB phase II)[13] (EnvSec, implemented by UNEP, UNECE, SIC-ICWC). 2007-2010

4.4.4 Preliminary Conclusions on the Status Quo of Adaptation

A number of existing policies and processes, organisations and initiatives as well as programmes and projects related to climate change adaptation should be taken into account when analysing the status quo of adaptation in Central Asia. With this in mind, the following conclusions can be derived:

1. General need to further develop national adaptation activities

To prepare for climate change and its adverse consequences and thereby to protect peoples, economies and the environment, Central Asian countries need sub-national, national and regional policies to develop and govern adaptation activities at different levels. At the policy level, progress towards the development of adaptation strategies and plans is still limited.

---

[6] http://www.carecnet.org/programmes-and-activities/climate-change-and-sustainable-energy/capacity-building-for-scenario-development-climate-change-and-water-food-energy-security-in-central-asia/?lang=en

[7] http://www.futurewater.nl/uk/projects/water-and-adaptation-interventions-in-central-and-west-asia/

[8] http://www1.unece.org/ehlm/platform/display/ClimateChange/Chu+Talas

[9] http://centralasia.iwlearn.org/

[10] http://www.carecnet.org/programmes-and-activities/water-initiatives-support/project-water-quality-in-central-asia/?lang=en

[11] http://www.unece.org/fileadmin/DAM/env/water/Chu-Talas/ChuTalas_II_Project_Report_Short_ENG.pdf

[12] http://www.futurewater.nl/uk/projects/cc-eca/

[13] http://www.envsec.org/index.php?option=com_content&view=article&id=77&lang=en&Itemid=95

Although Kazakhstan and Tajikistan started discussing the issue years ago, so far only Tajikistan (2003) and Turkmenistan (2012) have issued national plans or strategies.

Although rising on the political agenda during the last couple of years, strategies and implementation activities are just at the outset and the integration of adaptation into policy and planning is still nascent in all five countries. Existing policies and programmes do not yet seem to integrate adaptation imperatives. Adaptation to climate change is not perceived as a high-priority issue at the political level and sometimes intentionally left unattended by high ranking politicians. In general, there is a concern that adaptation action in Central Asia is primarily donor-driven and has not yet become a significant priority for national governments. While some progress has been made by research institutions and academia, gaps remain in terms of awareness and capacity (CAREC 2011: ii, 64f.). There is little evidence on substantial stakeholder participation in existing adaptation processes. In summary, there is a considerable need for action to sustain and strengthen adaptation policies and their respective processes in the countries of the region.

2. Lack of regional process on climate change, impacts and adaptation

Climate change is not bounded by national borders. Transboundary bio-geographical areas that share common topography and eco-systems, for example international river basins, demand coordinated regional responses. However, Central Asian approaches to climate change and adaptation are mostly national. Only limited regional projects on climate change adaptation exist at this point. The lack of regional projects is partly a structural deficit, as international funds are typically directed towards the national level. No regional multilateral process or strategy on climate change adaptation exists. Moreover, there is currently no effective regional discussion forum to facilitate exchange across countries and projects. The regional organisations that deal with political, security and economic interests, such as the Common-wealth of Independent States (CIS) or the Shanghai Cooperation Organization (SCO), do not have a significant programme or agenda on climate change adaptation. Existing institutions in the field need greater effectiveness and legitimacy in supporting regional adaptation. Regional exchange processes and structures to cooperate on climate change impacts and adaptation are necessary to address the climate-related challenges that the region is facing. Experts see the need to close this gap and enhance regional cooperation in the field of climate change adaptation and pursue transboundary approaches. Adaptation programmes need to be coordinated and a joint regional strategy must be developed. [14]

3. Limited success of previous projects regarding regional cooperation

Despite previous efforts of regional programmes to strengthen regional and multilateral cooperation among the countries of Central Asia in different fields such as water, agriculture and environment, such programmes have had only limited success. Whereas some current regional programmes include elements of regional exchange of experiences and data, regional cooperation is not a major focus. The strategy pursued by many initiatives – to start with technical and low politics subjects and to take on more contested topics and scale up pilot initiatives in following project phases – has worked only in few cases (such as in the Chu-Talas transboundary basin) and have not developed a positive momentum.

[14] Result of scenario workshop on climate change and security implications in Central Asia ; adelphi ; Organization for Security and Co-operation in Europe (OSCE)

Several regional cooperation efforts have been undertaken since 1991 to ease tensions over the water-energy-agriculture nexus. As a result, the governments of the five Central Asian states have signed several multilateral and bilateral agreements aimed at establishing a coordinated operation of, for example, power generation facilities and water releases. However, most agreements have not been successfully implemented due to various barriers.

Barriers to regional cooperation in the field of adaptation

- Political discrepancies and strong national priorities regarding water and energy that differ among the countries in the region - water and energy are high-policy issues in Central Asia and the self-sufficiency policy towards water and energy supply hinders cooperation
- Hostile personal relations between the Central Asian leaders, spill-over from historic conflicts and a lack of political will
- Openness for cooperation differs among the countries; while for example Kyrgyzstan and Tajikistan are comparatively more open towards cooperation, Uzbekistan is rather blocking regional cooperation efforts
- As countries in the region are very centralistic and in some cases authoritarian, it makes it difficult to introduce local or regional cooperation to foster positive inter-state relations.
- Most decision makers are not yet aware of and convinced by climate change, and therefore do not act on its impact today or prepare for what is projected
- Short term perspective of past and current approaches: water management is only looking at day-to-day problems (e.g. short term water allocation)
- UNFCCC and international funds focus on national plans (NAPAs, NAPs) and support for national institutions; lack of attention for the regional level
- Limited availability of data trusted by different countries; the deficit of data also imposes a significant barrier to awareness-building processes
- Equal involvement of actors from different countries in existing fora is oftentimes not guaranteed
- Lack of coordination between different international agencies/donors

4. Opportunities for cooperation on adaptation

This paper argues that inter-state cooperation on adaptation can hold significant co-benefits for regional stability. Adaptation offers new cooperation possibilities for Central Asian countries. Countries see similar (common) needs with a regard to climate adaptation. National vulnerability assessments and adaptation concepts show significant overlap. First, this applies for the needs of adaptation processes (financing difficulties, lack of capacities, knowledge gaps, and deficits in the legal basis). Second, this holds true regarding the topics that the countries prioritize in their adaptation strategies. Unsurprisingly, similar thematic areas and needs are presented that could offer common ground for regional discussion of vulnerabilities and adaptation activities (water-related issues, DRM, agriculture, climate and water data). Transnational governmental and non-governmental institutions, initiatives and networks have been key and will play a major role in the future. In the future, regional cooperation can also be supported via National Adaptation Plans under the UNFCC that will include provisions for

planning at the regional level, encouraging parties to cooperate on managing climate change impacts in watersheds, fisheries and other transboundary resources.

5. Risk of maladaptation

Increased adaptation activities could lead to cases of maladaptation. Not only climate change impacts, but also adaptation measures can lead to tensions or conflicts. Uncoordinated realisation of existing water infrastructure development plans and adaptation measures in the riparian states could negatively affect water availability downstream and harm water-dependent ecosystems. For example, technical measures to adapt to climate-induced water scarcity, such as the construction of new reservoirs, could lead to tension or conflicts. Maladaptation could also have non-technical roots. Experts criticise cases in which adaptation projects have had negative security implications due to poor project planning because project planners did not understand and take into account the regional context, processes and demands accordingly. Furthermore, with the increasing financial transfer for adaptation projects, risks of elite capture, corruption and organised crime arise.

6. There is currently little evidence for conflict-sensitive adaptation

While discussions about the potential implications of a changing climate on peace and stability are increasingly prevalent, there is currently little evidence that climate change adaptation could be called 'conflict-sensitive'. For the Central Asian countries studied here, existing discussions on climate impacts and approaches towards adaptation do not yet meaningfully take the security dimension into account. Benefits of adaptation measures, such as potentially positive and stabilising effects for fragile regions are not discussed. Apart from very few exceptions (e.g. EnvSec initiative for Amu Darya basin) projects related to climate change and adaptation do not explicitly look at the security implications, e.g. positive effects on regional stability. At the same time, however, a number of projects exists that particularly target energy and food security.

4.5 Towards a Roadmap for Adaptation, Peace and Stability in Central Asia

The following chapters offer detailed approaches towards climate change adaptation and cooperation in Central Asia with consideration for existing policies and processes, as well as the given regional configuration of actors and risks. The entry points outlined illustrate how adaptation processes could address vulnerability and fragility hotspots, thereby contributing to regional stability. In order to complement existing national adaptation efforts, the focus will be on the transnational and regional dimension.

4.5.1 Starting Point: Initiation of a Regional Adaptation Process

So far, regional cooperation has not been a success story in the region. Nevertheless, considering the immense challenges of climate change impacts, regional cooperation should remain the goal. Acknowledging the status quo of adaptation in Central Asia, this paper proposes to initiate a multilateral climate change adaptation process for the region of Central Asia - "Central Asia Climate Change Adaptation Roadmap" that could in the long term lead to the development of a joint regional political adaptation declaration or strategy between Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

Regional adaptation efforts need long-term regional vision and framework. Both should be developed through a "Central Asia Climate Change Adaptation Roadmap" in order to support continuous and coordinated adaptation efforts. Furthermore, a regional approach could, to some extent, decouple the overall success of adaptation activities in the region from single

national circumstances and developments – balancing individual country's ambitions and capabilities for climate change adaptation.

Benefits & Political Barriers

In a region where interstate cooperation is still in a preliminary phase, climate change related challenges that are currently rising on the agenda provide a major window of opportunity to start a regional process of exchange and learning. Such cooperation could support inter-state dialogue and further mutual understanding and mutual respect between governments as well as technical experts from academic and consultancy institutions and civil society.

The transboundary nature of water resources in Central Asia means that risks and challenges are shared between countries, and suggests the need for coordinated solutions (IISD 2011: 21). While the different countries face common climate change vulnerabilities, developing answers to climate-related challenges can be a new strategy and adaptation needs could revive past cooperation. Taking into account the different experiences within the region regarding National Communications as well as climate and adaptation strategies, the countries could benefit from increased exchange and mutual learning. A regional approach towards adaptation could also significantly strengthen current national efforts. A regional adaptation roadmap could attract donors and funds for efforts such as capacity building and institutional support as well as technical assistance. Likewise it could help to overcome the lack of awareness for possibilities of cooperation among countries on the topic of climate change and adaptation.

However, and in contrast to some of the past initiatives, future efforts need to clearly reflect the political barriers to multilateral cooperation on climate change adaptation within a region where water and energy are high politics. Adaptation to climate change is not only a technical issue but a rather political task, when looking at transboundary waters. The design of any activity needs to consider the barriers to cooperation outlined above and take into account political sensitivities, in particular the hydro-political settings in Central Asia, framing interventions accordingly. In regional responses towards adaptation, the conflict potentials of the water-energy-nexus should not be highlighted, with attention instead being directed towards the positive effects adaptation can have for economies and people. In short, new approaches towards adaptation should abstain from further securitisation of climate and water issues.

Common vulnerabilities and transboundary support needs

In starting a joint adaptation effort, the countries of the region would gather around the basic objective of better understanding regional climate change impacts, identifying benefits of needs-based cooperation on adaptation and discussing the case for a regional approach. Thus, looking for mutual interests would be the starting point. Common ground could be found in that all countries increasingly see the relevance of climate change for the whole region. In order to provide low barriers to participation, the range of topics to start with should focus on the following issues, in which national vulnerability assessments and adaptation strategies and plans overlap across the five countries:

- vulnerabilities to climate change impacts (especially with regard to transboundary bio-geographical areas that share common topography and eco-systems) with regard to water, agriculture, forestry, biodiversity, disaster risk management
- need for climate change and impact awareness raising

- need for capacity building and strengthening institutions in the field of climate change, adaptation and water
- need to protect shared water resources.

Based on the assumption that climate impacts cannot ideally be addressed on the national level but necessitate transboundary approaches, gaps between national adaptation strategies should be discussed and information could be exchanged for mutual support of the further development and regional implementation of national plans and activities (e.g. by exchanging data on climate projections and impact assessments). Furthermore, discussions about synergies between adaptation and DRM (e.g. transboundary early warning communications systems, anti-flood measures) could be fruitful as climate change will give momentum to disaster risk reduction programmes.

Process criteria and focus areas

A regional approach should start with joint discussions on the issues pointed out above and the development of criteria for a regional process – "Central Asia Climate Change Adaptation Roadmap" - by defining the problem and goal, milestones and activities and by discussing ambitions and expectations regarding a joint political declaration within 3-5 years. The dialogue process could be accompanied by scientific guidance provided through existing research networks.

It is proposed to design multiple levels of dialogue to be pursued by national governments and regional organisations. Taking into account current needs as well as opportunities and barriers for regional cooperation, it is recommended to focus the regional adaptation process on four areas, as presented below.

Table 8: Regional Adaptation Roadmap for Central Asia

Regional Adaptation Roadmap for Central Asia				
common regional vision on adaptation goal, milestones, activities				
Focus areas	Successful existing transboundary agreements	Common hydro-meteorological data basis	Transboundary fragility and vulnerability hotspots	Transboundary ecosystem-based adaptation
Rationale	build upon successful experiences extend + transfer / replicate successful cases support permanent bilateral and multilateral structures	improve the (scientific) basis (hydro-meteorological stations and posts as well as information systems) support commonly trusted data capacity building	focus on climate change and fragility hotspots: areas where there is a high risk that climate change will exacerbate existing tensions, e.g. among different groups of water users revitalise existing water cooperation	environmental protection / protected areas as "low politics" entry point for cooperation emerging topic ecosystem-based adaptation
Example	Chu-Talas River Basin	Syr Darya basin	Ferghana Valley	Aydar-Arnasay Lakes

case	Commission (Chapter 5.2)	(Chapter 5.3)	(Chapter 5.4)	system (Chapter 5.5)

Bilateral and trilateral approaches to adaptation

After initiating first steps of multilateral exchange and dialogue to start a regional adaptation process, the activities should focus on the areas presented above. The focus areas are complementary (e.g. technical and non-technical) and mutually strengthening for each-other and the regional process. They combine urgent issues and potentially low barriers for bilateral and multilateral cooperation. Each focus area provides a different entry point for bilateral and multilateral discussions on adaptation. Depending on the preferences of the parties, activities can discussed in parallel or subsequently.

Considering the barriers to regional cooperation on issues such as water, agriculture or the environment, bilateral approaches have been more successful than multilateral initiatives in the past. It is expected that this applies for climate change adaptation, too. Thus, depending on the parties' preferences, activities could first support bilateral approaches open for other countries to join in at a later stage. Since, for instance, Kyrgyzstan, Tajikistan and also Kazakhstan currently seem to be more open for cooperation within the Central Asian setting, initiatives could be supported between those countries.

Linking to Institutions and Current Projects

Any new regional initiative needs to identify and actively seek cooperation with the relevant national bodies and multilateral commissions, as well as current initiatives and projects, and also involve stakeholders from different sectors and civil society in Central Asia in order to build upon the experiences of past project and multilateral undertakings. A regional initiative would need to involve state representatives such as heads of relevant ministries and agencies. Organisations that should be involved in supporting a regional approach towards climate change adaptation include IFAS/ICWC/SIC, CAREC and the UNECE Water Convention Secretariat. These organisations will potentially all have key roles in awareness raising and mobilising (international) resources to support adaptation, but also for discussing the potential for a regional adaptation process. According to a study undertaken by the IISD, the ICWC is among the few intraregional organisations that could play a role in promoting adaptation across all the countries of Central Asia. (IISD 2011: 24). The following chapters will offer details into which organisations should be involved and which projects should be linked to each focus area.

4.5.2 Focus Area 1: Sustaining and Transferring Chu-Talas River Basin Commission Experiences

Uncoordinated realisation of water infrastructure development plans in the riparian states can negatively affect water availability downstream and harm water-dependent ecosystems. In this context, a long-term dialogue including all riparians is crucial. One approach is to establish a permanent bilateral cooperative structure and to strengthen bilateral monitoring of the planned infrastructure.

The Commission of the Republic of Kazakhstan and the Kyrgyz Republic on the Use of Water Management Facilities of Intergovernmental Status on the rivers Chu and Talas was established in 2006. The Commission is responsible for the joint management of the water management facilities listed in the agreement (UNECE 2011). The Chu-Talas Rivers Basin Commission (www.chutalascommission.org) is the only bilateral transboundary water commission in the

Central Asia region with an endorsed water-sharing agreement and relevant tools for costs compensation. The Chu Talas basin agreement was internationally recognised and the basin is expected to provide a good example of adaptation to climate change for other transboundary basins in the region and beyond. The agreement has commonly been regarded as a success and was described by some as the "way forward" in Central Asian water politics (EnvSec Project Fact-Sheet, Wegerich 2008:117, Granit et al. 2010). The experiences gained were later used to also support Tajikistan and Kyrgyzstan in establishing a joint river commission for Isfara and Khodzerbakirgan. Exceeding expectations, this has also lead to the development of a general legal framework for all transboundary rivers between those two countries.

It is proposed to build on this positive experience and further support the work of the Chu-Talas River Basin Commission and the transfer of experiences to other basins – thereby addressing water management, hydro-meteorological disasters and food-security, but also energy security and biodiversity issues.

Future support of the work of the Chu-Talas River Basin Commission could include:

- Encouraging the extension of the work of the Chu-Talas River Basin commission, e.g. by including more water facilities
- Supporting the establishment of an Interstate Chu Talas Basin Council (concept already developed)
- Improving stakeholder involvement in the Chu Talas basin, e.g. different decision makers from different sectors such as energy and agriculture
- Supporting the development of a comprehensive adaptation strategy for the basin that takes into account stabilising effects on climate change adaptation based on the existing proposals for different adaptation activities from the Chu-Talas Commission that already exist
- Supporting the inclusion of principles of IWRM and links with DRM and green economy.

Supporting the transfer of the experiences from the Chu-Talas case to other basins could include:

- Identification and regional publication of success factors of the Chu-Talas case
- Systematic analysis of (smaller) transboundary river basins to identify needs for river basin commissions / agreements (for many of the main rivers transboundary agreements exist – but not for smaller rivers)
- Feasibility studies for the transfer of Chu-Talas Basin Commission experiences to other river basins.

Examples of actors who should be involved:

- Chu-Talas Rivers Basin Commission (www.chutalascommission.org)
- ICWC, the SIC, as well as the IFAS Joint Working group involving experts from the different countries (no government-to-government negotiations so far); (With regard to current topics and experts involved not only in the context of ICWC's activities, "Central Asian International Research and Practice Conference - Twenty Years of Water Cooperation among the Central Asian Countries: Past Experience and Future Challenges" in September 2012 would be one major reference) (www.icwc-aral.uz)
- UNECE, which was involved in the initiative from the very beginning; involving UNECE

could also offer the benefit of enabling cross-learning from the broad range of similar UNECE activities in different regions; the UNECE Water Convention Secretariat, Task Force on Water and Climate has previously initiated National Policy Dialogues on Integrated Water Resources Management in Kazakhstan, Kyrgyz Republic, Tajikistan and Turkmenistan. The next working group meeting of the EUWI National Policy Dialogues meeting will take place on the 27th of September 2013 in Geneva, Switzerland (http://www.unece.org)

- Regional Environmental Centre for Central Asia (CAREC), which supports ICWC and driving different projects very relevant to regional adaptation
- Experts from giz who were involved in supporting the establishment of joint river commissions between Kazakhstan and Kyrgyzstan for the Chu-Talas river basin.

Examples of programmes and projects, which should be linked to

- German programme "Transboundary Water Management in Central Asia" (giz) for which the Project Study Area 7 is Chu-Talas; project component on fostering regional institutional cooperation (in Cooperation with Executive Committee of the International Fund for Saving the Aral Sea (EC IFAS)) and national pilot projects component (Improving IWRM planning at the Aral-Syrdarya Basin Organisation); Phase II of the Programme started in the beginning of 2012 and will continue until 2014 (www.waterca.org)
- UNECE, UNESCAP, OSCE project "Support for the Creation of a Transboundary Water Commission on the Chu and Talas Rivers between Kazakhstan and Kyrgyzstan" (2003-2006) ("Chu-Talas I") and UNECE / OSCE joint project "Development of cooperation in the basin of Chu and Talas Rivers" (Chu-Talas II) (2009-2010)
- UNECE project "Integrated Water Resources Management in the Chu-Talas Basin", implemented from 2010 to 2012 as part of the pilot project on water and climate change adaptation in the Chu-Talas River. A new programme from the UNECE Water Convention relates to projects in different regions, including climate change adaptation in transboundary rivers (Chu-Talas projects and others), is currently in the fundraising stage. (www.envsec.org)
- Among the few projects with the explicit objective of helping to decrease potential tensions in the water sector is "Promoting Cooperation to Adapt to Climate Change in the Chu-Talas Transboundary Basin (Finland (Environment and Security Initiative 2010–2012) EnvSec 2011)
- ADB: Improved Management of Shared Water Resources in Central Asia Volume I: Improving Trans-boundary Water Management on a Pilot Basis (Chu and Talas River Basins)
- Promoting Integrated Water Resources Management (IWRM) and Fostering Transboundary Dialogue in Central Asia (European Commission, Norway, UNDP, and Governments of Kazakhstan, Kyrgyzstan, Tajikistan)
- Asia Pacific Adaptation Network (CAREC and others): The sub-regional conference "Multi-stakeholder Dialogue on Adaptation to Climate Change in Central Asia facing COP 18 to the UNFCCC" took place as part of this project in Taschkent in November 2012 (www.apan-gan.net)

4.5.3 Focus Area 2: Technical Cooperation in the Syr Darya basin

Climate change will lead to an increase in hydrological uncertainty. Improving hydrological monitoring infrastructure can help to mitigate this development. Networks of hydrological and hydro-meteorological stations and posts are important for climate change adaptation and disaster risk management alike. Furthermore, multilateral water agreements depend on hydrological data, including contemporary and changing hydro-meteorological conditions. Climate and hydrological research in general depends on the technical basis of a functioning network of observation stations and posts. The data generated supports awareness raising and informing people about climate change impacts and risks related to hydro-meteorological disasters.

When looking at water issues in the context of crisis or conflict analysis, disparities in the parties' capacity to generate, interpret and legitimise data can lead to mistrust of those with better information and support systems (Kramer 2008, A.T. Wolf et al. (2005)).Technical cooperation among the countries of the Syr Darya basin on hydro-meteorological observation infrastructure can help building a common trusted database for coordinating adaptation activities and future cooperation on trans-boundary water management.

In Central Asia, hydrometric monitoring reached its most advanced level in the mid-1980s. However, in the 1990s, because of widespread economic destabilisation, this system declined (Granit et al.: 15). Owing to economic reasons, the network of hydro-meteorological observation stations of the national hydro-meteorological agencies (NHMA) of Central Asia was decreased (SNC Uzbekistan 2008: 127f). Of the some 100 hydrological monitoring stations in Kyrgyz territory within the Syr Darya Basin in 1980, currently only 28 are operational (UNECE 2011: 116; Granit et al.: 10).

Similarly, Tajikistan expressed the need to work on the subject in its National Plan of Action for Climate Change Mitigation and suggests inter alia training of personnel in adaptation-related fields such as climate and hydrological research. With a large mountainous area, glaciers need to be monitored as an important part of the water system. The State Organisation for Hydrometeorology lacks the resources and capacity for the overwhelming task of monitoring the glacial activity in Tajikistan (The National Plan of Action for Climate Change Mitigation (2003), Oxfam 2010 Tajikistan: 8).

Uzbekistan points to needs in this area and holds economic reasons responsible for the shrinking of the observation network. According to the Second National Communication, main climate change related risks include the reduction of available water resources and a growing variability and general trend growth in number of extreme years in terms of their dryness. Improving the hydro-meteorological network is one of the proposed adaptation measures. Uzbekistan points to the fact that there is a lack of background information from meteorological stations in the runoff formation area outside Uzbekistan (SNC Uzbekistan 2008: 78, 128, 162).

Notwithstanding past projects in this area, there still seems to be a strong need regarding technical capacity building for the hydro-meteorological observation network in Central Asia.

Elements of a technical cooperation in this focus area could encompass:

1) Restoration and upgrading of the hydro-meteorological observation network (stations and posts) in the Syr Darya basin (technical infrastructure, hydro-meteorological devices)

2) Implementation of IT systems for information collection and storing; establishment of databases appropriate to the modern requirements, including easing of access to information

3) Capacity building: trainings on improved procedures for collection, processing, analysis and distribution of hydro-meteorological observations data; Improvement of methods for forecasts and hydro-meteorological monitoring; trainings should include representatives from marginalised groups.

Joint activities of the riparian countries should support inter-state sharing of hydro-meteorological information between NHMA of the region that is already taking place.

Linking to institutions and existing projects

Examples of three actors who should be involved include the National hydro-meteorological agencies (NHMAs: Kyrgyz National Hydromet Service, Tajik State Organisation for Hydrometereology, Centre of Hydrometeorological Service under the Cabinet of Ministers of the Republic of Uzbekistan (Uzhydromet), National Hydrological and Meteorological Service Kazakhstan), the Water-Management Authorities (BWAs) for the Syr Darya and UNECE. Furthermore (interim) results and lessons learnt from a number of current projects need to be taken into close consideration.

Examples of four projects, which should be linked to include:

- EU Technical Assistance Programme for the CIS: Regional Action Programme 2002 - Technical assistance to Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan with respect to its Global Climate Change commitments (European Union)
- Swiss Support to Hydro-meteorological Services in the Aral Sea basin: assist the NHMS of the region in providing reliable hydro-meteorological data, flow and flood forecasts to key end-users (SDC, 2001-2009)
- Enhancing regional exchange of water resource information (CAREWIB) Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan) (UNEP, UNECE, SDC; 2003-2012)
- Projects of the Asian Development Bank with regional technical assistance of multilateral water agreements on the Syr Darya (since 2005)
- Link to national projects: the Water Resources Committee of Kyrgyzstan plans to set up an analysis and information centre and develop a unified information system on water (UNECE 2011: 116); SDC supported plans to create a Regional Centre for Hydrology under the auspices of EC-IFAS.

4.5.4 Focus Area 3: Revitalising and Climate Proofing Water Cooperation in the Ferghana Valley

Within Central Asia, the Ferghana Valley is situated between the mountain systems of the Tien-Shan in the north and the Gissar-Alai in the south. The valley is part of Kyrgyzstan, Uzbekistan and Tajikistan. Numerous development projects have been implemented in the past, for example in the area of water and agriculture. Nevertheless, the area remains one of the most vulnerable and fragile climate hotspots in Central Asia. Additionally a majority of the valley's population is poor and lives close to the riverbanks for their agricultural and domestic water needs and is, therefore, extremely vulnerable to climate impacts (CAREC 2011: 52). Kyrgyzstan, Uzbekistan and Tajikistan all explicitly name the Ferghana Valley in their National Communications and climate-related strategies in relation to climate change impacts and

vulnerable regions, stressing the need to address (projected) climate impacts on water and food security.

It is proposed to use the latest scientific evidence on climate change and projections regarding regional impacts to revitalise past development projects and experiences on water management in the Ferghana Valley and to introduce and strengthen the climate change adaptation perspective in a conflict-sensitive manner. Revitalising water cooperation in the Ferghana Valley, Sir Darya Catchment and small rivers like Shakhimardan and Khojabakirgan should encompass:

- Bringing together existing initiatives to discuss climate impacts and adaptation needs with regard to water, agriculture and natural resource management in general; encourage joint vulnerability assessments; climate-proof existing project;
- Strengthening institutional and technical structures to enable groups of people with different interests to peacefully agree on and coordinate actions on water use under the projected climate impacts – this would require linking the existing "piecemeal" to more systematic approaches of IWRM;
- Developing transboundary initiatives to climate-proof existing agreements on water usage and distribution; using the latest knowledge of peace and conflict research – applied to the current (hydro)political context of the region; strengthening participatory processes that include marginalised groups.

Linking to institutions

Some of the previous attempts to support cooperation in the valley date back many years and need to be revitalised. For future initiatives, processes would need to be more well-grounded and institutionalised through closer involvement of different ministries and other governmental bodies in order to allow for on-going work independent from single projects.

Examples of actors and initiatives which should be involved are the Scientific Information Center of the Interstate Commission on Water Coordination (SIC-ICWC), Environment and Security Initiative (EnvSec) and the Ferghana Valley NGO Network "Dolina Mira".

Linking to existing projects

Furthermore, (interim) results and lessons learnt from a number of current projects need to be taken into consideration. Examples of three projects, which should be linked to include:

- Integrated Water Resources Management in the Ferghana Valley; project by IWMI funded by the Swiss Agency for Development and Cooperation (SDC): in partnership with the Scientific Information Centre of the ICWC (SIC ICWC); project established water user groups (WUGs) and water user associations (WUAs), a System-wide management organization (SMO), a Union of System-wide water users (UWU) and a System-wide Water committee (SWC) (cooperation with GIZ) In addition to this water management project, SDC endeavored to prevent violence and promote development in the Fergana Valley by supporting local NGOs that offer continuing education courses for local mediators; project phase V ended in 2012; the assessments of the impact of development cooperation projects on water-related conflicts in Central Asia are among the rare examples of comprehensive frameworks for conflict impact assessments of water-related projects. (www.iwrm.icwc-aral.uz)
- "Cross-border cooperation between communities in the Ferghana Valley in the context of sustainable development" Environment and Security Initiative EnvSec, 2007 with financial assistance from the German Federal Environment Ministry
- Water and Adaptation Intervention in Central and West Asia; Asian Development Bank (Amu Darya and Syr Darya River Basins: Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan)

4.5.5 Focus Area 4: Ecosystem-Based Adapation in the Aydar-Arnasay Lakes System

The Aydar-Arnasay Lakes system (AALS) is a wetland of international importance that is particularly vulnerable to climate change. The Uzbek National Communication highlights the need for an adaptation strategy and stresses the importance of developing interstate collaboration in water resource management for ensuring ecological and social safety in the transboundary area (SNC Uzbekistan:116f).

Bilateral agreements between Kazakhstan and Uzbekistan exist in terms of the management of the lakes, however, there is a need for a specific agreement. The lakes system was designated as a Ramsar Site by Uzbekistan in 1983, but the area is not protected under national legislation. An Action Plan for maintaining the stability of ecological conditions and the effective use of the Aydar-Arnasay Lakes System for Uzbekistan in 2008-2015 was developed and approved by the Government of Uzbekistan. In 1983, the Arnasay ornithological zakaznik (a type of

protected area), which includes the three Tuzkan, Arnasay and Aydar reservoirs, was created, covering 63,000 ha. Most of the Aydar-Arnasay Lakes System is planned to be integrated into the Nuratau-Kyzylkum biosphere reserve. (UNECE 2011: 117)

It is proposed to strengthen cooperation between Kazakhstan and Uzbekistan in the field of ecologically important and protected areas by working together on the "low politics" of environmental protection in the AALS:

- Climate-proofing existing AALS agreements and plans and supporting joint development of adaptation concepts
- Cooperating on developing a concept on ecosystem-based adaptation[15] in trans-border ecological corridors
- Supporting bi-national dialogue and development of (bi-national) agreements such as the extension of the existing biosphere reserve; supporting and expanding the network of protected areas

Linking to institutions and existing projects:

- Environment Law Center "Armon" in Uzbekistan
- NGO EkoMaktab in Uzbekistan
- Creation of Nuratau Kyzykkum Biosphere reserve as a model of preservation of biodiversity of Uzbekistan – joint project of UNDP, GEF and the Government of Uzbekistan
- German Society for Nature Protection (NABU) that is currently supporting worldwide Important Bird Areas (IBA) programme of BirdLife International in Kazakhstan and Kyrgyzstan (www.nabu.de/en/themen/international/schutzgebiete)

4.5.6 Outlook: Development of a Regional Adaptation Strategy

Bilateral and trilateral approaches to adaptation in the four focus areas should be integrated via the regional umbrella process on adaptation by, for example, sharing the experiences of different regional projects.

The long-term goal of a regional adaptation process / "roadmap" active in different focus areas should be to develop a common understanding of regional climate change vulnerabilities and transboundary adaptation priorities as well as needs-based coordination and potential cooperation on adaptation activities. The results of the multilateral discussions should be

[15] Ecosystem-based adaptation (EbA) is the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change. As one of the possible elements of an overall adaptation strategy, ecosystem-based adaptation uses the sustainable management, conservation, and restoration of ecosystems to provide services that enable people to adapt to the impacts of climate change. It aims to maintain and increase the resilience and reduce the vulnerability of ecosystems and people in the face of the adverse effects of climate change. (IUCN 2009: http://cmsdata.iucn.org/downloads/iucn_position_paper_eba_september_09.pdf)

formalised to a certain degree and lead to a political document (e.g. “Adaptation Strategy Central Asia”). Possible elements of a regional adaptation strategy include:

1. Climate change impacts and vulnerabilities: vulnerability hotspots within Central Asia and common/transboundary vulnerabilities; prioritised risks and regional adaptation needs; economic evaluation of related climate change impacts and sectoral analysis
2. Regional adaptation priorities: prioritise common adaptation needs; establish consultation mechanisms to harmonise regional adaptation efforts
3. Potential transboundary adaptation projects: outlines of joint projects in water-related development fields such as energy, agriculture, environment and health; ideas for national activities for the implementation of the regional adaptation strategy; links to DRM

A regional adaptation strategy should include links to existing multilateral environmental and water-related agreements. This could include discussions for updating outdated agreements that do not provide for adequate regulations in the face of a changing climate. In the long run, a regional adaptation strategy could coordinate national responses to climate change.

4.6 Bibliography Central Asia

Adaptation Fund Board 2010: Addressing climate change risks to farming systems in Turkmenistan at national and community level. AFB/PPRC.1/10.

Adelphi 2012 (unpublished): Field Study Notes, ACAF Project,Tajikistan. Duschanbe: adelphi.

Bernauer, T., Siegfried, T. 2012: Climate Change and International Water Conflict in Central Asia. Journal of Peace Research 49/1, 227-239.

Bichsel, Ch. 2011: Liquid Challenges: Contested Water in Central Asia. Sustainable Development Law & Policy 12, No. 1 (2011) 24-30, 58-60.

Björklund, G. 2005: People, Environment and Water Security in the Aral Sea Area. In: Schlyter (ed.): Prospects for Democracy in Central Asia. Istanbul: Swedish Research Institute.

CAREC 2009: GAP Analysis in the Area of Climate Change and Energy Efficiency in Central Asia: Defining opportunities for CAREC. CAREC, Asia Pacific Adaptation Network.

CAREC 2011: GAP Analysis on Adaptation to Climate Change in Central Asia: Priorities, Recommendations, Practices. CAREC, IGES.

Carius, Alexander, Achim Maas and Kerstin Fritzsche 2009: Climate Change and Security in South West Asia. Brussels: European Commission.

Christensen, J.H., Hewitson, B., Busuioc, A., Chen, A., Gao, X., Held, I., Jones, R.K., Kolli W.-T., Kwon, R., Laprise, R., Magana Rueda, V., Mearns, L., Menéndes, C.G., Räisänen, J., Rinke, A., Sarr, A., Whetton, P. 2007: Regional Climate Projections. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. United Kingdom and New York, NY, USA: IPCC.

EnvSec 2005: Environment and Security. Transforming Risk into Cooperation. Central Asia. Retrieved March 4, 2013, from http://www.envsec.org/publications/ENVSEC.Transformingpercent20riskspercent20intopercent20cooperation.percent20Centralpercent20Asia.percent20Ferghana-Osh-Khujandpercent20area_English.pdf

EnvSec 2011: Adaptation to climate change in Chu-Talas Rivers basin. UNDP/ UNECE/ OSCE.

Eschment, B. 2011: Wasserverteilung in Zentralasien. Ein unlösbares Problem? Friedrich Ebert Stiftung. Retrieved March 4, 2013, from http://library.fes.de/pdf-files/id/08201.pdf

Genina et al. 2011: Gap Analysis on adaptation to climate change in Central Asia. Asia Pacific Adaptation Network, IGES, CAREC.

Giese, Ernst and Jenniver Sehring 2007: Regionalexpertise. Destabilisierungs- und Konfliktpotential prognostizierter Umweltveränderungen in der Region Zentralasien bis 2020/2050. Externe Expertise für das WBGU-Hauptgutachten "Welt im Wandel: Sicherheitsrisiko Klimawandel". Berlin: WBGU.

Granit, J., Jägerskog, A., Löfgren, A., Bullock, A., Gooijer, A., Pettigrew, S., Lindström, A. 2010: Regional Water Intelligence Report Central Asia. UNDP, Water Governance Facility, SIWI.

Gunya, A. 2007: Cross-border Cooperation in the Ferghana Valley. ECC October 2007.

Haas, M. 2007: The Shanghai Cooperation Organisation. Towards a full-grown security alliance? Clingendael.

HIIK 2008: Conflict Barometer. Retrieved March 4, 2013, from http://www.hiik.de/en/konfliktbarometer/pdf/ConflictBarometer_2008.pdf

IFAD 2009: Climate Change Impacts - Central Asia. Retrieved November 6, 2012, from http://www.ifad.org/events/apr09/impact/central.pdf

IISD 2011: Review of Current and Planned Adaptation Action: Central Asia. Adaptation Partnership/ IISD.

IISD Reporting Service 2009: UNIDO and EurAsEC to Cooperate on Climate Change, Energy and the Environment. Retrieved November 6, 2012, from http://climate-l.iisd.org/news/unido-and-eurasec-to-cooperate-on-climate-change-energy-and-the-environment/

Kraak, Eelke 2011: Dams of Damocles: The geopolitics of the operation of the Toktogul reservoir. Fieldwork report Kyrgyzstan. 19.11.2011. Oxford: School of Geography and the Environment, Oxford University.

Kramer, A. 2008: Regional Water Cooperation and Peacebuilding in the Middle East. Brussels: Initiative for Peacebuilding.

Libert, B. 2008: Water Management in Central Asia and the Activities of UNECE. In: Rahaman, M.M., Varis, O. (eds.): Central Asian Waters, 35-45.

Maas, A., Tänzler, D. 2009: Regional Security Implications of Climate Change. A Synopsis. Adelphi Report No. 01/09. Berlin: Adelphi Consult.

Ministry of Irrigation 2006: Water Sector Development Strategy in Tajikistan. UNDP Office in Tajikistan, Executive Committee of the International Fund for saving the Aral Sea.

Oxfam Tajikistan 2010: Reaching Tipping Point? Climate Change and Poverty in Tajikistan. Retrieved March 4, 2013, from http://www.oxfam.org/sites/www.oxfam.org/files/tipping-point-climate-poverty-tajikistan.pdf

Government of Kazakhstan 1998: First National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved February 28, 2013, from http://unfccc.int/resource/docs/natc/kaznc1.pdf

Government of Kazakhstan 2008: Kazakhstan Community Based Adaptation Country Programme Strategy. Global Environmental Facility, Small Grants Programme, United Nations Development Programme.

Government of Kazakhstan 2009: Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/kaznc2e.pdf

Government of Kyrgyzstan 2003: First National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/kyrnc1.pdf

The government of Kyrgyzstan 2009: Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/kyrnc2e.pdf

Government of the Republic of Tajikistan 2002: First National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Ministry for Nature Protection, Main Administration for Hydrometeorology and Environmental Monitoring. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/tainc1.pdf

Government of the Republic of Tajikistan 2003: National Action Plan for Climate Change Mitigation. Ministry for Nature Protection. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/nap/tainap01e.pdf

Government of the Republic of Tajikistan 2008: Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. State Agency for Hydrometeorology of Committee for Environmental Protection under the Government of the Republic of Tajikistan. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/tainc2.pdf

Government of the Republic of Tajikistan 2011: Strategic Programme for Climate Resilience. Prepared under the Pilot Program for Climate Resilience.

Government of Turkmenistan 2006: First National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Ministry of Nature Protection of Turkmenistan. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/tkmnc1a1.pdf

Government of Turkmenistan 2010: Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Ministry of Nature Protection. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/tkmnc2.pdf

Government of the Republic of Turkmenistan 2012: National Climate Change Strategy of Turkmenistan.

Government of Uzbekistan 1999: First National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/uzbnc1.pdf

Government of Uzbekistan 2008: Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Center of Hydrometeorological Service under the Cabinet of Ministers of the Republic of Uzbekistan. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/uzbnc2e.pdf

United Nations Development Program (UNDP) 2009: The Kyrgyz Republic's Second National Communication to the UNFCCC. Bishkek: UNDP Kyrgyzstan.

UNDP 2010: Supporting Integrated and Comprehensive Approaches to Climate Risk Management in Central Asia.

UNDP 2011: Tajikistan: Strategic Programme for Climate Resilience. Pilot Programme for Climate Resilience.

UNECE 2008: Adaptation to Climate Change in Eastern Europe, Caucasus and Central Asia and South-Eastern Europe.

UNECE 2011: Drainage Basin of the Aral Sea and other Transboundary Waters in Central Asia. Chapter 3, 107-130.

UNECE 2012: Task Force on Water and Climate. Retrieved November 6, 2012, from http://www.unece.org/env/water/water_and_climate.html

UNECE 2012: Water and Adaptation to Climate Change. Retrieved November 6, 2012, from http://www.unece.org/env/water/water_climate_activ.html

UNISDR Asia and Pacific 2011: At the Crossroads. Climate Change Adaptation and Disaster Risk Reduction in Asia and the Pacific - A Review of the Region's Institutional and Policy Landscape.

WBGU 2007: Welt im Wandel: Sicherheitsrisiko Klimawandel. Berlin: Springer.

Wegerich K, 2008: Passing Over the Conflict. The Chu Talas Basin Agreement as a Model for Central Asia? Irrigation and Water Engineering Group, Wageningen University.

Weinthal, E. 2006: Water Conflict and Cooperation in Central Asia. Human Development Report 2006.Occasional Paper. Retrieved March 4, 2013, from http://hdr.undp.org/en/reports/global/hdr2006/papers/weinthalpercent20erika.pdf

Wittich, A. Maas, A. 2009: Regional Cooperation in the South Caucasus. Lessons for Peacebuilding, from Economy and Environment. Brussels: Initiative for Peacebuilding.

Wolf, A. T., Kramer, A., Carius A., Dabelko, G. D. 2005: Managing Water Conflict and Cooperation. In: State of the World 2005: Redefining Global Security, Chapter 5: The WorldWatch Institute. Washington, D.C.

World Bank 2004: Central Asia Regional Framework. Europe and Central Asia Region, Central Asia Country Unit. Retrieved December 19, 2011, from http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2004/03/29/000012009_20040329104537/Rendered/PDF/28323.pdf

World Bank 2012: Increasing the Resilience of ECA Agriculture to Climate Change. Uzbekistan. Retrieved November 5, 2012, from: http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/ECAEXT/0,,contentMDK:22626153~pagePK:146736~piPK:146830~theSitePK:258599,00.html

5 Adaptation to Climate Change for Peace and Stability

Towards a Regional Roadmap for South Asia

5.1 Executive Summary

Climate change will negatively affect human security and development across the world. This may lead to political instability – especially in fragile areas. Adaptation can be a "threat minimizer" according to an analysis by the UN General Secretary. The Federal Environmental Agency tasked adelphi to analyse the interlinkages of climate change, adaptation, peace and stability in different regions severely affected by climate change. By analysing the role of adaptation in preventing climate-induced risks, this project also is to support the political discussions at the EU, UN and OSCE level.

In order to analyze current adaptation strategies and needs in the respective countries, a desk study was conducted, analyzing existing national policies and strategies, reports, documents and other relevant data as well as current and completed adaptation measures, organisations and initiatives. The entry points identified and the initiatives proposed were then verified by interviews and consultations with relevant experts at regional, national and local level.

In the following, we suggest a regional perspective on adaptation in South Asia including the countries Bangladesh, India, Pakistan and Nepal. Our review of climate science shows that the challenges of climate change, water and food security, disaster prevention and political stability cannot be addressed independently. In the face of common regional vulnerabilities countries should cooperate in developing responses to climate impacts. To this end, adaptation interventions need to be carefully designed not to provoke or exacerbate local tensions. In addition, tensions within societies ask for a better understanding as a way to help resolve them and prevent renewed violence. This can also help to decrease potential tensions over changing water regimes in the future.

Against the backdrop of the national and regional vulnerabilities, regional approaches and their limitations in South Asia are discussed and steps outlined how to address potential water and food crisis as well as the consequences of disasters in South Asia in a cooperative way.

In order to promote a regional perspective on adaptation as means of peace and stability we suggest the following initiative as promising starting points:

- To support the implementation of various SAARC agreements and initiatives (joint risk assessment, Mountain Initiative, Food Bank etc.) and facilitate cooperation with Inter-Governmental Expert Group on Climate Change
- To examine the prospects of improved and long term climate financing via a Regional Implementing Entity or other approaches
- To institutionalize the exchange on best practices (e.g. IWRM) in different South Asian transboundary rivers leading potentially to a Himalaya River Facility
- To facilitate a Dialogue on Migration and Adaptation aiming at improving the knowledge basis and integrating perspectives to improve among others financing options (in cooperation with the Asian Development Bank).

These approaches can prove how pro-peace adaptation processes can work in practice and contribute to a regional identity of facing and addressing climate change challenges. In this way, they can serve as a starting point for a more comprehensive regional adaptation strategy.

5.2 Climate Change, Peace and Stability

Climate change will affect South Asia in different ways. If action is delayed, climate change impacts will converge with resource exhaustion and growing regional and global demands for water, food and energy. Given the high poverty levels and poor response capacities, the people and governments of Bangladesh, India, Pakistan and Nepal are vulnerable to the impact of these changes. Transboundary relations can become even more fragile, and events such as floodings or other natural disasters can catalyze tension and crisis.

5.2.1 Climate Change Related Risks

Although uncertainty remains, current trends suggest that there will be tremendous impacts of climate change on the subcontinent South Asia. Key challenges are the melting of Himalayan glaciers, seal level rise, potential changes in monsoon patterns as well as extreme weather events which affects South Asian countries in different ways.

When assessing the extent of the impact it is crucial to consider the size of the population directly affected in the region – today and in the future. Over one billion people are currently living in the South Asian region and due to high degrees of underdevelopment nearly 600 million people in South Asia subsist on less than one U.S. dollar a day. Bangladesh and Nepal are characterised as Least Developing Countries (LDCs) (Adaptation Partnership 2011: vi). In all the countries, large parts of the population are highly dependent on agriculture which is the main source of income (60 percent of employment).

Forecasts suggest **that annual temperature increases** for South Asia may be between 2.4 and 4.5°C by the end of the century. Already today, rising annual mean temperatures have caused many **Himalayan glaciers to retreat** at a rapid rate of several tens of meters per year. These observed trends are likely to continue in the future. Should temperatures increase as suggested above, studies suggest that the number of people in the region experiencing water stress could increase by up to 137 million (IFAD 2009). Decreased snow cover will affect snow-fed and glacial systems such as the Ganges and Brahmaputra, especially in India. 70 percent of the summer flow of the Ganges comes from snowmelt (FNC: 2004). In Pakistan, there are major concerns due to the likely impact of receding Himalayan glaciers on the Indus River system, which could mean decreased capacity of water reservoirs and reduced hydropower especially during drought years. It is difficult to predict how climate change will unveil itself in Nepal because of its geographic location and topographic variability (from plains of the Terai to the high peaks of the Himalayas). However, being a mountainous country, the risk of landslides and loss of top soil (especially from hill slopes) will also increase due to degradation of forests and faster surface runoff.

A **sea level rise** of 1 to 3 millimetres per year is likely to lead to increased coastal flooding and, hence, saltwater intrusion into freshwater resources. This may have among others severe impacts on drinking water, local fisheries, aquaculture, agriculture, tourism, infrastructure, energy production through hydropower and industry. Sea level rise is a particular concern to low-lying coastal belts of India and Bangladesh, the latter generally recognized as the country most at risk due to climate change, particularly to the effects of sea-level rise (CIF, 2010; MEF, 2010). By 2050, 70 million people in the country could be affected annually by floods, up to 8 per cent of low-lying lands may be under water due to rising sea levels. “With a population over 150 million and 70 percent of land area 5 meters or less above sea level, each year, environmental hazards temporarily send half a million Bangladeshis to urban areas and displace 64,000 people.” (Foresight. Migration and Global Environmental Change. 2011 in Beddington et al. 2012: 5).

Sea level rise will among others lead to changes in the distribution and composition of natural habitats and forests, especially coastal mangroves as well as coral bleaching. With respect to natural resource management there may also be possible negative impacts on South Asia's **fisheries.** Climate change impacts are exacerbated by high concentration of settlements and economic hubs along the coast. By the end of the century, 125 million people across Bangladesh, India, and Pakistan could be rendered homeless by rising sea levels (Oxfam 2011:8).

Changes in monsoon patterns will have severe impact on the majority of people living in South Asia, whose livelihoods depend on subsistence. In India, erratic monsoons are associated with serious effects on rain-fed agriculture, peninsular rivers, water and power supply. The droughts of Rajasthan and Madhya Pradesh in India and the Sindh and Baluchistan provinces in Pakistan illustrate the negative impacts in this regard (Oxfam 2010:8). Some projections are already available for changes in South Asian summer monsoon (Sabade et. al. 2011, Kripalani et al. 2007).

Another challenge is an increase in the frequency and intensity of tropical storms and an increase in the intensity and frequency of **extreme weather events**. All South Asian countries expect an increase in this regard which will exacerbate the adverse impact of climate change on agriculture, water, health, forestry and biodiversity. In India, the area affected by floods already more than doubled in the 50 years between 1953 and 2003. In Bangladesh, 60 percent of the country is already considered flood prone. Most recently, the 2010 floods in Pakistan affected 20 million people and were the worst in the region since 1929 (Oxfam 2011:8). Pakistan, e.g., is likely to experience frequent occurrence of severe cyclones and storm surges. These events, accompanied by rising sea levels, could threaten coastal cities such as Karachi, Thatta and Badin (MOE Pakistan, 2003).

Despite the increase in precipitation, **water availability** is threatened by sea level rise and droughts. Future climatic trends have the potential to impact South Asia's agricultural productivity and, thus, a key socioeconomic sector in South Asia. Changes in the length of growing seasons may result in a reduction in crop yields and, hence, increased **food insecurity**. In India, a decline in wheat production by 4-5 million tonnes with as little as a 1ºC rise in temperature is expected (FNC: 2004). Considerable impacts are also expected on Pakistan's agricultural system, with possible impacts including vulnerability to heat stress, shifts in the spatial boundaries of crops, changes in productivity, and changes in water availability and use (MOE Pakistan, 2003).

5.2.2 Climate Change as a Driver of Crises, Tensions and Conflicts

In South Asia, climate change affects states with precarious political structures like, major economic and social problems and vast social inequality as well as a high level of existing intra- and interstate conflicts (WBGU 2007: 144). Both Bangladesh and Pakistan have faced political instability in light of a history of military coups. Security trends in the region are - among others - influenced by the conflict between India and Pakistan over Kashmir. Recent developments as the escalation of tensions along line of control this January 2013 show that despite a political dialogue the conflict is not yet much closer to being solved (WBGU 2007: 145, Crisis Group 2013a). In addition, Bangladesh has witnessed for many years internal migration and migration to neighbouring Indian states - especially to Assam - where the native population repeatedly resorted to violence against immigrants reacting to already scarce resources. The situation has worsened since last summer, where a month-long violence between the Bodo tribal community and the Muslim Bengali migrants from Bangladesh broke

out. July clashes between the two communities lead to death toll of 56, displacing thousands and triggering military intervention to contain the riots (Crisis Group 2013a). The Indo-Bangladeshi border issue can be seen as another potential source for conflict. Although the 2011 agreements to manage their common border are a promising start, the issue of boundary demarcation has not yet been solved.

Climate change is regarded as a threat multiplier, exacerbating existing weaknesses and tensions within the region having implications on peace and stability. Climate impacts are potential additional stressors for existing (sub-)national and inter-state tensions.

Water: Water resources in South Asia are highly vulnerable to the effects of climate change. Water shortages will affect the region in an extreme way due to increasing population growth, rapid urbanization and industrialization, inefficient water use and high dependency on rain-fed agriculture**. Water scarcity** will as a result aggravate **food scarcity** in the region as agriculture - the key source of livelihoods for the majority of people in South Asia - depends largely on water resources from the Himalayas and major rivers (Cruz et al. 2007). Vulnerabilities in the water sector furthermore have a direct impact on the regions **energy supply**, as the region depends significantly on hydropower for electricity generation and is already struggling to meet the huge energy demand.

Already, water conflicts exist **on all levels** of governance evolving around water management issues at the inter-state, intra-state and the grassroots level and between different water users. Several internal water disputes already exist between **water user groups** in the domestic and the industrial sectors and between communities on a **grassroots level**, which may be aggravated due to climate-induced water scarcity. It is predicted, that in the future a majority of conflicts are likely to emerge around water issues especially at the grassroots level. Water conflicts **between the individual states or provinces**, which have not yet been resolved have repeatedly give rise to outbreaks of violence in the past, one prominent example being the Cauvery River dispute. Tensions have furthermore occurred as a result of **regional and transboundary water disputes.** Water disputes are a persistent occurrence between India and its neighbouring countries: River systems of the Brahmaputra, the Ganga, and the Indus have a history of regional conflicts and cooperation with neighboring countries and therefore are subjects for major concern. Past controversy over water sharing of the Koshi, Gandak, Tanakpur and Mahakali rivers between India and Nepal, conflict over the Indus between India and Pakistan and disputes between Bangladesh and India on lower riparian rights have given reason for distress (Uprety 2007). Considering the already tense relations between India and Pakistan, the dispute may be exacerbated by climate related water shortage.

Conflicts between China and the South Asian states, arising from the reduction in the flow of glacier water from the Himalayas are a further potential problem. To a certain degree, these tensions are attributed to the lack of a clear legal framework for water sharing which is effectively binding and the small number of bilateral or regional institutional mechanisms to govern the region's transboundary water resources (Uprety 2012; Renner 2011). The recent conflict between India and Bangladesh evolving around the Teestat River which India controls through a barrage at Gazaldoba reducing the flow of water and leaving the Bangladeshi district of Nilphamari short of badly needed water serves as an example for a lack of binding legislation sparking conflict. A treaty was on the verge of being signed in 2012 but was postponed when the chief minister of the Indian state of West Bengal pulled out at the last minute (Rahaman 2013).

These challenges mentioned above may not only increase the pressure on already existing tensions, but also put additional pressure on the already weak water management structures.

As the high number of already existing conflict shows, water is likely to become an extremely strong threat multiplier within the region with a great need for regional cooperation.

Food Security: Irrigated croplands, mainly rice, in the watersheds of major Asian rivers are all to some extent depending on runoff from the high mountain regions in addition to monsoon rains which also recharge groundwater reservoirs. Given the high level of uncertainty regarding future runoff levels, and also the highly variable contribution of glacial water and snowmelt from the mountains, future agricultural production faces significant uncertainty putting food security in the region under threat (Kaltenborn et al. 2010). The impact of climate change will be extremely severe in the Punjab region adversely affecting Pakistan's and India's irrigation agriculture. Food shortages have already led to conflict and even violence in the past. In 2007 and 2008, riots broke out in Bangladesh's capital as well as in the Indian States of West Bengal, Uttar Pradesh and Bihar and Pakistan to protest against rising food prices- rice prices in Bangladesh doubled- and corruption in the food distribution system. The 2008 riots in Bihar and Uttar Pradesh took place in the wake of massive flooding when people displaced by the floods fought over limited supplies of food. Thousands demonstrated in Pakistan in January 2008 after the price of wheat flour doubled in less than a week (Schneider 2008: 28).

Natural Disasters: Sea level rise and a greater intensity and frequency of extreme weather events might lead to migration and food and water shortages thus trigger conflict over land and resources. Especially, Bangladesh is severely at risk due to sea level rise. "It is expected that sea level rise will put an increased pressure on plateau lands, which will undermine coastline stability and potentially lead into inter-community conflicts." (UNDP 2008 6). In Pakistan, the recent 2010/11 flood has shown that natural disasters have a direct adverse impact on political stability. While the Pakistani Army moved in quickly to provide relief to the affected people, the floods have exposed the lack of capacity of the Pakistani government who failed to react timely and effectively. The failures of the current civilian government to provide aid in time strongly weakened its credibility and thus directly contributed to political instability.

Migration: Due to various factors mentioned above huge parts of the south Asian population may be forced to adopted migration as a livelihood strategy. The intensity of climate induced disasters could overwhelm Bangladesh's coping capacity. As a result of the loss of arable and residential land through e.g. sea level rise, it is likely that migration towards India will increase and that existing conflicts like the current tensions in Assam between local Bodo population and Bengali Muslims or the decades-old boundary demarcation problem will escalate. Thus the instability in the east of the subcontinent is likely to increase and relationships between the countries will come under additional strain (WBGU 2007: 146).

Climate, peace and stability – all countries studied reference the interconnectedness of these issues in their UNFCCC communications:

The **Bangladeshi** NAPA highlights the diverse interests of water users in the country and states that the "areas of conflict between various interest groups (i.e., fishers and farmers) are expected to aggravate further" (NAPA Bangladesh 2005: 28ff).

In **India**, the First National Communication stresses the growing water stress due to climate change and voices concerns regarding water security (FNC India 2004: 59, 213). Furthermore, conflicts with respect to water management are predicted (FNC India 2004: 190). The Water-Food-Climate Change Nexus threatening the "livelihood security of millions of small and marginal farmers in the rainfed agriculture region" are mentioned in both the FNC and the NAPAC (FNC India 2004:83; NAPAC India 2008: 15)

Nepal predicts water conflicts between communities (SPCR Nepal 2011: 66) as well as disputes on a local level over natural resources and land (NAPA Nepal 2010: 60).Especially water scarcity has been identified as a major threat: "Conflicts over water resources have emerged and are likely to grow rapidly in coming years" (SPCR Nepal 2011: 79).

Pakistan's NCCP underlined the "increased stress between upper riparian and lower riparian regions on sharing the water resources" (NCCP Pakistan: 2011: 3) and thus presses for exploring "the possibility of joint watershed management of transboundary catchment areas with neighbouring countries" (NCCP Pakistan: 2011: 5).The Water-Food-Nexus and its implications for Pakistan's agriculture and subsequently its food security is also mentioned (NCCP Pakistan 2011: 3, TFCC Pakistan 2010: 19).

Furthermore **all countries** emphasise the risk of climate-induced transboundary migration which may lead to regional instability and conflict or even violence (NAPA Bangladesh 2005: 35; NAPAC India 2008:16; SPCR Nepal 2011: 81; NCCP Pakistan 2011: 3).

5.3 Adaptation as a Means of Peace and Stability

Adaptation measures can help to strengthen peace and stability. To this end, the design and development of conflict-sensitive adaptation is considered a meaningful tool. On a basic level, conflict sensitivity means being aware of the causes of potential conflict in a given location; it involves understanding the operational context and the effects of working there, and on that basis, developing a capacity to avoid negative impacts and maximise positive ones. Conflict-sensitive adaptation is not just ensuring that specific activities are designed with awareness of the context but, more ambitiously, working out how to address the context to offer options to support peace and stability. Conflict-sensitive adaptation aims at reducing risks of future crisis[16] triggered or exacerbated by:

[16] In this context "crisis" is used in a broad sense and encompasses disputes, tensions, low-intensity conflicts, violent and non-violent conflicts at different levels (inter-state, national, provincial, local).

1. **adverse climate change impacts** (e.g. water scarcity, reduced agricultural yields, climate-related natural disasters)
2. **maladaptation** (measures to adapt to environmental stressors that can lead to tension or conflicts - e.g. uncoordinated realisation of existing water infrastructure development plans and adaptation measures in the riparian states could negatively affect water availability downstream and harm water-dependent ecosystems).

Conflict-sensitive adaptation means preventively mitigating risks for human security that arise from adverse climate change impacts or maladaptation. The concept aims at highlighting the positive effects adaptation can have with regard to existing or looming conflict and regional stability. Conflict-sensitive adaptation is not working "on conflict" – conflict-sensitive adaptation measures do not explicitly aim to resolve an existing conflict. Neither is conflict-sensitive necessarily working "in conflict" but the concept focuses on fragile regions and on regional and sub-regional climate change and vulnerability hotspots.

As there is a risk that discussing climate change within a security perspective will be politicised in an inflammatory way, conflict-sensitive adaptation needs to be reflected upon in terms of how it is framed. Depending on the circumstances in the target region, alarmism and securitisation that hinder cooperation on adaptation should be avoided. Furthermore, rather than using the term "conflict-sensitive", more subtle terminologies such as "adaptation co-benefits", "stabilizing effects of adaptation", "peace-positive adaptation interventions", "avoid maladaptation", "climate-sensitive development" might be more appropriate to use in the target region.

To put conflict-sensitive adaptation in concrete terms, the following table summarises possible entry points for interventions. Depending on the circumstances in a given region or country, different starting points (and combinations thereof) might be appropriate for conflict-sensitive adaptation:

Table 9: Possible Entry Points for Policy Interventions

Level	Entry Points
Regional	• Regional, multilateral political adaptation process (declaration, strategy) • Community-based adaptation projects and pilot projects
Neighbouring countries	• Bi- or multilateral cooperation / agreements (e.g. on water, energy, environment)
National	• National climate and adaptation strategies and projects
Sub-national / provinces Local	• Building institutions and capacities • Sub-national strategies and activities • Mainstreaming of climate change adaptation into existing national policies and regulations (e.g. (economic) development and security as well as foreign- and neighbourhood-policies)

Climate change adaptation, regional cooperation and stability

Climate change is taking place across national borders. Adverse impacts are naturally of a transboundary nature, leading to similar climate-related risks in neighbouring countries. Thus, regional answers need to be developed to cope with adverse regional impacts. Common

vulnerabilities and similar adaptation needs seen by neighbouring countries hold a vast potential of dialogue, coordination and cooperation. When dialogue and the exchange of experiences helps to build trust among neighbours, this can have stabilising effects on a region. Such climate adaptation-related initiatives could potentially lead to the development of a common perspective towards adaptation, serve as a starting point for broader cooperation in the region and, for example, help to prevent controversy on the use of transboundary water resources. Supporting regional cooperation on adaptation in this sense is conflict-sensitive adaptation. The international climate negotiations have so far focused primarily on the national and local support to design and implement policies and measures for adaptation (e.g. through the assistance to prepare NAPAs and, more recently, NAPs). However, climate change impacts are often transboundary – calling for an adaptation perspective that crosses borders.

Aspects for adaptation programmes and projects

Adaptation needs to follow the "do no harm" principle. Care needs to be taken not to provoke or exacerbate local tensions. Therefore, adaptation programmes and projects need to identify crisis and conflict risks in the region that may be exacerbated by climate changes. The focus should be on fragility hotspots within a country and within the region. Specific conflict dynamics need to be considered, as they will play a decisive role in either increasing or decreasing the security risks of climate change. Approaches need to reflect upon the roles that the adaptation programme or project target groups play in current disputes or conflicts. Peace and conflict assessments can be used to reduce the risk of maladaptation.

Programmes and projects need to support the participation of all relevant stakeholders by strengthening participatory processes that explicitly include marginal and vulnerable groups and consider existing asymmetrical power relations and inequalities among the parties potentially involved in adaptation measures.

Adaptation should be guided by long-term planning as climate change and regional stability both demand long-term answers, e.g. in water resource management. Spill-over effects and the structural changes that are necessary to contribute to regional stability take a long time to manifest.

Aspects for the national level of partner countries

Awareness-raising on climate change, impacts and adaptation needs should be intensified. Adaptation needs to be mainstreamed into different sector policies on the national and sub-national level. National adaptation strategies and action plans need to reflect upon human security and links to the management of disaster risks. When planning national adaptation measures, transboundary effects need to be considered (e.g. impacts of constructing a water reservoir on riparian countries).

5.4 Adaptation to Climate Change – Status Quo

The following chapters summarise existing adaptation approaches in Central Asia that are potentially relevant for addressing negative implications of climate change on peace and stability:

- Regional, national and sub-national adaptation policies and processes (National Communications under the UNFCCC, NAPAs, LAPAs, NAPs, CC, CCA and CBA strategies as well as relevant environment- and development strategies and programs)

- Government and non-governmental organisations, policy and project-based initiatives and networks concerned with adaptation on the national, regional or international level
- International, regional and national programmes and projects related to climate change adaptation.

5.4.1 National Policies and Processes

Climate change affects the South Asian countries severely. Especially Bangladesh will be heavily affected by the impacts of climate change. Particularly sea-level rise poses an existential threat to Bangladesh. Climate change also has a severe effect on India, Nepal and Pakistan. It must be assumed that agriculture production and water supply in the entire region will suffer as result of climate change. Especially agriculture - accounting for a huge share of each country's GDP and represents the key source of livelihoods for the majority of people in South Asia - is particularly threatened by climate change.

All in all it can be stated, that all four countries recognized the need and urgency of developing climate change adaptation policies and made considerable progress especially in the last years in actively implementing those strategies. Especially Bangladesh and India have been assigned a leading role in climate change adaptation. All four countries have not only published their **Initial National Communication to the United Nations Framework Convention on Climate Change (UNFCCC)** but also developed national strategies for adaptation to climate change. Bangladesh and Nepal published their **National Adaptation Programmes of Action (NAPA)** as early as 2005 and 2010. The most important Strategy Documents within the Region next to the two NAPAs are the **Bangladesh Climate Change Strategy and Action Plan (BCCSAP)** published in 2009, the **National Action Plan on Climate Change (NAPAC)** prepared by India in 2008, as well as the **Strategic Program for Climate Resilience (SPCR)** and the **Climate Change Policy (CCP)** elaborated by the Nepalese Government in 2011 and the **National Climate Change Policy (NCCP)** of Pakistan published in the same year.

The **BCCSAP** has been developed in accordance with Bangladesh's **NAPA** and sets the foundation for the countries climate and adaptation policy for the next ten years while at the same time summarizing the current discourse on adaptation options and climate protection measures. The action plan presents a comprehensive program defining projects and policies incorporating immediate actions and short, medium as well as long term measures and setting a detailed schedule for implementation. Its Annex lists as much as 37 projects. Due to the uncertainty associated with climate change impacts and with the constantly growing scientific knowledge about climate change and possible adaptation measures, the BCCSAP has been termed a "living document" and allows and invites regular checks and recurrent updates.

The Indian government started early as well in addressing both possible Impacts of Climate Change and necessary adaptation measures by launching several research initiatives. Also adaptation measures are more and more included in the overall planning process across all governmental institutions. According to the Ministry of Environment and Forestry, India already spent 11 per cent of their household budget and 2 per cent of their GPD in 2006/07 for Adaptation Measures. **India's NAPAC** defines climate change induced threats and discusses possible adaptation strategies as well as potential implementation schemes. While publishing the action plan in June 2008, India simultaneously established a **Council on Climate Change** in charge of coordinating national action for assessment, adaptation and mitigation of climate change and monitoring key policy decisions. The Council, chaired by the Prime Minister, consists of representatives of ministries, academia and civil society. Taking the lead in the

implementation process, the Ministry of Environment and Forestry cooperates with different ministries while working on the realization of the **National Missions.** The NAPAC defines eight key areas for action called National Missions (National Solar Mission, National Mission for Enhanced Energy Efficiency, National Mission on Sustainable Habitat, National Water Mission, National Mission for Sustaining the Himalayan Ecosystem, National Mission for a Green India, National Mission for Sustainable Agriculture, National Mission on Strategic Knowledge for Climate Change). The responsible ministries are currently working on detailed plans of implementation for each mission in close cooperation with relevant stakeholders.

The **Nepalese SPCR** focuses especially on long term adaptation measures. The main issues and sectors affected are being tackled by five investment projects demanding a total of 110 Mio USD. Those investments aim at building resilience against climate-induced risk, mainstreaming climate change risk management in development cooperation planning and practice, supporting climate resilience within communities by fostering involvement of the private sector as well as promoting climate resilience of endangered species. However, the SPCR only partly elaborates on the time schedule and financing of the proposed actions. The Climate Change Management Division under the Ministry of Environment is responsible for the coordination of the SPCR activities.

Pakistan's NCCP was completed in April 2011 drawing on results presented in the TFCC Reports 2010 laying a foundation for successfully addressing the impacts of climate change in Pakistan. An action plan for the implementation of the NCCP as well as the development of subnational strategies is currently under way. The NCCP only vaguely touches upon concrete projects and activities and merely proposes policy measures for adaptation strategies tackling critical sectors as the water, agriculture and health sector, as well as the field of Forest and Disaster Preparedness.

However, implementation efforts especially in Bangladesh, Nepal and Pakistan still **depend heavily on external funding and support from the international community**. Implementation attempts often lack both capacities and political coordination. Considering the major climate-induced threats the countries are confronted with, the major challenge for the future will be to increase funding opportunities and investments in order to create a favourable environment for economic and social development.

In all documents examined, **participation** of relevant stakeholders in the development of adaptation activities has been recognized as of vital importance and the involvement of civil society as well as the use of participatory processes in adaptation policy was mentioned in each document. **Gender equality** has been declared important as well. **Mainstreaming and integration of adaptation** in all relevant fields of politics has been stated in all key strategies mentioned above. Necessary Adaptation measures should be integrated in general development efforts.

All four **climate-induced conflict constellations** established by the WBGU (WBGU 2007) have considerable relevance within the region of South Asia, although a special focus is put on water and agriculture.

Altogether, it is expected, that progressing climate change will trigger water and food shortages while simultaneously leading to an increase in the intensity and frequency of extreme weather events. In addition, sea level rise represents a threat for the whole region. The melting of Himalayan glaciers as well as sea level rise lead to heightened flood risks in all four countries. The high population density in coastal areas and densely populated urban agglomerations near the coastline exacerbates the risk posed by sea level rise, putting millions of people at risk especially in Bangladesh. Furthermore, a majority of the region's population

strongly depends on subsistence farming for their livelihoods and is thus directly affected by changes of monsoon patterns which are already subjected to significant changes.

Already limited supply of water within the region has fuelled conflicts between different water users, within countries, and across countries. Especially in the already tense Indo-Pakistani relations water will play a core issue with the potential to aggravate bilateral relations. The climate-induced conflict drivers mentioned above could also lead to internal migration to e.g. urban cities as well as to migration to other countries, evoking violence against immigrants by the destinations' population as has been already witnessed in the case of Bangladeshi migrants coming to India.

Subnational Adaptation Tendencies:

Climate change adaptation at a local level in Bangladesh has already been partly implemented by **the CBA Country Programme Strategy**. However local level actions plans are still missing. In India, the Indian Ministry of Environment and Forests has asked all 25 Indian states to develop **State Action Plan on Climate Change (SAPCC)** to define how they intend to undertake activities and programs aimed at climate change adaptation on a state level. Several SAPCCs have already been finalized. The implementation of local adaptation activities mentioned in the NAPA document, started in Nepal in 2011 with the development of a **Local Adaptation Plan for Action (LAPA).** In Pakistan, there as are no adaptation measures on a local level yet planned.

The following table lists the main national policies relevant to adaptation.

Table 10: National Policies and Processes in South Asia

Bangladesh	
• First National UNFCCC Communication (2002) • National Adaptation Programme of Action (2005) • Climate Change Strategy and Action Plan (BCCSAP) (2008) • Bangladesh Climate Change Strategy and Action Plan (2009)	also relevant: Coastal Zone Policy 2005, CBA Country Programme Strategy (2008), National Plan for Disaster Management 2008-2015, Disaster Management Act, Bangladesh Investment Plan 2011
India	
• First National UNFCCC Communication (2004) • National Action Plan on Climate Change (2008) • Second National UNFCCC Communication (2012)	also relevant: National Environment Policy 2006, 2006 Rural Electrification Policy, 2007 – 2012 India's 11th Plan, State Level Action Plans on Climate Change (SAPCC)
Nepal	
• First National UNFCCC Communication (2004) • NAPA(2010) • Strategic Program for Climate	also relevant: National Capacity Self-Assessment Report and Action Plan, 2009, Three Year Plan (TYP) Approach Paper (2010-2012), Local Adaptation Plans of Action (LAPAs)

Resilience (SPCR) (2011) • Climate Change Policy (2011)	

Pakistan	
• First National UNFCCC Communication (2003) • National Climate Change Policy (NCCP)(2011)	also relevant: Integrated Water Resources Management (IWRM) 1991, National Conservation Strategy (NCS) 1992, Pakistan Environmental Protection Act 1997, Vision 2030 Document 2003, National Environmental Policy 2005, Report of the Task Force on Climate Change 2010, National Strategy for Disaster Management 2011

5.4.2 Institutions, Initiatives and Networks

5.4.2.1 National level

The following table lists the institutions responsible and/or involved in adaptation approaches (institution in charge in bold). The list of institutions is not exhaustive.

Table 11: Institutions, Initiatives and Networks at the National Level

	state institutions	other institutions
Bangladesh	• Ministry of Environment and Forest • Ministry of Water Resources	Climate Change Cell, Local Consultative Group on Environment and Climate Change
India	• Ministry of Environment and Forests • Prime Minister's Council on Climate Change • Ministry of Water Resources • Ministry of Science and Technology • Ministry of Agriculture	Indian Network on Climate Change Assessment (INCCA), Climate Challenge India
Nepal	• Ministry of Environment, Science and Technology • Ministry of Forest and Soil Conservation • Ministry of Agriculture Cooperatives • Climate Change Program Secretariat • Climate Change Council	Climate Change Network Nepal, Mountain Alliance Initiative (MAI), Climate Change Initiatives Coordination Committee, Nepal Climate Change Knowledge Management Centers (NCCKMC)
Pakistan	• Ministry of Environment • Planning Commission • Taskforce for Climate Change • Ministries of Water Agriculture, and Industries • National Disaster Management Authority • National Disaster Management Commission (NDMC) • Prime Minister's Committee on Climate Change (PMCCC)	Leadership for Environment and Development, National Network on Climate Change, Technical Advisory Panel on Climate Change (TAP-CC)

5.4.2.2 Transnational

A number of transnational institutions, initiatives and networks have been identified that are involved with adaptation in South Asia in one way or another – government and non-governmental. The overview table below lists international and regional bodies and commissions, institutions and initiatives, as well as international economic organisations. These transnational institutions are responsible for dealing with issues closely related to climate change adaptation, such as water management.

The institutions identified take on different roles, ranging from intergovernmental fora to knowledge hubs and process facilitators. In addition to the overview provided below, three examples can be highlighted:

South Asian Association for Regional Cooperation (SAARC)

The South Asian Association for Regional Cooperation (SAARC) as an organisation of South Asian nations was established on 8 December 1985. The governments of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka formally adopted a charter providing for the promotion of economic and social progress, cultural development within the South Asia region. Afghanistan joined the organization in 2007. Meetings of heads of state are usually scheduled annually; meetings of foreign secretaries, twice annually. It is headquartered in Kathmandu, Nepal.

Climate change has become a core issue for SAARC considering that the entire region is vulnerable to the impacts of environmental degradation. Climate change has been part of the agenda already from 1990; only with the 2007 ministerial meeting in Dhaka the 'SAARC Action Plan on Climate Change' was adopted. Implementation has been slow not least due to the missing of pledges. With the Thimphu Statement on Climate Change (2010) adopted by the SAARC Heads of State or Government, a clear indication of the government's commitment and determination to enhance cooperation among Member States was given. The Statement outlines a number of initiatives to be implemented both at the national and regional level to address the adverse effects of climate change. Some of the key initiatives relevant for adaptation are outlined below:

Thimphu Statement on Climate Change (April 2010):

1. Establish an Inter-governmental Expert Group on Climate Change to develop clear policy direction and guidance for regional cooperation
2. Commission a study on 'Climate Risks in the Region'
3. Strengthen the understanding of shared water bodies in the region through a Marine Initiative
4. Inter-governmental Mountain Initiative to study mountain ecosystems and glaciers, and their contribution to livelihoods and sustainable development
5. Inter-governmental Monsoon Initiative on the evolving pattern of monsoons to assess vulnerability due to climate change
6. SAARC Inter-governmental Climate-related Disasters Initiative on the integration of Climate Change Adaptation (CCA) with Disaster Risk Reduction (DRR)
7. Establish institutional linkages among national institutions in the region to facilitate sharing of knowledge and capacity building programmes in climate change

International Centre for Integrated Mountain Development (ICIMOD)

ICIMOD is an international independent mountain learning and knowledge centre committed to improving the sustainable livelihoods of mountain peoples in the extended Himalayan region. There are eight regional member countries (RMCs) of the Hindu Kush-Himalayan area – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan. Already founded in 1983, ICIMOD is based in Kathmandu, Nepal, and brings together a partnership of its regional member countries, partner institutions, and donors. For instance, ICIMOD is currently implementing the Promotion of Sustainable Policy Initiatives in the Management of Natural Resources in the Hindu Kush Himalayas, in cooperation with the GIZ.

South Asia Water Initiative (SAWI)

The objective of the South Asia Water Initiative (SAWI) is to promote the goals of poverty reduction, economic growth, mitigation and adaptation to climate change and water security. This should be achieved through significant and measurable improvements in water resources management and development at the regional, international basin and national levels in South Asia. A budget of US$ 7 million at an initial stage is provided by the Global Environment Facility (GEF) and the World Bank. Support comes also from the Australian Agency for International Development (AusAID) and Department for International Development (DFID).

Those institutions are bundling knowledge about the technical as well as the political dimensions of adaptation and with SAARC also an entry point is available to address major climate change concerns.

Existing transnational initiatives of the countries

The following institutions are of particular interest when thinking about steps to substantiate discussions around the security dimension of adaptation and benefits for regional stability in South Asia:

The table below presents a non-exhaustive list of major transnational organisations, commissions and initiatives involved in adaptation in South Asia.

Table 12: Institutions, Initiatives and Networks at the Transnational Level

Government
• South Asian Association for Regional Cooperation (SAARC) (www.saarc-sec.org) • Adaptation Knowledge Platform (SEI, UNEP: SIDA): Regional Climate Adaptation Knowledge Platform for Asia (http://www.climateadapt.asia/about-us) • United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (http://unescap.org/)
Government – Research, Practitioners
• International Centre for Integrated Mountain Development (ICIMOD) (http://www.icimod.org) • Asia-Pacific Network for Global Change Research (APN) (http://www.apn-gcr.org/apn-overview/) • Asia-Pacific Water Forum (APWF) (http://www.apwf.org/) • Asian Development Bank (http://beta.adb.org/) • Climate Vulnerability Initiative (http://daraint.org/climate-vulnerability-monitor/climate-vulnerability-initiative/) • Asia-Pacific Climate Change Adaptation Project Preparation Facility (http://www.adapt-asia.org/) • South Asia Water Initiative (SAWI) (http://www.un.org/climatechange/projectsearch/proj_details.asp?projID=182&ck=aVmfG453KHSJI81) • Mangroves for the Future (http://www.mangrovesforthefuture.org)
Non-Governmental Research, Practitioners & Civil Society
• Asia Pacific Adaptation Network (http://www.apan-gan.net) • The Mountain Institute (TMI) (www.mountain.org/) • Climate Action Network South Asia – part of global Climate Action Network (http://www.climatenetwork.org/) • Climate Smart Agriculture Learning Platform for South Asia, CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) (http://ccafs.cgiar.org/blog/new-south-asia-climate-smart-agriculture-learning-platform-launched) • NGOs, e.g. TERI (India), LEAD(Pakistan), Bangladesh Institute of Peace and Security Studies (Bangladesh)

5.4.3 Programmes and Projects Related to Adaptation

With a strong increase in the last five years, a considerable number of adaptation projects exist, at both the national and regional level.

5.4.3.1 National

The overview table below lists selected projects with a national focus that have been implemented or are still being implemented in the countries concerned.

Table 13: Programmes and Projects Related to Adaptation with a National Focus

Bangladesh	• GIZ: Management of natural resources and community forestry, 2009-2015 • GIZ: Sustainable development and biodiversity conservation in coastal protection forests, 2011-2014 • World Bank: Pilot Program for Climate Resilience (PPCR) Bangladesh, ongoing • UNEP: CBA-Project Bangladesh, ongoing • ABD: Strengthening Resilience of Water Sector to Climate Change in Khulna, 2008 – 2011 • USAID: Integrated Protected Area Co-management, 2008 – 2012 • LDCF, UNDP, GOB: Community-based Adaption to Climate Change through Coastal Afforestation in Bangladesh, 2009-2013 • AusAID, CSIRO: Bangladesh Integrated Water Resources Assessment, 2010-2013 • UK, EU, Denmark, Sweden: Bangladesh Climate Change Resilience Fund (BCCRF), 2010-2014 • UK, EU, SIDA, AusAID, UNDP: Comprehensive Disaster Management Program Phase II, 2010-2014 • ActionAid: Assistance to Local Community on Climate Change Adaptation and Disaster Risk Reduction, 2008-2009 • FAO: Improving Adaptive Capacity to Climate Variability and Change for Sustainable Food and Livelihood Security in Drought Prone and Coastal Regions of Bangladesh, 2008-2009 • UNDP (GEF): Community Based Adaptation to Climate Change through Coastal Afforestation, 2007-2010 • UNDP (GEF): Integrating Community-based Adaptation into Afforestation and Reforestation Programmes in Bangladesh, 2011- ongoing
India	• GIZ: Climate change adaptation in India's North East Region (CCA-NER), 2011-2014 • GIZ: Climate Change Adaptation in Rural Areas of India, 2009-2014 • GIZ, KfW: Indian-German Climate Change Adaptation Programme, ongoing • KfW Development Bank, WWF: India Increasing Resilience to Climate Impacts of Vulnerable Communities and Critical Ecosystems in the Eastern Himalayas of India, 2009-2010 • BMZ: National Bank for Agricultural and Rural Development: Umbrella Program on Natural Resource Management, Climate Change and Biodiversity, 2008-2013 • International Water Management Institute, WWF: Environmentally Sustainable Water Resources Management in the Upper Ganga Basin, under Climate Change, 2008-2011 • World Bank: Sustainable Rural Livelihood Security through innovations in Land and Ecosystem Management, 2009-2013 • ADB: Sustainable Coastal Protection and Management Project, 2010-2018

Nepal	• World Bank: Pilot Program for Climate Resilience (PPCR) Nepal, ongoing • Development Fund Norway: Strengthening Climate Network in Nepal, 2008-2010 • ABD: Strengthening Capacity for Managing Climate Change and Environment: Nepal, 2008-2010 • FAO: Strengthening Capacities for Disaster Preparedness and Climate Risk Management in the Nepalese Agriculture Sector, 2008-2010 • WWF Nepal: Implementing Climate Change Adaptation in Nepal, 2009-2011 • UK: Nepal Climate Change Support Programme, 2009-2015 • ADB: Community Based Vulnerability Assessment, Risk Mapping, and Adaptation Planning, 2010-2011 • ADB/ World Bank: Supporting Government Planning in Building Climate Resilience, 2010-2012 • UNDP: Community Based Flood and Glacial Lake Outburst Risk Reduction, 2011- ongoing
Pakistan	• IFAD: Promotion of Rural Livelihoods through Adaptation Support Programme, 2011-2014 • UNEP, ICIMOD, WWF: Integration and Harmonization of Sustainable Development Interventions in the Central Karakorum National Park, ongoing • UNDP: Reducing Risks and Vulnerabilities from Glacier Lake Outburst Floods in Northern Pakistan, 2011-2015 • Adaptation Fund, UNDP: Reducing Risks and Vulnerabilities from Glacier Lake Outburst Floods in Northern Pakistan, 2011-2015 • LEAD Pakistan: Climate Leadership for Effective Adaptation and Resilience, 2011-2016 • LEAD Pakistan: National Alliance for Climate Action (NACA), 2009-2014

5.4.3.2 Transnational

There are also a number of projects with a transnational focus that can help to address climate change challenges by initiating a regional dialogue on the need for climate change adaptation. Examples include projects of German international cooperation as well as international approaches and initiatives:

Table 14: Programmes and Projects Related to Adaptation with a Transnational Focus

German Programmes/Projects
• Protection of Sustainable Policy Initiatives in the Management of Natural Resources in the Hindu Kush Himalayas, ICIMOD, GIZ (Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, Pakistan), 2008-2012 • Preserving biodiversity in the Kailash region, ICIMOD, GIZ, (India, Nepal, China), 2012-2015
International Programmes/Projects
• SAARC Action Plan on Climate Change 2009–2011 and SAARC Initiatives • South Asia Water Initiative (SAWI), U.K., Australia, Norway: World Bank (Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan), 2009-2013 • Mangroves for the Future (MFF), National governments with CARE International, FAO, International Union for the Conservation of Nature, UNDP, UNEP and Wetlands International with NGOs and community based organizations (India, Indonesia, Maldives, Pakistan, Seychelles, Sri Lanka, Thailand and Vietnam), second phase (2010-13) • The Himalayan Climate Change Adaptation Programme (HICAP), ICIMOD, CICERO, 2011-2016 • Floods from the Roof of the World: Protection thanks to applied research, Swiss Development

Corporation: ICIMOD (Bhutan, India, Nepal, Pakistan, China), 1999-2012

- Monitoring the Glaciers of the Himalayas, WWF, (Eastern Himalayas, India and Nepal), 2005-2009
- Management of Flash Floods: Capacity building and awareness raising in the Hindu Kush Himalayas, USAID: ICIMOD, (Hindu Kush Himalaya region: Nepal, Pakistan, China) 2006-2010
- Glacial Melt and Downstream Impacts on Indus-Dependent Water Resources and Energy, ABD, ICIMOD, UNEP, Centre for International Climate and Environmental Research (CICERO) (Afghanistan, India, Pakistan), 2007-2009
- Adaptation to Climate Change in the Hindu Kush Himalayas and Central Asia, Norway: ICIMOD, CICERO, UNEP, UNDP, (India, Nepal, Pakistan, China) 2007-2011
- Vulnerability to Climate Change: Adaptation strategies and layers of resilience, ADB: International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), 2008-2012
- Asia-Pacific Climate Change Adaptation Project Preparation Facility (ADAPT), USAID: WWF, Conservation International, the Nature Conservancy, ARD Inc., National Oceanic and Atmospheric Administration, (Bangladesh, Nepal and others), 2011-2016

5.4.4 Preliminary Conclusions on the Status Quo of Adaptation

A number of existing policies and processes, organisations and initiatives as well as programmes and projects related to climate change adaptation should be taken into account when analysing the status quo of adaptation in South Asia. With this in mind, the following conclusions can be derived:

1. Lack of finance for regional processes

Climate change is not bounded by national borders. Transboundary bio-geographical areas that share common topography and eco-systems, for example international river basins, demand coordinated regional responses. However, South Asian approaches to climate change and adaptation are mainly national although with SAARC a regional forum exists with various climate change activities. However, this regional discussion forum lacks financial and other capacities to facilitate exchange across countries and projects. Regional exchange processes and structures to cooperate on climate change impacts and adaptation need to be equipped with institutional and financial capacities necessary to more effectively address the climate-related challenges that the region is facing. Experts see the need to close this gap and enhance regional cooperation in the field of climate change adaptation and pursue transboundary approaches. Adaptation programmes need to be coordinated and a joint regional strategy must be developed.

2. Limited success of regional cooperation programmes

Despite previous efforts of regional programmes to strengthen regional and multilateral cooperation among the countries of South Asia in different fields such as water, agriculture and disaster preparedness, such programmes have had only limited success. Whereas some current regional programmes include elements of regional exchange of experiences and data, regional cooperation still needs to be improved.

Several regional cooperation efforts have been undertaken – especially with respect to SAARC that can also help to ease tensions over the water-energy-agriculture nexus. As a result, the governments of South Asian states have signed several multilateral and bilateral agreements aimed at establishing a coordinated operation of, for example, transboundary water cooperation, a food bank or integrate climate change adaptation and DRM. However, most agreements have not been successfully implemented due to various barriers.

Barriers to regional cooperation in the field of adaptation:

- Limited availability of data trusted by the countries which also poses difficulties for awareness-building processes
- Political discrepancies and different levels of economic development among the countries
- Lack of funding to implement already agreed initiatives and programmes
- UNFCCC and international funds focus on national plans (NAPAs, NAPs) and support for national institutions; lack of attention for the regional level
- Lack of coordination between different international agencies/donors

3. Opportunities for cooperation on adaptation

This roadmap argues that inter-state cooperation on adaptation can hold significant co-benefits for regional stability. Adaptation offers new cooperation possibilities for South Asian countries. Countries see similar needs with respect to climate change adaptation. National vulnerability assessments and adaptation concepts show significant overlap as outlined in the National Communications and NAPAs (in two cases). This applies for the needs of adaptation processes (financing difficulties, lack of capacities, knowledge gaps, and deficits in the legal basis). This holds although true regarding the topics that the countries prioritize in their adaptation strategies. Transnational governmental and non-governmental institutions, initiatives and networks (SAARC, ICIMOD) have been key and will play a major role in the future. In the future, regional cooperation can also be supported via National Adaptation Plans under the UNFCC that will include provisions for planning at the regional level, encouraging parties to cooperate on managing climate change impacts in watersheds, fisheries and other transboundary resources.

4. Risk of maladaptation

Increased adaptation activities could lead to cases of maladaptation. Not only climate change impacts, but also adaptation measures can lead to tensions or conflicts. Uncoordinated realisation of existing water infrastructure development plans and adaptation measures in the riparian states could negatively affect water availability downstream and harm water-dependent ecosystems. For example, technical measures to adapt to climate-induced water scarcity, such as the construction of new reservoirs, could lead to tension or conflicts. Maladaptation could also have non-technical roots. Experts criticise cases in which adaptation projects have had negative security implications due to poor project planning (e.g. Nepal) because project planners did not understand and take into account the regional context, processes and demands accordingly. Furthermore, with the increasing financial transfer for adaptation projects, risks of corruption increase without due consideration of good financial governance.

5.5 Towards a Roadmap for Adaptation, Peace and Stability in South Asia

The following chapters offer detailed approaches towards climate change adaptation and cooperation in South Asia with consideration for existing policies and processes, as well as the given regional configuration of actors and risks. The landscape of regional climate change cooperation in general, and more specifically in the field of adaptation, is well advanced in South Asia compared to other regions in the world. With the SAARC active on climate change

impacts as well as natural disasters a platform for joint government activities is provided. In addition, development partners (bi- and multilateral) as well as civil society organisations have been focusing on climate change related risks and supportive in developing initiatives.

Table 15: Regional Adaptation Roadmap for South Asia

Regional Adaptation Roadmap for South Asia				
Focus areas	1. Support SAARC Focus on Adressing Climate Change Risks	2. Empower Regional Adaptation Processes s	3. Understanding and best practice transboundary rivers	4.Dialogue on Migration
Rationale	build on Thimpu Statement and other SAARC initiatives support joint risk assessment and implementation of Mountain Initiative & Food Bank Broaden perspective to include future climate change impacts	Ensure long-term financing of SAARC and other initiatives Examine the prospects of establishing a RIE Analyse alternative climate financing solutions	Mainstream best practice examples (IWRM et al.) to inform water cooperation revitalise existing water cooperation explore the opportunities for a Himalaya Rivers Facility	Improving the knowledge basis for project development Improve understanding of mitigation as adaptation strategy Integrating perspectives to improve financing options (in coop. with ADB)
Example case	All countries	All countries	All countries	West India & Bangladesh

5.5.1 Focus Area 1: Support SAARC Focus on Addressing Climate Change Risks

Regional entry points for addressing crucial climate change risks are already established with the SAARC focus rapid response to natural disasters and additional activities related to climate change adaptation such as the Dhaka action plan. The 'Thimphu Statement on Climate Change' adopted by eight Heads of State, among them Bangladesh, India, Nepal and Pakistan, in April 2010, again outlined what the main challenges for the region are in the light of a changing climate. Among the key elements and proposals were the establishment of an Inter-governmental Expert Group on Climate Change that should help developing policy direction and guidance for regional cooperation. A marine as well as a mountain initiative should support to form a common understanding of shared water bodies as well as mountain ecosystems and glaciers. The statement already elaborated that there is the need to ensure an integrated approach of climate change adaptation and disaster risk reduction. To this end, strengthening of knowledge exchange and capacity building is one priority that can be addressed by a regional study on climate change risks.

There has been some progress since the adoption of the Thimpu statement, however, due to an unclear situation how to fund the proposed activities, additional momentum is needed to make

use of this regional arrangement to strengthen climate change adaptation. To this end we propose that the EU and/or its member states encourages the political process by arranging an EU-SAARC dialogue on the question how - from a regional organization's perspective - key climate change risks can be addressed. The **first partner to speak to can be the Inter-Governmental Expert Group on Climate Change** which held its second meeting in Kathmandu on 16-17 April 2012 reviewing some the key initiatives of SAARC in relation to climate change. The following topics can be addressed as part of such a dialogue series:

- Regional Climate Impact Assessment: The European Environment Agency can share some of its insights on how to carry out **a flagship report on climate change impacts vulnerabilities, and adaptation needs.** This can happen as part of a joint workshop to figure out the methodological requirements, e.g. with respect to **scenarios development, preparing projections and the use of indicators** to prepare such a study that is also proposed by the 'Thimphu Statement on Climate Change'.

- Support the SAARC Mountain Initiative: Based on the experience on protecting mountain ecosystems and glaciers e.g. in Europe (Alps) and elsewhere, joint research and dialogue efforts can be encouraged. To **ensure a robust scientific basis for decision making, the modeling of precipitation patterns** and the resulting effects on water availability can be one subject still associated with vast scientific uncertainties. To study the **effects of glacial recession, cooperation** with science partner such as ICIMOD is needed. To institutionalize this knowledge generation, the establishment of a **Regional Information Center** to exchange data and share information especially with respect to disaster prevention and mitigation can be a long-term result.

At the center of the attention of a **joint dialogue between policy makers** can be the exchange on **how small and large-scale water capture and storage systems** can be established. Here, also close cooperation with SAARC Inter-governmental Climate-related Disasters Initiative should be helpful **to integrate the perspectives of climate change adaptation and disaster risk reduction.** In addition, steps to ensure more **efficient irrigation systems** can be promoted, e.g. through best practices on the use of agricultural knowledge or the implementation of green technologies.

- Finally, another entry point for dialogue and mutual exchange of SAARC with European or other partner can be on how to provide **regional food security** in times of climate change. Since no South Asian country is able to ensure food security by itself, cooperation should help to tackle food shortages during times of disasters. To this end, the **SAARC Food Bank Board** was **established in 2007.** Its board is currently also considering the bank's use during volatility of food prices to help stabilising the South Asian food market. During a special session in Dhaka in May 2012, however, difficulties were recognized to take informed decision **due to insufficient data on annual food grain requirements, production or export/import of food grains.** To address this challenge and to systematically expand the food security debate to consider also the future potential impacts of climate change on agricultural production, partners such as the FAO or the WFP can support the SAARC Agricultural Center (SAC) with best practice advise on how to strengthen data quality but also how to increase adaptive capacity in the agricultural sector. The WFP has already been active e.g. in Bangladesh with a Food Security Monitoring Bulletin.

Examples of actors who should be involved:

1. SAARC (several initiatives)
2. EU
3. ICIMOD

5.5.2 Focus Area 2: Empower Activities for Regional Adaptation

The support of the SAARC activities on climate change can be considered as a key element of a South Asia adaptation regime. However, there are various communities of adaptation practices due to a very active donor community in the region (Adaptation Partnership 2011). Despite that comprehensive international engagement, a stronger, long-lasting ownership for tackling of adaptation challenges can be achieved by **ensuring access to international funding** e.g. through a regional entity. A lack of prolonged funding of the manifold programs and projects in the region is one of the main barriers to mainstream adaptation into planning and development processes. Accordingly, support to establish funding structures for climate change adaptation may help to address some delays in the implementation of the SAARC activities but, more generally, this is true for many of the initiatives involved in adaptation practices.

To this end, regional partners can consider to agree on supporting a **Regional Implementing Entity** to get accredited by the Adaptation Fund Board to receive **direct financial transfers from the Fund in order to carry out adaptation projects and programmes.** Implementing entities are mainly the national, but also regional and multilateral institutions accredited by the Adaptation Fund Board to receive direct financial transfers from the Fund in order to carry out adaptation programmes and projects. The AFB favors project proposals that outline what a project defines as an adaptation project (in contrast to a "business as usual" development project) and that shows that climate change is the primary cause of the problem that the project will address. In addition, the proposals should elaborate that measures **are suitable and adequate for addressing the identified climate threats,** in which way cost effectiveness can be provided and what kind of **social, economic and environmental benefits** of the programme or project can be specified.

In order to become accredited, entities are required to meet the legal and fiduciary standards adopted by the Board as detailed in the Operational Policies and Guidelines of the AFB. India has so far been the only South Asian country to establish a National Implementing Entity with the National Bank for Agriculture and Rural Development (NABARD). NABARD **can provide insights on how to prepare for the accreditation process.** More generally, developments partners active in the area of climate financing such as the GIZ can offer **a training or briefing for representatives from the national focal points on climate change** but also other additional regional organisations that may be appropriate to serve as a regional implementing entity. The example of the West African Development Bank as the first and so far only Regional Implementing Entity illustrates the important role of **good financial governance** to become a RIE.

Examples of actors who should be involved:

1. National Climate Change Focal Points
2. SAARC
3. GIZ
4. UNDP

5.5.3 Focus Area 3: Strengthen the Understanding of Shared Water Bodies

Transboundary water cooperation is a difficult challenge in South Asia. In addition to the SAARC initiative outlined above, additional activities can be helpful to address regional adaptation needs and to contribute **to trust building and an improved understanding of the shared water bodies in the region.** To complement the activities in this area by SAARC, a bottom-up process can be promoted to start on the basis of bilateral cooperation.

The objective can be to build **a regional knowledge and practice network on adaptation for water security** that provides national governments and the SAARC with best practice examples on how to ensure water security in the short- as well as in the long-term. It should further be helpful to address water security as part of the broader context of an ecosystem perspective to consider also questions of food security, biodiversity and health.

The initial focus of a strengthened regional knowledge and practice network can be on linking two main topics. On the one hand, the communication and implementation of the principles of **integrated water resource management (IWRM)** has been subject of donor-supported civil society efforts. IWRM is, first of all, **crucial for guiding the water policies of the South Asian countries.** However, additional support for the regional consideration of the principle can help to accelerate the diffusion of the principles. In the past, this was the main objective of CapNet-South Asia - regional network of capacity building institutions in South Asia for institutionalising Integrated Water Resources Management (IWRM) with a secretariat based in Dhaka. On the other hand, initiatives like **CapNet-South Asia** should be supported to actively address key aspects of adapting the water sector to future climate change. Apart from question of water conservation like e.g. measures to **improve irrigation efficiency and greater reliance on rainwater harvesting,** this also refers to programmes **considering if and how substitute water-intense crops**. These focus areas can be communicated on a regular basis to already **existing bilateral arrangements** such as the Nepal-India Joint Ministerial Commission on Water Resources (JMCWR) and serve as a basis to decide on joint adaptation projects.

To initiate the regional knowledge and practice network, **regular meetings with multilateral and bilateral development partners and civil society organisations** will play an important role in highlighting climate change related risks and opportunities. The South Asia Water Forum initiated by TERI may serve as good example how to facilitate the exchange between research, civil society, private sector and government representatives. A long-term target of such an approach may take the form of a **Himalayan Rivers Facility** or providing a framework to enable sustainable water management for the entire catchment area (see also Renner 2011). However, at the beginning a more informal setting of regional or river-specific working groups of water ministers or a cross-border forum of water user associations may facilitate to create an enabling environment.

Linking to institutions and existing projects

1. SAWI
2. CapNet-South Asia
3. SAARC Marine Initiative

5.5.4 Focus Area 4: Facilitate a Dialogue on Climate-Induced Migration between India and Bangladesh

One of the most contested risks associated with climate change is that of climate-induced migration. Worsening environmental conditions can influence decisions to migrate – normally in addition to further social, political, economic, and demographic drivers. It is worth noting that where environment-induced movements occurred, in most cases it has been likely to **be internal rather than trans-border.** However, this is likely to change in the future. The consequences of climate change on both sides of a border in combination with existing political or social issues of dispute may lead to tensions and also violent conflict in certain areas. As already outlined above, the region of Assam can serve as an example in this regard. Sudden-onset events—such as flooding, cyclones, and storm surges could further lead to the displacement of large numbers of people in India and Bangladesh.

The Asian Development Bank already made this area a topic of a comprehensive report in 2012 (ADB 2012). One of the key results of "**Addressing Climate Change and Migration in Asia and the Pacific"** is that migration should be considered as pertinent adaptation strategy linked not only to costs but also to potential benefits to the regions of origin and destination. The pressure on resources and the environment may be reduced. In addition, remittances can be help to strengthen adaptive capacities and to build social networks. However, in the light of the already conflict prone situation in the Indian/Bangladesh context, a carefully designed dialogue process is needed to improve the regional potential of migration as an adaptation strategy.

Such a dialog series should consider remaining In addition, the project proposal on Climate Change and Migration in Bangladesh and West India submitted to the Special Climate Change Fund (SCCF) can offer further insights on how to reach out for the funding needed especially when it comes to international climate funds. According to the SCCF, the project was ultimately not recommended for approval. The GEF Operational Focal Points in India and Bangladesh finally decided not to endorse the project, presumably because the countries wanted to prioritize other initiatives for support through the LDCF and the SCCF. Another reason was apparently that a scientific assessment was suggested to be carried out to **fill considerable knowledge gaps before practical interventions can be designed.** However, it is not the purpose of the respective funds to finance stand-alone research projects. Here, possible further entry points for partners exist to pave the way for concrete projects.

To this end, international donors like the ADB **should be encouraged to start with a civil society dialogue series in the Assam region** to introduce this topic as a matter of regional adaptation requirements. As participants, among others, adaptation practitioners from both countries should be involved to explore ways of cooperation on climate change, adaptation, and migration. First priority remains to figure out **how to reduce migration caused by worsening environmental conditions.** By exploring jointly ways of strengthening resilience of at-risk communities, such a **dialogue series could inform governments and donors in which**

way they can commit financing to social protection, basic infrastructure especially in cities, and disaster risk management.

Second priority is to **raise awareness for unavoidable climate-induced migration.** A key aspect is to **establish social protection frameworks** and to ensure some key social benefit with regard to health services in particular. In addition, the benefits of sending remittances by migrants can be discussed, as it can greatly reduce the vulnerability of families and communities living in regions at risk.

Finally, such a dialogue series should further examine the **question of funding**. The ADB can enter into the debate on different potential funding options in this area, e.g. suggestion to establish public insurance pools or mechanism to enable private insurance or risk transfer ("catastrophe bonds").

Linking to actors/institutions

1. Asian Development Bank
2. International Organisation of Migration (IOM)
3. UNU-EHS

5.6 Bibliography South Asia

Adaptation Partnership 2011: Review of Current and Planned Adaptation Action: South Asia, International Institute for Sustainable Development.

ADB 2011: Policy Dialogues on Climate-induced Migration in Asia and the Pacific. ABD Discussion Paper, Geneva, Bangkok: Asian Development Bank

ADB 2012: Addressing Climate Change and Migration in Asia and the Pacific. Mandaluyong City: Asian Development Bank.

Bhattacharyya, A.; Werz, M. 2012: Climate Change, Migration, Conflict in South Asia. Rising Tensions and Policy Options across the Subcontinent. Washington: Center for American Progress, Heinrich Böll Stiftung.

Corendea, C.; Warner, K.; Yuzva, K. 2012: Social Vulnerability and Adaptation in Fragile States. Interdisciplinary Security ConnecTions, No. 11/2012, Bonn: UNU-EHS.

Cruz, R.V.; H. Harasawa; M. Lal; S. Wu; Y. Anokhin; B. Punsalmaa; Y. Honda; M. Jafari; C. Li and N. Huu Ninh, 2007: Asia. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: IPCC.

Eriksson, M.; Jianchu, X.; Shrestha, A..B.; Vaidya, R.A.; Nepal, S.; Sandström, K. 2009: The Changing Himalayas. Impact of Climate Change on Water Resources and Livelihoods in the Greater Himalaya., Kathmandu: International Centre for Integrated Mountain Development (ICIMOD).

Government of the People's Republic of Bangladesh 2002: First National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change, Dhaka: Ministry of Environment. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/bgdnc1.pdf

Government of the People's Republic of Bangladesh 2005: National Adaptation Programme of Action (NAPA), Dhaka: Ministry of Environment.

Government of the People's Republic of Bangladesh 2009: Bangladesh Climate Change Strategy and Action Plan 2009, Dhaka: Ministry of Environment.

Government of India 2004: First National Communication to the UNFCCC, New Dehli: Ministry of Environment and Forests. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/indnc1.pdf

Government of India 2008: National Action Plan on Climate Change (NAPCC), New Dehli: Prime Minister's Council for Climate Change.

Government of India 2012: Second National Communication to the UNFCCC, New Dehli: Ministry of Environment and Forests. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/indnc2.pdf

Government of Nepal 2004: First National Communication to the Conference of the Parties of the UNFCCC, Kathmandu: Ministry of Population and Environment. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/nepnc1.pdf

Government of Nepal 2010: National Adaptation Programme of Action (NAPA) to Climate Change, Kathmandu: Ministry of Environment.

Government of Nepal 2011: Strategic Program for Climate Resilience (SPCR), Kathmandu: Ministry of Environment.

Government of Nepal 2011: Climate Change Policy, Kathmandu.

Government of Pakistan 2003: Pakistan's First National Communication on Climate Change, Islamabad, Ministry of Environment. Retrieved March 18, 2013, from http://unfccc.int/resource/docs/natc/paknc1.pdf

Government of Pakistan 2011: National Climate Change Policy, Islamabad: Ministry of Environment.

International Crisis Group 2012: Bangladesh back to the future. Asia Report N°226. 13 June 2012. Retrieved March 18, 2013 from http://www.crisisgroup.org/~/media/Files/asia/south-asia/bangladesh/226-bangladesh-back-to-the-future.pdf

International Crisis Group 2013: Pakistan: Countering Militancy in PATA. Asia Report N°242. 15 January 2013 Retrieved March 18, 2013 from http://www.crisisgroup.org/~/media/Files/asia/south-asia/pakistan/242-pakistan-countering-militancy-in-pata.pdf

International Crisis Group 2013a: CrisisWatch Database. India. Retrieved March 18, 2013 from http://www.crisisgroup.org/en/publication-type/crisiswatch/crisiswatch-database.aspx?CountryIDs=%7B674136F5-D8E6-49FF-B192-62A4A714E27B%7D

Kaltenborn, B. P.; Nellemann, C.; Vistnes, I. I. (Eds). 2010: High mountain glaciers and climate change. Challenges to human livelihoods and adaptation. Birkeland: United Nations Environment Programme (UNEP), GRID-Arendal.

Kripalani, R. H.; Oh, J.H.; Chaudhari, H. S. 2007: Response of the East Asian summer monsoon to doubled atmospheric CO 2: Coupled Climate Models simulations and projections under IPCC AR4, Theor. Appl. Climatol., 87, 1–28.

Planning Commission GoP 2010: Taskforce on Climate Change. Final Report, Islamabad.

Rahaman, Pantho 2013: Stalled water-sharing treaty frustrates Bangladesh. 7 Mar 2013. AlertNet. Retrieved March 23, 2013 from http://www.trust.org/alertnet/news/stalled-water-sharing-treaty-frustrates-bangladesh/

Renner, M. 2011: Water and energy dynamics in the Greater Himalayan region: opportunities for environmental peacebuilding, NOREF Report, Oslo: Norwegian Peacebuilding Resource Centre.

SAARC 2012: SAARC News. Newsletter of the South Asian Association for Regional Cooperation, April-June 2012, Vol. XIX, No.2., Kathmandu: South Asian Association for Regional Cooperation.

SAARC 2010: Thimphu Statement on Climate Change. SAARC/SUMMIT.16/15. Sixteenth SAARC Summit, 28-29 April 2010, Timphu: South Asian Association for Regional Cooperation.

Sabade, S., Kulkarni, A., and Kripalani, R. 2011: Projected changes in South Asian summer monsoon by multi-model global warming experiments, Theor. Appl. Climatol., 103, 543–565.

Schneider, Mindi, 2008: “We are Hungry!” A Summary Report of Food Riots, Government.

Response and States of Democracy in 2008, Retrieved March 18, 2013 from http://www.corpethics.org/downloads/Hungry_rpt2008.pdf

UNDP 2008: CBA Country Programme Strategy Bangladesh. Dhaka: United Nations Development Programme.

Uprety, Bishnu Raj 2007: Changing Political Context, New Power Relations and Hydro-Conflict in Nepal. Retrieved March 18, 2013 from http://kms1.isn.ethz.ch/serviceengine/Files/ISN/110785/ichaptersection_singledocument/fae0c167-5f27-4719-a74a-74f4a4a7e32a/en/1.PDF

WBGU 2007: Sicherheitsrisiko Klimawandel. Hauptgutachten 2007. Berlin, Heidelberg: Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen.

6 Adaptation to Climate Change for Peace and Stability

Towards a Regional Roadmap for the Andean- Region

6.1 Executive Summary

Climate change will negatively affect human security and development across the world. This may lead to political instability – especially in fragile areas. Adaptation can be a "threat minimizer" according to an analysis by the UN General Secretary. The Federal Environmental Agency tasked adelphi to analyse the interlinkages of climate change, adaptation, peace and stability in different regions severely affected by climate change. By analysing the role of adaptation in preventing climate-induced risks, this project also is to support the political discussions at the EU, UN and OSCE level.

In order to analyze current adaptation needs and strategies in the respective countries, a desk study was conducted, analyzing existing national policies and strategies, reports, documents and other relevant data as well as current and completed adaptation measures, organisations and initiatives at a regional level. The entry points identified and the initiatives proposed were then verified by interviews and consultations with relevant experts at regional, national and local level.

In the following, we suggest a regional perspective on adaptation in the Andes region including the countries Bolivia, Colombia, Ecuador and Peru. Our review of climate science shows that the challenges of climate change, water security and political stability cannot be addressed independently. In the face of common regional vulnerabilities, countries should cooperate in developing responses to climate impacts. To this end, adaptation interventions need to be carefully designed not to provoke or exacerbate local tensions. In addition, tensions within societies ask for a better understanding as a way to help resolve them and prevent renewed violence. This can also help to decrease potential tensions over e.g. changing water regimes in the future.

Against the backdrop of the national and regional vulnerabilities, regional approaches and their limitations in the Andes are discussed and steps outlined how to address them in the Andes – aggravated by climate change - in a cooperative way.

In order to promote a regional perspective on adaptation as means of peace and stability, we suggest the following initiative as promising starting points:

1. Adaptation strategy for the eco-region of the tropical Andes encompassing a series of national (policy) workshops and a regional conference
2. Community-based and eco-system based adaptation in the Amazon basin
3. Exchange and learning on coastal vulnerabilities and adaptation measures between coastal departments (Colombia, Ecuador, Peru)
4. Community-based adaptation on water and small-scale agriculture in rural hamlets in the border region of Colombia and Ecuador.

These approaches can prove how pro-peace adaptation processes can work in practice and contribute to a regional identity of facing and addressing climate change challenges. In this way, they can serve as a starting point for a more comprehensive regional adaptation strategy.

6.2 Climate Change and Peace and Stability

The Andean region is characterised by a unique but vulnerable mosaic of ecosystems. Climate change and associated rises in temperature are likely to intensify and increase the frequency of the El Niño Phenomenon (ENP) and endanger the fragile balance of the Amazonian biodiversity. High poverty rates that limit the capacity of governments and people to adapt combined with the immense diversity among the Andean states make this region especially vulnerable to the changing climate (Andean Community 2011).

6.2.1 Climate Change Related Risks

South America's **diverse climate ranges from tropical and humid** in the Amazon to semi-arid and desert and to the cool and dry conditions of Patagonia and Antarctica. The region's climate is highly influenced by the **El Niño Southern Oscillation (ENSO)** phenomenon, resulting in extreme events such as heavy rainfall, hail storms, floods and droughts in various areas of the continent. Within this variability, important changes in the climate have been observed in recent decades. Rainfall has been increasing in south-east Brazil, Paraguay, Uruguay and the Argentinean Pampas, but decreasing in southern Chile, south-western Argentina and southern Peru. Temperatures increases of 0.5° to 1°C have been observed, which have contributed to the dramatic receding of Andean glaciers over the past few decades (Magrin et al., 2007).

Climate projections indicate that further increases in **temperature** and changes in rainfall patterns will occur over the remainder of this century. According to Christensen et al. (2007), warming in the southern half of South America will be similar to the global average, or between 1.8° and 4.0° C by the period 2090 to 2099, but will likely be above average for the Amazon (ranging from 1.8° to 5.1°C by 2080 to 2099).

As a result of these warming trends, **glaciers have retreated rapidly.** Some Andean glaciers, such as the Cordillera Blanca in Peru, have lost 30 per cent of their glacial mass (Mark et al 2010). There is considerable certainty that Andean inter-tropical glaciers will continue to recede and are very likely to disappear altogether in the coming decades (Magrin et al., 2007). Parts of the people in the Andean region depend on glacial seasonal discharge for their water supply. The increased melting of the glaciers has short term consequences such as erosion, mudslides and flooding and results in water scarcity in the long term.

Great uncertainty persists regarding how regional precipitation **patterns will change in the future,** with projections ranging from positive to negative for all sub-regions, seasons and time horizons (Magrin et al., 2007). Recent analysis by the Economic Commission for Latin America and the Caribbean show a distinctive pattern of decreasing rainfall in the north-eastern areas of South America, in the southwest of Bolivia, and in the southern two thirds of Chile, with increasing precipitation in all other areas—especially west of the Ecuadorian mainland and in western Brazil (ECLAC, 2010). Ecuador, for instance, anticipates increasing periods of water scarcity due to reduced rainfall, but also extreme events with excessive rainfall. Rainfall periods are expected to be shorter, but stronger (SNC Ecuador 2011).

In addition to shifts in precipitation patterns, **changes in cloud cover** can also severely impact the ecosystem of the region. Some studies indicate a decrease in cloudy weather accompanied by rising cloud levels and increases in hours of sunshine without shielding clouds (IAI & SCOPE 2011). Reduced protection from sunrays can have a negative impact on the Amazon forest and decrease the humidity necessary for the regional ecosystem to flourish.

The **Amazon rainforest** is highly vulnerable to **changes in temperature and the ENSO phenomenon,** accompanied by **changes in rainfall and cloud covering**. Apart from its

ecological importance as a habitat for rare species and plants, it holds a central role in the global carbon cycle (IPCC). Losing large areas of rainforest, due to dryness or deforestation leads to growing carbon dioxide concentrations in the atmosphere, as the forest functions as a carbon sink (UNEP 2009) (Betts et al 2008).

Projections also suggest that the **frequency of extreme events**, such as heavy rainfalls and consecutive dry days, will increase in parts of South America (ECLAC, 2010; Magrin et al. 2007). According to the Second National Communication of Ecuador, 35% of the population is living in zones prone to landslides and flooding (SNC Ecuador 2011). In general, the increase of intensity and frequency of natural catastrophes is closely interlinked with changes in the El Niño Southern Oscillation (ENSO) and La Niña phenomenon (IISD 2011: vii). Across the board, climate related natural disasters are increasing and thereby threatening local populations and ecosystems.

6.2.2 Climate Change as a Driver of Crises, Tensions and Conflicts

Development levels in Latin America are relatively high, with all countries being classified as at least middle income (OECD, 2009). Yet, millions of South Americans continue to live in poverty, and climate-related hazards, such as heavy rainfall, hail storms, floods and droughts, continue to adversely affect national economies and local livelihoods. In particular, communities such as indigenous groups, ethnic minorities, displaced persons and small-scale farmers are already suffering from economic and social stressors and have limited response capacities, making them especially vulnerable to climate change. Climate change therefore presents an additional challenge to South American countries as they progress towards their development goals.

In terms of regional security, some of the countries see on-going, though weakening armed conflict. Vast segments of the society still face exclusion, while there is a lack of protection policies and a related incapacity to influence public policy processes or to affect change in the conditions that directly affect their human security (adelphi 2012). While there are few tensions between nations in the region, social conflicts and internal strife are ongoing in numerous states.

Climate change is regarded as a threat multiplier, exacerbating existing weaknesses and tensions with implications on peace and stability. Climate impacts are potential additional stressors for existing (sub-)national and inter-state tensions. Thereby, water is a major topic when discussing climate change and stability in the Andes.

Water: Observed and projected changes of Climate Change will affect the availability and quality of water within the region. Many already vulnerable sectors such as agriculture, hydroelectric power and human health depend on water availability. Glacier melt in the Andes, for instance, threatens the water supply of major cities such as La Paz and Lima as precipitation is limited to a few months of the year, glacier water is vital for water availability. Retreating glaciers are a potential trigger for natural disasters, as increased melting will worsen the flooding risk and in the long term the likelihood for prolonged periods of drought (IPCC 2011). As a result of the retreating glaciers, water scarcity in arid and semi-arid regions is expected to increase, while higher precipitation is estimated to occur in the lowlands. Similar expectations with regard to water availability have been identified by the Peruvian and Bolivian governments in their National Communications. Desertification is progressing in Bolivia, especially in the Lake Titikaka basin (European Commission 2007). Colombia, for instance, has recognised water security as an issue of major national concern (SNC Colombia 2010). If climate change increases water scarcity in regions where water resources are under pressure because of e.g. mining activites it could exacerbate existing tensions (Mountain Research Development,

2008). While climate change is expected to negatively affect water supply in some areas, other factors such as changes in land use are expected to have an even stronger impact. Furthermore, potential water scarcity is driven largely by increased demand (see for example Buytaert/Tovar/De Bievre 2012).

Food: Food security and the negative implications of climate change on the agricultural landscape are displayed at varying levels of risk in the concerned countries. Food insecurity is often triggered by insufficient water supply, which leads to reduced agricultural production. Droughts, combined with growing populations, can lead to food scarcity. The food crisis in 2008-2009, partially triggered by natural disasters associated with climate change, led to a sharp increase in rice prices by 224 percent and wheat prices by 108 percent (Cuesta et al. 2009 & U.S. Department of State 2011). However, floods can also destroy fields and crops. The El Niño flooding in Bolivia in 2007/2008, for example, damaged 200,000 hectares of food crops (SNC Bolivia 2009). The Ecuadorian government expects a deficit in the rice production of up to 60 percent and in potato production up to 34 percent by 2030 as a result of climate change. The Colombian government estimates that 23 percent of the agricultural landscape in the coastal region will be threatened by sea level rise. Bolivia stresses the impact of climate change on food security with the imminent threat of biodiversity loss (SNC Bolivia 2009). Climate change will bring new arguments to the discussion of land rights; if climate change is deteriorating (agricultural) livelihoods and increasing rural poverty, this fuels existing tensions and could potentially lead more people to join the guerrilla movement, for instance in Colombia.

Natural Disasters: According to the IPCC, the Latin American region will - with high confidence - be exposed to an increase in extreme weather events. The Colombian government has already noted the increased frequency and intensity of major floods. In 2000 and 2010, the country's largest rivers had exceeded historical benchmarks. During the first months of 2012, heavy rainfall, overflowing rivers and mudslides forced people to flee and destroyed entire municipalities in the mountain areas of Bolivia. More than 760,000 people were affected in Peru. The Loreto Department recorded the worst flooding ever and Ecuador registered the worst rains since 1970 (ECHO 2012). "Territorial security" is an important issue in Colombia where some people are re-located from vulnerable areas. Peru is also indicating an increased appearance of the El Niño phenomenon resulting in flooding. Bolivia was severely hit by El Niño related flooding in 2007 that led to the displacement of 75,000 people (SNC Bolivia 2009). However, the intensification of the El Niño phenomenon due to climate change remains contested within the scientific community.

Migration: Government documents in this region do not discuss the role of migrants in the course of climate change. Migration, such as the internal migration that occurred in Colombia, is mentioned in the context of activities of armed groups. In Ecuador, increased rural migration flows have led to an increase of poverty and vulnerability of urban regions, which now serve as home to 66 percent of the population (World Bank Group 2011: p. 7).

Climate change cannot be thought of as an individual risk factor amongst a group, but instead must be recognised as a complex factor that interrelates to all others. As such, it must be noted that future conflicts in the region could be either directly or indirectly related to the coming effects of climate change.

The following table summarises the regionally relevant **vulnerability and fragility hotspots** related to water, food, natural disasters and migration in four geographical areas.

Table 16: Regionally relevant Fragility and Vulnerability Hotspots

Geographical area	Areas of major climate-related vulnerabilities	Examples for existing fragilities and tensions in the region
Tropical Andes (Colombia, Bolivia, Ecuador, Peru)	• ecosystems • water (incl. glaciers) • food • natural • disasters	• Colombia: limited war between FARC Guerilla and paramilitary groups and the government (negotiations ongoing); including in the border zone Colombia- Ecuador (HIIK 2011), areas of limited statehood. In addition, protests by agricultural groups (e.g. coffee farmers). • Peru: Shining Path left-wing Maoist rebel group vs. government, violent incidents (HIIK 2011) • Bolivia, Ecuador and Peru: Protests and strikes against high food prices and high cost of living (Global Research 2008, El País international 2011) • Inner-state and local tensions, at times violent conflicts related to natural resources: e.g. violent protest against mining and environmental pollution (e.g. Peru: Protests against mining projects turned violent (2011, cities of Puno and Juliaca near Titicaca lake (HIIK 2011)) • Tensions and conflicts around the distribution of land
Amazonas (Colombia, Bolivia, Ecuador, Peru)	• ecosystems • water • food	• Resistance of indigenous groups against planned water regulation and mining activities in the Amazon; further conflicts arise because of the oil sector operating in the Amazon region of Ecuador (EACH-FOR 2008: 39)
Coastal regions (Colombia, Ecuador, Peru)	• water • food • natural disasters	• Protests and strikes against high food prices and high cost of living (e.g. in Piura, north-west Peru near the coast and Ecuador) (Defensoría del Pueblo 2008)
Colombia-Ecuador border region	• ecosystems water • food • natural disasters	• Colombia: conflict between FARC Guerilla and paramilitary groups and the government: Limited war in Cauca, crisis in Narino, Putumayo and Amazonas (all provinces with a border to Ecuador and/or Peru) and in other provinces (HIIK 2011) (negotiations ongoing) • Colombia: border regions in neighbouring countries such as Ecuador are heavily affected by the conflict (UNHCR 2011) • Columbia, together with Sudan account for the largest number of internally displaced persons (IDMC 2011) • Ecuador: Conflicts between water user groups (big vs. small-scale farmers, hydro power vs. domestic use or environmental protection groups; mining vs. farmers etc.) • Ecuador: long list of examples of environmental issues leading to conflict. Some of the issues are transboundary – for example, the spraying of pesticides on coca plantations across the border in Colombia led to protests by farmers in Ecuador; within Ecuador: conflicts between environmental groups and farmers because of the use of chemical pesticides in potato farming (e.g. San Gabriel region/northern border to Columbia) (EACH-FOR 2008: 39).

6.3 Adaptation as a Means for Peace and Stability

Adaptation measures can help to strengthen peace and stability. To this end, the design and development of conflict-sensitive adaptation is considered a meaningful tool. On a basic level, conflict sensitivity means being aware of the causes of potential conflict in a given location; it involves understanding the operational context and the effects of working there, and on that basis, developing a capacity to avoid negative impacts and maximise positive ones. Conflict-sensitive adaptation is not just ensuring that specific activities are designed with awareness of the context but, more ambitiously, working out how to address the context to offer options to support peace and stability. Conflict-sensitive adaptation aims at reducing risks of future crisis triggered or exacerbated by:

1. **adverse climate change impacts** (e.g. water scarcity, reduced agricultural yields, climate-related natural disasters)
2. **maladaptation** (measures to adapt to environmental stressors that can lead to tension or conflicts - e.g. uncoordinated realisation of existing water infrastructure development plans and adaptation measures in the riparian states could negatively affect water availability downstream and harm water-dependent ecosystems).

The concept of concept-sensitive adaptation aims at highlighting the positive effects adaptation can have with regard to existing or looming conflict and regional stability. Conflict-sensitive adaptation is not working "on conflict" – conflict-sensitive adaptation measures do not explicitly aim to resolve an existing conflict. Neither is conflict-sensitive necessarily working "in conflict" but the concept focuses on fragile regions and on regional and sub-regional climate change and vulnerability hotspots.

As there is a risk that discussing climate change within a security perspective will be politicised in an inflammatory way, conflict-sensitive adaptation needs to be reflected upon in terms of how it is framed. Depending on the circumstances in the target region, alarmism and securitisation that hinder cooperation on adaptation should be avoided. Furthermore, rather than using the term "conflict-sensitive", more subtle terminologies such as "adaptation co-benefits", "stabilizing effects of adaptation", "peace-positive adaptation interventions", "avoid maladaptation", "climate-sensitive development" might be more appropriate to use in the target region.

To put conflict-sensitive adaptation in concrete terms, the following table summarises possible entry points for interventions. Depending on the circumstances in a given region or country, different starting points (and combinations thereof) might be appropriate for conflict-sensitive adaptation:

Table 17: Possible Entry Points for Policy Interventions

Level	Entry Points
Regional	• Regional, multilateral political adaptation process (declaration, strategy)
Neighbouring countries	• Bi- or multilateral cooperation / agreements (e.g. on water, energy, environment)
National	• Mainstreaming of climate change adaptation into existing national policies and regulations (e.g. (economic) development and security as well as foreign- and neighbourhood-policies) • National climate and adaptation strategies and projects

Sub-national / provinces Local	• Building institutions and capacities • Sub-national strategies and activities • Community-based adaptation projects and pilot projects

Climate change adaptation, regional cooperation and stability

Climate change is taking place across national borders. Adverse impacts are naturally of a transboundary nature, leading to similar climate-related risks in neighbouring countries. Thus, regional answers need to be developed to cope with adverse regional impacts. Common vulnerabilities and similar adaptation needs seen by neighbouring countries hold a vast potential of dialogue, coordination and cooperation. When dialogue and the exchange of experiences helps to build trust among neighbours, this can have stabilising effects on a region. Such climate adaptation-related initiatives could potentially lead to the development of a common perspective towards adaptation, serve as a starting point for broader cooperation in the region and, for example, help to prevent controversy on the use of transboundary water resources. Supporting regional cooperation on adaptation in this sense is conflict-sensitive adaptation. The international climate negotiations have so far focused primarily on the national and local support to design and implement policies and measures for adaptation (e.g. through the assistance to prepare NAPAs and, more recently, NAPs). However, climate change impacts are often transboundary – calling for an adaptation perspective that crosses borders.

Aspects for adaptation programmes and projects

Adaptation needs to follow the "do no harm" principle. Care needs to be taken not to provoke or exacerbate local tensions. Therefore, adaptation programmes and projects need to identify crisis and conflict risks in the region that may be exacerbated by climate changes. The focus should be on fragility hotspots within a country and within the region. Specific conflict dynamics need to be considered, as they will play a decisive role in either increasing or decreasing the security risks of climate change. Approaches need to reflect upon the roles that the adaptation programme or project target groups play in current disputes or conflicts. Peace and conflict assessments can be used to reduce the risk of maladaptation.

Programmes and projects need to support the participation of all relevant stakeholders by strengthening participatory processes that explicitly include marginal and vulnerable groups and consider existing asymmetrical power relations and inequalities among the parties potentially involved in adaptation measures.

Adaptation should be guided by long-term planning as climate change and regional stability both demand long-term answers, e.g. in water resource management. Spill-over effects and the structural changes that are necessary to contribute to regional stability take a long time to manifest.

Aspects for the national level of partner countries

Awareness-raising on climate change, impacts and adaptation needs should be intensified. Adaptation needs to be mainstreamed into different sector policies on the national and sub-national level. National adaptation strategies and action plans need to reflect upon human security and links to the management of disaster risks. When planning national adaptation measures, transboundary effects need to be considered (e.g. impacts of constructing a water reservoir on riparian countries).

6.4 Adaptation to Climate Change – Status Quo

The following chapters summarize existing adaptation approaches in the Andean region that are potentially relevant for addressing the negative implications of climate change on peace and stability:

1. Regional, national and sub-national adaptation policies and processes (National Communications under the UNFCCC, NAPAs, LAPAs, NAPs, CC, CCA and CBA strategies as well as relevant environment and development strategies and programmes)
2. Government and non-governmental organisations, policy and project-based initiatives and networks concerned with adaptation on the national, regional or international level
3. International, regional and national programmes and projects related to climate change adaptation.

6.4.1 National Policies and Processes

The Andean countries, Bolivia, Ecuador, Colombia and Peru are currently developed to varying degrees. As Non-Annex I countries, the Andean countries have published National Communications under the UNFCCC. The awareness regarding climate change impacts and adaptation needs is growing – mostly due to internationally funded projects in the region and the National Communications.

Bolivia, Colombia and Peru have published their Second National Communication under the UNFCCC in 2009 and 2010. Ecuador has completed its Second National Communication in April 2012.

National adaptation processes, strategies or policies have been developed to a differing degree in the four countries. Three out of four countries have their own national plans detailing how to cope with the impacts of climate change. Peru has issued an Action Plan for Adaptation and Mitigation Against Climate Change (2010:103 pages). Bolivia has published a National Adaptation Plan (2007) and Colombia has recently developed guidelines for a National Plan Adaptation to Climate Change (2012). Ecuador lacks a stand-alone national adaptation strategy or policy.

The following table lists the main national policies relevant to adaptation.

Table 18: National Policies and Processes in the Andean Region

Bolivia	
• First National UNFCCC Communication (2000) • Second National UNFCCC Communication (2009) • National Adaptation Plan (2007) • National Development Plan (NDP) (2006)	also relevant: Bolivia's National Climate Change Strategy (BNCCS) (2002), CBA Country Program Strategy (2007), Climate Change National Strategy for Education and Public Awareness (2009), Five-Year Climate Change Action Plan (2004-2009), National Mitigation Strategy (2006), Law on "Food Sovereignty" (2011)

Colombia	
• First National UNFCCC Communication (2001) • Second National UNFCCC Communication (2010) • Integrated National Adaptation Project (INAP) (2006-2011) • National Plan Adaptation to Climate Change (PNACC) (2012)	also relevant: National Development Plan 2002 - 2006 (DNP), Plan de Adaptación al Cambio Climático en Cartagena (2012)
Ecuador	
• First National UNFCCC Communication (2000) • Second National UNFCCC Communication 2012	also relevant: Vulnerability, adaptation and mitigation to climate change in Ecuador 2001, National strategy for climate negotiations, Ecuador 2008, National Plan for Good Living 2009 - 2013
Peru	
• First National UNFCCC Communication (2001) • Second National UNFCCC Communication (2010) • National Climate Change Strategy (2003, 2009) • National Guidelines for Climate Change Mitigation (NGCCM) • National Adaptation Plan (APCCAM) (2010)	also relevant: National Program on Climate Change and Air quality (PROCLIM) 2003-2005, Climate Change Adaptation Programme (PACC) 2009-2012, National Plan and Risk Management - Adaptation to the adverse effects of Climate Change in the Agricultural Sector (PLANGRACC, 2012 – 2021)

As is the case in many developing and emerging economies, reporting requirements under the UNFCCC and the financial support of the UNDP and UNEP were the driving forces behind national approaches towards adaptation. All four countries have issued their first National Communication shortly after COP 2, in which the guidelines for the preparation had been defined. The relevant documents have a scientific-technical focus; however Ecuador has also prepared policy proposals for measures and national requirements. Although Ecuador has not provided stand-alone national adaptation strategies, the National Communications are well developed. Whilst the National Communication of Peru, Ecuador and Columbia focus mainly on technical processes, the Bolivian National Communication is quite political reflecting Bolivia's strong positions towards the UNFCCC.

There is little evidence of adaptation mainstreaming and coherent policy integration in the Andean region. Links to climate change, its impact and adaptation needs are rarely integrated into other policies. Analyzing the National Communications prepared under the UNFCCC as well as existing adaptation strategies, sub-national and regional levels are rarely explicitly referred to or included in national strategies.

Official government documents such as the afore-mentioned National Communications only rarely contain explicit links between climate change and security (e.g. tensions around scarce water resources). In the region, climate change is not referred to as a security issue; however climate disasters, extreme events and related losses are stressed as climate threats. The Ecuadorian Communications makes a connection between climate change and food security whilst the Bolivian government recognizes that national food security could be affected by climate change (SNC Ecuador 2011, SNC Bolivia 2009).

6.4.2 Institutions, Initiatives and Networks

6.4.2.1 National Level

A range of different government and non-government institutions are driving the existing adaptation approaches, strategies and plans. However the implementation of concrete adaptation action is still the exception with most initiatives focusing on only capacity building and policy-related research. Nonetheless, a few notable initiatives have been launched recently in various countries and sectors in cooperation with international donors.

The major part of existing projects and initiatives has been initiated and are financed by international organisations, such as the Global Environment Facility (GEF), the UNDP, UNEP and the World Bank, especially in Bolivia and Colombia. Other major donors funding adaptation measures are the Spanish Agency for International Cooperation for Development (AECID), the Swedish International Development Agency (SIDA), the Swiss Agency for Development and Cooperation (SDC) as well as EuropeAid and the German Federal Ministry for Economic Cooperation and Development (BMZ)/Deutsche Gesellschaft für Internationale Zusammenarbeit (giz). The IADB is one of the most significant funder of country-specific adaptation programming in South America.

Overall, adaptation efforts are mainly driven by external financial and technical support from multilateral institutions under the United Nations. At this stage, none of the four countries has an accredited National Implementing Entity for the Adaptation Fund. As National Communications form the main body of information relevant to adaptation, the departments responsible for the reporting commitments to the UNFCCC are guiding the discussions around adaptation in most countries.

However, the Andean countries are driving their own initiatives as well. Bolivia and Ecuador have declared climate change mitigation and adaptation a state policy (EuropeAid 2009). After the early approaches in 2000/2001, the commitment to the implementation has increased. The Bolivian Ministry of Water, for example, has initiated a “Water for All” policy to promote adaptation of water resources to climate change in cities affected by water scarcity (SNC Bolivia 2009: 29). Two inter-institutional fora—one on water and climate change and one on food security and climate change have been set up and are sponsored by (among others) the Bolivian government (Dixit et al. 2012: 46).

Although the National Communications have been supported by national governments, the political weight of the existing adaptation processes determine the implementation and is usually based on the agendas of governments or major ministries. In this regard a major constraint, faced by all four countries hindering planning and implementation of adaptation measures are the lack of involvement of important ministries e.g. the ministries of finance and the ministries of planning as well as by the weak coordination among public institutions.

The following table lists the institutions responsible and/or involved in adaptation approaches. The list of institutions is not exhaustive.

Table 19: Institutions, Initiatives and Networks at the National Level

	State institutions	Other institutions
Bolivia	• Ministry of Water and the Environment • Vice-ministry of the Environment, Biodiversity and Climate Change • National Climate Change Programme (PNCC) & the Office of Clean Development (ODL)	Oxfam, Friends of Nature Foundation (FAN), Nature Foundation "Natura Bolivia", Cuna Association Sustainable Water Foundation
Colombia	• Ministry for the Environment, Housing and Development • Water Resources Group of the Ministry of Environment and Sustainable Development • Colombian Office for the Mitigation of Climate Change • Institute of Hydrology, Meteorology and Environmental Studies (IDEAM) • National Planning Department	MADS, MVCTD, DNP, Ideam, Invemar, IAvH, National Parks of Colombia, Corpoica, Colombia National University, Administrative Department of Science, Technology and Innovation, Colombian Red Cross CI-Colombia, WWF-Colombia, University of Cauca, Nature Foundation "Natura Colombia", Conservation International Colombia, Foundation Ecohabitats, Quinaxi Institute,
Ecuador	• Ministry of the Environment • National Meteorology and Hydrology Institute (INAMHI) • National Directorate of Climate Change, Production and Sustainable Consumption (DNCCPCS) • National Water Secretariat	United Nations Development Programme Ecuador, Civil Labour Association, EcoCostas, Ecopar, Dipecho, FFLA - Foundation for the Future of Latin American, UTPL - Technical University of Loja, PROMAS - Management for Water and Soil, University of Cuenca
Peru	• Ministry of the Environment (MINAM) (General Directorate of Climate Change, Desertification and Water Resources) • Inter-Institutional Climate Change Committee (since 2010) (Second National Communication) • National Environment Fund (management of projects that are interlinked with Clean Development Mechanism) • National Commission on Climate Change (NCCC) • National Water Authority • National Service of Protected Natural Areas by the State of Peru, SERNANP	Civil Labour Association; CooperAcción, AEDES-Special Association for Sustainable Development, WWF-Peru Mountain Institute, Natura Environmental Institute, Huascaran National Park, SERNANP, IPROGA - Promotion Institute for Water Management, The National Meteorological and Hydrological Service - SENAMHI, The National Institute of Natural Resources - INRENA, The National Council for Science and Technology - CONCYTEC

6.4.2.2 Transnational

A considerable number of transnational institutions, initiatives and networks have been identified that are involved with adaptation in the Andean region in one way or another. The table below lists international and regional bodies and commissions, institutions and initiatives, as well as international economic organisations giving an overview of the major actors involved. The transnational institutions named below are responsible for dealing with issues

closely related to climate change adaptation, such as water management. Further institutions are implementing programs and projects relevant to adaptation and/or are referred to in the National Communications / adaptation plans and strategies.

The institutions identified take on different roles, ranging from intergovernmental fora such as the Ibero-American Network of Climate Change Offices (RIOCC) to knowledge hubs and process facilitators such as the Regional Policy Dialogue: Water and Climate Change Adaptation. Those institutions are bundling knowledge about the technical as well as the political dimensions of adaptation.

The engagement of regional governance bodies in the field of climate change appears to be limited so far, although it seems to be growing. As in other world regions, most of the institutions and networks active in the field of adaptation are focused on water issues. A variety of initiatives are directly linked to the conservation of the Amazon, such as the Amazon Basin Conservation Initiative or the Initiative for Conservation in the Andean Amazon.

A selection of institutions that are of particular interest when thinking about steps to substantiate discussions around the security dimension of adaptation and benefits for regional stability in the Andean region are shortly described below.

Andean Community (CAN): is a regional integration organization (Bolivia, Colombia, Ecuador and Peru), focusing more on social and economic issues. It was founded in 1969 under the Cartagena Agreement, which was primarily developed to increase economic and social well-being of the Andean population. Today, it also aims to deepen the integration process for a sustainable development (CAN, 2013). The environmental focus was incorporated into the common policy in 2007 and clarified in more detail in the General Secretariat's Working Plan. The recently set-up Andean Environmental Agenda (2012- 2016) identifies global threats, such as climate change, biodiversity, water and disasters to be of high relevance for the Community. Its strategy on biodiversity is detailed and enjoys a prominent role in the debate. Climate change has recently been taken up and still needs assessment (www.comunidadandina.org).

Consortium for Sustainable Development in the Andean Ecoregion (CONDESAN): is an independent NGO dealing with matters of natural resource management and sustainable development with a special focus on water and watershed management. Since its founding in 1993, it has been committed to combat poverty in rural Andean societies, to support sustainable leadership and to foster policy dialogues and policy implementation. CONDESAN is active in Venezuela, Colombia, Ecuador, Peru, Bolivia and Chile, but also in different mountain regions worldwide. It takes part in many different networks, programs and initiatives, such as the Diálogo Andino and the Mountain Partnership Consortium (www.condesan.org).

Ibero-American Network of Climate Change Offices (RIOCC): is a prominent intergovernmental initiative that is coordinated and partly funded by Spain, involving all the Spanish- and Portuguese-speaking countries of South America (i.e., all countries except Suriname and Guyana), as well as Spain and Portugal. Other countries participating are Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama; Mexico; the Dominican Republic and Cuba. Founded in 2004, RIOCC provides a regional platform for knowledge exchange, capacity building and the promotion of regional adaptation projects. It assists parties in improving their understanding and assessment of climate impact, vulnerability and adaptation, and in making informed decisions on practical adaptation action (http://www.lariocc.es).

Regional Gateway for Technology Transfer and Climate Change Action (REGATTA): is an initiative led by UNEP. Its main donors are the governments of Spain, Norway and Sweden. It aims to foster knowledge management and information exchange on climate change relevant

technologies, adaptation and mitigation throughout Latin America and the Caribbean. Tools to achieve this goal include an online platform that bundles initiatives and best practice examples, the establishment of regional centres of knowledge and technology to support the development of sustainable leadership and specific mitigation and adaptation assistance for affected regions The Community of Practice Andes (COP-Andes) focuses on the impact of climate change with regard to agriculture and water resources. Adaptation efforts currently concentrate on the distribution of information via news, discussion forums and webinars (http://www.climatechange-regatta.org).

Regional Policy Dialogue - Water and Climate Change Adaptation: focuses on the Latin American countries and the Caribbean. The network is a regional effort where 22 dialogue partners from civil society, multilateral partners, the private sector and governments collaborate to share knowledge and lessons learnt on climate change and water. With a clear focus on water issues related to climate change, it aims to raise awareness among the public and decision-makers, to promote a united voice in global discussions, and to exchange experiences (Regional Policy Dialog on Water and Climate Change Adaptation in the Americas 2012).

Table 20: Institutions, Initiatives and Networks at the Transnational Level

Government
• Amazon Cooperation Treaty Organization (OTCA) (www.otca.org.br/) • Andean Community (CAN) (www.comunidadandina.org/) • Andean Development Corporation (www.caf.com) • Association of Independent Alliance of Latin America and the Caribbean (AILAC) • Caribbean Community and Common Market (CARICOM) (www.caricom.org) • Cartagena Dialogue • Mercosur (Southern Common Market) (www.mercosur.int) • Pacific Alliance(www.cancilleria.gov.co/international/consensus/pacific-alliance) • Organization of American States (OAS) (www.oas.org) • Spanish Agency for International Cooperation (AECID) (www.aecid.es) • UN Economic Commission for Latin America (ECLA (=CEPAL) (www.eclac.org) • UNEP - Regional Office for Latin America and the Caribbean (www.pnuma.org)
Government – Research, Practitioners
• Amazon Basin Conservation Initiative (USAID 2008) • Amazon Conservation Association (ACA) (www.amazonconservation.org) • Amazon Conservation Association (ACCA - Peru) (www.acca.org.pe) • Amazon Institute for Environmental Research (IPAM)(www.ipam.org.br) • Ecosystems and Livelihood Adaptation Network (ELAN) (www.elanadapt.net) • Ibero-American Network of Climate Change Offices (RIOCC) (www.lariocc.es) • Initiative for Conservation in the Andean Amazon (ICAA) (www.amazonia-andina.org) • Inter-American Water Resources Network (IWRN) • Inter-American Network for Disaster Mitigation (INDM) (www.rimd.org)

- International Center for Tropical Agriculture (CIAT) (http://ciat.cgiar.org)
- Regional Andean Program for Risk Reduction and Disaster Prevention (CAF Andean Development Corporation, since 2000) (PREANDINO) (www.eird.org)

Non-Governmental Research, Practitioners & Civil Society

- Andean Climate Change Interamerican Observatory Network (ACCION) (www.ecpamericas.org/Initiatives/default.aspx?id=74)
- ADAnet: Thematic Network on Climate Change Adaptation and Ecosystem Services in Latin America, Latin American Center for Rural Development (RIMSIP) (www.rimisp.org/inicio/index.php)
- COICA (Coordinator of Indigenous Organizations of the Amazon Basin) (www.coica.org.ec)
- Conservation International (CI) (www.conservation.org)
- Consultative Group on International Agricultural Research (CGIAR) (www.cgiar.org)
- Consortium for Sustainable. Development in the Andean Ecoregion (CONDESAN) (www.condesan.org)
- Coordinating Body for Indigenous Organizations in the Brazilian Amazon (www.coiab.com.br)
- Critical Ecosystem Partnership Fund (CEPF) (www.cepf.net)
- Foundation for the Future of Latin American (FFLA) (www.ffla.net)
- Global Water Partnership (GWP) (www.gwp.org/en/gwp-in-action/South-America/)
- Initiative of Indigenous Peoples of the Amazon Basin to Combat Climate Change Regional Policy Dialogue: Water and Climate Change Adaptation (Regional Policy Dialog on Water and Climate Change Adaptation in the Americas 2011)
- Latin American Network of capacity development for integrated water management (http://la-wetnet.org)
- Latin American Platform on Climate (LAPC) (www.intercambioclimatico.com)
- Program on Armed Conflict and Peacebuilding (ConPaz) (http://conpaz.uniandes.edu.co)
- Project of the Andean Forum (Cities and Sustainable Consumption to Combat Climate Change/Civil Society of the Andean Community (SOCICAN) (Foro Ciudades 2013)
- The International Union for the Conservation of Nature (IUCN) Working Group on Snow, Ice and Glaciers of IHP-LAC(GTNH-IHP) (www.iucn.org)

Although a large number of initiatives and networks are already active within the region their efforts to date remain largely fragmented and isolated suffering from little coordination and limited visibility. Attempts by civil society and research organisations to solve the lack of synchronization have been impeded by the absence of political processes on a regional level.

6.4.3 Programmes and Projects

A number of adaptation projects are either currently underway or have been very recently finalized at both the local, national and regional level. After describing country-related examples, an overview of the major projects is given in the table below.

6.4.3.1 National

A number of adaptation projects focusing on capacity development exists in the area of agriculture and food security, water management and vulnerability assessments. The following four projects are in the process of being implemented and can be considered as exemplary approaches to climate change adaptation at the national level.

Bolivia: The UNEP Country Program Strategy in Bolivia being implemented since 2007 aims at combating Climate Change on the community level integrating the local communities in the planning and decision-making progress. The programme focuses mainly on the Region around the Titicaca Lake and the Crucenos Valleys. Emphasising participatory research and integration of local knowledge and capacities of communities, local government institutions as well as private investor initiatives, the program intends to reduce vulnerability of rural livelihoods and ecosystems in the face of flood, drought and erosion due to climate change.

Colombia: The Integrated National Adaptation Project (INAP) implemented by Conservation International Columbia and the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM) aims at improving Colombia's understanding and assessment of impacts, vulnerability, and adaptation to climate change by taking an ecosystem-based approach (EbA) to adaptation to address climate change and supporting efforts to define and implement specific pilot adaptation measures. The EbA, which includes community-based initiatives and integrates the use of biodiversity and ecosystem services, assists communities to participate in adaptation policy while simultaneously adapting to climate.

Ecuador: The World Food Program "Enhancing resilience of communities to the adverse effects of climate change on food security, in Pichincha Province and the Jubones River basin" will run from 2011 through 2016. Its Executing Entities are Ecuador's Ministry of Environment in coordination with the Ministry of Agriculture, Livestock, Aquaculture and Fisheries; the Commonwealth of the River Jubones Basin; and the Provincial Government of Pichincha. The aim of the initiative is to strengthen the resilience and increase food security in the vulnerable communities affected by malnutrition. The development of local strategies and community adaptation plans are part of the project, as well as the restoration of overexploited resources (such as forests). The project is intended to have a long term effect and to serve as a guideline for the other water-stressed areas of Ecuador (Adaptation Fund 2011).

Peru: The Climate Change Adaptation Programme (PACC) is implemented by the Ministry of Environment, Regional Governments and facilitated by Intercooperation, PREDES and Libelula (2009-2012). It's focus at the national level includes the promotion and implementation of adaptation strategies and the facilitation of dialogues and knowledge sharing. At the local/ regional level, the strategy is the promotion of local projects, taking regional vulnerabilities into account and using traditional knowledge (Adaptation Learning Mechanism 2009).

The table below lists selected projects with a national focus that have been implemented or are still being implemented in the countries of interest aiming at giving an overview showing the diversity of activities without claiming to be exhaustive.

Table 21: Programmes and Projects Related to Adaptation with a National Focus

Bolivia	• Kenneth Lee Foundation, Oxfam: Rescuing the Past: Using Indigenous Knowledge to Adapt to Climate Change in Bolivia (2009) • UNDP: Sustainable management of water and soils: knowledge and tools to improve community adaptive capacity and reduce vulnerability in the municipality of Moro Moro (Duration 2009-2011) • UNDP: Participatory and integral learning on community adaptation to climate change to reduce food insecurity in three communities in the Anocoraimes Municipality (Duration 2009-2011) • UNDP: Setting up of protection systems for water sources and establishing soil conservation and management practices through reforestation in three communities in the town Municipio de Batallas, as strategies for climate change adaptation and mitigation (Duration 2009-2011) • UNDP: Reforestation of recharge areas and freshwater sources agrobiodiversity recovery of tubers and cereals as an adaptation measure to climate change in communities Colquechaca Township (2009-2011) • UNDP: Sustainable Management Model Planting Areas Water (2010-2011) • UNDP: Strengthening the productive system of food security in the district of Vila Vila communities in the municipality of Sacaca, as a measure of adaptation to climate change (2011-2012) • University of Calgary: Water Management in Bolivia (2008 – 2013)
Ecuador	• Conservation International: Bridging the gap between forest conservation and poverty alleviation (2008-ongoing) • Ministry of Environment Ecuador: Project Management Adaptation to Climate Change to reduce social vulnerability, economic and environmental (GACC) (2010-2014) • Ministry of Environment Ecuador, UNDP: Adaptation to Climate Change through an Effective Water Governance in Ecuador (PACC) (2008-2011) • UNDP, Municipality of Quito: Program for Disaster Risk Reduction in the Metropolitan District of Quito (2009-2011) • World Food Programme, Ministry of Environment, Ministry of Agriculture: Enhancing resilience of communities to the adverse effects of climate change on food security, in Pichincha Province and the Jubones River basin (2011-2016)
Colombia	• Conservation International: Chingaza-Sumapaz-Páramo de Guerrero Conservation Corridor • Conservation International, IDEAM, INVEMAR, CORALINA, INS: : Integrated National Adaptation Project (INAP) (2006-2011) • Natura Foundation (Colombia): Robles Conservation Corridor, a Strategy for the Conservation and Forest Management in Colombia • Red Cross Organizations, IDEAM, enterprises, municipalities, indigenous and peasant communities and universities: Effects of climate change and adaptation in indigenous and peasant communities of La Guajira and Magdalena • Regional Autonomous Corporation of San Jorge and Valleys Sinú (CVS); Conservation International (CI) Colombia: Adaptation and mitigation of climate change on aquatic ecosystems river Córdoba department, as part of the restoration and sustainable management of wetlands • UNDP: Reducing Risk and Vulnerability to Climate Change in the Region of La Depresion Monposina in Colombia (2012- 2017) • UNDP; UNICEF, FAO, OPS/OMS, MAVDT, IDEAM, Spanish Cooperation Agency, National Planning Department, Management and Disaster Prevention, regional environmental authorities, municipalities, Council for Indigenous: Integration of ecosystems and adaptation to climate change in the Colombian Massif (2008-2011) • WWF Colombia: Epicenters for combating climate: Adaptation Strategies for Northern Andes

Peru	• AEDES: Project Actions to reduce the negative effects of climatic change on the river basin Ocoña (2011) • CONDESAN: RAMPPERU, promotion of technology for development (2007- ongoing) • FAO, UNDP, UNEP, PAHO, ministries, regional governments, municipalities: Integrated and adaptive management of environmental resources and climatic risks in High Andean micro-watersheds (2008-2011) • Inter-American Development Bank (IDB), Adaptation to the Impacts of Climate Change on Peru's Coastal Marine Ecosystem and Fisheries (Proposal to Adaptation Fund) (2013-2017) • MINAM, UNDP: Promoting Land Use Management in the Area of Influence of Bambas (planned) • MINAM, BID: Regional Capacity Building in climatic change management (2010-2011) • MINAM, UNDP, RBLAC, Regional Government of Piura: ENSOindex insurance (2009-2011) • Project: Q'emikuspa: "Adaptation Measures to Climate Change for protecting and improving the livelihoods of indigenous communities" (2009-2012)

6.4.3.2 Transnational

There are also a number of projects with a transnational focus that can help to address climate change challenges by initiating a regional dialogue on the need for climate change adaptation. Examples include projects of German and European international cooperation, as well as international approaches and initiatives:

Table 22: Programmes and Projects Related to Adaptation with a Transnational Focus

German and European Programmes/Projects
• Adaptation to Climate Change in the Andean Region (Bolivia, Colombia, Ecuador, Peru) (funded by BMZ, implemented by GIZ, CAN). 2011-2016 (www.giz.de/themen/en/36812.htm) • Annual Action Programme 2011 in favour of the Andean community (European Commission) 2011 (http://ec.europa.eu/europeaid/documents/aap/2011/aap_2011_andean_en.pdf) • Climate Change in a Living Landscape: Vulnerability and Adaptation in the Eastern Cordillera Real of Colombia, Ecuador and Peru (EU, WWF, national partners), End Date 2009 (http://awsassets.panda.org/downloads/cc_ecr_final_web.pdf) • giz Programme until 2017 on food security • CELA: Network of Climate Change Technology Transfer Centre in Europe and Latin America (Bolivia, Guatemala, Nicaragua and Peru / Germany, Estonia) (part of ALFA Programme of the EU) • Ecosystem-Based Adaptation Programme (IUCN, BMU, UNEP, UNDP) • EUROCLIMA: Climate change regional cooperation programme (European Commission). 2009-2013 (http://ec.europa.eu/europeaid/where/latin-america/regional-cooperation/euroclima/index_en.htm) • International Network on Climate Change - Impacts on Small Farmers in the Tropical Andes (INCA – International Network on Climate Change). Part of the Climate-Networks-Initiative of the German Academic Exchange Service (DAAD). (http://weadapt.org/knowledge-base/forests-and-climate-change/inca-network) • Supporting the Plan for Watershed Management in Bolivia (European Union, Bolivian Ministry of Environment and Water, GIZ). 2009-2012 (www.giz.de/themen/en/32425.htm) • Training in the agricultural and water sectors and disaster prevention in Bolivia, Colombia, Ecuador and Peru (InWent). 2010 – 2013 (www.lima.diplo.de/Vertretung/lima/de/07/Organisationen/Inwent.html)

International Programmes/Projects

- Andean Countries- Regional Adaptation to the Impact of Rapid Glacier Retreat in the Tropical Andes[17] (World Bank). 2008-2013
- Amazon River Basin, Management of Transboundary Water Resources (OAS, OTCA, UNEP, 2005-2007)
- AndeanPáramoProject(PPP): Conservation of the Biodiversity of the Paramo in the Northern and Central Andes, CONDESAN, (GEF, UNEP, 2005-2012)
- Adaptation to the Impact of Rapid Glacier Retreat in the tropical Andes – PRAA[18] (2009-2012); SCCF, CAN, Government ministries, regional organisations
- Capacity Development for Policy Makers to Address Climate Change, extension for Latin America19 (Spain, UNDP) 2011-2012.
- Cities Initiative Climate Change (CCCI) (Municipalidad de Esmeraldas, MDMQ, UNDP) (6 month)
- Climate Change and Biodiversity Information in the Tropical Andes[20] (IADB, Centro Internacional para la Investigación del Fenómeno de El Niño). 2010-2011
- Climate Change Impacts on Biodiversity in the Tropical Andes: Climate risk, vulnerability and decision making tools for the planning of conservation[21] (John D. and Catherine T. MacArthur Foundation, IAI). 2011-2013
- Climate Change in the tropical Andes - Impacts and consequences for glaciation and water resources. Part III: Future recommendations[22] (paper by eldis, publ. 2012)
- Climate Change Vulnerability Evaluation of Coastal and Marine Areas (2009-2011): Spain, PIACC, (Argentina, Brazil, Chile, Colombia, Ecuador, Peru, Uruguay and Venezuela) implementation: ECLAC, University of Cantabria
- Challenge Program on Water and Food (CPWF)[23] (CIGAR). Start 2002
- Coming Down the Mountain: Understanding the vulnerability of Andean communities to hydro climatologic variability and global environmental change[24] (Inter-American Institute for Global Change Research, University of Regina, Canada). 2007-2011
- Design and Implementation of Pilot Climate Change Adaptation Measures in the Andean Region (PRAA Project)[25] (implemented by World Bank with Government ministries, regional organizations). 2008-2012

[17] http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/LCR/2012/10/27/090224b081726825/1_0/Rendered/PDF/Andean0Countri0Report000Sequence009.pdf

[18] http://www.careclimatechange.org/files/adaptation/CARE_PRAA_Summary.pdf

[19] http://www.undp.org/content/undp/en/home/ourwork/environmentandenergy/strategic_themes/climate_change/focus_areas/capacity_developmentandtheunfcccprocess/capacity_developmentforpolicymakerstoaddressclimatechange.html

[20] http://www.iadb.org/en/projects/project-description-title,1303.html?id=RG-T1821

[21] http://www.iai.int/index.php?option=com_content&view=article&id=120&Itemid=68

[22] http://www.eldis.org/go/display&type=Document&id=61784

[23] http://waterandfood.org/basins/andes/

[24] http://www.iai.int/index.php?option=com_content&view=article&id=99&Itemid=70

[25] www.careclimatechange.org/adaptation-initiatives/praa

- Ecoficinas: good practice-Environmental policies in the Public Sector (Secretaría de Ambiente, MDMQ)
- Research for integrated coastal management, which is funded by the Comisión Permanente del Pacífico Sur (Colombia)
- Ibero-American Programme on Adaptation to Climate Change (PIACC): (RIOCC, 2008)
- Information System Multimodal Event Climate Extremes Ecuador Coast (Esmeraldas, Manabí, Los Ríos y El Oro) (CIIFEN, INAMHI, UNDP) 2008
- Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin Considering Climate Variability and Change[26] (GEF, OAS, UNEP). 2009-2011
- Knowledge management and environment in coastal areas (Academic Management Research PUCP) (Peru)
- Mitigation and Adaptation to Climate Change in Coastal Zones[27] (Asociación Civil LABOR, ADMICCO). 2011-2015
- Mitigation and Adaptation to Climate Change in Sustainable Forest Management in Ibero-America[28] (INIA, CIFOR, CATIE, Polytechnical University of Madrid). Start 2008
- Peru-Ecuador: Binational conservation programme and participatory forest management (Chinchipe basin) (2005-2009)
- Potential Impact of Climate Change in Latin America and the Caribbean Mountain Forest Ecosystems[29] (IADB, CATIE). Start 2010
- PREANDINO. Regional Andean Program for Risk Reduction and Disaster Prevention, (Bolivia, Colombia, Ecuador, Peru, Venezuela) (Andean Development Corporation 2000-ongoing)
- Preparedness for Climate Change, Argentina, Bolivia, Colombia, Guyana (National Red Cross/Red Crescent Societies).
- Reducing Climate Change Vulnerability through Adaptation[30] (IADB). 2010
- Regional Action on Water Resources (OTCA, 2012-2014)
- Regional Hydrological Monitoring Network of Andean Ecosystems CONDESAN
- Understanding Potential Impacts of Climate Change in Latin America and the Caribbean[31] (ECLAC). 2008-2010
- Utilization of Potato Genetic Diversity as Tool to Adaptation to Climate Change[32] (IADB). 2009-2012
- Vulnerability assessment to climate change in marine and coastal areas of Ibero-America[33] (implemented by ECLAC, University of Cantabria, supported by Spain). 2009-2011

Despite a large number of regional and transnational programs existing in the region, the problem of dedicatory coordination remains. When it comes to strategy and policy formation at the intergovernmental level, there has so far been little collaboration between countries

[26] http://iwlearn.net/iw-projects/2364

[27] http://www.admicco.labor.org.pe/

[28] http://unfccc.int/files/adaptation/application/pdf/riocc_ap_update_sep_09_assess_1_sp.pdf

[29] http://www.caribbeanclimate.bz/index.php?option=com_wrapper&view=wrapper&Itemid=104&adstr=%3Fid%3D48%0D%0A

[30] http://www.iadb.org/en/projects/project-description-title,1303.html?id=rg-t1840

[31] http://www.un.org/esa/devaccount/projects/2008/0809AE.html

[32] http://www.iadb.org/en/projects/project-description-title,1303.html?id=rg-t1690

[33] http://unfccc.int/files/adaptation/application/pdf/riocc_ap_update_sep_09_assess_1_sp.pdf

(IISD 2011: 16). Hence there is a great need to harmonize existing adaptation efforts and to strive for comprehensive regional approaches.

6.4.4 Preliminary Conclusions

Considering the major existing policies and process, organisations and initiatives as well as programmes and projects related to climate change adaptation, the following conclusions regarding the Status Quo of adaptation in the Andes can be derived:

1. General need to further develop national adaptation activities

To prepare for climate change and its adverse consequences and to protect the people, economies and environment of the region, Andean countries need sub-national, national and regional policies to develop and govern adaptation activities at different levels. Bolivia, Columbia, Peru and Ecuador are leading the in Latin America with regard to climate change adaptation. Efforts in Colombia are comparably well developed and more strategically aligned than in other countries in the region. However, in all countries, strategies and implementation activities are just at the outset. Bolivia, Colombia, Ecuador and Peru have identified and prioritised their adaptation needs but priorities are rarely reflected in other policies so far. While at the national level the inter-ministerial integration of adaptation has started to some extent, this is not the case on the ground in the departments.

Adaptation is discussed with regard to a broad range of sectors such as water, agriculture, health, eco-systems and coastal zones, while the single topic of glacier retreat attracts a lot of the overall (international) attention on adaptation. The implementation of adaptation processes and measures is still in its early phases. Beginning only a few years ago, pilots and implementation of adaptation measures have become visible. However, the growing number of local projects related to climate change adaptation does not yet have broader effects. Most of the activities are exploratory, focusing on preparation for actual implementation projects, with current endeavours limited to feasibility studies and exchange of knowledge, resulting in few substantial implementation results so far. A lot of adaptation measures on the ground seem to be mainly based on known approaches such as Integrated Water Resources Management, catchment management, tree-planting.

Community-based adaptation is among the key terms of national strategies (e.g. Colombia) but is neither fully defined nor implemented. Overall, existing policies and programmes do not yet seem to integrate adaptation imperatives. While some progress has been made by research institutions and academia, gaps remain in terms of awareness and capacity. In summary, there is a considerable need for action to sustain, strengthen and coordinate adaptation policies and their respective processes in the countries of the region.

Examples for barriers to effective adaptation

- Insufficient political awareness and priorities for adaptation
- Lack of institutional capacities and financial resources (especially at the local level)
- Lack of information on climate change and hydro-meteorological data
- Conceptual inconsistency for local adaptation projects (different terminologies and methods) at times leading to confusion at the community level

2. Lack of regional processes on adaptation

Climate change is not bounded by national borders. Transboundary bio-geographical areas that share common topography and eco-systems, such as the vulnerable mountain areas of the tropical Andes or the transboundary rivers, for example between Colombia, Ecuador and Peru, demand coordinated bilateral and regional responses. However, existing approaches to climate change and adaptation in the regional are mostly national.

Currently, regional processes that address climate change and its impacts and offer harmonised adaptation efforts across various countries are lacking. The lack of regional approaches is partly a structural deficit, as international funds are typically directed towards the national level. There are a considerable number of projects to support adaptation in the region – largely supported by international donors. Yet, although such programmes are international, they tend to focus on small local projects targeting certain areas and lack transboundary elements. Regional activities exist (e.g. workshops dealing with sub-questions of climate change adaptation, for instance climate monitoring), yet there is still a question as to whether they are either substantial or comprehensive enough.

A large number of (small) organisations and initiatives exist, working in two or more countries of the region on topics related to adaptation. However, there is currently no effective regional discussion forum to facilitate exchange across countries and projects. Some of the regional organisations that deal with political, security and economic interests have started a number of adaptation projects such as the Andean Community under their Environmental Agenda. However, these approaches lack visibility and political weight.

3. Opportunities for regional cooperation on adaptation

The lack of an effective regional approach towards adaptation means two things. First, regional, transboundary adaptation needs are not adequately addressed. Second, the large potential of regional adaptation efforts, for instance regionally stabilising effects, are not harnessed. This paper argues that inter-state cooperation on adaptation can hold significant co-benefits for regional stability, as adaptation offers new cooperation possibilities for the Andean countries.

Countries see similar (common) needs with regard to climate adaptation. First, national vulnerability assessments and adaptation concepts show significant overlap and thus starting points for cooperation regarding structural and process needs, such as to increase awareness of policy makers and planners, increase institutional capacities and resources, improvement of inter institutional coordination and improvement of the data basis.

Second, opportunities for regional coordination and cooperation is also seen regarding the common thematic and geographic priorities of the countries (biodiversity & forestry, mountain eco-systems, agriculture & food security, water resources, health, DRM / early warning systems, coastal zones).

4. Risk of Maladaptation

Increased adaptation activities could lead to cases of maladaptation. Not only climate change impacts, but also adaptation measures can lead to tensions or conflicts. For example, in Colombia dams built for flood protection measures in one place were leading to flooding of other places, namely in slums, where poor and vulnerable people were not able to cope. In general, uncoordinated realisation of existing water infrastructure projects and adaptation measures could negatively affect water availability downstream and harm water-dependent ecosystems – within the state borders and for riparian states. Maladaptation could also have

non-technical roots. Experts criticise cases in which adaptation projects have had negative security implications due to poor project planning because project planners did not understand and take into account the regional context, processes and demands accordingly. Thus, in order to avoid maladaptation it is essential to support participatory and socially inclusive adaptation approaches that pay particular attention to marginalised groups (e.g. migrants, indigenous groups, small-scale farmers). Furthermore, with the increasing financial transfer for adaptation projects, risks of elite capture, corruption and organised crime arise.

5. Little evidence for conflict-sensitive adaptation

While discussions about the potential implications of a changing climate on peace and stability are increasingly prevalent, there is currently little evidence that climate change adaptation could be called 'conflict-sensitive'. For the Andean countries studied here, official documents contained only vague links to and discussions on climate impacts and approaches towards adaptation did not yet meaningfully take the security dimension into account. There are, however, a number of activities on "food security" and "territorial security" of people in vulnerable areas. Benefits of adaptation measures, such as potentially positive and stabilising effects for fragile regions are not discussed.

6.5 Towards a Roadmap for Adaptation, Peace and Stability in the Andes

The following chapters describe approaches towards climate change adaptation and cooperation in the Andes that reflect upon existing policies and processes, as well as the given regional setting of actors and risks. The entry points outlined illustrate how adaptation processes could address vulnerability and fragility hotspots, thereby contributing to regional stability. In order to complement existing national adaptation efforts, the focus will be on the regional dimension.

6.5.1 Starting Regional Adaptation Processes

Considering the immense challenges prompted by the impact of climate change Bolivia, Colombia, Ecuador and Peru should strive for regional cooperation in order to address regional and transboundary adaptation needs adequately and harness the potential of regional adaptation efforts, protecting eco-systems and people's livelihoods.

In a region where interstate cooperation on climate change is in the beginning, regional adaptation processes could strengthen national and regional efforts to cope with adverse impacts. Particularly in border regions, people face similar climate-related risks that prompt the need for coordinated solutions.

Multiple benefits

- While the different countries face common climate change vulnerabilities, developing answers to climate-related challenges can be a promising strategy for regional integration.
- Taking into account the different experiences within the region regarding National Communications as well as climate and adaptation strategies, all countries could benefit from increased exchange and mutual learning. Different countries are at different progress levels regarding different areas. The huge diversity of conditions along the Andes requires some "mapping" efforts but presents immense learning opportunities.

- Furthermore, regional adaptation processes could attract donors and funds for capacity building and institutional support, as well as technical projects and thus improve overall resource mobilization for adaptation. Thereby, joint regional adaptation efforts would also endorse collective Andean negotiating positions under the UNFCC.
- Last but not least, a regional approach could, to some extent, close gaps between national efforts and decouple the overall success of adaptation activities in the region from single national circumstances and developments – balancing individual country's ambitions and capabilities for climate change adaptation or taking the role of an "institutional memory" should adaptation processes in one country be interrupted.

Starting point: common vulnerabilities and needs

In starting joint adaptation efforts, the countries of the region could gather around the basic objective of better understanding regional climate change impacts, identifying benefits of needs-based cooperation on adaptation and discussing the case for a regional approach. Looking for mutual interests would be the starting point. Common ground could be found in that all countries increasingly see the relevance of climate change for the whole region. In order to provide low barriers to participation, the range of topics to start with should focus on the following issues, in which national vulnerability assessments and adaptation strategies and plans overlap across the four countries:

- vulnerabilities to climate change impacts with regard to eco-systems and biodiversity, water resources and food security - especially with regard to transboundary bio-geographical areas that share common topography and eco-systems
- need for awareness raising on climate change, its impacts and adaptation
- need for capacity building and strengthening institutions in the field of climate change, adaptation and water.

Based on the assumption that climate impacts cannot ideally be addressed only on the national level but necessitate transboundary approaches, gaps between national adaptation strategies should be discussed and information could be exchanged for mutual support of the further development and implementation of national plans and activities (e.g. by exchanging data on climate projections and impact assessments). Furthermore, discussions about synergies between adaptation and DRM (e.g. transboundary early warning communications systems, anti-flood measures) could be fruitful, as climate change will give momentum to disaster risk reduction programmes. Last but not least, regional adaptation processes need to reflect upon climate-related uncertainties that are significant for the large region of the Andes and in many cases do not allow for clear adaptation decisions based on projections/trends of climate signals.

Barriers to regional approaches

Discussions about adaptation at the regional level need to reflect political barriers. Adaptation to climate change is not only a technical issue when touching upon issues such as mining and related conflicts that are high on the political agenda. Distribution of land is a politically difficult topic as well. Climate change is adding new arguments to this debate as zones where plants can be grown will be shifting. The design of any activity needs to into account political sensitivities, and frame activities accordingly. Furthermore, driving regional approaches from outside the countries might prove difficult because the countries are very sensitive and can regard support by third countries from outside Latin America as agenda setting. Among the countries in Latin America, on a political level, cooperation in the field of environment and climate change between Colombia, Ecuador and Peru seems to be easier than with Bolivia,

which has for example blocked the CAN 2nd Environmental Agenda for several years (approved 2012 by the CAN governments). However, the different political tendencies of Bolivia and Ecuador (oriented towards the centre-left) and Colombia and Peru (oriented towards the centre-right) are not believed to be a barrier to cooperation in the field of climate change adaptation. On the operational level, cooperation efforts need to reflect upon the compatibility of the different national institutional frameworks and face barriers for local project implementation such as existing areas of limited statehood in border regions.

Agenda setting and inspiring examples

A regional approach could start with joint discussions on the issues pointed out above. Different venues of informal and formal opportunities to set the idea of a joint regional adaptation process on the national policy agendas are for example:

- Andean Communitiy: the Environmental Agenda (2012-2016) calls for the formulation of an Andean Plan of Action on Climate Change including concrete mitigation and adaptation measures in line with the national adaptation plans
- Formal and informal fora during UNFCCC COP preparations among the countries of Latin American.

Furthermore, two cases for regional approaches towards adaptation have been identified that could inspire activities in Latin America:

- Caribbean Community and Common Market (CARICOM): “In 2009, CARICOM Heads of Government [...] asked the Caribbean Community Climate Change Centre (CCCCC) to prepare a Regional Framework for Achieving Development Resilient to Climate Change (the “Regional Framework”). The Framework provides a roadmap for action over the period 2009 to 2015.”
- Adaptation efforts of the European Union: multi-year process of discussing ideas and priorities: “green paper” (2007), followed by “white book” (2009), EU adaptation strategy (2013).

Regional, trilateral and bilateral focus areas

Taking into account current needs, opportunities and barriers for regional cooperation, regional adaptation processes can start focussing on a limited number of areas. As presented below, four possible focus areas have been identified – by mapping climate change vulnerability and fragility hotspots in trans-border contexts:

Table 23: Regional Adaptation Roadmap for the Andean Region

Regional Adaptation Roadmap for the Andes				
common regional vision on adaptation goal, milestones, activities				
Focus areas	Tropical Andes	Amazon	Coastal regions	Transboundary waters
Aspects / rationale	political agreement /strategy for the eco-region workshops + regional conference networks of local communities	community-based adaptation eco-system based adaptation indigenous knowledge & networks	exchange and learning between coastal departments vulnerabilities & adaptation measures	community-based adaptation transboundary rivers / aquifer rural, small-scale farmers stabilize border region
Example cases	Colombia, Bolivia, Ecuador, Peru (Chapter 5.2)	Colombia, Bolivia, Ecuador, Peru (Chapter 5.3)	Colombia, Ecuador, Peru (Chapter 5.4)	Colombia, Ecuador (Chapter 5.5)

The focus areas are developed in a way to provide complementary examples for adaptation issues that are pressing in all countries. Thus, the focus areas discussed below can serve as entry points for discussing potentials for regional, multilateral or bilateral adaptation programmes or projects.

6.5.2 Focus Area 1: Tropical Andes (Bolivia, Colombia, Ecuador, Peru)

With both slow onset changes such as changing temperatures and precipitation patterns and an increased risk of natural hazards, climate change is threatening eco-systems and the livelihoods in the tropical Andes. All four countries identify the tropical Andes as a vulnerability hot spot in the region, especially because climate change is threatening the biodiversity and diverse sectors that depend upon the eco-system services and natural resources provided. A sub-topic that has already received a lot of international attention is the glacier retreat, particularly in Bolivia, Ecuador and Peru, but also in Colombia. Thus, all four countries prioritise adaptation needs related to eco-systems, biodiversity, water resources and agriculture in their national adaptation approaches. However, they seldom do so with regard to cooperation with neighbouring states although these areas can hardly be limited in its regional focus.

In order to close this gap, climate change adaptation should be discussed on the eco-regional level, focusing on the geographical area of the tropical Andes to address biodiversity hotspots, climate-related water issues, food insecurity triggered by insufficient water supply, effects of glacier retreat and natural disasters.

We propose to encourage a political process involving Bolivia, Colombia, Ecuador and Peru with the goal to develop a regional agreement or strategy for adaptation to climate change in the eco-region of the tropical Andes. The process could be based on the Andean Environmental Agenda (2012-2016) of the Andean Community (Programs on Climate Change, Biodiversity, Water and Disasters; Action Plan for the Andean Strategy for Integrated Management of Water Resources). Experiences from other mountain regions such as the Alps in Europe with the regional environmental agreement of the Alpine Convention are available. For example, its

Action Plan on Climate Change in the Alps is presenting goals and measures as well as good-practice examples for both, adaptation and mitigation in the Alps (Alpine Convention 2009). [34]

The political process could be framed by a broader public process of discussing vulnerabilities and adaptation needs for the tropical Andes involving the scientific community as well as civil society organizations along with representatives from governments and relevant agencies through a series of workshops and a regional conference. The following topics are proposed for workshops:

- Identification and assessment of vulnerabilities: climate-sensitive transboundary ecosystems of regional importance for the tropical Andes
- Development of a portfolio of transboundary projects focusing on ecosystem-based adaptation; management of protected areas; disaster risk management / early warning systems.

A regional conference could improve visibility of a regional adaptation agenda and gather a broader audience around the following topics:

- Presentation of the latest scientific results regarding climate change and impacts on the tropical Andes
- Presentation of existing projects and good practices for adaptation
- Panel discussions on regional adaptation needs and joint strategies.

Furthermore, the political process and the implementation of resulting declarations or other policy documents should be rooted in the local level by establishing networks of communities pioneering in climate change adaptation (and mitigation) oriented towards the vision formulated in a regional strategy or agreement. A goal could be to establish transnational networks of local authorities and facilitate exchange among those communities with regards to overarching climate-related problems such as glacier retreat and water issues.

[34] For a comparison of CAN and the Alpine Convention see Church 2010.

Examples of organisations that could be involved include

- Andean Community
- CONDESAN
- Ibero-American Network of Climate Change Offices (RIOCC)
- The Ecosystem and Livelihoods Adaptation Network (ELAN)

Examples of projects that could be linked to include

- Ibero-American Programme on Adaptation to Climate Change (PIACC): (RIOCC, 2008)
- Climate Change Impacts on Biodiversity in the tropical Andes (John D. and Catherine T. MacArthur Foundation, Inter-American Institute for Global Change Research, 2011-2013
- Potential Impact of Climate Change in Latin America and the Caribbean Mountain Forest Ecosystems (IADB, CATIE, 2010-2013)
- Adaptation to the Impact of Rapid Glacier Retreat in the tropical Andes – PRAA (2009-2012); SCCF, CAN, Government ministries, regional organisations
- Regional Program to Adaptation to Climate Change in Andes Region, BMZ; giz, CAN 2011-2016

6.5.3 Focus Area 2: The Amazon (Colombia, Bolivia, Ecuador, Peru)

The fragile ecosystem of the Amazon Forest and the Amazon Basin in the Andean region is threatened by climate change. A large section of the population in Peru, Ecuador, Bolivia and Colombia directly depend on the ecosystem for their living. Its alteration or disappearance would not only mean the extinction of unique species, but also a decrease in resources for the growing populations, thus increasing exploitation and prompting further decline (Anderson et al 2009).

The Amazon Basin contains the largest contiguous tropical rainforest on earth, almost 5.8 million km^2. Its ecosystems are characterised by great biodiversity, being home to around 20% of the planet's plant and animal species. There is an abundance of water resources and the Amazon River accounts for 18% of the freshwater input to the global oceans (Magrin et al. 2007). A high percentage of the total population inhabiting the Basin area consists of indigenous communities settled mainly along the banks of the river. Over the past 30 years, the Basin area has been confronted with massive deforestation, with almost 600,000 km^2 cut down in Brazil alone (INPE-MMA 2005a), making the region one of the hotspots of global environmental change (Magrin et al. 2007). Research shows that degradation of land, forest and water resources evoked by deforestation, changes in the hydrologic cycle and water pollution cause massive environmental problems, threatening biodiversity as well as the livelihoods of the indigenous population.

Most existing adaptation efforts are focused on policy-related research and capacity building, largely failing to implement concrete adaptation, not to mention coordinated efforts addressing the whole Basin area. Current adaptation measures in the Basin face major constraints on account of the isolated implementation of initiatives, an only limited exchange of technical and scientific knowledge and information and only limited consideration of the rights and interest of indigenous and local communities.

Three approaches to address current challenges and gaps are proposed:

1. **Support community-based adaptation efforts** in hamlets in the border regions of the transboundary rivers Putumayo (Colombia, Ecuador, Peru), Napo and Tigre (Ecuador, Peru) and Madre de Dios (Peru, Bolivia). Efforts should be based on participatory rural appraisal methods, taking into account indigenous knowledge and encompass appropriate vulnerability assessments of ecosystem services and communities. Climate-related vulnerabilities could be identified and discussed and small-scale pilot adaptation measures could be implemented in the field of ecosystems-based adaptation and participatory management of tropical forests.
2. **Involve and strengthen indigenous organisations** in the same regions by building knowledge and capacities related to climate-change and its regional effects – enabling the organisations to voice their needs and views with regard to sub-national and national policy and programme development relevant to adaptation.
3. **Integration of questions of climate change, impacts and adaptation into existing networks.** Promote knowledge sharing and effective coordination of local projects and initiatives and develop strategies to integrate the adaptation perspective into existing environmental and development networks and initiatives.

Examples of organisations that could be involved include

- Amazon Cooperation Treaty Organization (OTCA)
- Coordinator of Indigenous Organizations of the Amazon Basin (COICA)
- Amazon Conservation Association (ACCA)
- Amazon Institute for Environmental Research (IPAM)
- Inter-American Water Resources Network (IWRN)

Examples of projects that could be linked include

- Regional Action on Water Resources (OTCA, 2012-2014)
- Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin Considering Climate Variability and Change (OTCA, GEF, UNEP, 2006-2007)
- Amazon River Basin, Management of Transboundary Water Resources (OAS, OTCA, UNEP, 2005-2007)
- Peru-Ecuador: Binational conservation programme and participatory forest management (Chinchipe basin) (2005-2009)

6.5.4 Focus Area 3: Coastal regions (Colombia, Ecuador, Peru)

Climate change is very likely to be a major challenge for all coastal nations according to the IPCC report on Latin America. This is especially true with respect to the Pacific coasts whereas the Caribbean coast is only relevant for Colombia. With most of their population, economic activities and infrastructure located at or near sea-level, coastal areas will be very likely to suffer floods and erosion, with high impacts on people, resources and economic activities. Projected impacts include floods; population displacement; salinisation of lowland areas affecting sources of drinking water; coastal storm regime modification; increased erosion and altered coastal

morphology; diversion of farm land; disruption of access to fishing grounds; negative impacts on biodiversity, including mangroves; over-exploitation of water resources, including groundwater and pollution and sea-water acidification in marine and coastal environments (Magrin al. 2007). This is also partly reflected in the National Communications of Colombia, Ecuador and Peru where, for example, Colombia describes climate impacts on its coastal region with Tumaco at the border to Ecuador being one of four particularly vulnerable areas (SNC Colombia 2010). Ecuador is pointing to the effects of climate change on coastal areas but coastal zones are not explicitly prioritized (SCN Ecuador 2012).

While a lot of international and donor attention is focused on glaciers and eco-systems, vulnerabilities in the coastal region should be addressed, too. In order to close this gap adequately, **exchange of knowledge** and discussion between the neighbouring Colombia, Ecuador and Peru should be encouraged regarding:

- **Vulnerability analysis of coastal zones:** identification of both, national and transboundary vulnerability hotspots and issues taking into account adaptive capacities and reflecting on existing problems related to water and natural disasters
- **Potential adaptation measures:** addressing coastal protection and fishing as well as agricultural livelihoods; links to Disaster Risk Management and Early Warning Systems; links between adaptation and integrated coastal zone management.

Exchange and discussions could be organized on the department level for example in the form of two **workshops** of representatives from the **neighbouring coastal departments** – one between Columbia and Ecuador and one with Ecuador and Peru. For example participants from southern Colombia (Narino) and northern Ecuador (Esmeraldas) could meet in the coastal cities of Tumaco (Colombia) or Esmeraldas (Ecuador). Participants from southern Ecuador (El Oro) and northern Peru (Tumbes) could meet in the coastal cities of Cantón Huasquillas (Ecuador) or Zarumilla (Peru). It is proposed to involve officials as well as scientists, technical experts and civil society organisations. The format could be repeated and expanded to a regional conference involving all coastal departments of the three countries.

Joint regional workshops could help to **strengthen the case for coastal adaptation on the department level and help to subsequently set coastal issues more prominent also on the national adaptation agendas** of the single countries. A regional workshop could also facilitate establishing a community on coastal adaptation practitioners supporting knowledge generation and exchange.

Furthermore, unlike in Columbia and Ecuador, a major part of existing adaptation activities in Peru has been undertaken in the coastal departments (SNC Peru 2010). Thus regional workshops could also help to identify areas for possible transfer of Peru's experiences on adaptation in coastal regions to Ecuador and Colombia, but also vice versa.

Examples of organisations that could be involved include

- Ecosystems and Livelihood Adaptation Network (ELAN)
- Critical Ecosystem Partnership Fund (CEPF) - Strategy for the Chocó-Manabí Conservation Corridor (coastal area Colombia-Ecuador)
- Conservation International (CI)
- Centro International para la Investigación des Fenómeno El Nino (CIIFEN)

Examples of projects that could be linked include

- Mitigation and Adaptation to Climate Change in Coastal Zones (Ecuador, Peru, Chile), (ADMICCO) (2011-2015)
- Climate Change Vulnerability Evaluation of Coastal and Marine Areas (2009-2011): Spain, PIACC, (Argentina, Brazil, Chile, Colombia, Ecuador, Peru, Uruguay and Venezuela) implementation: ECLAC, University of Cantabria
- Research for integrated coastal management, which is funded by the Comisión Permanente del Pacífico Sur (Colombia)
- EUROCLIMA (2011-2013) Methodological guide - Climate Change and Risk Management: Vulnerability Analysis of Coastal Marine Infrastructures in Latin America
- Knowledge management and environment in coastal areas (Academic Management Research PUCP) (Peru)
- Research on climate variability and vulnerability in the Peruvian sea (IMARPE, OIEA, IRD, Max Planck Institute Bremen, Universidad Paris, VI- LOCEAN, Universidad de Washington, Universidad de Hawai y Woods Hole) (Peru)
- Inter-American Development Bank (IDB), Adaptation to the Impacts of Climate Change on Peru's Coastal Marine Ecosystem and Fisheries (Adaptation Fund 2012)

6.5.5 Focus Area 4: Community based adaptation – water and agriculture (Colombia, Ecuador)

Across parts of southern Colombia and northern Ecuador, people are increasingly facing water scarcity. In addition, vulnerable rural communities lack the capacities for adaptation which may lead to forced migration as incidents back in 2007 already illustrated (UNESCO 2007, 118; IOM 2008, 33). There is a strong need to strengthen the small number of existing efforts in a coordinated and coherent way and to create an opportunity to learn from community-based efforts implemented in different regions within the two states.

With regard to the on-going conflict between the FARC Guerrilla and paramilitary groups and the government in Colombia, the International Crisis Group encourages the international community to "support Colombia and its neighbours in stabilising the border region and tackling these areas' underlying structural problems by [...] funding additional projects to boost social, economic and sustainable alternative development, institutional capabilities of local governments [...] and helping community-based (bi-national) initiatives to spur development and integration in the border regions" (ICG 2011). There has already been bilateral cooperation on water in the area. Despite the armed conflict along the border region between Colombia

and Ecuador, which led to tensions between the two states in the past, the two countries have managed to implement joint management projects concerning communal river basin areas (Physical Planning and Management Plan for the San Miguel and Putumayo River Basins) (Burgos González et al. 2007). These experiences should be drawn upon to strengthen similar activities along other transboundary rivers in the region.

Given that the current outlook for a political solution to the conflict in Colombia is rather positive, rural community-based adaptation projects could be supported simultaneously on both sides of the border in Ecuador (northern departments Carchi and Sucumbíos) and Colombia (southern departments Putumayo and Narino) in order to address regional climate change vulnerabilities in ways that have positive effects on migration and stability along the border region.

Community-based adapation efforts could focus on:

- Assessing vulnerabilities using participatory rural appraisal methods in combination with existing research on vulnerabilities of transboundary basins (Bernal 2012), encompassing appropriate vulnerability assessments of ecosystem services and communities
- Identifying community-based adaptation measures related to water and small scale agriculture; developing and implementing technical pilot projects.

Support for community-based adaptation needs to ensure participatory and socially inclusive processes, which include marginalised groups such as migrants. It is vital to include local stakeholders like community-based organisations and local governments. Concepts and successful (technical) adaptation pilots should be suitable for transferring and up scaling. Successfully implemented community-based efforts on both sites of the border should be identified, used as best-practice cases and linked to in order to provide an opportunity for comprehensive knowledge sharing.

Geographically, the support of community-based adaptation could focus on rural communities in the above named departments that share common water resources and thus are potentially affected by climate impacts in similar ways. One strategy could be to select neighbouring communities from both sides of the border situated along the transboundary rivers of the region (Patia, Mataje, Mira). Another entry point for joint adaptation efforts (although less rural) in the same region could be the transboundary aquifer system Tulcán-Ipiales (UNESCO 2007).

Examples of organisations that could be involved include

- Institute of Hydrology, Meteorology and Environmental Studies (IDEAM)
- Colombia: Ministry of Environment, Housing and Territorial Development, Neighborhood Commission, Binational Subcommittee on Environmental Affairs and Watersheds
- CONDESAN

Examples of projects that could be linked include

- Rural water supply and waste water management in Colombia (Inter-American Development Bank, 2012-2017) (www.iadb.org/en/projects/project-description-title,1303.html?id=CO-L1105)
- Promoting integrated security along the northern border (European Commission, giz Secretaría Técnica del Plan Ecuador (STPE) (www.giz.de/themen/en/33617.htm)
- Proyecto Binacional de Aprovechamiento de Residuos Sólidos Tulcán – Ipiales (Colombia, Ecuador)
- Chingaza-Sumapaz-Páramo de Guerrero Conservation Corridor, Conservation International Colombia
- Bridging the gap between forest conservation and poverty alleviation, Conservation International Ecuador

6.6 Bibliography Andean Region

Adaptation Fund 2011: Enhancing resilience of communities to the adverse effects of climate change on food security, in Pinchincha Province and the Jubones River basin. Retrieved November 6, 2012 from http://www.adaptation-fund.org/project/1328-enhancing-resilience-communities-adverse-effects-climate-change-food-security-pichincha

Adaptation Learning Mechanism 2009: Climate Change Adaptation Programme PACC Peru. Retrieved February 27, 2013 from http://www.adaptationlearning.net/project/climate-change-adaptation-programme-pacc-peru

adelphi 2012: Andean dialogue brief. Retrieved February 27, 2013 from http://www.adelphi.de/files/uploads/andere/pdf/application/pdf/andeandialoguebrief_final_eng_12-03-05.pdf

Andean Community 2009: Programa Regional Andino CAN-Aecidcodhes 2009-2011. Retrieved February 27, 2013 from http://www.comunidadandina.org/cooperacion/AECID_INFORME.pdf

Andean Community 2011: Climate Change. Retrieved February 23, 2013 http://www.comunidadandina.org/ingles/desarrollo/climate_change.htm

Anderson, Elizabeth P. et al 2009: Consequences of Climate Change for Ecosystems and Ecosystem Services in the Tropical Andes.

Alpine Convention 2009: Action Plan on Climate Change in the Alps. Retrieved April 2, 2013 from http://www.alpconv.org/en/ClimatePortal/actionplan/Documents/AC_X_B6_en_new_fin.pdf

Adaptation Fund 2012: Proposal for Peru. AFB/PPRC.9/6. 8 June 2012. Retrieved February 27, 2013 from http://adaptation-fund.org/sites/default/files/AFB.PPRC_.9.6 Proposal for Peru.pdf

Betts, R.A., Malhi, Y., Roberts, J.T. 2008: The future of the Amazon: new perspectives from climate, ecosystem and social sciences. Phil. Trans. R. Soc. 363 (1498), 1729-1735.

Bernal, Fabio Andrés 2012: Third Work Shop Climate Change Adaptation in Transboundary Watercourses. Vulnerability Assessment in Colombian Transboundary Basins. Colombia: National Hydrological Institute, Retrieved February 27, 2013 from http://www.unece.org/fileadmin/DAM/env/documents/2012/wat/workshops/Transboundary_adaptation_april/presentations/4_Bernal_final.pdf

Bolin, I. 2009: The glaciers of the Andes are melting: indigenous and anthropological knowledge merge in restoring water resources. In Anthropology and Climate Change: From Encounters to Actions, S.A. Crate and M. Nuttall, eds. Walnut Creek, California: Left Coast Press. 228 – 239.

Burgos González et al. 2007: Avances y retos en la gestión de las cuencas bionacionales de Columbia: los casos de la cuencas hidrográficas internactionales colombo-ecuatorians y colombo-venezolanas. Ana Cecilia Burgos González and Giselle Catalina Gómez Velandia: Bogotá.

Buytaert, W., Tovar, C., Bievre, B. 2012: Potenciales impactos del cambio climático sobre el balance hídrico de los Andes Tropicales. Retrieved January 27, 2013 from http://www.condesan.org/portal/publicaciones/potenciales-impactos-del-cambio-climatico-sobre-el-balance-hidrico-de-los-andes-tropicales

Christensen, J.H., Hewitson, B., Busuioc, A., Chen, A., Gao, X., Held, I., Jones, R.K., Kolli W.-T., Kwon, R., Laprise, R., Magana Rueda, V., Mearns, L., Menéndes, C.G., Räisänen, J., Rinke, A.,

Sarr, A., Whetton, P. 2007: Regional Climate Projections. In: Climate Change2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

CODHES 2011: Informe sobre desplazamiento, conflict armado y derechos humanos en Colombia en 2010. Retrieved February 27, 2013 from http://www.rebelion.org/docs/130767.pdf

Cuesta, J., Jaramillo, F. 2009: Taxonomy of Causes, Impacts and Policy Responses to the Food Price Crisis in the Andean Region. Inter-American Development Bank. Retrieved February 27, 2013, from http://ibcperu.org/doc/isis/10504.pdf

Church, Jon Marco. "Environmental Regionalism: The Challenge of the Alpine Convention and the "Strange Case" of the Andean Community." CID Research Fellow and Graduate Student Working Paper No. 47. Center for International Development at Harvard University, September 2010.

Dixit, A., McGray, H., Gonzales, J. Desmond, M. 2012: Ready or Not: assessing institutional aspects of National Capacity for Climate Change adaptation. WRI Report.World Resources Institute, Washington DC. Retrieved from http://www.wri.org/publication/ready-or-not.

EACH-FOR 2008: Environmental Change and Forced Migration Scenarios. Specific Targeted Project. Scientific support to policies – SSP. Retrieved February 27, 2013, from http://www.each-for.eu/documents/EACH-FOR_Synthesis_Report_090515.pdf

ECHO 2012: Humanitarian Implementation plan (HIP) South America. Retrieved February 27, 2013, from http://ec.europa.eu/echo/files/funding/decisions/2012/HIPs/south_america_91000_en.pdf

ECLAC 2010: Summary. UN. Retrieved February 27, 2013, from http://www.eclac.cl/dmaah/publicaciones/xml/9/41909/2010-914-Climate_change-COMPLETO_WEB.pdf

Ecosistemas 2008: Crisis Alimentaria. Retrieved February 27, 2013, from http://www.ecosistemas.cl/1776/fo-article-82274.pdf

El País international 2011: Los principales aliados de Morales lideran una huelga que paraliza Bolivia. Retrieved February 27, from http://internacional.elpais.com/internacional/2011/02/19/actualidad/1298070001_850215.htm

EU 2011: Commission Implementing Decision on the Annual Action Programme 2011 in favour of the Andean Community to be financed under Article 19 09 01 of the general budget of the European Union. Draft. Retrieved March 2, 2013 from http://ec.europa.eu/europeaid/documents/aap/2011/aap_2011_andean_en.pdf

EuropeAid 2009: Climate Change in Latin America. Retrieved February 27, 2013, from http://ec.europa.eu/europeaid/where/latin-america/regional-cooperation/documents/climate_change_in_latin_america_en.pdf

European Commission 2007: Bolivien Länderstrategiepapier 2007-2013. Retrieved February 27, 2013, from http://eeas.europa.eu/bolivia/csp/07_13_de.pdf

Foro Ciudades 2013: Proyecto Foro Andino, Ciudades y Consumo Sostenibles frente al Cambio Climático. Retrieved March 2, 2013 from http://www.ciudad.org.pe/index.php?option=com_content&view=article&id=67%3Aproyecto-

foro-andino-ciudades-y-consumo-sostenibles-frente-al-cambio-climatico&catid=34%3Ainstitucional&Itemid=45

Fraser Institute 2012: Peru's social conflict is about more than mining. Retrieved February 27, 2013, from http://www.fraserinstitute.org/uploadedFiles/fraser-ca/Content/research-news/research/articles/perus-social-conflict-is-about-more-than-mining.pdf

Global International Water Assessment 2004: Amazon Basin GIWA Regional assessment 40b. Retrieved February 27, 2013, from http://www.unep.org/dewa/giwa/areas/reports/r40b/giwa_regional_assessment_40b.pdf

Global Research 2008: Amid mounting food crisis, governments fear revolution of the hungry. Retrieved February 27, 2013, from http://www.globalresearch.ca/amid-mounting-food-crisis-governments-fear-revolution-of-the-hungry/8846

Government of Bolivia 2000: First National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved February 27, 2013, from http://unfccc.int/resource/docs/natc/bolnc1e.pdf

Government of Bolivia 2009: Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved February 27, 2013, from http://unfccc.int/resource/docs/natc/bolnc2.pdf

Government of Colombia 2001: First National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved February 27, 2013, from http://unfccc.int/resource/docs/natc/colnc1.pdf

Government of Colombia 2010: Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved February 27, 2013, from http://unfccc.int/essential_background/library/items/3599.php?rec=j&priref=7355#beg

Government of Colombia 2010a: Informe Del Gobierno Nacional A La Corte Constitutional Sobre la Suberación Del Estado de Cosas Inconstitutional Declarado Meiante La Sentencia T-025 de 2004. Retrieved February 27, 2013, from https://www.dnp.gov.co/LinkClick.aspx?fileticket=zG5WOL1WE3c%3D&tabid=1552

Government of Colombia 2012: National Adaptation Plan. Plan National De Adaptación al Cambio Climático. Retrieved Febrary 27, 2013, from http://www.sigpad.gov.co/sigpad/archivos/ABC_Cambio_Climatico.pdf

Government of Ecuador 2000: First National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved February 27, 2013, from http://unfccc.int/essential_background/library/items/3599.php?rec=j&priref=2743#beg

Government of Ecuador 2009: National Plan for Good Living. Retrieved February 27, 2013, from http://plan2009.senplades.gob.ec/web/en

Government of Ecuador 2012: Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved February 27, 2013, from http://unfccc.int/essential_background/library/items/3599.php?rec=j&priref=7663#beg

Government of Peru 2001: First National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved February 27, 2013, from http://unfccc.int/resource/docs/natc/pernc1.pdf

Government of Peru 2010: Second National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change. Retrieved February 27, 2013, from http://unfccc.int/essential_background/library/items/3599.php?such=j&symbol=PER/COM/2%20E#beg

Government of Peru 2010a: Plan de Acción de Adaptación y Mitigación. Retrieved February 27, 2013 from http://www.theredddesk.org/sites/default/files/cp-plan_de_accion_final_14_abr_2.pdf

Guardian 2012: Peru seeks to build a new relationship with mining companies. Wednesday 8 August 2012. Retrieved February 27, 2013 from http://www.guardian.co.uk/global-development/2012/aug/08/peru-seeks-new-relationship-mining-companies

HIIK 2011: Conflict Barometer 2010. Heidelberg: Heidelberger Institut für internationale Konfliktbearbeitung. Retrieved February 27, 2013 from http://www.hiik.de/de/konfliktbarometer/pdf/ConflictBarometer_2011.pdf

Human Development Report 2007: Ecuador Case Study: Climate Change Impact on Fisheries. Retrieved February 27 2013 from http://hdr.undp.org/en/reports/global/hdr2007-2008/papers/cornejo_pilar.pdf

IAI & SCOPE 2011: Climate Change and Biodiversity in the Tropical Andes. Retrieved February 27, 2013, from http://www.iai.int/files/communications/publications/scientific/Climate_Change_and_Biodiversity_in_the_Tropical_Andes/book.pdf

ICG 2011: Moving Beyond Easy Wins: Colombia's Borders. Retrieved February 27, 2013, from http://www.crisisgroup.org/en/regions/latin-america-caribbean/andes/colombia/40-moving-beyond-easy-wins-colombias-borders.aspx

IDMC 2012: Internal Displacement Global Overview 2011: People internally displaced by conflict and violence. Retrieved February 27, 2013, from http://www.internal-displacement.org/publications/global-overview-2011.pdf

IISD 2011: Review of Current and Planned Adaptation Action: South America. Adaptation Partnership/IISD. Retrieved February 27, 2013, from http://www.preventionweb.net/english/professional/publications/v.php?id=25344

IISD 2012: Brazil, ACTO Launch Amazon Regional Action on Water Resources. Retrieved February 27, 2013, from http://larc.iisd.org/news/brazil-acto-launch-amazon-regional-action-on-water-resources/

IISEC 2002: Rural-Urban migration in Bolivia: advantages and disadvantages. Retrieved February 27, 2013 from http://www.iisec.ucb.edu.bo/papers/2001-2005/iisec-dt-2002-05.pdf

INEC. 2011: Ecuador en Cifras. Instituto Nacional de Estadística y Censos. Retrieved April 8, 2011, from http://www.ecuadorencifras.com/cifras-inec/main.html

INPE-MMA 2005: Monitoramento do desflorestamento bruto da Amazônia Brasileira (Monitoring the Brazilian Amazon gross deforestation). Ministério da Ciência e Tecnologia, São José dos Campos: São Paulo.

IOM 2008: Perfil Migratorio del Ecuador 2008. Retrieved February 27, 2013, from http://publications.iom.int/bookstore/free/ecuador_profile.pdf

IOM 2011: Ecuador. Retrieved February 27, 2013, from https://www.iom.int/cms/en/sites/iom/home/where-we-work/americas/south-america/ecuador.html

IPCC 2011: Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) Report 2011. Retrieved February 27, 2013, from http://ipcc-wg2.gov/SREX/images/uploads/SREX-All_FINAL.pdf

KAS international report 2011: Indigenous Internal Migration in Bolivia. Causes and Current Challenges. Retrieved February 27, 2013, from http://www.kas.de/wf/doc/kas_28723-544-2-30.pdf?110908155529

La cocaloca company 2008: Perú: ¿Porque son las protestas del 8. 9 y 10 de julio? Retrieved February 27, 2013, from http://lacocalocacompany.blogcindario.com/2008/07/02320-peru-porque-son-las-protestas-del-8-9-y-10-de-julio.html

Lehmann, P. 2010: Challenges to Water Pricing in Developing Countries: The Case of Lima, Peru. Retrieved February 27, 2013, from http://www.lima-water.de/documents/plehmann_berlin2010.pdf

Linder, A., Pretzsch, J. 2013: An International Network on Climate Change Impacts on Small Farmers in the Tropical Andes - Global Conventions from a Local Perspective. Sustainable Agriculture Research 2(2): 92-98. Retrieved February 27, 2013, from http://www.ccsenet.org/journal/index.php/sar/article/view/21004

Magrin, G., C. Gay García, D. Cruz Choque, J. C. Giménez, A. R. Moreno, G. J. Nagy, C. Nobre, and A. Villamizar. 2007. Latin America. Pp. 581-615 in Climate change 2007: impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, edited by M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden, and C. E. Hanson. Cambridge: Cambridge University Press. Retrieved February 27, 2013, from http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter13.pdf

Mark, B., Bury, J., McKenzie, J., French, A. 2010: Climate change and Tropical Andean glacier recession: evaluating hydrologic changes and livelihood vulnerability in the Cordillera Blanca, Peru. Annals of the Association of American Geographers 100(4): 794-805.

McCatty, M. 2004: The Process of Rural-Urban Migration in Developing Countries. Retrieved February 27, 2013, from http://www1.carleton.ca/economics/ccms/wp-content/ccms-files/he-mccatty-machel.pdf

Mountain Research Development 2008: Water and Mining Conflicts in Peru. In: Mountain Research and Development, 28(3/4): 190–195. Retrieved February 27, 2013 from http://snobear.colorado.edu/Markw/Research/08_peru.pdf

OECD 2009: Latin American Economic Outlook 2009. Retrieved February 27, 2013 from http://www.oecd.org/dev/americas/latinamericaneconomicoutlook2009.htm

Regional Policy Dialog on Water and Climate Change Adaptation in the Americas 2012: Water and Climate Change in the Americas: Solutions from the Regional Policy Dialogue 2012, Retrieved March 2, 2013 from http://www.aguacambioclimatico.org/fotos/evento_elemento/0WCC_RPD.pdf

Regional Policy Dialog on Water and Climate Change Adaptation in the Americas 2011: Solutions from the Regional Policy Dialog (RPD) on Water and Climate Change Adaptation

in the Americas Executive Summary, Draft for discussion, November 2011. Retrieved March 2, 2013 from http://waterclimatechange.org/fotos/evento_elemento/1folletoD7ingles.pdf

RIOCC 2008: Contribution of a regional cooperative structure to the objectives of the UNFCCC Nairobi Work Programme (NWP). Retrieved February 27, 2013 from http://www.lariocc.es/es/reuniones-documentos/documentos-riocc/action_pledge_riocc_tcm25-173711.pdf

Smith, D., Vivekananda, J. 2007: A Climate of Conflict. The links between climate change, peace and war. Retrieved February 27, 2013, from http://reliefweb.int/sites/reliefweb.int/files/resources/16A12BCAEAD0E411852573AE007570A3-International%20Alert_Climate%20of%20Conflict_07.pdf

U.S. Department of State 2011: Food Prices Crisis of 2007-2008: Lessons Learned. Fact Sheet. Retrieved February 27, 2013, from http://www.state.gov/r/pa/prs/ps/2011/03/157629.htm

UN DESA 2011: Population Distribution, Urbanization, Internal Migration and Development: An International Perspective. Retrieved February 27, 2013, from http://www.un.org/esa/population/publications/PopDistribUrbanization/PopulationDistributionUrbanization.pdf

UN EHS 2012: Climate Change and Fragile States: Rethinking Adaptation. Retrieved February 27, 2013, from http://www.ehs.unu.edu/file/get/9717.pdf

UNAM 2008: Crisis Mundial Y Sobernaía Alimentaria En Améria. Retrieved February 27, 2013 from http://193.144.75.244/congresos/xiirem/pdf/28.pdf

UNEP 2009: Geo Amazonia. Environment Outlook in Amazonia. Retrieved February 27, 2013 from http://www.unep.org/pdf/GEOAMAZONIA.pdf

UNEP 2011: Keeping Track of our changing environment. Retrieved February 27, 2013 from http://www.unep.org/geo/pdfs/keeping_track.pdf

UNESCO 2003: Lake Titicaca Basin (Bolivia, Peru). Retrieved February 27, 2013 from http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/wwap_Lake%20Titicaca%20basin_case%20studies1_EN.pdf

UNESCO 2007: Acuíferos Transfronterizos en las Américas. Evaluacion Preliminar. Retrieved Febuary 27, 2013 from http://www.oas.org/dsd/Water/Documentos/Sistemas%20Acu%C3%ADferos%20Transfronterizos%20en%20las%20Am%C3%A9ricas.pdf

UNHCR 2011 Aktuelle UNHCR-Resettlement – Prioritäten 2011/2012. Retrieved February 27, 2013 from http://www.unhcr.ch/fileadmin/user_upload/fotos/04_recht/Resettlement-Prioritaeten.pdf

USAID 2008: Initiative for Conservation in the Andean Amazon. Retrieved March 5, 2013 from http://pdf.usaid.gov/pdf_docs/PDACS188.pdf

World Bank Group 2011: Vulnerability, Risk Reduction, and Adaptation to Climate Change. Country Profile Ecuador. Retrieved February 27, 2013 from http://sdwebx.worldbank.org/climateportalb/doc/GFDRRCountryProfiles/wb_gfdrr_climate_change_country_profile_for_ECU.pdf

WWF 2011: Climate change in in a living landscape: Conceptual and methodological aspects of a vulnerability assessment in the Eastern Cordillera Real of Colombia, Ecuador and Peru. Retrieved February 27, 2013 from http://awsassets.panda.org/downloads/cc_ecr_final_web.pdf

7 Adaptation for Peace and Stability – a Memorandum for Action

7.1 Climate Change as a Conflict Driver

An increasing number of research efforts are directed to the interrelationship between climate change and conflict on the one hand and adaptation as a means for peace and stability on the other. Based on a review of regional and national climate impacts assessments, conflict analysis approaches, and policies and practices for promoting adaptation to climate change, this Memorandum aims to provide guidance and support advocacy efforts regarding opportunities where action can be taken and to promote adaptation as a peaceful response to climate change.

By analysing the implications of current and future climate impacts on peace and stability in crisis and conflict prone areas, a number of challenges, but also potential starting points for further action can be identified. Of particular importance is the ability of governance structures and institutions to manage adaptation to climate changes, not as an isolated technical effort, but as a multi-level, holistic, long-term, and conflict-sensitive approach.

This memorandum is based on the results of key international discussion at the UN as well as the EU level:

- The United Nations Security Council meetings on climate change as a security threat in 2007 and 2011 and the presidential statement adopted as a result of the 2011 debate unanimously.
- The report of the United Nations Secretary General in 2009 “Climate Change and Its Possible Security Implications” outlining, among others, that adaptation to climate change may serve as a threat minimizer.
- The Joint Reflection Paper of the European External Action Service and Services of the European Commission in 2011 on “Towards a Renewed and Strengthened EU Climate Diplomacy”.
- Council conclusions of the European Union on Climate change and security. 2985th Foreign Affairs Council meeting Brussels, 8 December 2009.
- The joint report by the High Representative of the EU and the European Commission in 2008 to the European Council “Climate Change and International Security”.

7.1.1 Key Impacts of Climate Change for Peace and Security

Climate change will affect key areas that are crucial for peace and stability; the water-food-energy nexus, among others, is of prominent concern in many regions:

- Climate change will cause important changes in the quality, quantity and **availability of water resources** already under pressure from population growth, economic development, and inefficient water use.
- Rising sea levels will lead to salt intrusion into **coastal fresh water sources** and thus threaten water availability in densely-populated areas and those areas crucial for **agricultural productivity.**
- Reduced water availability for **agricultural development** will affect productivity levels, particularly for crops highly dependent on irrigation. Allocation problems and conflicts will be aggravated, meaning adverse consequences for food security and exports.

- Decreasing river water levels will reduce the potential for **hydropower generation,** bringing about negative consequences for the economy and societies in many regions alike.
- Vector-borne diseases and certain plagues and diseases which negatively affect crops will impact **agricultural productivity** as well as health through the resulting risk of **malnutrition.**
- Increases in economic damage due to the greater intensity and frequency **of hurricanes and tropical storms** may cause a loss of infrastructure, mainly in the **energy industries** located in coastal areas, but also a disruption of economic activity in general.
- The **melting of glaciers** will affect the water cycles in many regions of the world. Initially, an increase in water flow will bring high risks of **glacier lake outburst floods and landslides.** In the long-term, however, the runoff is likely to shrink and water availability will likely be seriously endangered.

These climate change impacts may exacerbate or even **cause instability, tensions or even violent conflicts**, at different levels:

- Climate change can lead to a greater impoverishment of the rural population due to the negative effects on their sources of income. Thus, climate change may also lead to increased unemployment. As a result, **inequality as well as social disparities can become more entrenched**. A reduction in agricultural productivity will affect the most vulnerable sectors of the population, which can lead, e.g., to **social tensions** as a result of higher prices. The so called "bread riots" of 2008 can serve as an example in this regard.
- Increased water scarcity due to climate change will not only threaten the livelihoods of many local communities or different water user groups but will also affect water politics in transboundary river basins. As is the case with many transboundary rivers worldwide, countries have the potential to cooperate closely in **sharing water resources** but it can also be an element of **discord between some of the riparian states** due to plans of an upper riparian to build a dam which sparks protests on the part of lower riparians.
- **Glacier melting** in South Asia or South America will seriously affect the livelihoods of large populations. It may not only **increase the pressure to migrate** within a country, but also across borders with unclear consequences for the areas receiving these population flows. Extreme events such as the **massive floods** also illustrate how **coping capacities of fragile countries and regions** may be overstretched and lead to social discord.

Accordingly, climate change is considered to be a threat multiplier. Its adverse consequences will hit nations with low adaptation capacities hardest in the decades to come and decisive action is needed to prevent social tensions and conflicts.

7.1.2 Adaptation and Peace

- Adaptation is defined by the UNFCCC as an "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities". Adaptation is, hence, more than a merely technical challenge: It requires empowering people, building their resilience and securing livelihoods.

- By ensuring effective local action, national coordination, and international cooperation, peaceful processes of transformation can be fostered. These multi-level processes need to be supported by the long-term engagement and financial support of the international community. In addition, the scope of adaptation action depends on the context in which it is operating: many countries and regions are already today prone to crisis and conflict which requires due consideration when planning and implementing programmes and projects.
- Accordingly, UN Secretary General Ban Ki-Moon stressed in his 2009 report on climate change and security to the UN General Assembly that "many developing countries would stand to benefit from a comprehensive programme of institutional capacity-building for climate change adaptation including institutions for prevention, mediation and the peaceful resolution of conflicts."

Seen in this light, adaptation can ....

1. *...serve as a peace builder being a catalyst for dialogue and peaceful conflict resolution*

   Public authorities and user groups may be able to use non-violent conflict resolution techniques to help implement necessary, but unpopular adaptation measures, such as population resettlement and the negotiation of appropriate compensation packages. By increasing their ability to adapt to climate change, stakeholders are also likely to increase their social resilience and thus improve their capacity to achieve peaceful conflict resolution and conflict transformation in other areas of society.

   Adaptation has the potential to empower countries to better withstand various social and economic stressors, while avoiding the destabilization of their governing institutions and societal structures. If adaptation processes are participatory, they can ideally give marginalized groups a voice to integrate their concerns in building resilient communities.

2. *...be a potential cause of or contributing factor to conflict through - among other to processes of 'maladaptation'.*

   Adaptation measures may generate friction or resistance, predominantly from those who profit from the status quo or are interested in diverting adaptation-related funding for other purposes. In a worst case scenario, adaptation measures may also potentially be a direct cause of conflict. When two or more states or regions share the waters of a river, for example, climate change adaptation measures may increase the likelihood of confrontation between upper and lower riparian populations.

   At the local level, there are examples of tension in the course of addressing competing demands for available water supplies. This was the case in different local contexts, where efforts to provide communities with additional water taps also stirred tensions; as an initial effort, taps were located sparsely, benefiting the selected communities, but angering neighbouring communities without taps. With the increasing availability of funds for adaptation purposes, the overall questions of how to distribute assistance equally among affected communities and how to avoid risks of elite capture, corruption and organised crime need to be addressed.

3. *...be hindered by sudden or long-lasting conflicts.*

   Analysis of international support for adaptation suggests that not all fragile or conflict prone countries benefit to the same degree from support given to establish adaptation frameworks. To avoid a situation in which climate change further increases the risk of

destabilization or violent conflict, conflict-sensitive adaptation needs to be ensured – especially during processes of peacebuilding and consolidation.

The enormous challenges for adaptation processes in this context becomes obvious most recently in the case of countries affected by violence, where as a result of the most recent conflict, on-going and planned adaptation projects have been frozen with no clear indication as to when and how activities to diversify the country's agricultural production will continue.

7.1.3 Political Entry Points

- There are a number of processes that can help to address the peace potential of adaptation. On the one hand, the international climate change negotiations have been active in establishing international guidance for adaptation activities. On the other, different activities at the UN or EU level illustrate that climate change adaptation has already entered decision making agendas in other policy domains such as foreign and security policies.
- The UN has called attention to the need for adaptation in the context of global security, particularly in a UN Secretary General report on climate change and security published in 2009. However, these summons to action have remained somewhat vague about how adaptation policies might be designed and implemented, thus preventing countries from taking concrete action. One reason for this situation may be that most security policy discussions and deliberations over adaptation take place in separate political arenas, with minimal exchange between the two fields.
- As part of the international climate change process, there are several starting points to promote mainstreaming of adaptation into other policy areas and to acknowledge co-benefits of adaptation for peace and stability – especially in countries and regions affected by tensions and conflicts:
    - NAPAs and NAPs: 21 of the National Adaptation Programmes of Action (NAPAs) for least developed countries submitted to the UNFCCC were developed in countries considered to be states at high risk of destabilization. The next step is to move to more comprehensive national adaptation plans (NAPs) which should facilitate the coherent integration of climate change adaptation into relevant new and existing policies, programmes and activities. The guidelines to develop NAPs by the Least Developing Countries Expert Group (LEG) recommend participatory approaches for national adaptation planning and also acknowledge the importance of regional adaptation processes.
    - Adaptation Fund and the Least Developed Countries Fund (LDCF): To design and implement concrete adaptation projects and programs in developing countries, the Adaptation Fund will likely offer incentives to institutionalise national processes to increase adaptive capacities. The same is true with respect to the Green Climate Fund which is currently established. National or Regional Implementing Entities (NIE/RIE) can facilitate direct access to these funds based on the provision of good financial governance.
    - Loss and Damage: Most recently, the international climate negotiations have also started to deal with negative effects of climate change that people have not been able to cope with or adapt to, despite efforts to take best practice

adaptation measures. Although concrete provisions are still subject to negotiation most vulnerable countries can expect support to become more resilient.

- Other donor initiatives: More substantial funding to promote adaptation and to build resilience is available from other donors such as the World Bank.

7.2 Adaptation as Peace-Builder

In order to support the contribution of adaptation to peace and stability, we suggest that decision makers from national governments and international donor agencies consider six main principles for adaptation for peace that can be translated and implemented in three main focus areas:

6 Principles for "Adaptation and Peace"

1. Establish peace and conflict assessments for adaptation programmes and projects going beyond a pure technical understanding of adaptation;
2. Mainstream climate change adaptation in conflict-prone contexts applying conflict sensitive approaches;
3. Ensure participatory processes to design and implement adaptation measures in an inclusive manner;
4. Build robust governance structures linking local, national, and regional levels – also in order to foster transparent and accountable spending;
5. Use training/capacity building approaches to understand and address current and future conflicts;
6. Ensure coherence of climate change adaptation and development processes nationally and internationally.

7.2.1 Focus 1: Establish Conflict-sensitive Adaptation Practices

Target Groups: Practitioners, Policy Planners, Donor Agencies, Governments

Activity level: local/national/transnational

- Conflict-sensitive adaptation should allow decision makers to address vulnerabilities to climate change as well as development priorities, while aiming to ensure long term sustainability and peace through a basic understanding of the consequences of political decisions under climate change conditions.
- Specifically, conflict sensitivity means the ability a) to analyse and to understand the context in which one is operating, working and intervening; b) to understand and to anticipate the interaction between one's own intervention and the context, and c) to build the capacity to act upon this understanding, in other words, to avoid negative impacts and maximize positive ones. Hence, climate change adaptation is "to do no harm", but "to do good", and to understand the context in which one operates.
- Conflict-sensitive adaptation will be especially crucial in areas where there is high dependence on natural resources and which are already known as conflict prone due ,e.g. to an existing history of conflict. Therefore, analyses are needed to understand a variety of factors including the general context, based on e.g. peace and conflict assessments but also on improved methodologies to measure the impact of adaptation interventions.

- Adaptation measures should be better integrated into countries' development initiatives and poverty-reduction campaigns. Embracing a systematic, integrated approach to creating National Adaptation Plans, e.g., can help to improve the conflict-sensitive design of these policy interventions.
- Capacity building support for conflict-sensitive adaptation policies is needed. Based on a more detailed picture of the overall context, support for capacity building is needed to avoid climate change-related conflicts at the local level. To this end, training can be organised and offered to relevant stakeholders, ranging from public sector representatives to those active in the field of natural resource management and members of country delegations in selected regions.

7.2.2 Focus 2: Promote Regional Adaptation Processes

Target Groups: International Organisations, Donor Agencies, Governments

Activity level: (mainly) transnational

- The international climate negotiations have so far primarily focused on the national support to design and implement policies and measures for adaptation. Climate change, however, takes place across national borders. Adverse impacts are of a transboundary nature, leading to similar climate-related risks in neighbouring countries. Thus, regional solutions need to be developed to cope with adverse regional impacts.
- Common vulnerabilities and similar adaptation needs seen by neighbouring countries offer vast potential for dialogue, coordination and cooperation. When dialogue and the exchange of experiences helps to build trust among neighbours, this can have stabilising effects on an entire region.
- A further step towards regional climate adaptation-related initiatives could potentially lead to the development of a common perspective towards adaptation, serve as a starting point for broader cooperation in the region, help, e.g., to prevent controversy on the use of transboundary water resources and may yield also positive results in other issue areas.
- Based on the identification of joint vulnerabilities and needs, regional initiatives and even regional adaptation roadmaps can be designed and implemented, e.g. to ensure water and food security. Such initiatives may likely not require the establishment of new institutions but can be built on already existing initiatives. The idea to establish Regional Implementing Entities to spur on adaptation can complement these approaches.
- Regional adaptation approaches could to a limited extend decouple the overall success of adaptation activities in a region from single national circumstances and developments – balancing individual country's ambitions and capabilities for adaptation and taking the role of an "institutional memory" should adaptation processes in one country be interrupted.
- Early communication of national adaptation plans and projects with potential transboundary impacts can help to prevent maldadaptation and tensions with neighbouring countries. Thus, supporting regional cooperation on adaptation should also follow criteria of conflict-sensitive adaptation.

7.2.3 Focus 3: Strengthening International Governance

Target Group: Negotiators, Donor Agencies, International Organisations

Activity level: local/national/transnational

- International climate negotiations have already established basic support and learning mechanisms to facilitate adaptation. Processes to develop NAPAs and NAPs put a strong emphasis on ensuring participatory processes to support an equal representation of stakeholders. In addition to the existing framework, the consideration of conflict-sensitive adaptation guidelines can be further strengthened, e.g. through a special report by the Least Developed Countries Expert Group.
- Building strong, supportive institutions for climate change adaptation is a key priority in crisis and conflict-prone areas. Institutions responsible for climate change adaptation – whether under the UN climate change framework, international financial institutions, development agencies, or peacebuilding organisations – need to ensure that their internal systems and structures promote adaptation even where there is no existing state fragility or conflict.
- In July 2011, the UN Security Council asked the UN to provide regular information on how climate change may endanger peacebuilding processes and, hence, the mandate of the UN Security Council. The international climate negotiations can, as part of the on-going mandate, work on a number of points such as: facilitating adaptation governance; addressing the risks of loss and damage; facilitate knowledge generation and sharing on how climate change may endanger processes to build peace; and report back to the UN Secretary General.
- Access to climate financing should be built on a strong framework for enabling good financial governance by enabling the direct access of national entities in order to support learning on climate change adaptation. Here, a special focus is needed on how to facilitate access to climate finance in conflict-prone countries and regions. In addition, it is important to ensure that funding for peacebuilding, development and climate change adaptation is organized along the lines of principles of the Paris Declaration.