Practitioners and Policy-makers Exchange on Climate Change Adaptation in Agriculture
Frequently Asked Questions Booklet
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REGIONAL CLIMATE CHANGE ADAPTATION KNOWLEDGE PLATFORM for Asia
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Prepared by Satya Priya¹, Gernot Laganda², Felicity Woodhams², Shirley Kai³, Serena Fortuna³, Nicole Hansen³, Hiromi Inagaki¹, Roopa Rakshit¹, Kim Jihyun¹.

¹AIT-UNEP Regional Resource Centre for Asia and the Pacific (RRC.AP)
²United Nations Development Programme (UNDP) Asia-Pacific Regional Centre
³United Nations Environment Programme Regional Office for Asia and the Pacific (UNEP ROAP)
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ACRONYMS

ACIAR Australian Centre for International Agricultural Research
ADB Asian Development Bank
ADPC Asia Disaster Preparedness Center
AIT Asian Institute of Technology
ALM Adaptation Learning Mechanism
APAARI Asia-Pacific Association of Agricultural Research Institutions
APFED Asia-Pacific Forum for Environment and Development
ATRC-NHRL Australian Tsunami Research Centre & Natural Hazards Research Laboratory
AWG-LCA Ad Hoc Working Group on Long-term Cooperative Action under the Convention
CCA Climate Change Adaptation
CCAI Climate Change and Adaptation Initiative
CGIAR Consultative Group on International Agricultural Research
CPWF Challenge Program on Water and Food
CSDI Communication for Sustainable Development Initiative
CSIRO Australian Commonwealth Scientific and Research Organization
DRR Disaster risk reduction
EC-FAO European Commission - Food and Agriculture Organization
EET Environment Education Training
EU European Union
FAO Food and Agriculture Organization
FEWS NET Famine Early Warning System Network
FiBL Research Institute of Organic Agriculture
GEF Global Environment Facility
GFDRR Global Facility for Disaster Reduction and Recovery
GWP Global Water Partnership
IAIA International Association for Impact Assessment
ICBA International Center for Biosaline Agriculture
ICRISAT International Crops Research Institute for the Semi-Arid-Tropics
IFAD International Fund for Agricultural Development
IFOAM International Federation of Organic Agriculture Movements
IFPRI  International Food Policy Research Institute
ILEIS  Centre for Information on Low External Input and Sustainable Agriculture
IRRI  International Rice Research Institute
ISDR  International Strategy for Disaster Reduction
IUCN  International Union for Conservation of Nature
IWMI  International Water Management Institute
LEISA  Low External Input and Sustainable Agriculture
LI-BIRD  Local Initiatives for Biodiversity Research and Development
MDG-F  Millennium Development Goal Achievement Fund
MFF  Mangroves for the Future
NWP  Nairobi Work Programme
PAR  Platform for Agrobiodiversity Research
RIMES  Regional Integrated Multi-Hazard Early Warning System for Africa and Asia
SDCC  Sustainable Development in the Context of Climate Change
SRI  System of Rice Intensification
SWEPs  Systemwide and Ecoregional Programmes
UNDP  United Nations Development Programme
UNESCAP  United Nations Economic and Social Commission for Asia and the Pacific
UNESCO-IWE  United Nations Educational, Scientific and Cultural Organization, Institute for
UNFCCC  United Nations Framework Convention on Climate Change
UNISDR  United Nations International Strategy for Disaster Reduction
UNPAN  United Nations Public Administration Network
USAID  United States Agency for International Development
VBARD  Viet Nam Bank of Agricultural and Rural Development
WFP  World Food Programme
WMO  World Meteorological Organization
WRI  World Resources Institute
WSBI  World Savings Banks Institute
WWF  World Wildlife Fund
By adapting agricultural systems to become more resilient to climatic trends and changes, losses in production can be reduced.
BACKGROUND & SUMMARY

Climate change induced increases in temperature and the variability of rainfall and extreme weather events are projected to influence the occurrence of crop failures, pest and disease outbreaks, and the degradation of land and water resources. These impacts are likely to affect developing countries in South and Southeast Asia especially hard, as they push to expand their agricultural production to support growing populations and pursue income from export markets.

By adapting agricultural systems to become more resilient to climatic trends and changes, losses in production can be reduced. However, the concept of adaptation is still relatively new and practical lessons from agricultural adaptation projects are limited, leaving policy makers in South and Southeast Asian countries often lacking the technical armory to take timely steps toward adaptation. There is a distinct need for agricultural practitioners to further their understanding of climate change adaptation practices.

The ‘Practitioners and Policy makers Exchange on Climate Change Adaptation in Agriculture’, which was held at the Asian Institute of Technology (AIT) in Bangkok / Thailand from 30 August to 1 September 2010, aimed to address this need. With 25 practitioners, researchers and policy makers from Bangladesh, Cambodia, Lao PDR, Myanmar, Philippines, Thailand and Viet Nam, the event facilitated the transfer of knowledge gained from increasing experience with adaptation in the agriculture sector. Linkages between different adaptation projects and their management teams were established, access to new research results were facilitated, and resources to support mutual learning and knowledge sharing were provided. Throughout the event, the participants of this exchange were at the center of this learning experience, being at the same time providers and receivers of information.

ABOUT THIS FAQ

Over the course of the three days exchange, the organizers recorded all participants’ questions and attendees then voted on the questions they felt to be most relevant to their particular situation. The top 15 questions are captured in this booklet, divided into the following sections:

- Advocacy and Engagement
- Climate-resilient Farming Practices
- Climate Change Adaptation Financing
- Knowledge Sharing
- Thematic linkages between Climate Change Adaptation and other fields

This booklet aims to provide participants with access to relevant resources, examples, case studies and specialized organizations which might be useful in addressing these questions in a particular country context. Together with all presentations and material delivered during the practitioners and policy makers exchange, it is available on the Knowledge Portal, ‘Climate Change Adaptation in Asia and the Pacific’ (www.asiapacificadapt.net).

The Practitioners and Policy-makers Exchange on Climate Change Adaptation in Agriculture was co-organized by the Regional Climate Change Adaptation Knowledge Platform for Asia (Adaptation Knowledge Platform) and the United Nations Development Programme (UNDP) with support from the Adaptation Learning Mechanism (ALM), the European Commission/Food and Agriculture Organization (EC/FAO) Food Security Programme, and the Millennium Development Goal Achievement Fund (MDG-F).
Basic concepts and terminology

Who are stakeholders?

When it comes to climate change adaptation in the agriculture sector, the term “stakeholder” generally refers to a broad range of individuals/groups who have an active interest in the resilience and protection of agricultural processes from climate-related shocks and stresses. This generally includes the whole agribusiness value chain consisting of the following groups:

1. **Seller/s of agricultural products**: Independent individual operations, small groups, whole sellers, exporters and importers, corporate sellers
2. **Buyers**: Independent individual buyers, small-independent retailers, institutional bulk buyers, whole sellers, exporters and importers, retail chains
3. **Producers**: Independent individual farmers/producers, groups of farmers, co-operatives, contract farming agencies, corporate farming agencies
4. **Consumers**: raw produce consumers, processed bulk produce consumers, retail packed produce consumers
5. **Knowledge Management Service Providers**: Non-Governmental Organizations (NGOs) and Not-for-Profit Organizations (NPOs), contract farming organizations, group promoters - developers - managers, international organizations (FAO, IFAD, WFP, UNDP)
6. **Network Suppliers**: Suppliers of inputs, tools and equipments, supplier/s of technology and services
7. **Network Marketing**: Independent individuals, unorganized groups, organized groups
8. **Processing Facilities**: Micro enterprises, small and medium enterprises, large processors
9. **Logistics and Linkage Service Providers**: Packaging and labeling, transport, warehousing, handling, procurement management, cold chain management, banking, credit and investment services, insurance and risk management services
10. **Regulatory - Quality Certification agency/ies**: Accreditation agencies, quality regulatory and certification agencies
11. **Public sector representatives**: Policy makers, agricultural planners, land-use planners, economic and fiscal planners
12. **Others**: Trade promotion bodies and agencies, research organizations, academic institutions, technology development agencies, quality management organization/s.

Source: Agri-infotech, [http://www.agri-infotech.com](http://www.agri-infotech.com)

Links to examples and case studies

- **Agro-Biodiversity and Climate Adaptation Project Proposal**
  This project is designed to enhance capacity and awareness at key national agencies and at local levels, to respond to climate variability and change and better equip local communities to cope with climate change through the conservation and use of agro-biodiversity.
  [http://www2.gtz.de/wbf/4tDx9kw63gma/SEI_Rockefeller_Africa_Climate_Report_04April08.pdf](http://www2.gtz.de/wbf/4tDx9kw63gma/SEI_Rockefeller_Africa_Climate_Report_04April08.pdf)

- **Climate change and adaptation in African agriculture**
  This study, commissioned by the Rockefeller Foundation, set out to identify and understand how information from climate change models is being integrated into agricultural development practice and decision making.
  Source: SEI (2008), Climate change and adaptation in African agriculture.
  [http://www2.gtz.de/wbf/4tDx9kw63gma/SEI_Rockefeller_Africa_Climate_Report_04April08.pdf](http://www2.gtz.de/wbf/4tDx9kw63gma/SEI_Rockefeller_Africa_Climate_Report_04April08.pdf)
Southeast Asia regional learning event on System of Rice Intensification (SRI) in context of climate change and water productivity

SRI experts from Vietnam, Cambodia, Laos and Thailand gathered for a regional workshop. It was organized by the Asian Institute of Technology (AIT) in collaboration with World Bank Institute, Washington DC, USA to help disseminate information to varied audiences, including both farmers as practitioners as well as policymakers, researchers, project managers and others who may be interested in promoting SRI as a way to produce more with less input, especially water productivity and climate change. Workshop participants actively discussed and exchanged ideas to understand the different country experiences, benefits by farmers, problems encountered in SRI adoption, gaps in information, and opportunities for regional collaboration and networking in knowledge dissemination.


Lessons learned from FAO’s participatory environment education and training for sustainable agriculture

Food and Agriculture Organization (FAO) supported bottom-up Environment Education Training (EET) initiatives with eight institutions in six countries (China, Bangladesh, Thailand, Indonesia, the Philippines, and Malaysia). Highlights of the lessons learned from the experiences in planning, implementing and managing the participatory and collaborative EET activities in the Asian region are drawn and best practices in EET are offered for improving similar programmes and/or replications by other interested institutions or agencies.


Communication for Sustainable Development Initiative (CSDI) project in Bangladesh

The Government of Bangladesh recognizes the key role of participatory techniques and community media encouraging the use of radio trainings, video and audio-visual training materials to facilitate and accelerate technological transformation in agriculture.

Source: CSDI (undated), CSDI project in Bangladesh. http://www.csdinitiative.org/projects/project-bangladesh.html

Links to specialized institutions

- Local Initiatives for Biodiversity Research and Development (LI-BIRD): http://www.libird.org/
- Platform for Agrobiodiversity Research (PAR): http://agrobiodiversityplatform.org/
- Consultative Group on International Agricultural Research (CGIAR) - CGIAR Systemwide and Ecoregional Programmes (SWEPs) and other Inter-Center Initiatives: http://www.cgiar.org/impact/initiatives.html
- International Fund for Agricultural Development (IFAD)-Climate change and the future of smallholder agriculture: http://www.ifad.org/climate/roundtable/index.htm
Links to further reading


**Basic concepts and terminology**

**Basic adaptation options for drier conditioned farms include:**

- Expanded use of traditional rainwater harvesting and water conserving techniques
- Rotation of irrigation during water shortage
- Adjustment of planting regimes and crop varieties (e.g., planting drought resilient species)
- Improvement of soil condition that enhances water storage capacity (For more information see Question 7) - Which farming practices increase soil water holding capacity?
- Adjustment of farming practices (e.g., spatial separation of plots for cropping and grazing to diversify exposures)


**Links to examples and case studies**

- **Supplemental irrigation in India**
  Stored water is used communally for supplemental irrigation during dry spells or for growing a post–rainy season crop. A promising technology that has been widely adapted in India is the percolation tank, a small reservoir that captures runoff and holds the water for percolation into shallow water tables.

- **Dry land ecosystem-based methods in Bangladesh**
  Projected higher temperatures and water stress due to heat could pose an additional risk of droughts, causing reduction in vegetation and agricultural production. In response, several ecosystem-based adaptation methods were introduced, including supplemental irrigation (mini-ponds), diversification of crops, and dry seedbeds for rice and homestead gardens.

- **Community preparedness for climate change and increased water use efficiency for rice cultivation using principles of System of Rice Intensification (SRI) in Central Thailand**, [http://www.apfed.net/showcase/project/index.htm](http://www.apfed.net/showcase/project/index.htm)
  This project is strengthening farmers’ capacities to deal with location-specific heterogeneity and develop area-specific technologies on rice production. It focuses on optimal use of purchased input and water in order to prepare against the negative externalities of climate change, and achieve higher net returns from rice farming.

- **Potential role of green mulches in combination with clay and organic amendments to soils as a means of enhancing the fertility and water holding capacity of degraded sandy soils in Northeast Thailand**
  AIT and Consultative Group on International Agricultural Research (CGIAR) have set up experiments to integrate and evaluate the introduction of rice and green mulch with improved soil amendment techniques (bentonite and termite mound) to enhance the soil’s water holding capacity as well as the productivity of jasmine rice.
  Source: CGIAR, Civil Society Organizations and the CGIAR. [http://www.cgiar.org/csos/cs=cgiar_grant_program.html](http://www.cgiar.org/csos/cs=cgiar_grant_program.html)
Links to specialized institutions

- Food and Agriculture Organization (FAO) Conservation agriculture: http://www.fao.org/ag/ca/

Links to further reading

Basic concepts and terminology

On-farm water storage

On-farm storage includes tanks, ponds, natural wetlands, soil moisture, groundwater and reservoirs. Tanks and ponds are cisterns or cavities (uncovered or covered, unlined or lined) built on-farm to store water. These are filled either by runoff, groundwater or from nearby water sources. On-farm water storage presents many adaptive benefits for farmers as they can improve control over water application, increase production and reduce the risks that limit water access. Water stored in on-farm storage installations can help to cover peaks in demand and also smooth out variations in supply, thus presenting both environmental and economic benefits.


Links to examples and case studies

- **Drip irrigation helps farmers in Bangladesh grow crops in salt-affected soil during the dry season**

Using drip irrigation technology on raised planting beds, tomato farmers were able to increase their yields fourfold by leeching salts out of the root zone of the plants. Water for drip irrigation was taken from rainwater ponds. As a result, salinity levels dropped to less than 30% of levels typically recorded. Researchers at the International Center for Biosaline Agriculture (ICBA http://www.biosaline.org/) in conjunction with the Bangladesh Agricultural Research Institute (BARI http://www.bari.gov.bd) determined that for every dollar invested in this innovative farming practice, it would return $4.71 extra in profits.


- **Restoration of earth-made water tanks in India**

Together with a local NGO and a number of target villages, the WWF restored 12 tanks in the 88,000 ha sub-catchment of the Maner River, a tributary of the Godavari River, through de-silting to capture more monsoon runoff. Village committees were formed to maintain the tanks and further manage water use. The villagers benefited from increased water availability and enriched biodiversity.


Links to specialized institutions

- International Water Management Institute (IWMI) on water storage: http://www.iwmi.cgiar.org/Topics/Water_Storage/

Links to further reading

**Basic concepts and terminology**

**Soil and Nutrient Management**

This does not only relate to fertilizer management, but also to the efficient management of organic nutrients in the soil. Nutrients from straw and manure are important parts of the farming system and can be managed to enhance productivity in rain-fed agriculture. Nutrient availability can be improved by avoiding over application of fertilizer, planting green manure crops, adopting reduced or no-till farming practices and avoiding over application of water.

**Drought and Flood Management**

Reducing the risk of crop losses caused by flooding in rain-fed systems may include work on embankments and drainage channels, altering bund height, adjusting planting regimes and planting flood-tolerant crop types. Drought risk can be managed by responsibly using on-farm water storage and groundwater, by increasing the soil water holding capacity [refer to question 7], by adjusting planting regimes and by planting drought resilient crop types. Managing for both drought and flood can be made easier by gaining access to climate forecasting services, such as those delivered by Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES).


**Links to examples and case studies**

- **Improved rice cultivation in Cambodia**

  The Cambodia Farmers’ Association Federation for Agricultural Development started an initiative to help adapt the sector to climate change impacts. The organization formulated a new sustainable farming practice called 'System of Rice Intensification' which helps smallholder farmers increase their yields by following the principle of ‘transplanting young seedlings singly and widely spaced’, a technique that has the advantage of requiring less seeds and minimum irrigation.


- **Improving water and fertilizer-use-efficiency in rain-fed rice cultivation in Northeast Thailand**

  In Thailand, farmers of the Northeast province were interested to grow more rice with less water using green mulch and cover crops in SRI rice field. This was suggested as an attractive option because the ground cover would not only suppress weeds and reduce the rate of soil moisture depletion, but would add readily decomposable organic matter, which after incorporation would enhance the soil’s fertility and fertilizer-use-efficiency in preceding crops. With support from AIT and the Consultative Group on International Agricultural Research (CGIAR) Challenge Program on Water and Food (CPWF), farmers’ evaluation of this innovative idea showed that rice crops grown with SRI practices that also had mung bean as an intercrop gave higher yield, along with highest foliage cover, compared to non-intercropped SRI crops using herbicides for weed control.


**Links to specialized institutions**


- International Water Management Institute (IWMI)-Comprehensive Assessment on Water Management in Agriculture: http://www.iwmi.cgiar.org/Assessment/Synthesis/rainfed.htm?zoom_highlight=rainfed+

- System of Rice Intensification (SRI): http://sri.ciifad.cornell.edu/index.html

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**Question 4**

How can we increase production gains in rain-fed agriculture?
**Links to further reading**


Basic concepts and terminology

Small-scale groundwater irrigation

Small-scale irrigation schemes have significantly contributed to agricultural productivity in several parts of the world, especially in Asia. Diversion or direct pumping from rivers and streams, gravity flows from small reservoirs (tanks), and pumping from underlying groundwater aquifers constitute the principal means of sourcing water for small-scale irrigation schemes.


Links to examples and case studies

- **Rainwater harvesting bylaw in India**
  
  In India, rainwater harvesting is a bylaw in urban construction regulations in cities such as Chennai, Delhi, and Rajkot. Artificial recharge is promoted and financially supported by the government. At the local level, rainwater harvesting has gained the character of a mass movement, especially in western India, where groundwater exhaustion is a real impediment for agricultural activities.


- **Autonomous smallholder shallow groundwater irrigation in Ghana**
  
  In Ghana’s upper east region, farmers have started using shallow groundwater to produce horticultural crops. Groundwater infrastructure is developed using rudimentary digging/drilling technologies, banking on the abundant human labor during the long dry season.


- **Small-holder System Innovations in Integrated Watershed Management in Tanzania and South Africa**
  
  This programme is an applied and multidisciplinary research initiative which focuses on the potential of indigenous and exogenous water system innovations in smallholder farms for improved land and water productivity.


Links to specialized institutions

- **Food and Agriculture Organization (FAO):** http://www.fao.org/corp/google_result/en/?cx=018170620143701104933%3Aqq82jsfba7w&q=Groundwater&cf=FORID%3A9#1043

- **International Water Management Institute (IWMI) on groundwater:** http://www.iwmi.cgiar.org/sitesearch.aspx?cx=01804556773391895172%3Af9s-u72dpc&ccf=FORID%3A11&q=groundwater#1138

- **Centre for Information on Low External Input and Sustainable Agriculture (ILEIA):** www.ileia.org

Links to further reading


- **Purdue University, Types of Water Wells. Retrieved from** http://www.purdue.edu/envirosoft/well/src/types2.htm

- **India Water Portal, Recharge Wells (undated). Retrieved from** http://www.indiawaterportal.org/node/6217

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**Question 5**

How can groundwater be used to improve water reliability on small farms?
Question 6
Which farming practices increase soil water holding capacity?

Basic concepts and terminology
Soil water holding capacity
Soil water holding capacity refers to the ability of the soil to hold water and use the stored moisture to retain and supply the nutrients for plant growth. Soil water holding capacity is increasingly becoming an issue for climate resilient agriculture, particularly as a result of changing rainfall patterns, higher temperatures and increasing drought.

Farming practices which can be implemented to increase soil water holding capacity include:
- conservation tillage;
- mulching and compost/manure use; and
- application of soils from termite mounds and clay materials (bentonites).


Links to examples and case studies
- Improved water holding capacity of sandy soil in Northeast Thailand
  Field based soil studies were undertaken to evaluate local traditional practices currently adopted by farmers and innovative approaches to improve the productivity of these soils. The treatments included: composted leaf litter, termite mound material, and bentonite.


Links to specialized institutions

Links to further reading
Basic concepts and terminology

**Ecosystem services**
The ecosystems approach is a strategy for the integrated management of agriculture, land, water and living resources that promotes conservation and sustainable use in an equitable way. Examples of agriculture/land use to deliver ecosystems services include:

- Agricultural productivity or biodiversity maintenance;
- Provision of livelihood services such as food, fiber, or fish;
- Maintaining health services such as carbon sequestration; and
- Cultural services such as eco-tourism.

Source: WWF (undated), Agriculture: major impacts on species and places. [http://wwf.panda.org/about_our_earth/agriculture_impacts/](http://wwf.panda.org/about_our_earth/agriculture_impacts/)


**Links to examples and case studies**

- **Shrimp farming and mangrove losses in Thailand**
  A study of mangrove conversion near Tha Po Village in Thailand compared the economic returns from shrimp farms with those from sustainably managed mangroves. Conversion of mangroves to shrimp farms appeared the economically sound choice when only the values of the shrimp harvest and forest products were considered in the economic analyses.


- **Reconnection of lakes to the Yangtze River in China**
  The WWF initiated a project to reconnect three lakes of Zhangdu, Hong and Tian’e Zhou back to the Yangtze River through opening the sluice gates. In connection with this activity, illegal and unprofitable aquaculture facilities and other infrastructures were removed or modified. As a result, floodwater storage is improved and livelihood sources are enhanced.


**Links to specialized institutions**


**Links to further reading**

Basic concepts and terminology

**Funding opportunities**

Numerous international aid and non-government funding opportunities exist which can be used to implement on-the-ground adaptation projects to enhance resilience to climate change. Most of these are not solely focused on the agricultural sector, however more on climate change adaptation in agriculture.

**Links to examples and case studies**

- **Optimal rainfall insurance contracts for maize producers in Ghana’s Northern Region**

  This paper assesses the feasibility of rainfall insurance contracts for agricultural production in Ghana’s Northern Region. The theoretical contract is implemented using monthly rainfall and annual maize crop yield data from 1998 to 2004 from 12 districts in the Northern Region under varying premium rates.

  **Source:** IFPRI (2010), Optimal rainfall insurance contracts for maize producers in Ghana’s Northern Region. http://www.ifpri.org/publication/optimal-rainfall-insurance-contracts-maize-producers-ghana-s-northern-region

**Links to specialized institutions**

- Climate Funds List: http://www.climatefundsupdate.org/listing
- Climate Financing Options: http://www.climatefinanceoptions.org/cfo/index.php

**Links to further reading**

Basic concepts and terminology

**Sources of climate information**

Improved access to climate information can reduce the impacts of drought, flood and other extreme weather events on the agriculture sector. Climate information can come from four potential sources.

- Past climate figures – high potential, underutilized
- Climate information monitoring – moderate potential, reasonably well utilized
- Climate forecasting – moderate potential, underutilized
- Climate change scenarios – not yet systematically applied, utilization largely unknown


**Links to examples and case studies**

- **Climate field school in Indonesia**
  Climate Field Schools have been set up to improve the basic knowledge of farmers to help them to use climate forecast information when designing crop management strategies. Materials to be used in the field schools were mostly developed with farmers, based on their experiences.
  Source: FAO [undated], Technology for agriculture: Climate Field School for Farmer. [http://www.fao.org/teca/content/climate-field-school-farmers](http://www.fao.org/teca/content/climate-field-school-farmers)

- **AgroMetShell – a crop yield forecasting software**
  The FAO developed the AgroMetShell, a crop specific soil water balance model which is a useful “early warning” indicator for yield reduction due to water stress. This software is especially useful for countries that rely on rain-fed agriculture and inadequate availability of water to the crop is the main constraint.
  The software can be downloaded from: [http://www.hoefsloot.com/agrometshell.htm](http://www.hoefsloot.com/agrometshell.htm)

- **Mobile phone used to transfer climate information in India**
  The Indian Farmers Fertilizer Cooperative Limited launched a project to leverage communication technology, in particular mobile telephony, to disseminate expert agricultural knowledge to small-scale farmers in rural India.

**Links to specialized institutions**

- Asia Disaster Preparedness Center (ADPC): [http://www.adpc.net/](http://www.adpc.net/)

**Links to further reading**

Frequently Asked Questions Booklet


Basic concepts and terminology

Existing mechanisms: Research

A large amount of agricultural research has been carried out on sustainable adaptive farming practices in the region, including:

- Asia-Pacific Association of Agricultural Research Institutions (APAARI): http://www.apaari.org/
- Consultative Group on International Agricultural Research (CGIAR): http://www.cgiar.org/
- Agricultural Science and Technology Indicators: http://www.asti.cgiar.org/
- Southeast Asian Network for Agroforestry Education: http://www.worldagroforestry.org/
- International Rice Research Institute (IRRI): http://beta.irri.org/
- Council for Partnership on Rice Research in Asia: http://irri.org/partnerships/networks/council-for-partnership-on-rice-research-in-asia

Existing mechanisms: Advisory services

A number of agricultural advisory services and information systems have developed knowledge sharing toolkits and manuals which can be used by farmers to gain new practices which increase their resilience to climate change, including:

- Agricultural manuals provided by Eldis (a knowledge service provided by the Institute of Development Studies, Sussex, UK), available at: http://www.eldis.org/go/topics/resource-guides/agriculture/agriculture-manuals

Existing mechanisms: Insurance

The current lack of a suite of financial risk-sharing mechanisms (e.g. index based insurance) is a key constraint to funding climate change adaptation initiatives in the agricultural sector. This barrier can be addressed by flexible insurance mechanisms which encourage risk reduction initiatives and provide payment in a timely manner.


Existing mechanisms: Micro-finance options

Microfinance is the provision of small-scale financial services to the poor. The Asian microfinance market structure varies significantly across the countries, depending on the stage of financial development, the level of economic development and the policy environment.


Links to examples and case studies

- Flood insurance in the Mekong Delta

An index-based flood insurance product has been offered to the Vietnam Bank of Agricultural and Rural Development (VBARD). The product is designed to pay for consequential losses that are suffered by VBARD when flooding creates problems for farmers in repaying loans. The contract is being offered by a Vietnamese insurance company, has support from a global reinsurer, and has been approved by the Vietnam regulatory authority.
Stakeholder communication is key in Thailand agricultural insurance

The Thailand case study demonstrates how careful pilot project management within a conducive external environment contributes to success. The project has had a significant demonstration effect and has generated wide interest from other institutions in Southeast Asia, as well as international reinsurers.


Links to specialized institutions

- Low External Input and Sustainable Agriculture (LEISA) : http://www.leisa.info/
- Agriculture links in Practical Action : http://practicalaction.org/links/agriculture
- UNDP Climate Risk Transfer Facility: http://europeandcis.undp.org/poverty/show/7B3B261B-F203-1EE9-B8410E1A81B58989

Links to further reading


Basic concepts and terminology

What is indigenous knowledge?

Indigenous knowledge (also known as ‘traditional knowledge’) refers to the methods and practices developed by a group of people from an advanced understanding of the local environment, which has formed over numerous generations. This knowledge contains several other important characteristics which distinguish it from other types of knowledge. These include originating within the community, maintaining a non-formal means of dissemination, collectively owned, developed over several generations and subject to adaptation, and imbedded in a community’s way of life as a means of survival.


Why is indigenous knowledge important?

- Significant contributions to global knowledge have originated from indigenous people
- Indigenous knowledge systems are at risk of becoming extinct
- Indigenous knowledge is part of the lives of the rural poor
- Not yet fully utilized in the development process livelihood

**Links to examples and case studies**

- **Weather forecasting through indigenous knowledge for crop cultivation in Vietnam.**

Since weather forecasting is still limited in some areas, the use of indigenous knowledge for weather forecasting is useful in crop cultivation, for instance the methods of atmospheric and moon observations for predicting weather changes. Another is the observations of dragonfly habits which is passed down from generation to generation in the local folk song.

“Dragonfly flies high, sunny sky / Flies low, rain / Flies neither high nor low, cloudy sky”


- **The zabo (the word means ‘impounding run-off’) system (also known as the ruza system) practiced in Nagaland in North-Eastern India.**

Villages such as Kikruma, where zabos are found even today, are located on a high ridge. Though drinking water is a major problem, the area receives high rainfall. The rain falls on a patch of protected forest on the hilltop; as the water runs off along the slope, it passes through various terraces. The water is collected in pond-like structures in the middle terraces; below are cattle yards, and towards the foot of the hill are paddy fields, where the run-off ultimately meanders into.


**Links to specialized institutions**


**Links to further reading**


Basic concepts and terminology

**Establishment of a regional network**

To address common climate change concerns that are shared by different countries, regions and institutions across Asia and the Pacific region, better links between local, national and regional institutions are required. A network involving individuals and organizations who share a common interest in agricultural adaptation work, aimed at addressing emerging climate constraints, could be a relevant starting point. Before such a network can be established, a scoping assessment of existing networks is necessary to maximize synergies and reduce duplication of efforts.

**Links to examples and case studies**

- **Centre of Excellence on Sustainable Development in the Context of Climate Change (SDCC) at AIT, Thailand**

  The goal of the AIT Center of Excellence in SDCC is to consolidate the institute’s research efforts and broaden the networks and partnerships by providing a platform to discuss and launch shared initiatives and pool resources to effectively address the issues and challenges of sustainable development in the context of climate change. The platform coordinates and implements project activities and also serve as platform for facilitating policy dialogue on food security, on climate change mitigation and adaptation, and on research, marketing, and extension issues for Asia.

  Source: SDCC. http://www.sdcc.ait.asia/

**Links to specialized institutions**

**Existing global networks**

- Links to resources on climate change adaptation networks and knowledge platforms maintained by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat and the Nairobi Work Programme (NWP) partner organizations. Available at: http://unfccc.int/adaptation/nairobi_work_programme/knowledge_resources_and_publications/items/5135.php

- In 2008 SEI Oxford developed a list of large global and regional networks and initiatives (existing and being developed). Available at: http://www.weadapt.org/wiki/Overview_of_major_climate_adaptation_initiatives_and_networks

**Existing regional networks**

At the regional level, there are a number of existing regional networks including

**Agriculture networks**

- Asia Network for Sustainable Agriculture and Bioresources: http://www.ansab.org/
- Asia-Pacific Association of Agricultural Research Institutions (APAARI): http://www.apaari.org/
- Asia Pacific Natural Agriculture Network: http://www.apnan.org/
- Network of Aquaculture Centers in Asia-Pacific: http://www.enaca.org/
- South Asia Conservation Agricultural Network: http://sacanasia.org/
- South Asian Network for Social and Agricultural Development: http://www.sansad.org.in/

**Climate change networks**

- Adaptation Knowledge Platform: http://www.climateadapt.asia/
- Asia-Pacific Network on Climate Change: http://www.apn-gcr.org/
- Asia Pacific Network for Global Change research: http://www.apn-gcr.org/newAPN/indexe.htm
- ADB: http://www.adb.org/Climate-Change/default.asp
- Capacity Building for integrated water resource management: http://www.cap-net.org/node/1176
- Climate Change and Adaptation Initiative (CCAI): http://www.mrcmekong.org/ccai/Climate-change-n-adaptation-initiative.htm
- UNDP Adaptation Learning Mechanism (ALM) http://www.adaptationlearning.net/
- World Bank Institute (WBI) climate change: http://wbi.worldbank.org/wbi/about/topics/climate-change

Links to further reading
Basic concepts and terminology

**Organic agriculture**

Organic agriculture is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.


**Links between organic agriculture and climate change adaptation**

Organic agriculture has significant potential for enhancing resilience to climatic variability and change:

- Organic agriculture commonly builds on traditional farming management practices which are highly adaptive to changing conditions and focus on long-term sustainability
- Organic agriculture reduces vulnerability associated with reduced water availability. Measures to improve soil fertility and soil moisture content are often central to organic agriculture practices
- Organic agriculture reduces the amount of environmentally detrimental pesticides, herbicides, fertilizers, etc which are released into the agro-ecosystems


**Links to examples and case studies**

- **Emerging organic agriculture in Lao PDR**

  In Lao PDR, organic rice is being developed under the “ProRice Program,” referred to as PROFIL. The program is being carried out by Helvetas and the Department of Agriculture. The goal is to produce and market good quality organic rice produced in the marginal rain-fed rice growing environments of the Lao PDR.


**Links to specialized institutions**

- Organic Agriculture Certification Thailand: [http://www.ioas.org/act.htm](http://www.ioas.org/act.htm)
- Round Table on Organic Agriculture and Climate Change: [http://www.organicandclimate.org](http://www.organicandclimate.org)

**Links to further reading**

Basic concepts and terminology

**Climate Change Adaptation (CCA)** is the process of adjusting to a changing climate, either through explicit and planned interventions, or spontaneously as a consequence of inherent flexibility. Because climate change will affect every aspect of society, environment and the economy, adaptation includes activities that are both directly and indirectly related to the impacts of climate change.

**Disaster Risk Reduction (DRR)** includes a suite of interventions, approaches and policy frameworks needed to avoid or minimize the impacts of natural hazards on vulnerable societies and the environment. Disaster risk reduction includes the concept of disaster risk accumulation, i.e. it reflects that each disaster event reduces the ability to cope with the next event.


Links to examples and case studies

- **Philippines Climate Change Act of 2009**

  The Philippines is among the most disaster-prone countries worldwide. Every year, the country is exposed to numerous powerful tropical cyclones, and it also suffers from periodic droughts. In 2009, the tropical storms Ketsana and Parma caused hundreds of casualties and severe damage to housing and other property. In response to the concern about increasing disaster risks arising from climate change, the Philippines Government enacted the Climate Change Act of 2009, which integrates disaster risk reduction measures into climate change adaptation plans, development and poverty reduction programmes.


- **Viet Nam, National Forum to Link Climate Change and Disaster Risk Reduction Agendas**

  Viet Nam, a coastal country with a long monsoon-affected coastline and a number of major river deltas, will be highly affected by climate change and is among the most disaster-prone countries in Asia. In response, the Vietnamese Government organized a National Forum in late 2009 to enhance the synergies between the two agendas of the “National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020” (2007) and the "National Target Program to Climate Change Response" (2008).

  The Forum aimed to identify areas of overlap and interface between disaster risk reduction and climate change adaptation, and to improve linkages between government agencies responsible for both programmes as well as streamlining the financial channels for joint initiatives.


Links to specialized institutions

- Prevention web: [http://www.preventionweb.net/](http://www.preventionweb.net/)

Links to further reading


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**Question 15**

What is the difference between a vulnerability assessment and an impact assessment?

**Impact Assessment**

Impact assessment is the process of identifying the future consequences of a current or proposed action. The ‘impact’ is the difference between what would happen with the action and what would happen without it.  

**Vulnerability Assessment**

Vulnerability assessment is the process of identifying, quantifying, and prioritizing (or ranking) the vulnerabilities in a system/unit of concern. Vulnerability assessment selects a particular group or unit of concern (e.g. landless farmers, tropical forest ecosystems, coastal communities, development sectors) and seeks to determine the risk of specific adverse outcomes for that unit in the face of a variety of hazards and stresses. In doing so, it identifies a range of factors that may reduce response capacity and adaptation to stressors.  
Links to examples and case studies

- **Vietnamese project to reduce vulnerability to climate change and disasters**

  The project combines a participatory approach and water modeling. The main objective is to strengthen the capacity of the sectors, institutions, and Vietnamese people to adapt and respond to climate change impacts. It aims to reduce their vulnerability to climate change and disasters by raising their understanding and preparedness to foresee impacts and minimize losses.


- **Vulnerability assessment of people, livelihoods and ecosystems in the Ganga Basin, India**

  The Ganga Basin is one of the most densely populated and fertile basins in the world and supports approximately 300 million Indians. There are various approaches and methods which can be used to assess vulnerability to climate change. A detailed study of existing assessment methods was undertaken as part of the project and a LVI-IPCC (Livelihoods Vulnerability Index) methodology was determined to be most appropriate for the scale of the assessment. The assessment methodology involves four key steps, starting with the identification of specific and measurable indicators (e.g. crop production and land capacity for Agriculture) and finally calculating the vulnerability index (vulnerability index = [exposure – adaptive capacity] x sensitivity) and then scaling the results from low to high vulnerability.


Links to specialized institutions

- International Association for Impact Assessment (IAIA): http://www.iaia.org/default.aspx

Links to further reading

A number of initiatives have been launched to help countries build their capacity to respond to the changing climate, but many of these are undertaken independently of each other. The Adaptation Knowledge Platform addresses this challenge by building bridges between initiatives, researchers, policymakers, business leaders, and those working on climate change adaptation “on the ground”. The overarching goal of the Adaptation Knowledge Platform is to strengthen adaptive capacity and facilitate climate change adaptation in Asia at local, national, and regional levels. It focuses on three pillars:

- Establishing a regional system for sharing knowledge on climate change adaptation, making it easy to understand and available to those who need it;
- Generating new knowledge about adaptation that national and regional policymakers can use as they plan for climate change; and
- Promoting the application of new and existing knowledge about climate change in Asia.

Who and Where
In its first phase (2009-2011), the Adaptation Knowledge Platform will actively engage with governmental and non-governmental practitioners, researchers, media and private sector who are interested in climate change adaptation issues in 13 countries: Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, the Philippines, Sri Lanka, Thailand and Viet Nam.

Initial Partners
The Adaptation Knowledge Platform is supported by the Swedish International Development Cooperation Agency (Sida). Initial partners are the Stockholm Environment Institute (SEI), the Swedish Environmental Secretariat for Asia (SENSA), the United Nations Environment Programme (UNEP) and the Asian Institute of Technology (AIT)-UNEP Regional Resource Centre for Asia and the Pacific (RRC. AP), which also hosts the Adaptation Knowledge Platform Secretariat.

Join us!
Join us in strengthening the adaptive capacity in Asia by sharing your projects and learning experiences through the Climate Change Adaptation in Asia and the Pacific web-portal (www.asiapacificadapt.net) or the Asia-Pacific Climate Change Adaptation Forum. For more information on this and other ways of collaboration and mutual benefit, contact: