Practitioner's Exchange on CCA in Agriculture. Bangkok, August 2010

Building Adaptive Capacity to Climate Change in Agriculture Sector

Presented by

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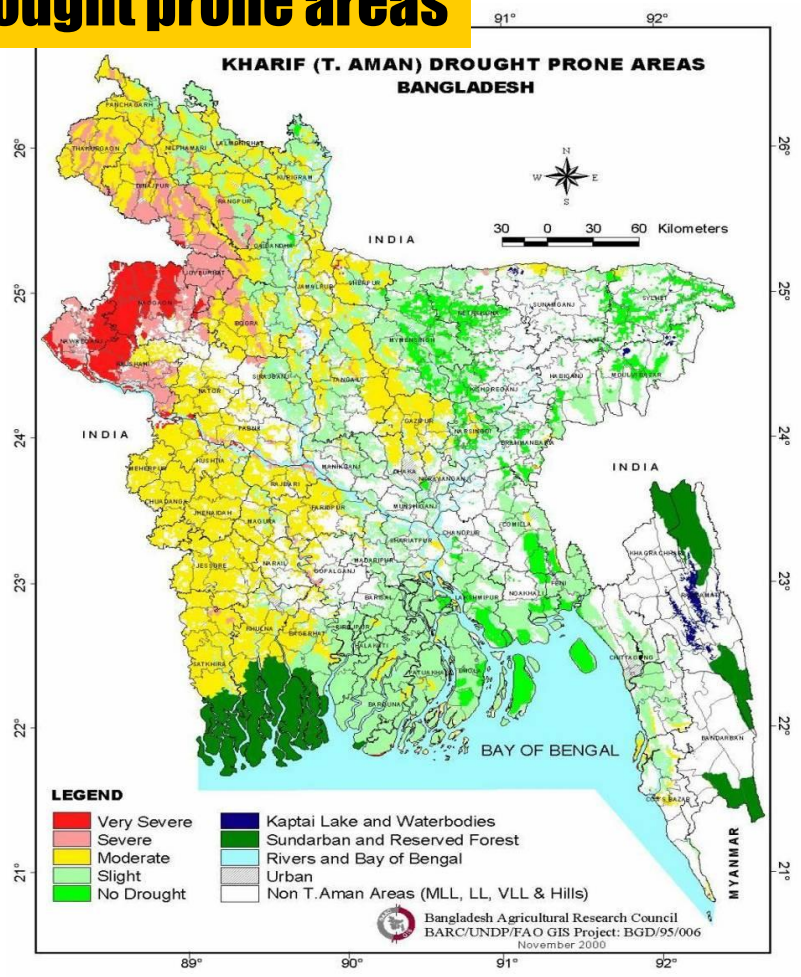
The Initiative

LACC objectives

- Develop a **methodology** to transform climate change impact modelling into livelihood adaptation practices
- Strengthen **institutional structures** to handle climate change adaptation
- Initiate and facilitate the **field testing with farmers** of livelihood adaptation strategies

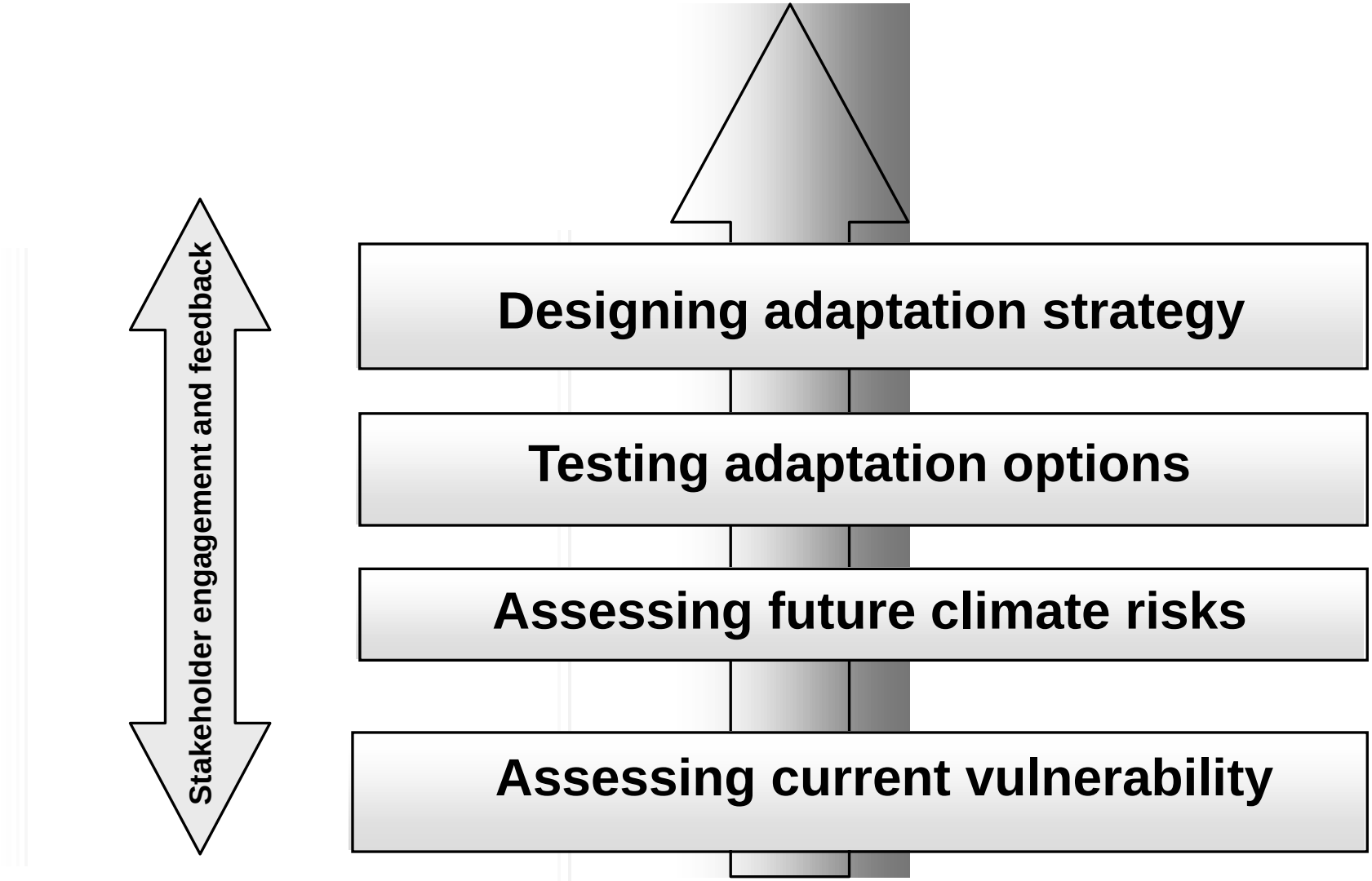
Eco-system considered

Drought prone areas



Coastal areas

Key strategy



Assessing current vulnerability

One can, actually, visualize the situation .....

High evaporation rate and temperature

Dried up canals and water bodies

High agricultural drought and dryness

Affected stages of agricultural crops

Local perceptions –1 On climate variability

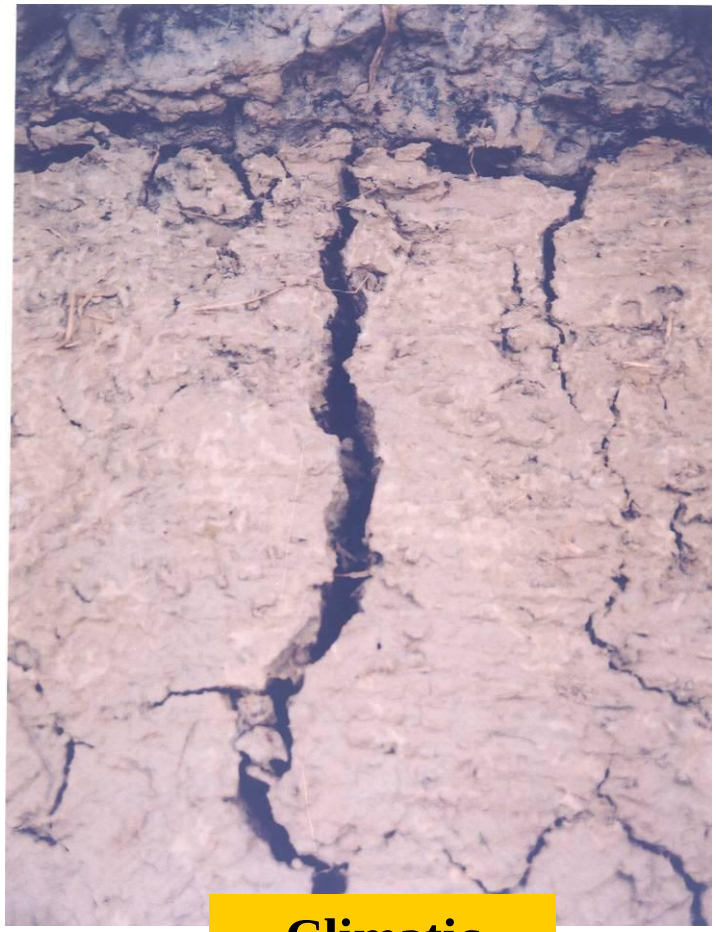
- Current climate is **behaving differently** from the past years. The past climate condition was better (says the elderly people) .
- **Seasonal cycle (locally called *rhituchakra*) has changed** from the past. Where it used to be 6 distinct seasons in the past but now its almost 3 or 4 seasons observed distinctly in a year.
- Climatic conditions have changed due to the **God's will** (*khodar ichay*) and the cure – the rainfall is in the **God's hand** (*akasher pani allar haatey*).
- The average temperature in the area has changed. People feel that **summer time heat increased** and the **winter has become shorter** and in some winter days **cold became severe**.

Local perceptions –2 On drought situation

- People's **perceptions** on drought are equated to:
  - **a)** **dryness** (locally known as *shukna*),
  - **b)** **consecutive non-rainy days** (locally known as *ana-bristi*),
- Drought is **more frequent** now than before.
- Prevalence of **pest and disease incidence increased** and largely associated with HYV rice.
- With adoption of HYV rice the production increased but due to climatic variability adverse impact of drought causes **yield reduction.**
- **Vegetable and fruits (Mango varieties)** remain affected due to variations in rain, temperature and drought situations.

Risks and vulnerabilities

Both types of factors: climatic & non-climatic factors emerged.

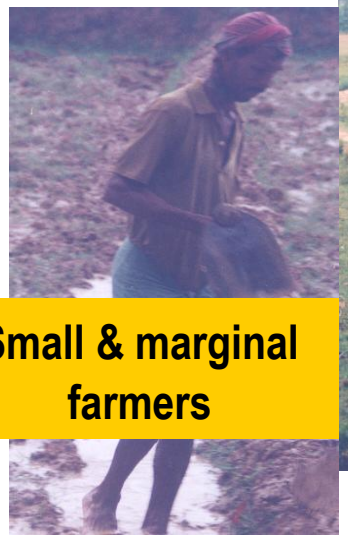


Climatic

Non-climatic

Profiling of livelihood groups

Most vulnerable groups



Small & marginal farmers

Wage labourers

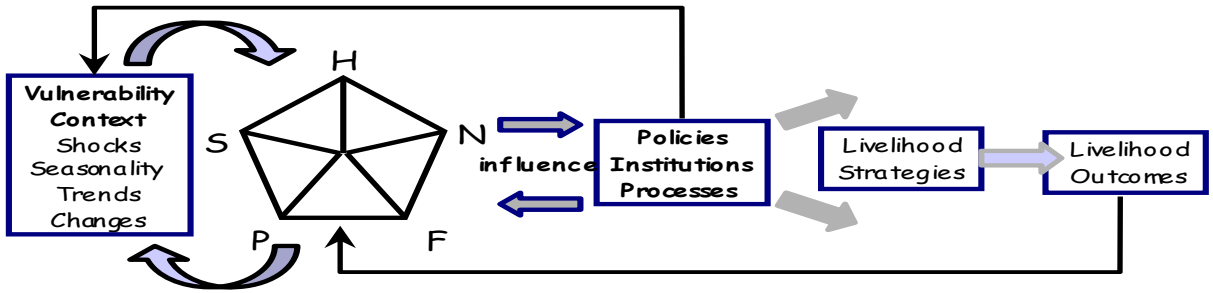
Fishers

Petty traders/ businessmen

'Non' or 'least' vulnerable groups

Large businessmen

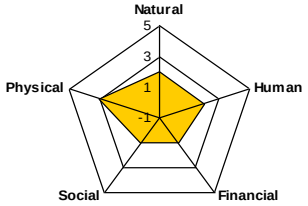
Large farmers



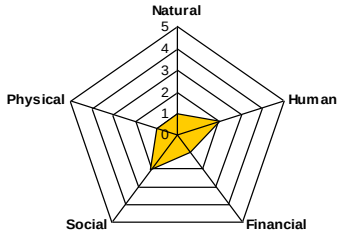
Comparative asset composition

Non-irrigated areas

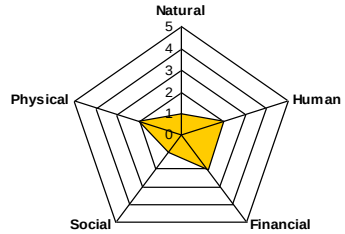
Small and marginal farmers
(Non-irrigated areas)



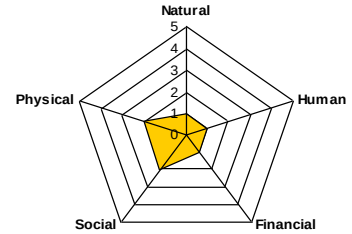
Rural wage labours
(Non-irrigated areas)



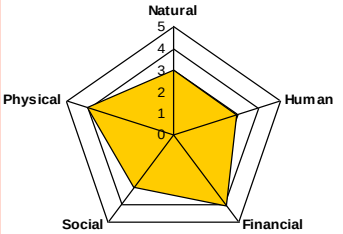
Petty trader/businessmen
(Non-irrigated areas)



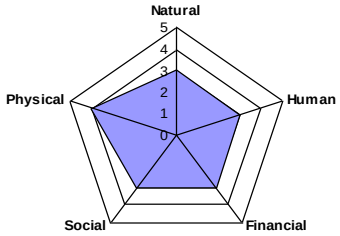
Fishermen/fish traders/fishing labours
(Non-irrigated areas)



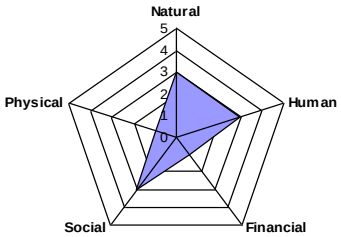
Large businessmen
(Non-irrigated areas)



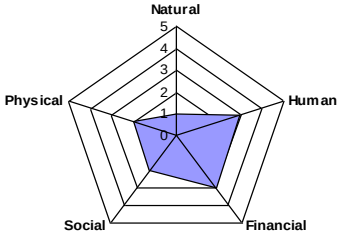
Small and marginal farmers
(Irrigated areas)



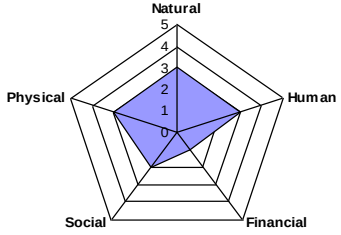
Rural wage labours
(Irrigated areas)



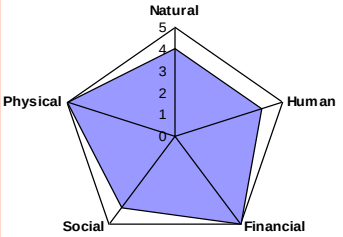
Petty trader/businessmen
(Irrigated areas)



Fishermen/fish traders/fishing labours
(Irrigated areas)



Large businessmen
(Irrigated areas)



Irrigated areas

Vulnerability context

Small/marginal farmer			
Major vulnerability factors	**Nature**	**Non-irrigated areas**	**Irrigated areas**
Low rainfall	Climatic		
High evaporation rate	Climatic		
Dryness	Climatic		
High temperature	Climatic		
Crop yield reduction due to drought effect	Climatic		
Electricity failure (for irrigation supply)	Non-climatic		
Unavailability of surface water storage facilities (e.g. *khari*, ponds)	Non-climatic		
Unavailability of natural water bodies (e.g. canals, rivers)	Non-climatic		
Pest infestation	Climatic/Non-climatic		
Insufficient canal irrigation supply systems (mostly tertiary canals)	Non-climatic		
Inability to cultivate 'boro' crop	Non-climatic		
Unavailability of DTW	Non-climatic		
Unavailability of supplementary irrigation facilities	Non-climatic		
High price of agricultural inputs	Non-climatic		
Tenancy complexities	Non-climatic		

Source: CEGIS Fieldwork 2005.

Legends:

= Relatively low level of impact

= Relatively higher level of impact

= Not identified

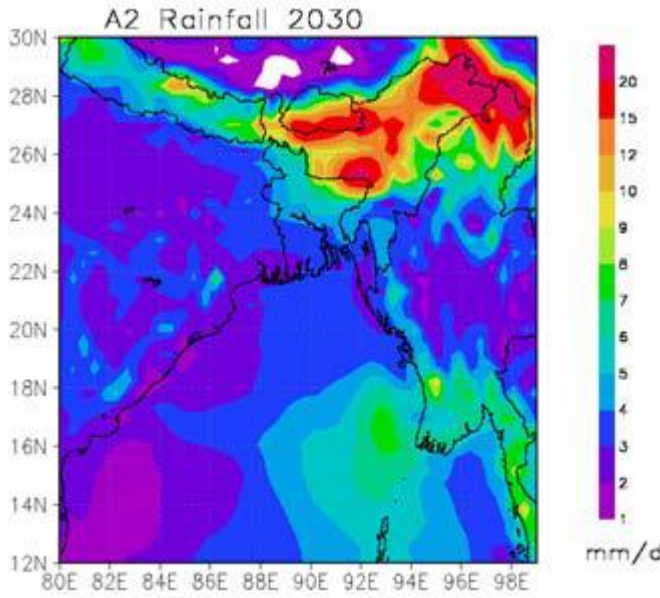
Assessing future climatic risks

Making synergy of what is anticipated

Year	Mean Temperature Change (°C)			Mean Precipitation Change (%)			Sea Level Rise		
	Annual	DJF	JJA	Annual	DJF	JJA	IPCC (Upper range)	SMRC	NAPA
2030	1.0	1.1	0.8	5	-2	6	14	18	14
2050	1.4	1.6	1.1	6	-5	8	32	30	32
2100	2.4	2.7	1.9	10	-10	12	88	60	88

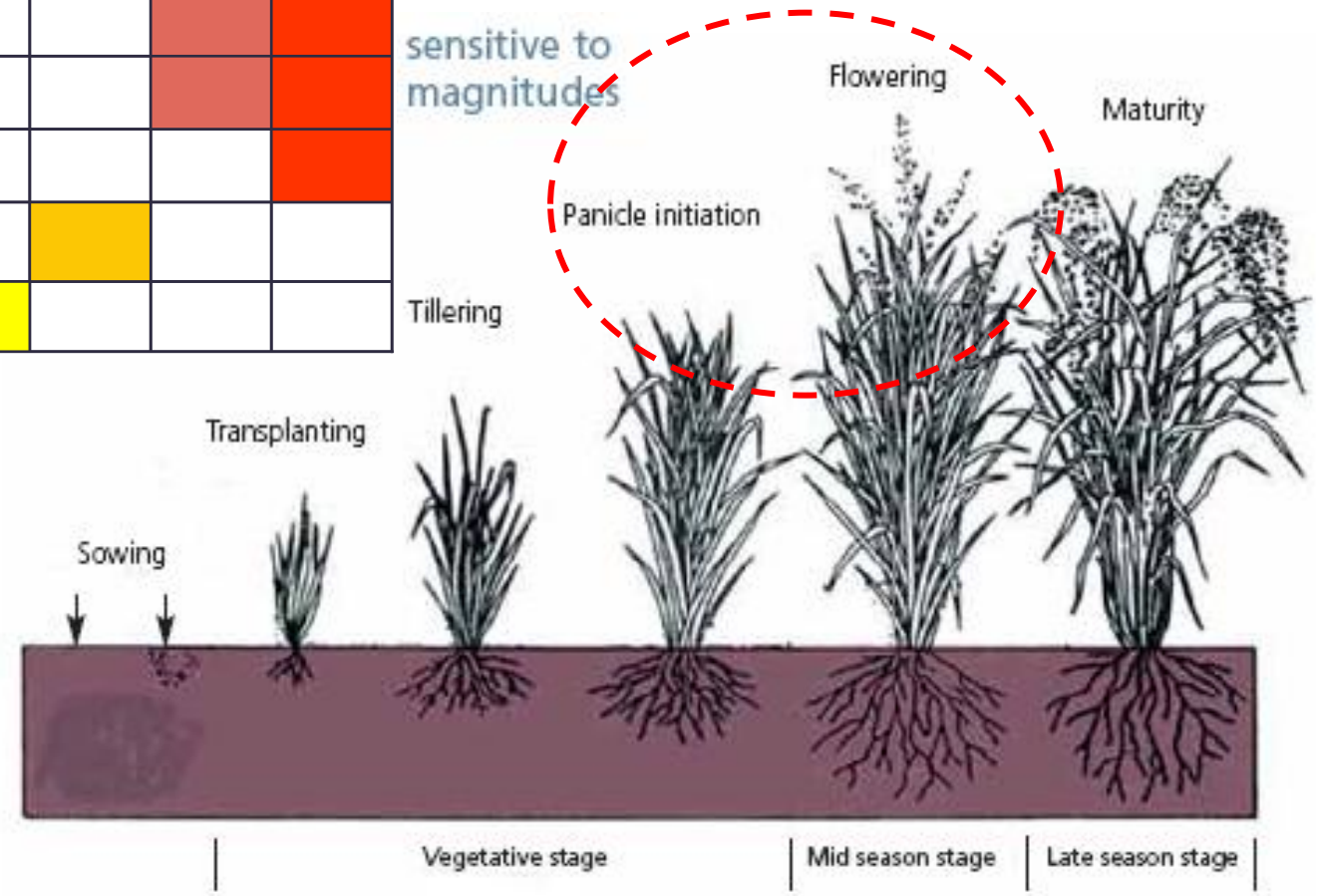
Note: DJF= December-January-February; JJA= June-July-August, SMRC= SAARC Meteorological Research Center *(Source: Adopted from IPCC 2001, OECD Report 2003)*

- Increasing frequency, intensity and variability of droughts, floods, tropical storms
- Sea level rise and salt water intrusion
- Agriculture will be the most affected sector



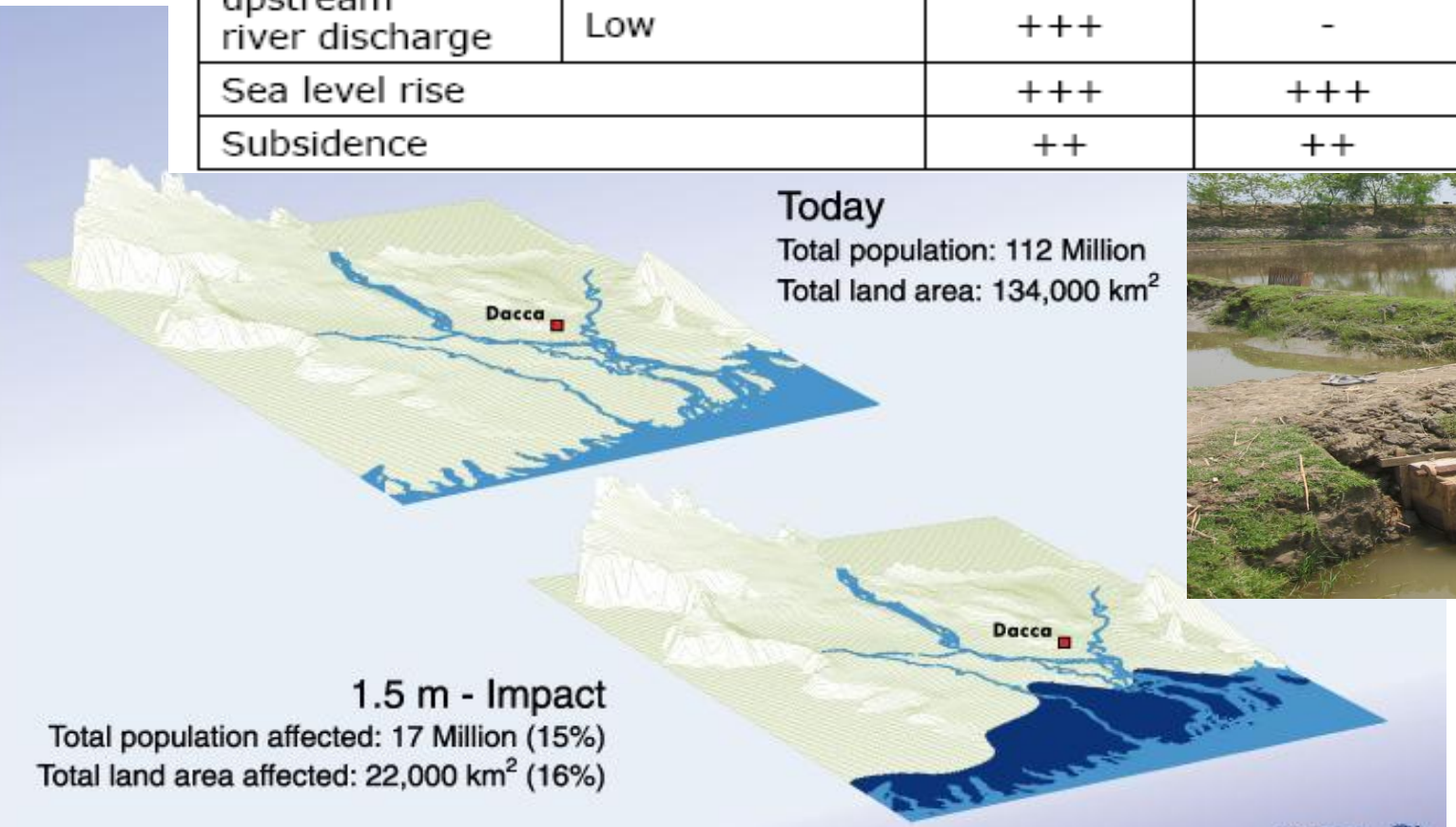
Future Climate Risk: Drought Spells

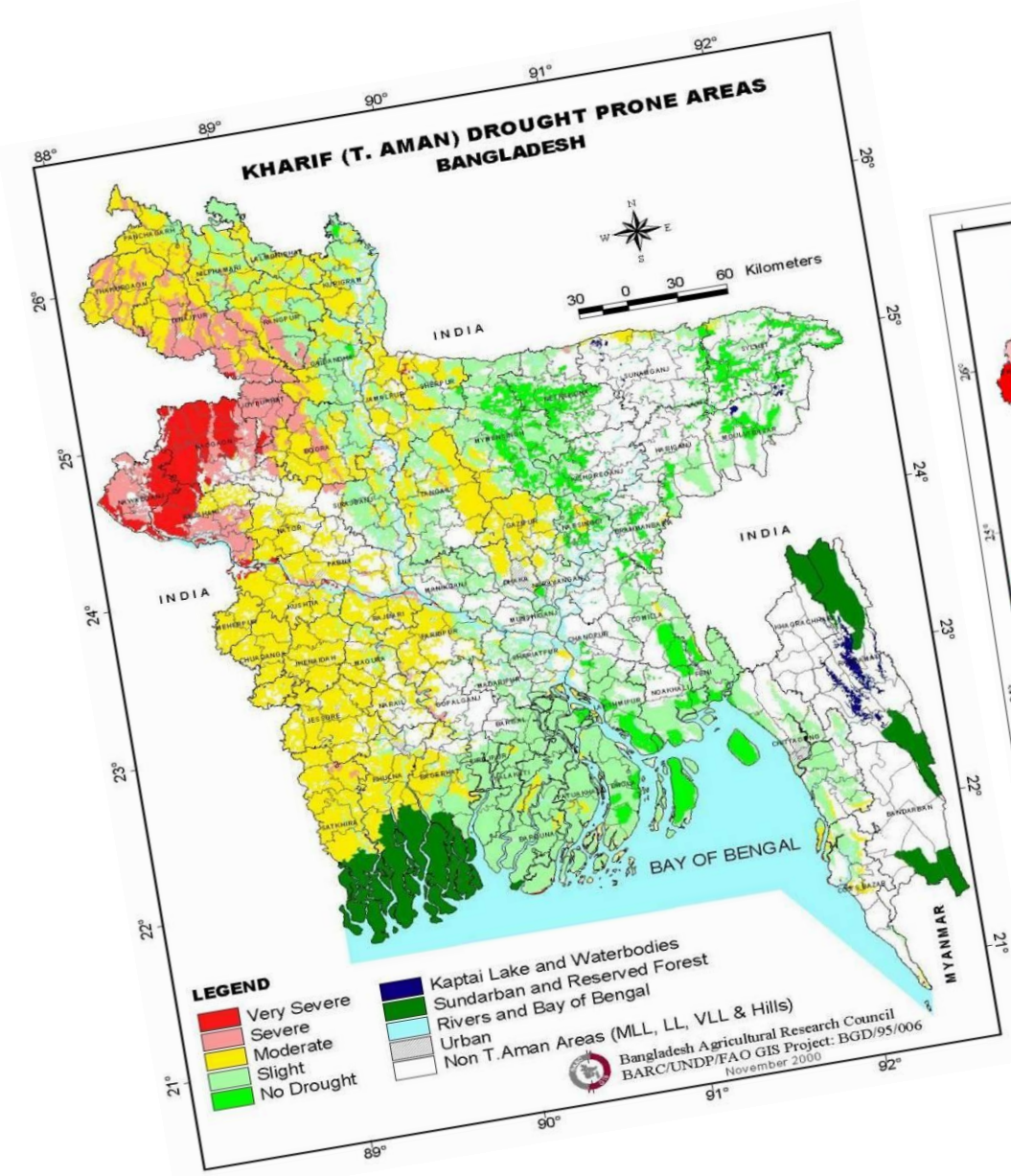
Rice cropping Cycle (days)	Stage	Drought intensity			
		1	2	3	4
0-10	Transplanting				
10-25	Establishment				
25-50	Active Tillering				
50-65	Panicle Initiation				
65-70	Flowering				
70-85	Ripening				
85-100	Maturity				
100-105	harvesting				

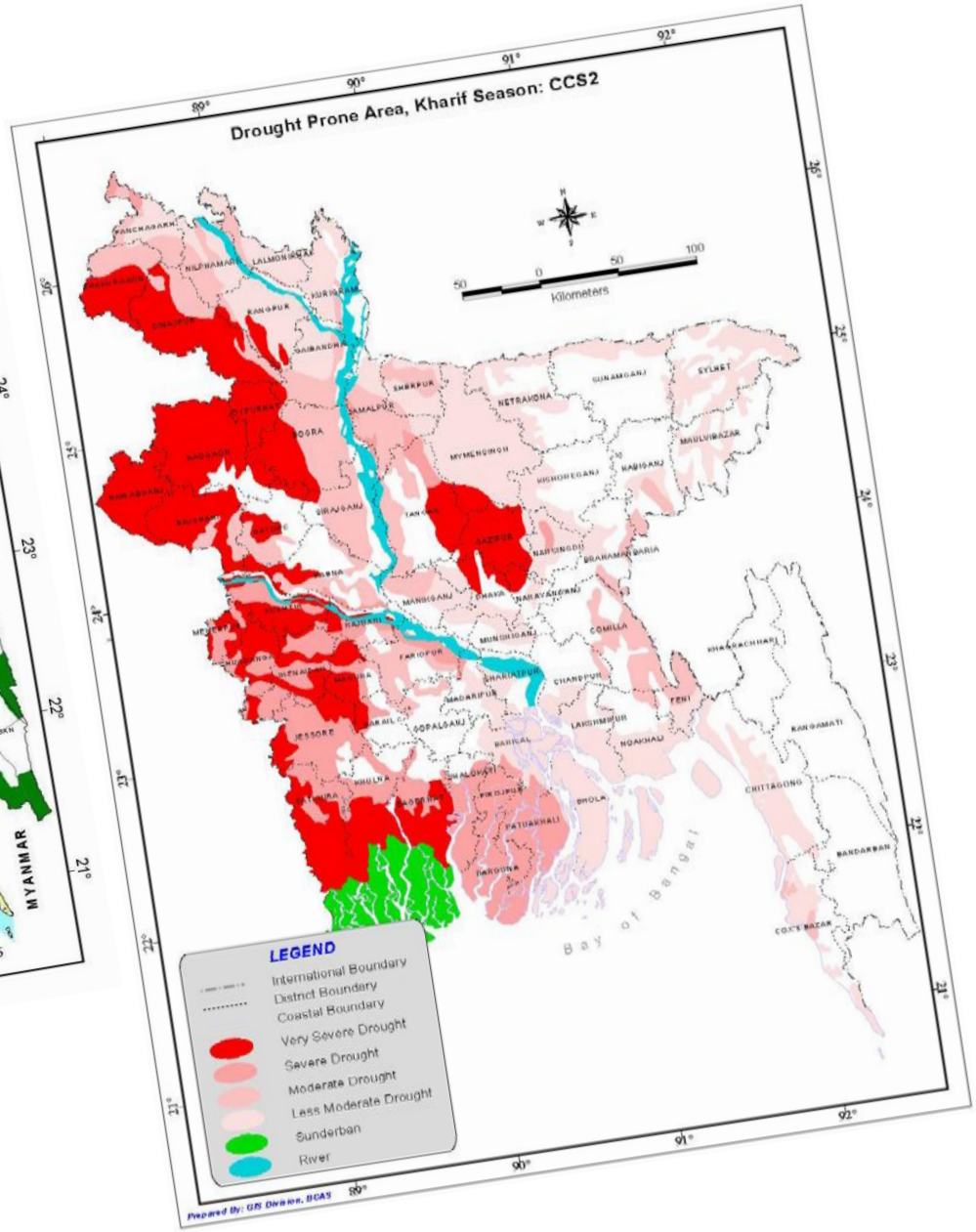


Likely impacts in the coastal areas

Primary Physical Effects / Agents of Change		Salt-water Intrusion	Drainage Congestion	Coastal Morphology	Cyclone and Storm Surges
Climate change (temperature, precipitation, evapo-transpiration)		+	+	-	+++
Changes of upstream river discharge	Peak	-	++	+++	-
	Low	+++	-	-	-
Sea level rise		+++	+++	++	++
Subsidence		++	++	++	++




KHARIF (T. AMAN) DROUGHT PRONE AREAS
BANGLADESH
INDIA
INDIA
INDIA
MYANMAR
BAY OF BENGAL
30 0 30 60 Kilometers
LEGEND
Very Severe
Severe
Moderate
Slight
No Drought
Kaptai Lake and Waterbodies
Sundarban and Reserved Forest
Rivers and Bay of Bengal
Urban
Non T.Aman Areas (MLL, LL, VLL & Hills)
Bangladesh Agricultural Research Council
BARC/UNDP/FAO GIS Project: BGD/95/006
November 2000

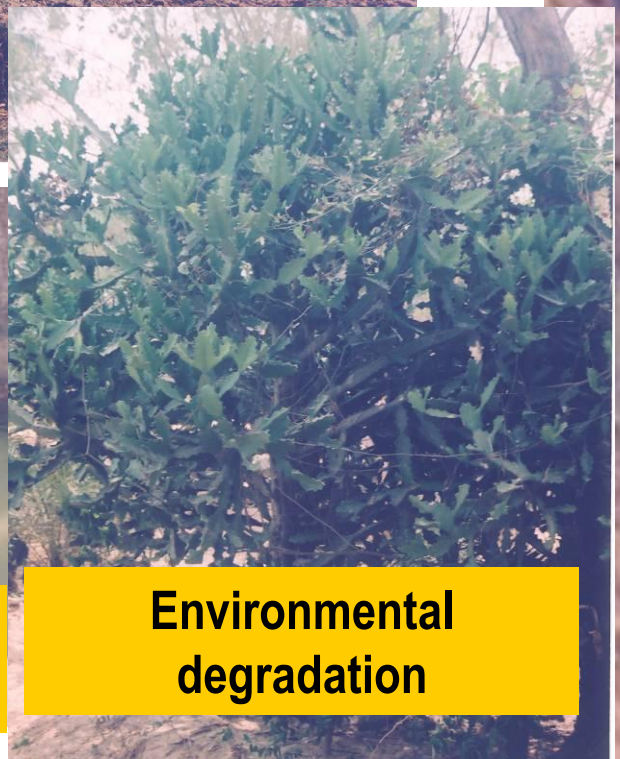

Drought Prone Area, Kharif Season: CCS2
50 0 50 100
Kilometers
LEGEND
International Boundary
District Boundary
Coastal Boundary
Very Severe Drought
Severe Drought
Moderate Drought
Less Moderate Drought
Sunderban
River
Bay of Bengal
Prepared By: GIS Division, BCAS

Analogy with past impacts

Agriculture/crops failure >> fallow land

Loss of livelihoods

Deterioration of water quality/fisheries

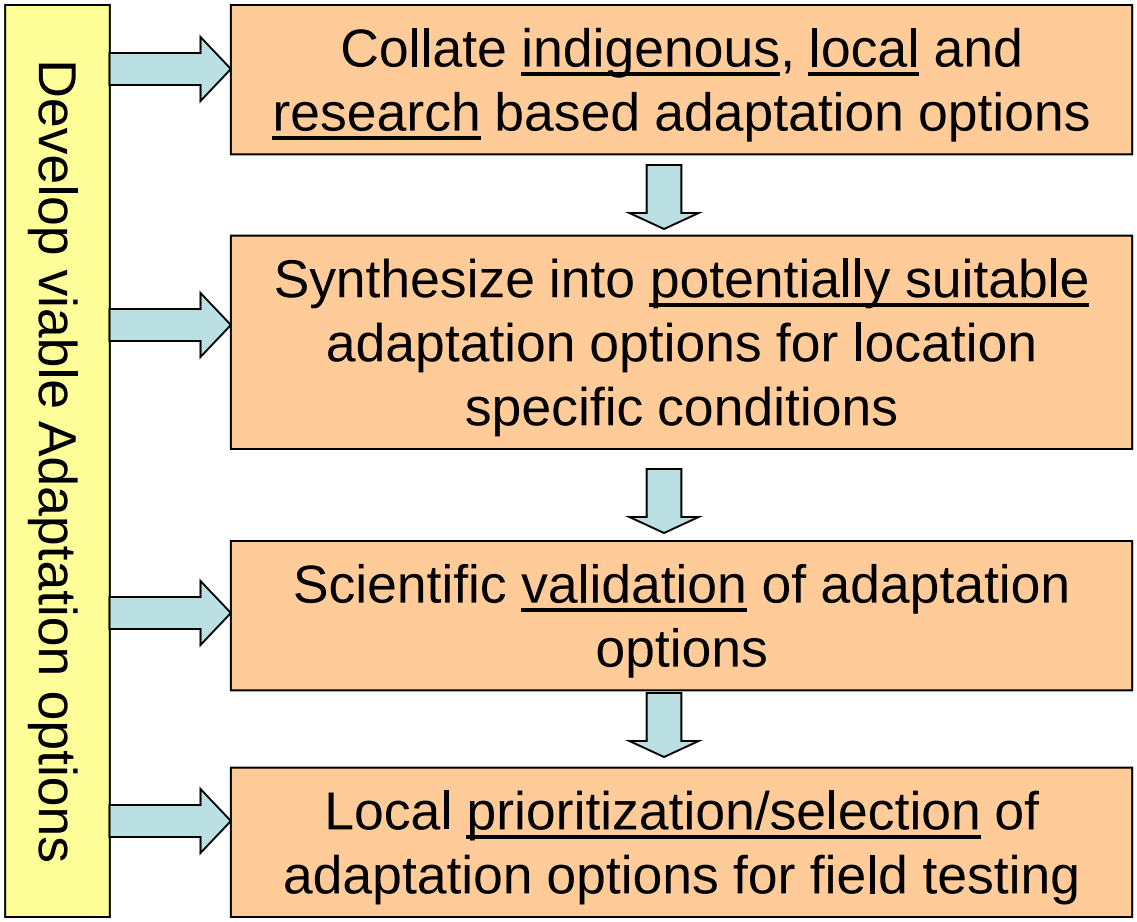


Environmental degradation

Livestock loss

Testing and Designing Adaptation options

Designing adaptation options

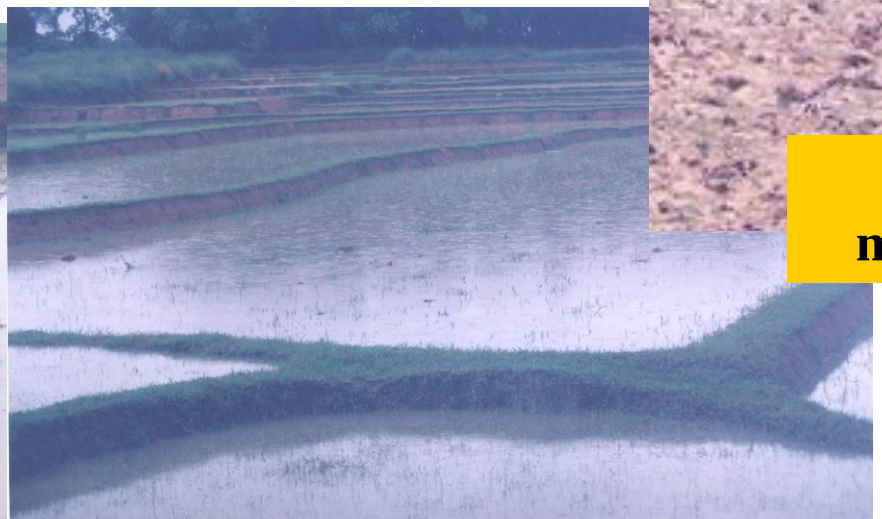


Made use of traditional measures

Pond/*khari*

Tillage, mulching(shedding)

***ayel* (bundh) raising**



Some farmers innovatively made use of the retained water

Agricultural adaptations

- Agronomic management
- Water harvesting and exploitation
- Water Use efficiency

- **Crop intensification and diversification**
- **Alternate enterprises**
- **Post harvest practices**

Field demonstration of prioritized adaptation options

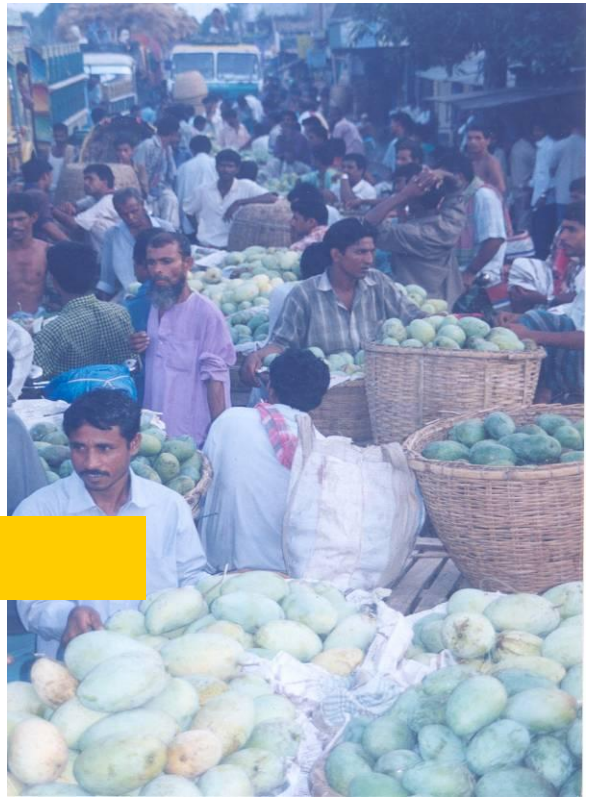

শুকনা পদ্ধতিতে আমনের বীজতলা স্থাপন
ফসলের নাম : শুকনা বীজতলা
জাত : সাদা স্বর্ণা
বপন/রোপনের তাং : ২৭/৫/০৬
গ্রাম : বাশবাড়ীয়া
প্লটের আয়তন : ১২ শতক
বাস্তবায়নে:
কৃষি সম্প্রসারণ অধিদপ্তর, জাতিসংঘের খাদ্য ও কৃষি সংস্থা


15 3:50PM


বসতবাড়ির আঙ্গীনায় বছরব্যাপী সবজীচাষ
কৃষকের নাম: মো: হাসান আলী
বাস্তবায়নে: সরেজমিন গবেষণা বিভাগ

Made use of alternative responses

Mango



Home gardening

Dual purpose (optimal use of water & plant)

Livestock and birds

(that consume less water)

Trying out coastal adaptation options

Innovative hydroponics

Saline tolerant varieties

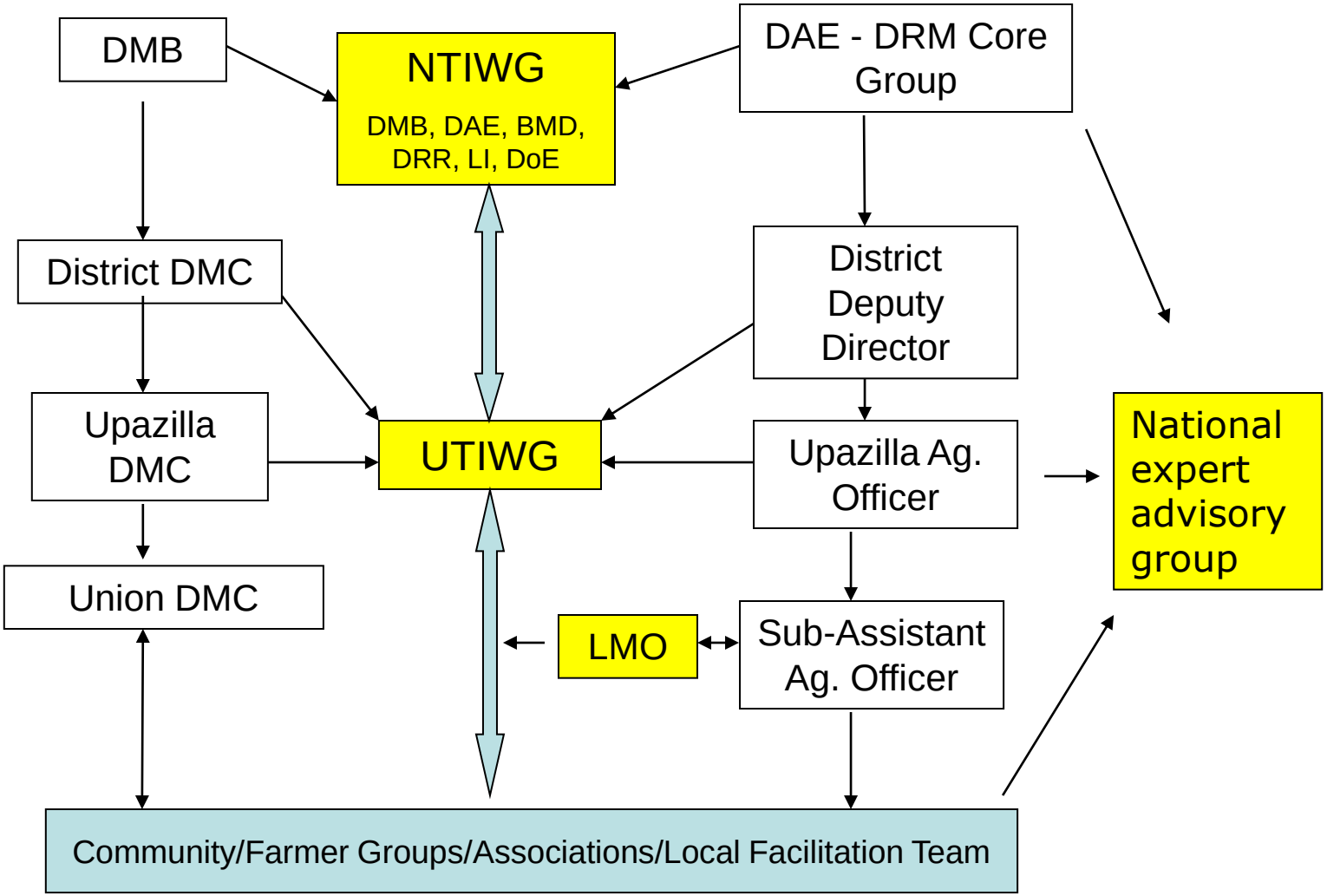
Minor structural adjustments

Cage fishing

More ducks than chicken

Institutional ambiguity

Strengthening Institutional set-up



Capacity Building

i) Climate risk and impact analysis

- climate risk analysis methods
- climate change impacts
- viable adaptation options

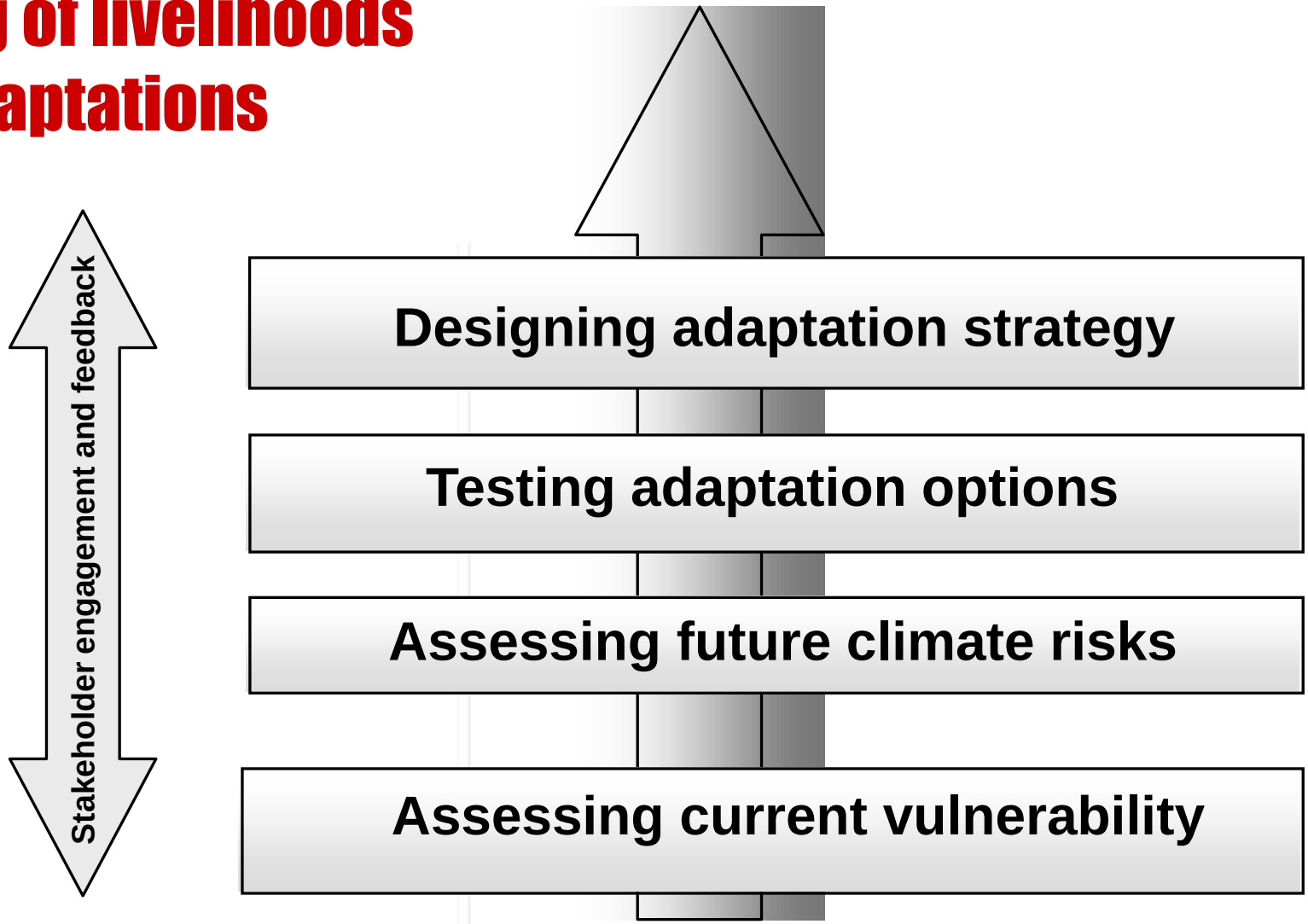
ii) Climate forecast applications trainings

- introduction to forecast products
- Application of weather and climate forecast products

Community mobilizations

- Community awareness raising
- Farmers groups mobilization
- Planning, action and monitoring demonstrations on farmers fields
- Capacity building and training sessions
- Community Risk reduction planning

Gradual systematic up-scalling of livelihoods adaptations



Some lessons

- **Development, DRR and CCA are integrated issues at the local level**
- **Moving towards adaptation requires a livelihoods perspective**
- **Institutional capacity building is key both at national and local levels**
- **We need comprehensive responses: "WHO does WHAT and HOW best ?"**
- **Value indigenous/local knowledge ; we need to build on those, and integrate it with external "know how"**
- **Engagement strategy is crucial and the "adaptive learning" at all levels is essential.**

Thanks