



Pakistan Meteorological Department



THE UNIVERSITY OF TOKYO

AWCI Training Workshop 15-17 Sep 2014, Islamabad-Pakistan

APN PROJECT-CBA2012-03NMY-RASUL
CLIMATE-WATER NEXUS OF PAKISTAN

by

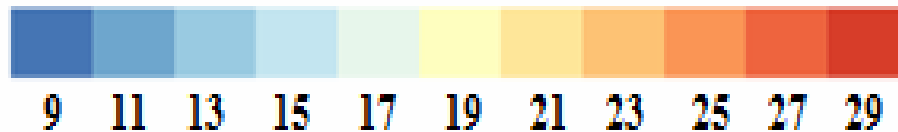
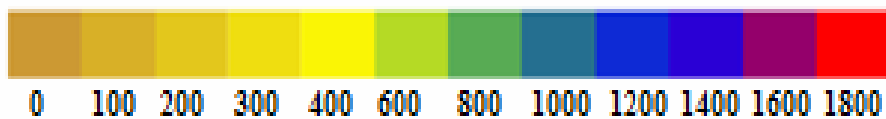
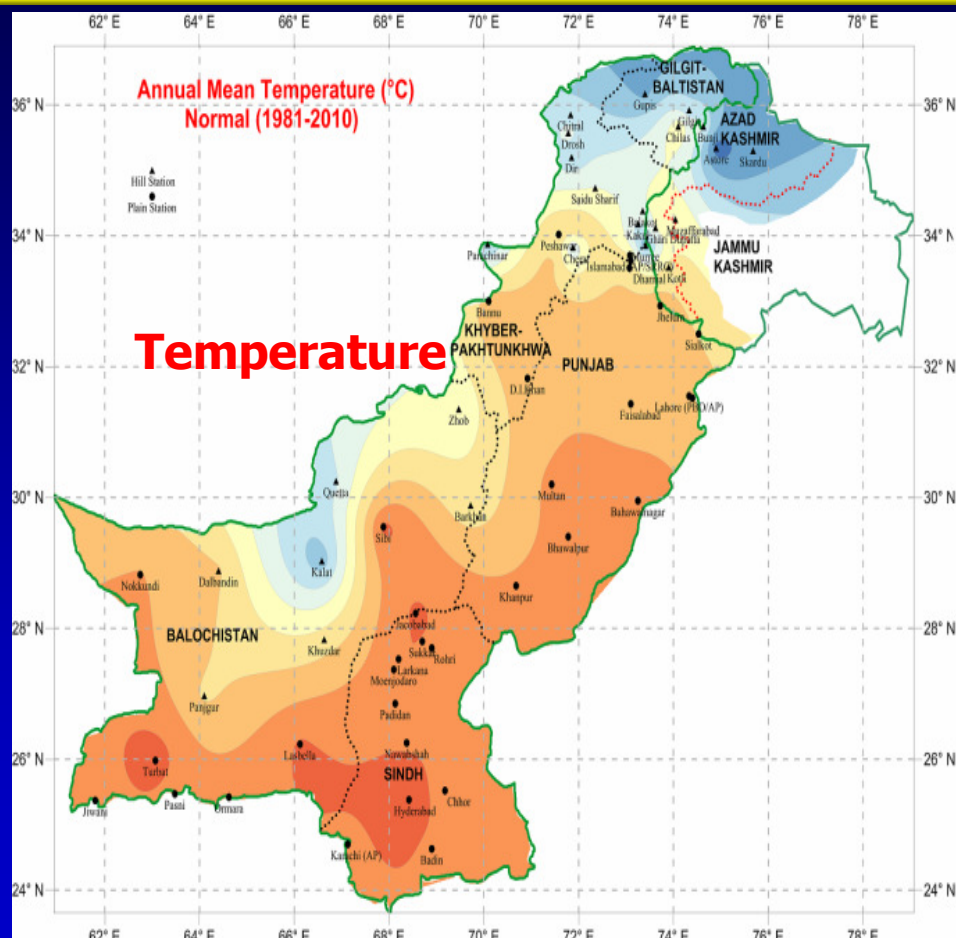
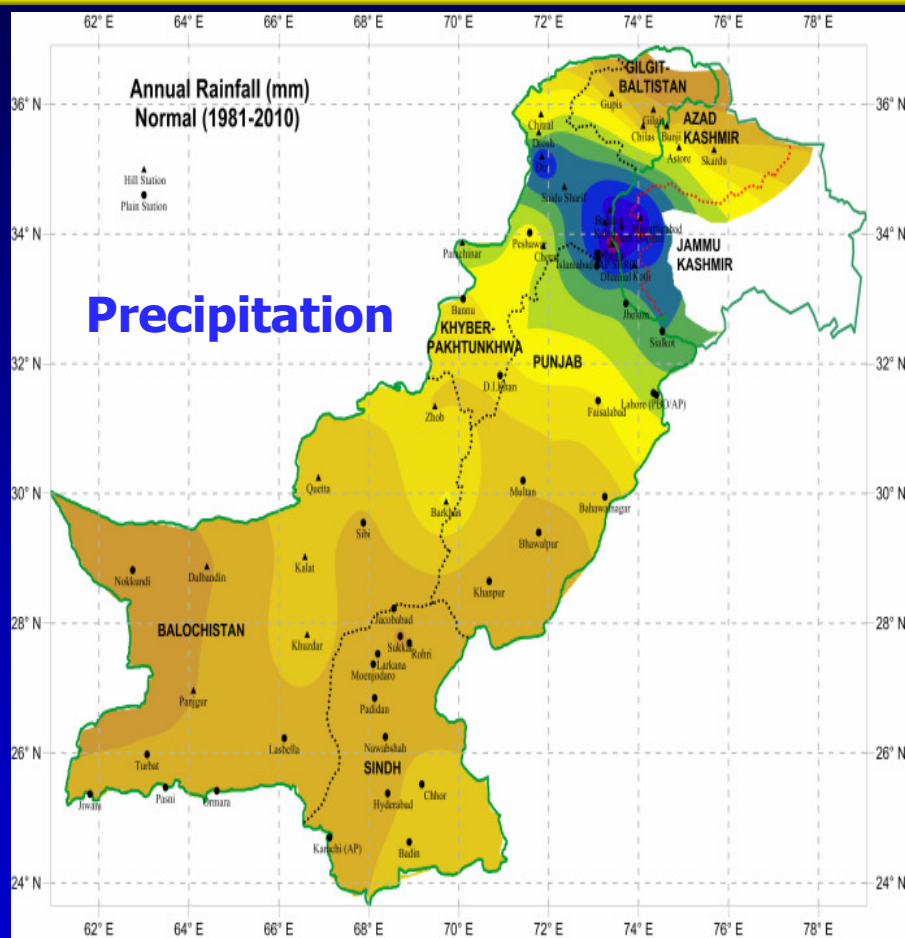
Dr. Ghulam Rasul

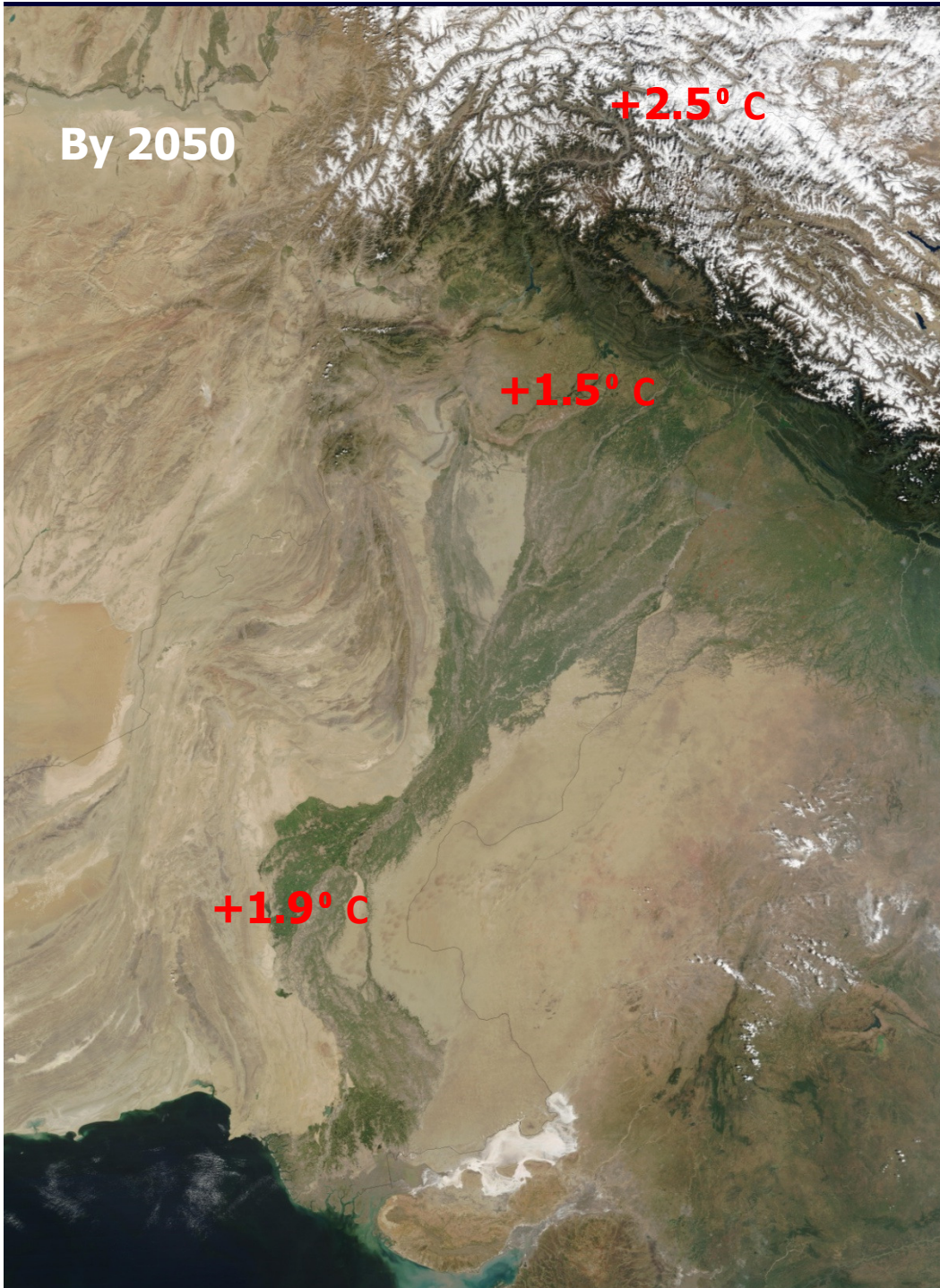
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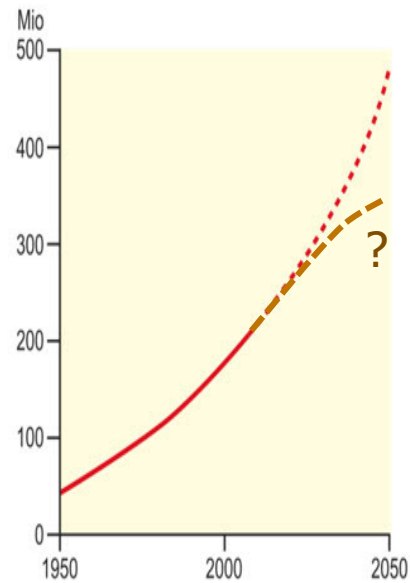
Climate of Pakistan (1981-2010)



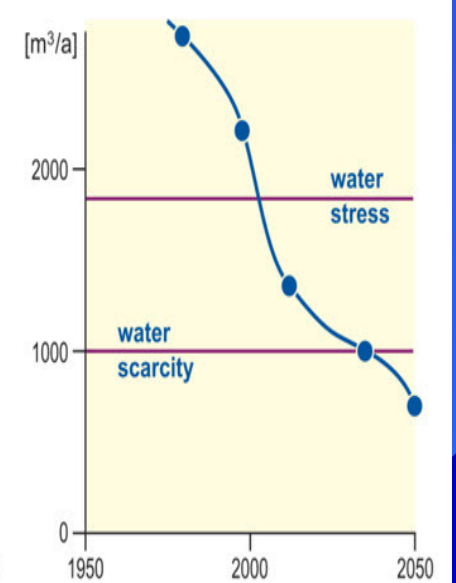


Indus River Basin: Water scarcity: a frightening perspective

Total Population of Pakistan



Water Availability per Capita



(Winiger, 2010)

Data: J. Briscoe, U. Qamar, 2006)

Challenges

- Frequent floods and drought inflict serious damages on socio-economic conditions
- Inadequate storage capacity of water in reservoirs from rain and snow/glacier to cater the needs of dry season.
- Depleting ground water reserves because of increased pressure on pumping for irrigation but lagging recharge
- Conventional adherence to high water demanding crops such as rice and sugarcane despite the water shortages
- Low efficiency of conventional irrigation system and least adoption of irrigation efficient techniques
- Lagging pace of research in developing new varieties best suited to the ongoing and future changes in climate
- Urbanization on the agricultural lands

Vision & Policy Interventions

- Construction of dams for flood control, irrigation and power generation
- Encourage local industry on water and energy saving equipment
- New agro-ecological zones has to be identified with recommendation of climate resilient crops
- Rain water harvesting, ponding and new irrigation efficient practices will be encouraged through subsidies
- Research communities to keep pace with climate change
- Climate policy of Pakistan (approved in 2012) will be implemented in letter and spirit

Ongoing Projects

1. **Impact of Climate Change on Melting Glaciers and Water Cycle Variability in Asian River Basin. Funding Agency - APN**
2. **Differentiation of solid and Liquid Precipitation in Upper Indus Basin (UIB) for Hydrological Models. Funding Agency: DFID**
3. **Strengthening Flood Forecasting Capabilities in Pakistan. Funding Agency: UNESCO**
4. **Climate Change adaptation in water and agriculture: IDRC and DFID funding**
5. **Early Warning System for Glacial Lake Outburst Floods (GLOF) in UIB. Funding Agency: UNDP**
6. **Flash Flood Guiding System for South Asia: Funded by HRC and WMO**
7. **Demonstration of adaptation technologies at watershed scale. USAID funding**
8. **AgMIP Pakistan Project for Inter-comparison of Climate, Agriculture and Economic Models. USA**

Impact of Climate Change on Glacier Melting and Water Cycle Variability in Asian River Basins

- To improve climate change assessment and downscaling techniques;
- Building the capacity of member countries for climate projections;
- Training of professionals to apply WEB-DHM-S (Hydrological Model);
- Assessment of glacier melt and hydrological regime shift in the light of climate change scenarios;
- Assessment of water cycle variability and development of drought early warning system.

APN Project Activities

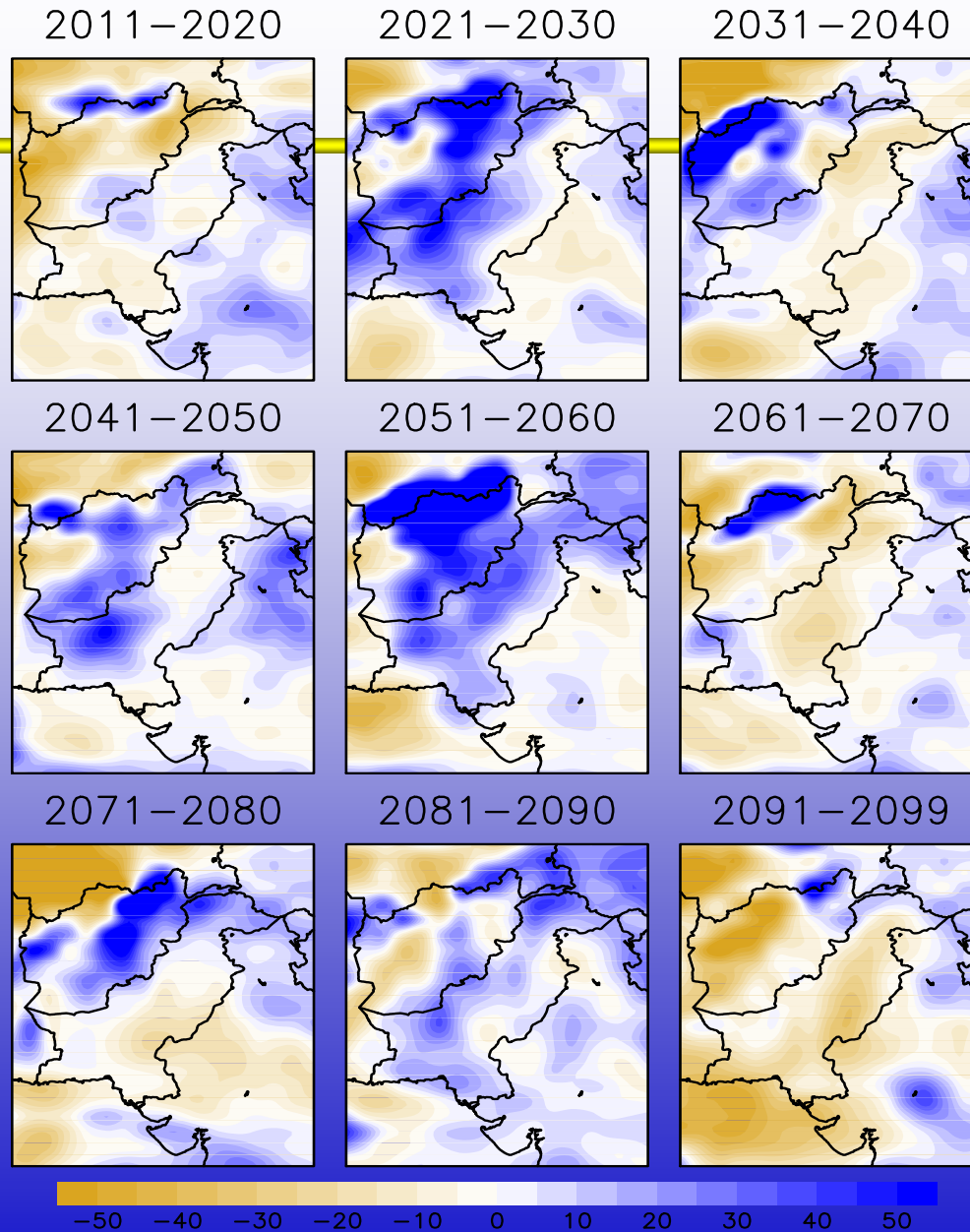


AWCI Training Course on Improved Bias Correction and Downscaling Techniques for Climate Change Assessment/Drought Indices

Tokyo, Japan, 18 – 20 June 2013



% Change of Monsoon Rainfall Under RCP 4.5



Global AgMIP Project at University of Agriculture Faisalabad

Solution to the Problem

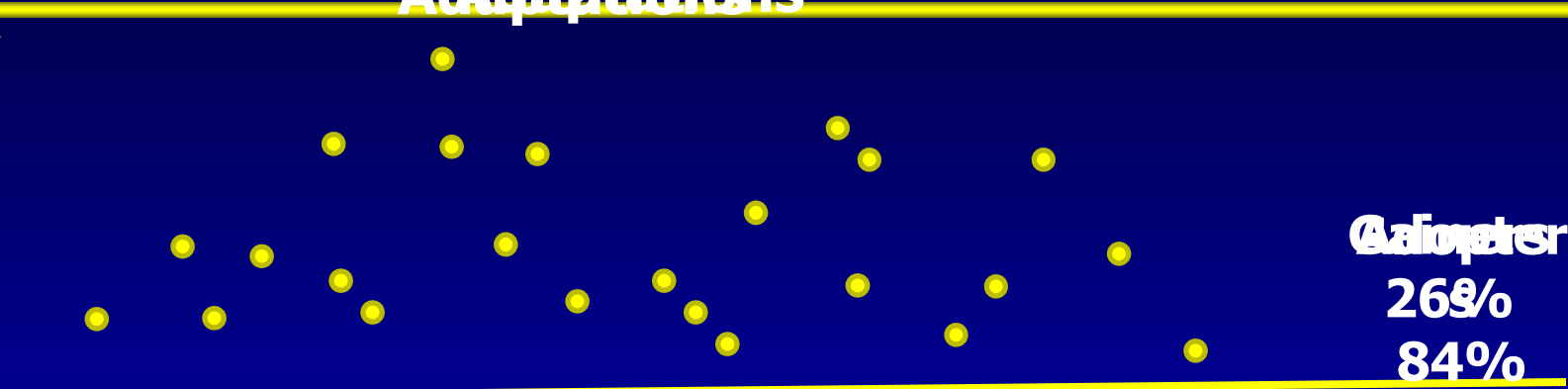
- A Comprehensive adaptation package was developed by combining
 - Bio-physical factors
 - Policy change
 - Socio-economic factors
 - Information Technology and others



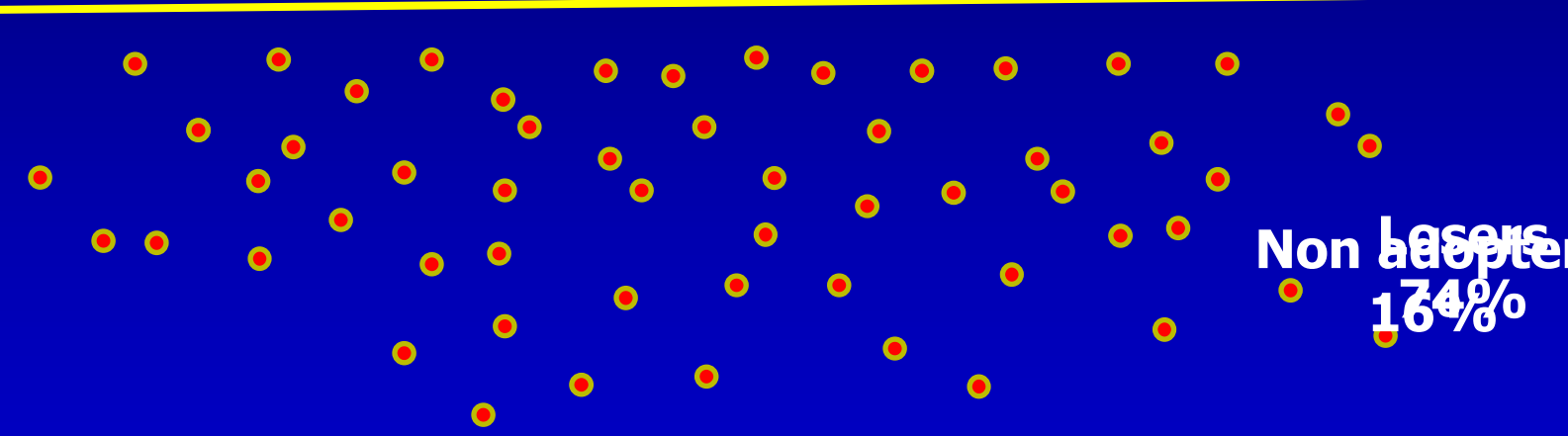
After Adaptations
Before Adaptations

Losses (Rs)

0



Adopters
26%
84%



Non-adopters
16%
74%

Farm Population (%)



Create awareness



Need for effective adaptation policy

Roles & Responsibilities

Practicing Community

- Actions
- Adjustments
- Management

Government

- Strengthen the Institutions
- Policy Support
- Infrastructure Development

Responsibilities

Society

- Awareness
- Public-private partnership
- Capacity Building

Global Partnership

- Sharing the Ideas
- Bearing the responsibilities
- Trade

Thank You

