

Organisers:



Event partners:



Practitioners' and Policy Makers' Exchange on Climate Change Adaptation in Agriculture

Myanmar

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Ministry of Agriculture and Irrigation

30 Aug – 1 Sept 2010

**Practitioner's and policy-makers exchange on
climate change adaptation in agriculture**

1. Major crop agricultural industries and production systems

- Myanmar : Seven States – hilly regions
- Seven Divisions – plain areas

1. Northern Mountain
2. Western Mountains: 2000-5800 m
3. Shan Plateau: >2000 m
4. Central Basin
5. Coastal Strips



- Country area **676,557** Km², stretches from N-S and lies between latitudes 9° 32' N to 28° 32'N and longitudes 92° 10' E to 101° 11'E.
- Population at **57.5** Millions,
- Growth rate of 1.75 %, **135** nationalities

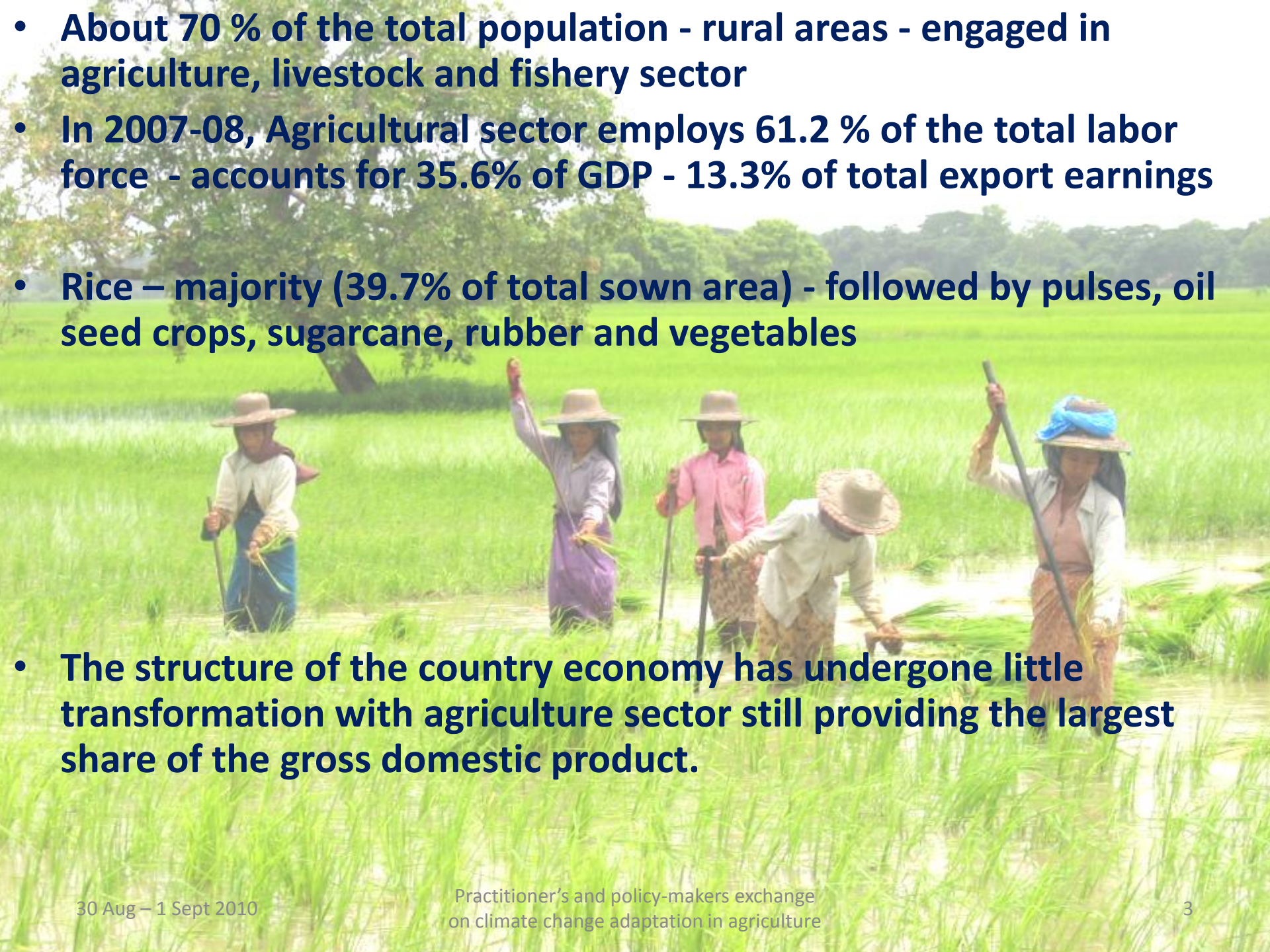
Agro-Ecological Zones:

Deltaic, Central Plain: Rice, Oilseeds and Pulses

North and North-East Hilly : Corn, Soybean, Fruit trees, Vegetables

Coastal: Rubber and Oil palm

- **About 70 % of the total population - rural areas - engaged in agriculture, livestock and fishery sector**
- **In 2007-08, Agricultural sector employs 61.2 % of the total labor force - accounts for 35.6% of GDP - 13.3% of total export earnings**
- **Rice – majority (39.7% of total sown area) - followed by pulses, oil seed crops, sugarcane, rubber and vegetables**
- **The structure of the country economy has undergone little transformation with agriculture sector still providing the largest share of the gross domestic product.**



Agricultural Impacts of Climate Change



Technological advances - second half of the 20th century - weather and climate -key factors in determining agri. productivity

Agriculture - one of the most vulnerable sectors affected by Climate Change

Related phenomena - fluctuations in temp., rainfall, water availability, pests, disease, extreme weather events, - substantially affect - potential of agricultural production

2. Current and emerging climate-related threats/risks to food security

Possible Disasters in Myanmar

Type of Hazards

Affected Areas

Hydro-meteorological Hazards

- Cyclones, Tropical storms, Storm surges and Tsunamis
- Heavy rain and flood
- Land slides
- Droughts
- Earthquakes
- Fire

Coastal regions
(Rakhine, Ayeyarwaddy)

Across the country

Hilly regions

The whole country

Significant regional variations: South-west monsoon rains

Coastal, Rakhine & Tanintharyi: 4000-6000 mm

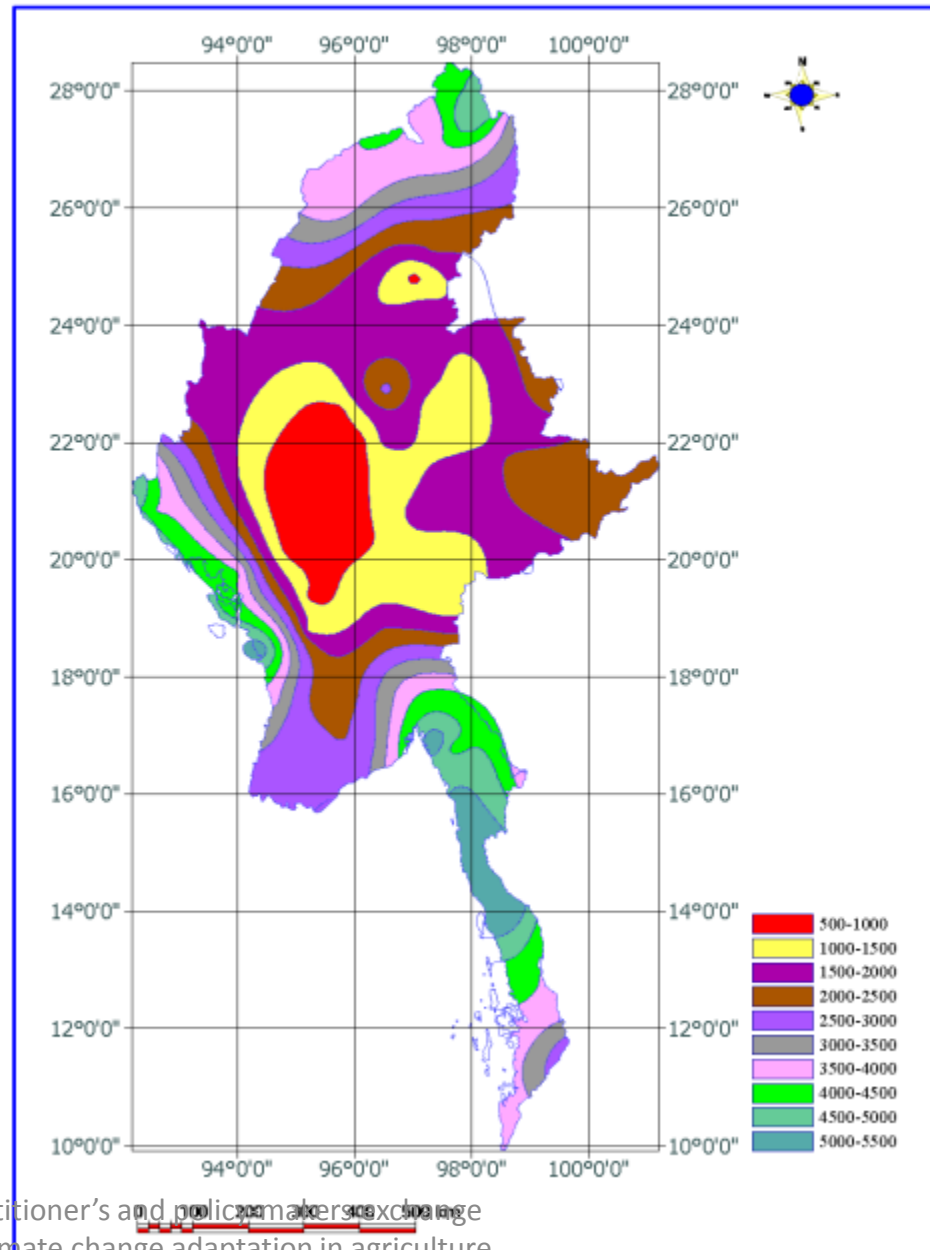
Central : 500-1000 mm/ yr

Ayeyarwady: 2000-3000 mm

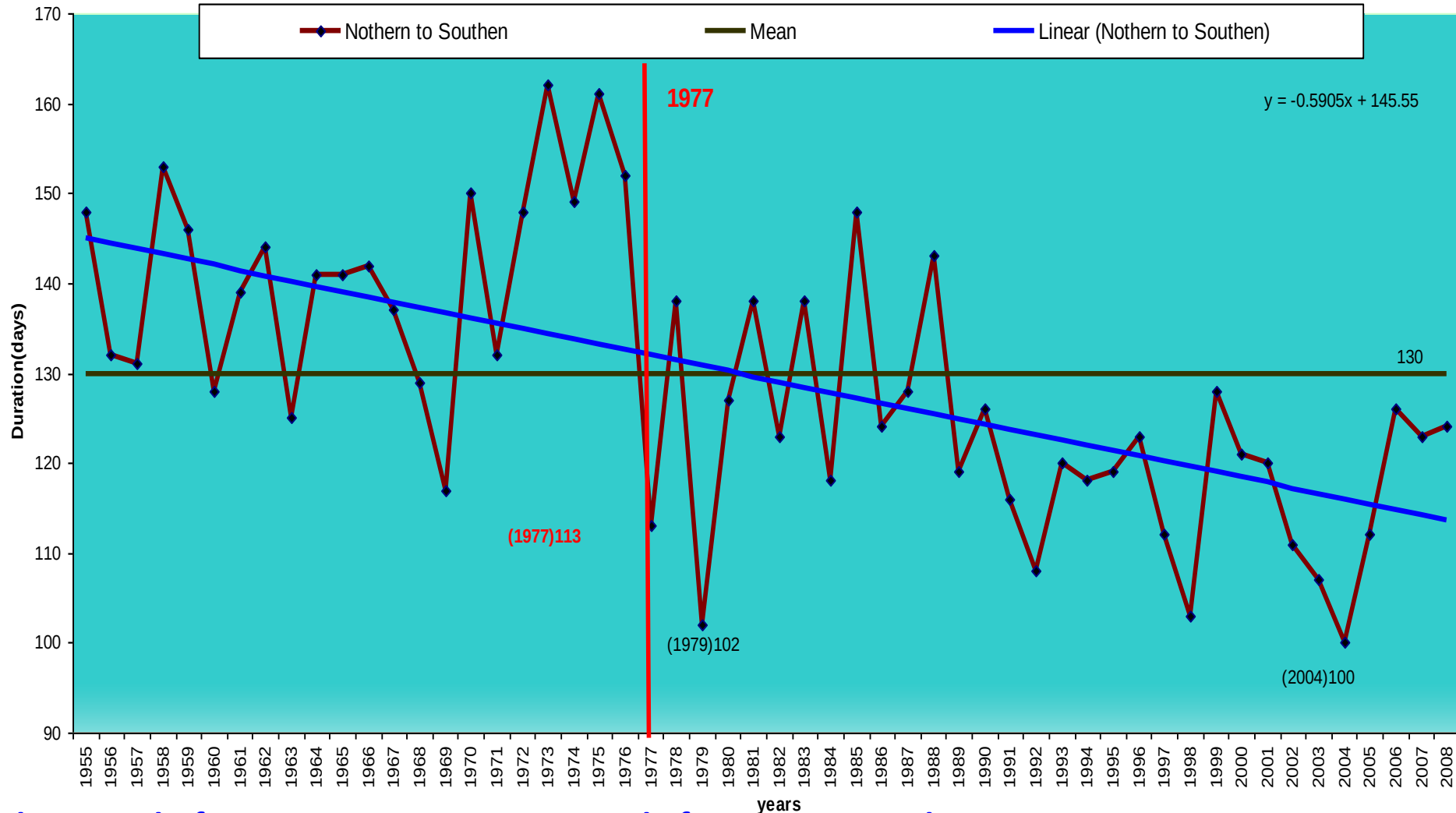
Shan : 1000-2000 mm

In Myanmar, the observations indicated that the climate change is taking place in the southwest monsoon features, in the field of temperature, precipitation, extreme climate and severity of disasters.

Normal Rainfall in Myanmar



Duration of Monsoon since Onset in Northern till Withdrawl from Southern Myanmar Areas(1955-2008)

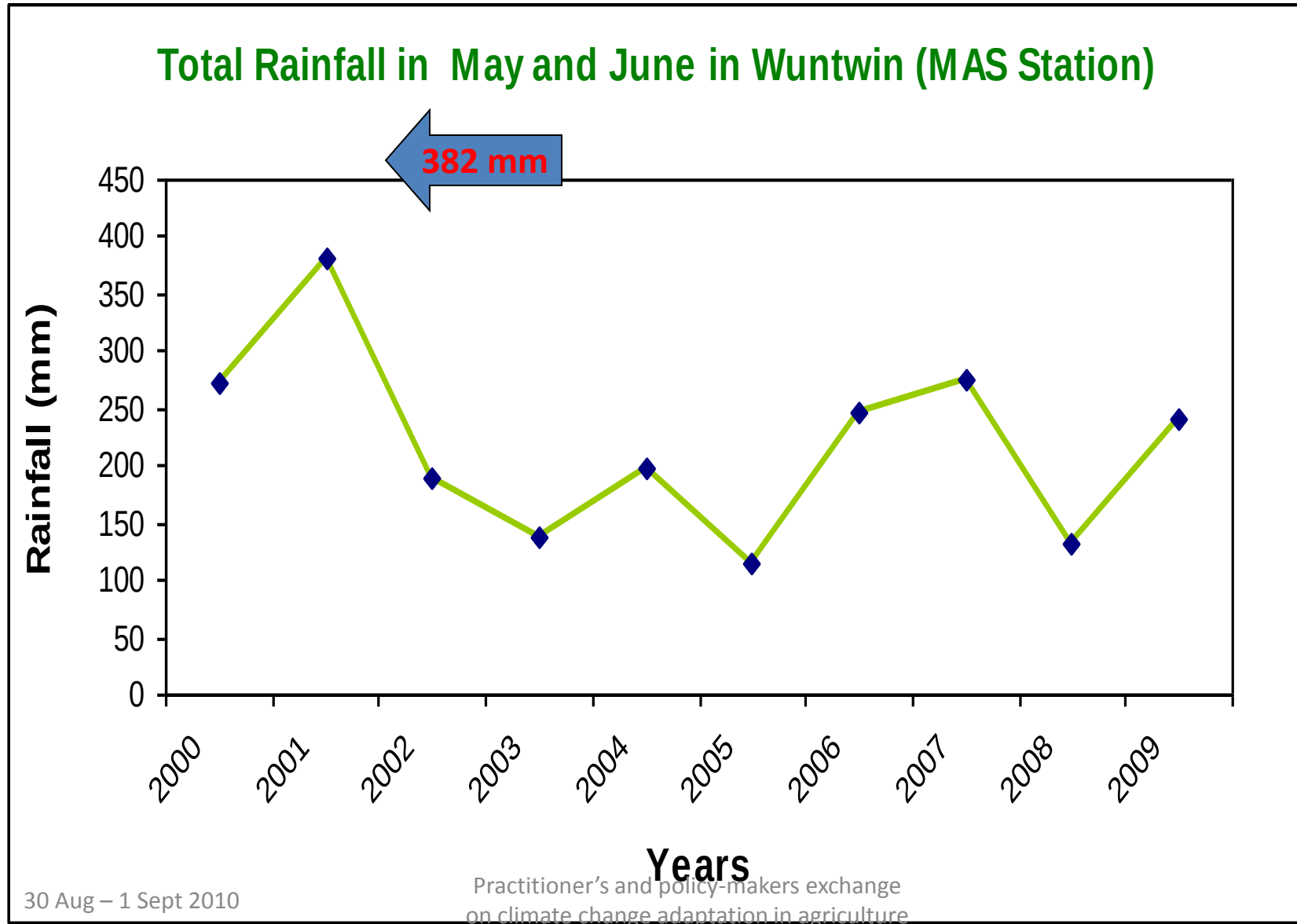


The years before 1977 were wet years and after 1977 were dry years.
Both the two fields –heat indices and annual rainfall showed a good agreement in phase change in 1977.

Most El Nino years occurred in 1980s and 1990s.

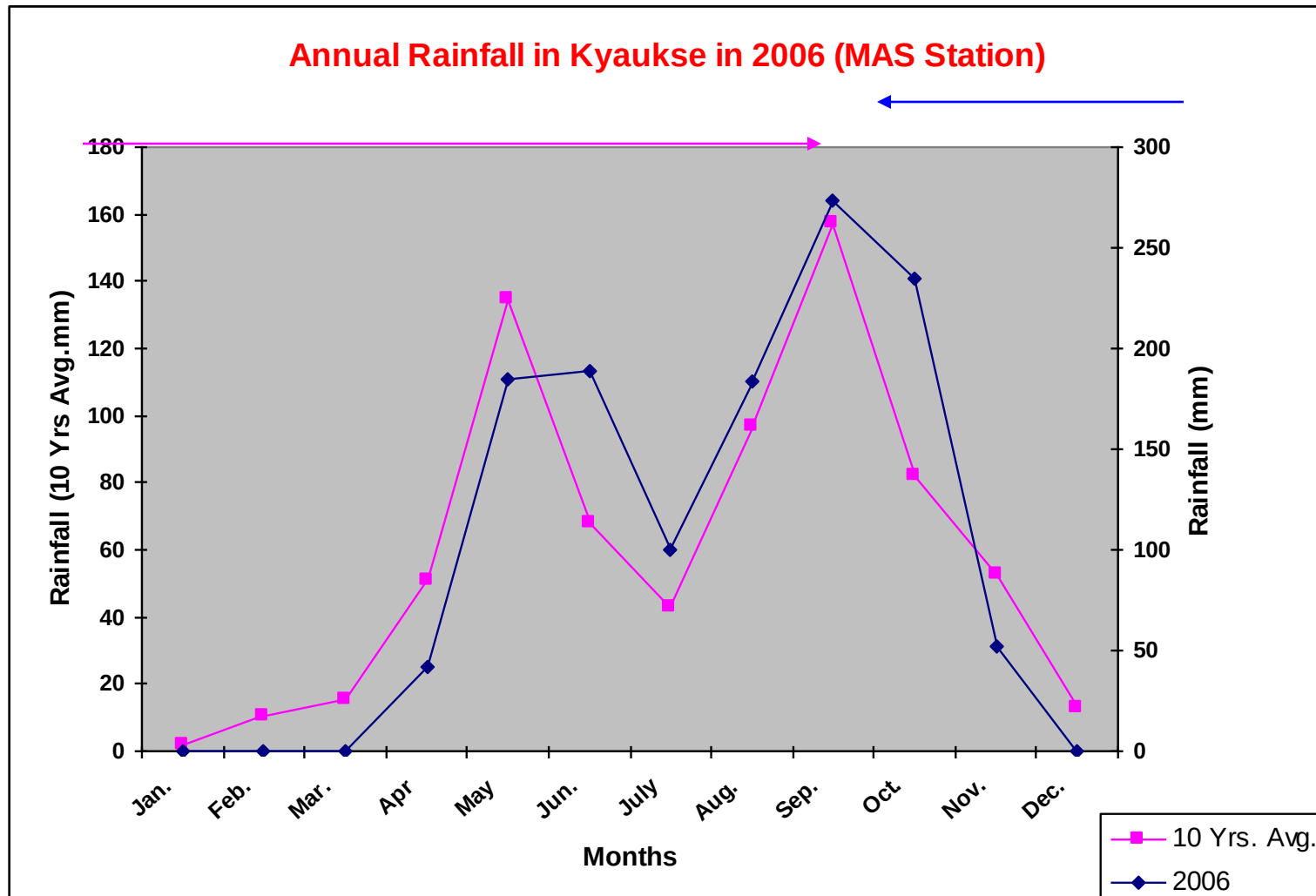
Case Study 1: Wuntwin Township, Central Myanmar

Wuntwin Creek Flash Flood: June 6, 2001

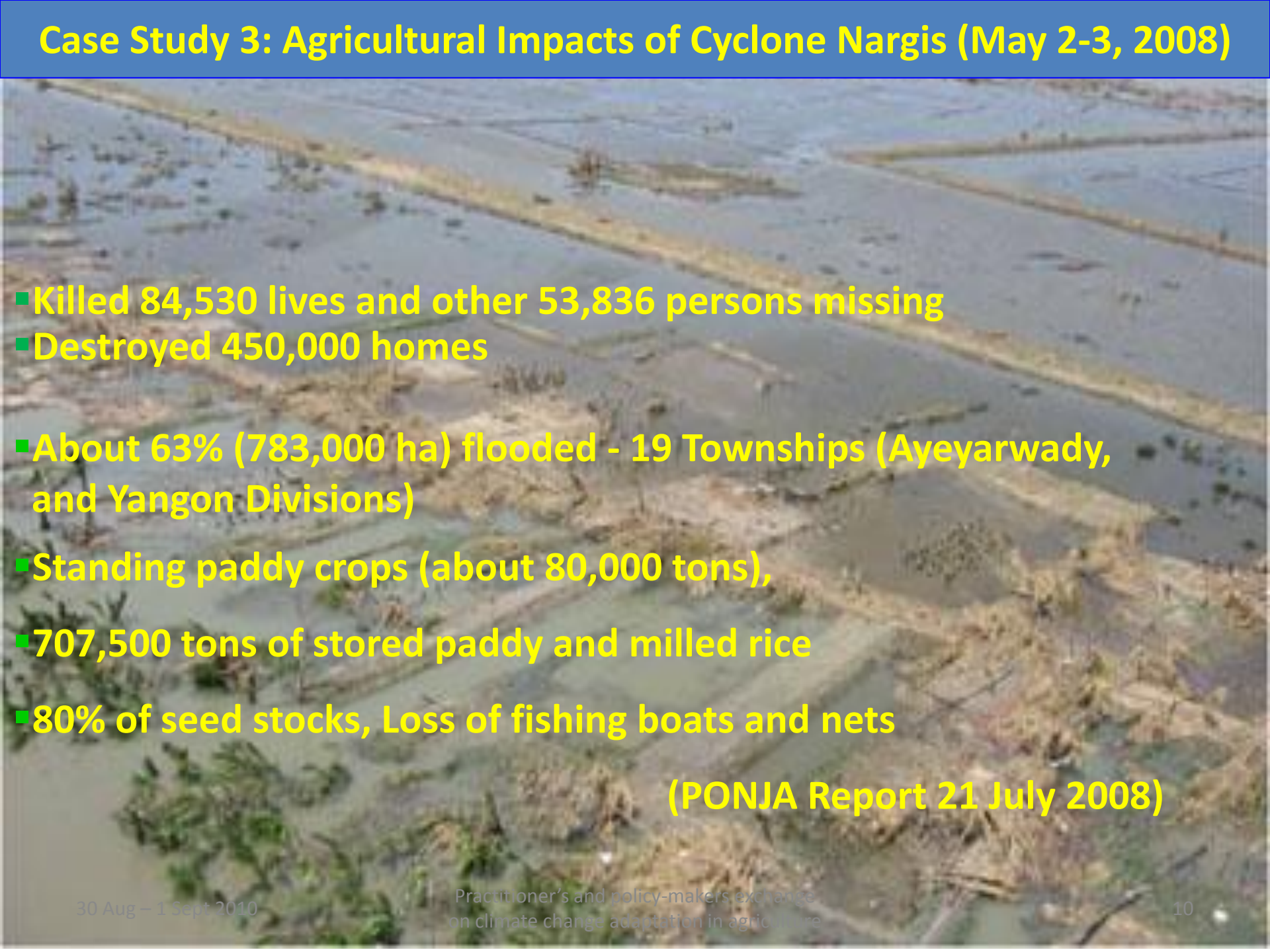


Case Study 2: Kyaukse Township, Central Myanmar

Zawgyi River Flood: October 2006



Case Study 3: Agricultural Impacts of Cyclone Nargis (May 2-3, 2008)

- 
- Killed 84,530 lives and other 53,836 persons missing
 - Destroyed 450,000 homes
 - About 63% (783,000 ha) flooded - 19 Townships (Ayeyarwady, and Yangon Divisions)
 - Standing paddy crops (about 80,000 tons),
 - 707,500 tons of stored paddy and milled rice
 - 80% of seed stocks, Loss of fishing boats and nets

(PONJA Report 21 July 2008)



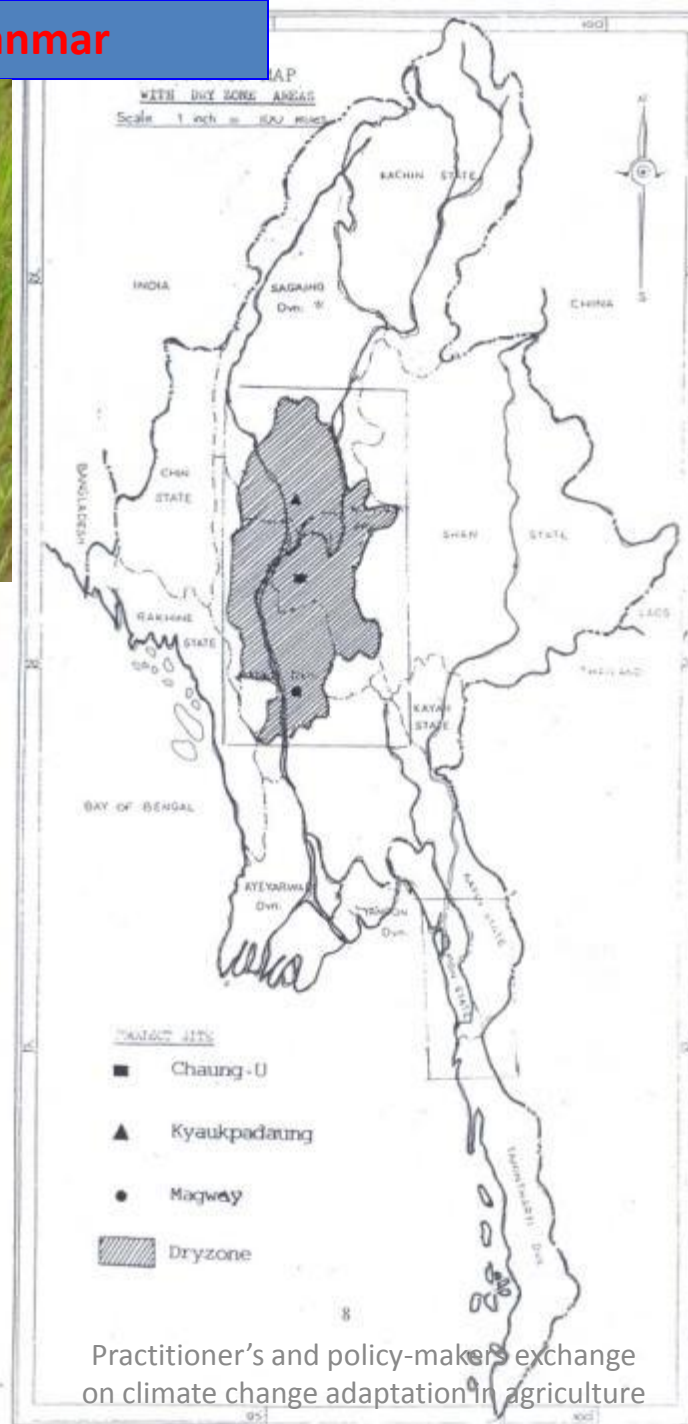
- Draft animals killed: 50% of buffaloes
- More than 80% of rural households have lost livelihood assets, farm implements
- Sea water intrusion to paddy fields

Lessons learnt from Nargis

- Highlighted Myanmar's extreme vulnerability to high impact natural hazards
- Need for the country to undertake actions for reducing disaster risks and adaptation measures
- Protecting individuals, families and communities -particular focus - vulnerable groups
- Unless - needs of poor -most vulnerable are addressed – adaptation, mitigation options - fail



Dry Zone, Central Myanmar

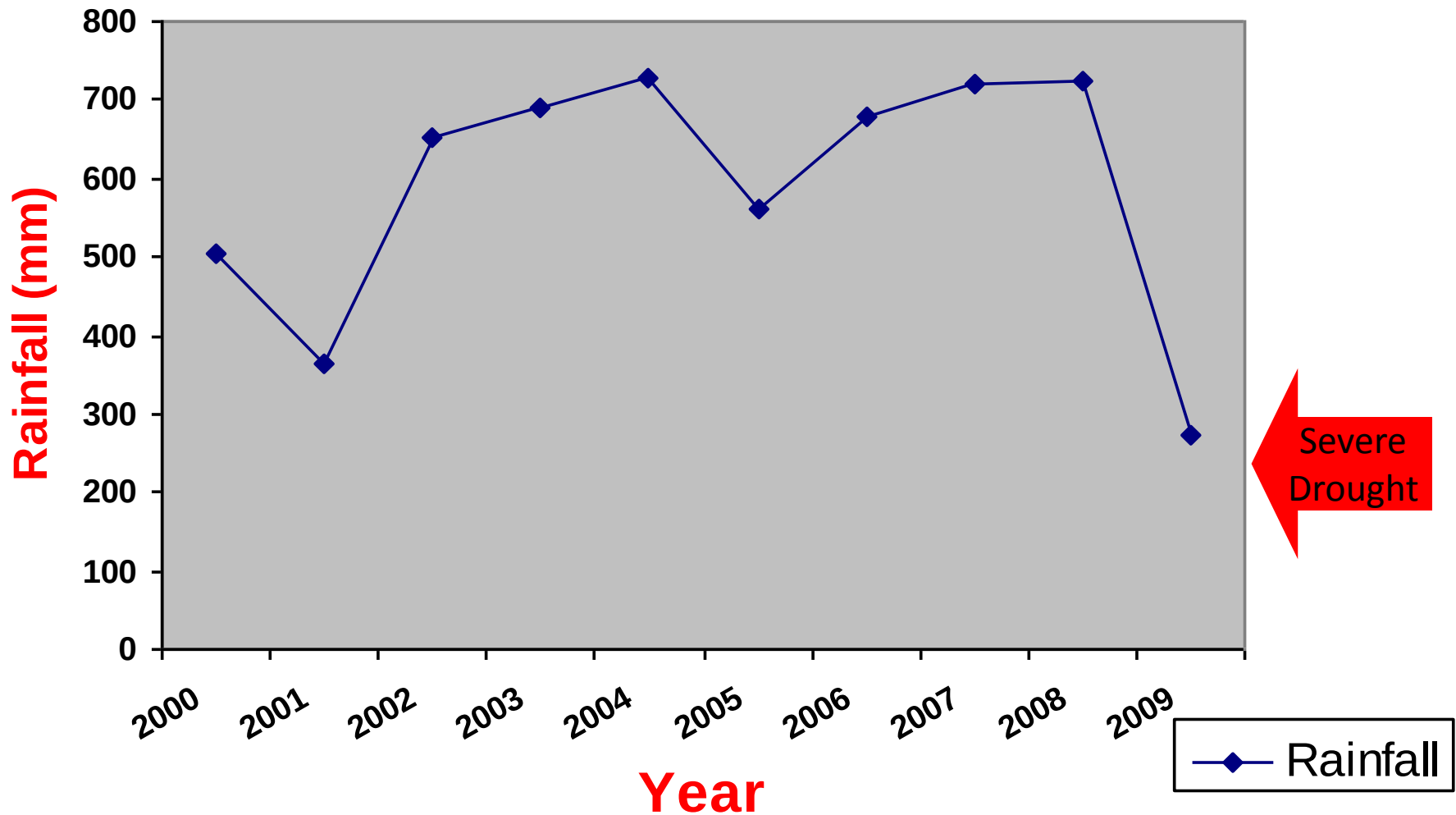


Drought-prone areas in Myanmar



Dry zone area of Sagaing, Mandalay, and Magway Division: in association with wind erosion, drought, dependent solely on irrigation for year round production

Annual Rainfall in Nyaungu Agricultural Research Farm



Potential Impact of Drought on Agriculture and Food Security



Rice plants harvested for cattle feed

Survey trip in Nov. 2009

- Lepyinthar village, Yamethin Township, Central Myanmar – lower rainfall than usual
- Rain-water is insufficient for paddy and upland crops cultivation



Cattle grazing in the rice fields

Chronic food insecurity, livelihood and vulnerability analysis

Impact of Drought on Agriculture



Dry seeding of rice under rain fed ecosystem



Rice seedbed with lack of rain-water



Meikhtila – Nyaungu Highway

Sorghum and Groundnut plants are waiting for rain

3. Existing risk management and adaptation efforts

Traditional Adaptation Strategies to Combat Drought in Dry Zone, Myanmar

1. TIMELY LAND PREPARATION

Water Harvesting Technology in Central Myanmar, Dry Zone

Enhancing innovative dry land farming system
enhancing crop-water use efficiency

Frequent Ploughing and Harrowing
while waiting for the sufficient rain

Traditional Adaptation Strategies to Combat Drought in Dry Zone, Myanmar

2. FREQUENT INTERCULTIVATION

Nyaung-u Township, Central Dry Zone June, 2010

Inter-cultivation kills the weeds and holds soil moisture

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Traditional Adaptation Strategies to Combat Drought in Dry Zone, Myanmar



3. MIX CROPPING AND INTERCROPPING

Groundnut with chili



Groundnut with sesame



Sunflower, corn and sesame

Mix or intercropping - not to lose the entire crops

Adaptation for drought: Mix-cropping (crop diversification) is common with low input technology in Central Myanmar

Traditional Adaptation Strategies to Combat Drought in Dry Zone, Myanmar

**Crop Rotation in Central Myanmar:
Black gram after rice**

**Zero tillage or incomplete tillage for
conservation of residual soil
moisture: Post monsoon season
black gram after rice harvest**



4. ZERO TILLAGE FOR CROP ROTATION



Leway Township, January, 2010

**Sun-drying of the harvested rice
on the bunds**



Blackgram growing just after rice harvest

Traditional Adaptation Strategies to Combat Drought in Dry Zone, Myanmar

5. TIMELY SOWING

Traditional water harvesting practice in Magwe Division, Central Myanmar



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Land Preparation at very early morning for timely seeding of peanut and sesame

Traditional Adaptation Strategies to Combat Drought in Dry Zone, Myanmar



Sintewa Creek, Nyaungu – Myingyan highway, Magwe Division, April 2009

When the creek dries up, some vegetables like onion are grown in pre-monsoon season

6. GROWING ON ALLUVIAL SOIL WHEN WATER IS RECEDED



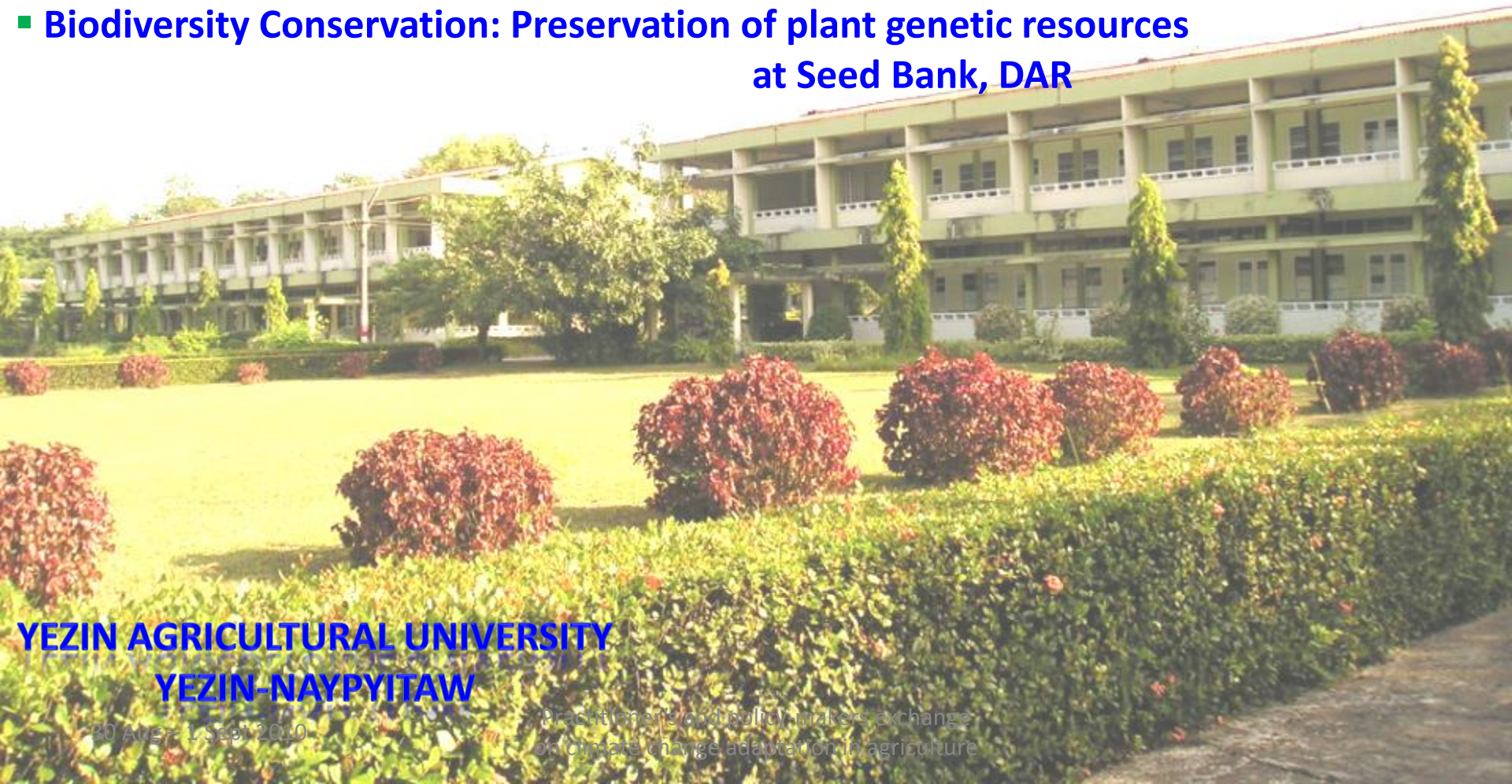
Potato plantation: irrigation with underground water





Current Research Projects in Yezin agricultural University and Department of Agricultural Research

- Research Thesis: Post-graduate Programs
- Breeding programs: Salt-tolerant varieties (Rice)
Drought –tolerant varieties (Groundnut and
Sesame)
- Biodiversity Conservation: Preservation of plant genetic resources
at Seed Bank, DAR



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National Medium-Term Priority Framework (NMTPF) 2010-2014 for MOAI



Yindaw Tank under maintenance of earth embankment, Pyawbwe Township, supply potable water for local consumption and for agricultural purpose



Paypin Lake Kong-taung Village, Thazi Township

- Renovation of existing dams/ embankments built in the time of Myanmar monarchs
- Proper management of water storage



National Medium-Term Priority Framework (NMTPF) 2010-2014 for MOAI

- Construction of new reservoirs or dams
- Diversion of water from streams and creeks



Groundwater Irrigation Project, Meiktila and Thazi Townships, Central Dry Zone

July 2010



Apyauk Village



Water Resource Utilization Department:

Tradle-pump to fetch the ground water from a tube well: Shallow tube wells - 30 m

**Efficient utilization of ground water
Supplementary Water for growing rice, cotton and water chesnut,**

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Promoting ecosystem based-adaptation



Ground-water Irrigation Project more common after 2000



Kontaung Village Thazi Township, Central Myanmar, July 2010



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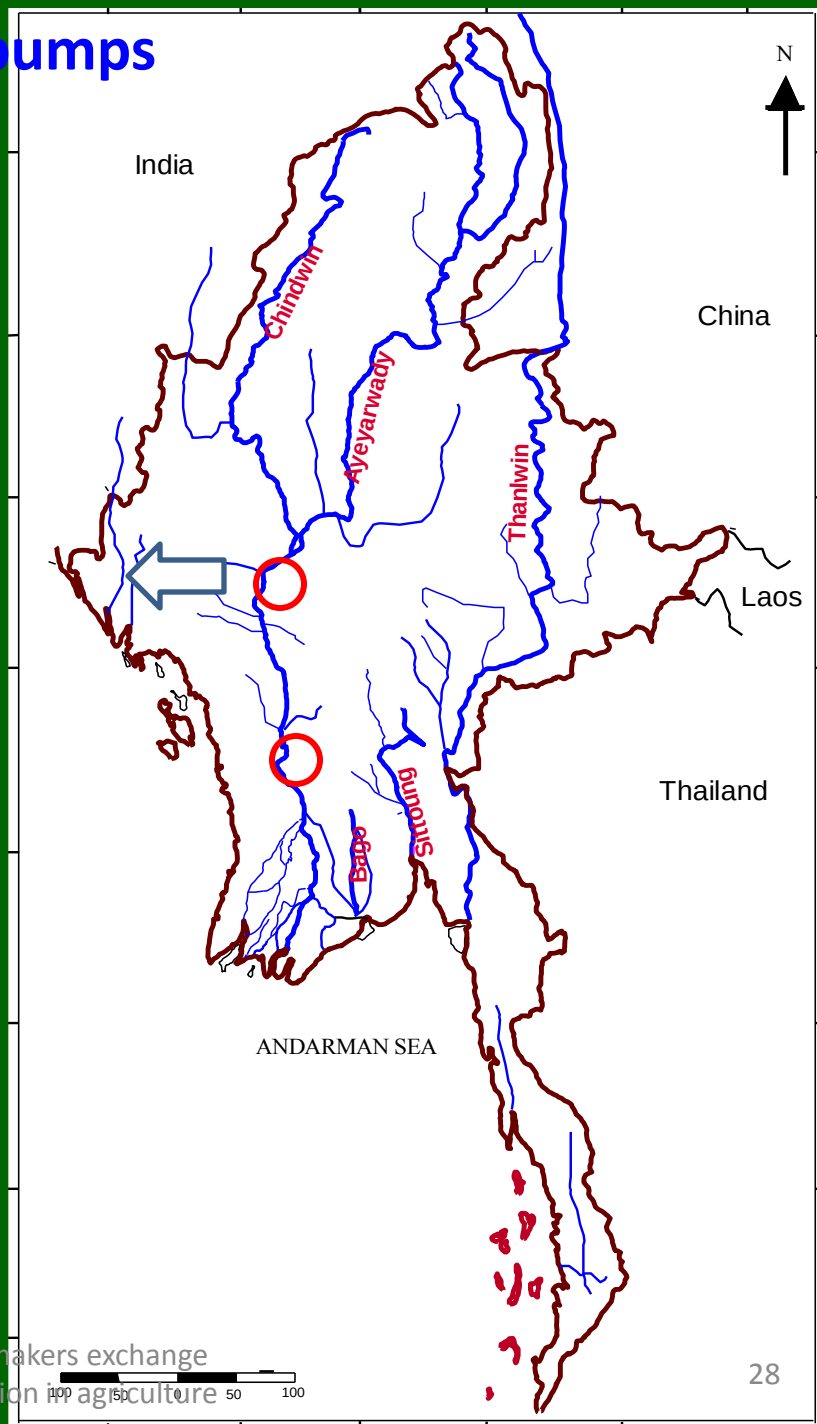
7974 underground water tapping stations
across Myanmar - Shallow / Deep tube
wells (30-100 m)

policy-makers exchange
adaptation in agriculture

Lifting of water from rivers through pumps



322 river water pumping stations



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Climate Change Adaptation Measures by Water Resource Utilization Department in Dry Zone



**Meiktila plain electric-powered
water pumping project
in 2008-2009**

**A gasifier used for groundwater
extraction from a tube well
Magyipinbu village, Meiktila
towhship**



Needs for Climate Change Adaptation in Agriculture

For the increasing adaptation capacities in regions which are highly vulnerable to the consequences of climate change

- Identify communities' own priorities and needs, value their knowledge which is key to the development of sound adaptation strategies
- Develop policies that are enabling for local - level action
- Establishment of a framework and development of optimized national and regional land use concepts (optimized resource management, especially of water, soil, biomass etc.)
- Sustainability of ecosystems to climate change adaptation
- Technical assistance and capacity building , finance, institutions, and the policy environment

THANK YOU

