A Reminder: Irrigation Now than Ever in Ethiopia

Project Kickoff Workshop: Taming Water in Ethiopia

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Irrigation Now than Ever in Ethiopia

- Historical Perspectives
- The Functional Relationship of Rainfall variability still persists
- Increasing Major Drought Phenomena
- Every 20 years Doubling Population
- Increasing Land Degradation
- What Action?
- PIRE Research

2. History of Drought (NAPA, 2007)

Period	Episode	Total Years
16th Century	1	
17th Century	1	
18th Century	0	
19th Century	6	
20th century	13	30
1900 - 1949	3	8
1950 - 2000	10	20
1950-1960	**2**	**3**
1961-1970	**1**	**3**
1971-1980	**2**	**4**
1981-1990	**3**	**5**
1991-2000	**2**	**5**

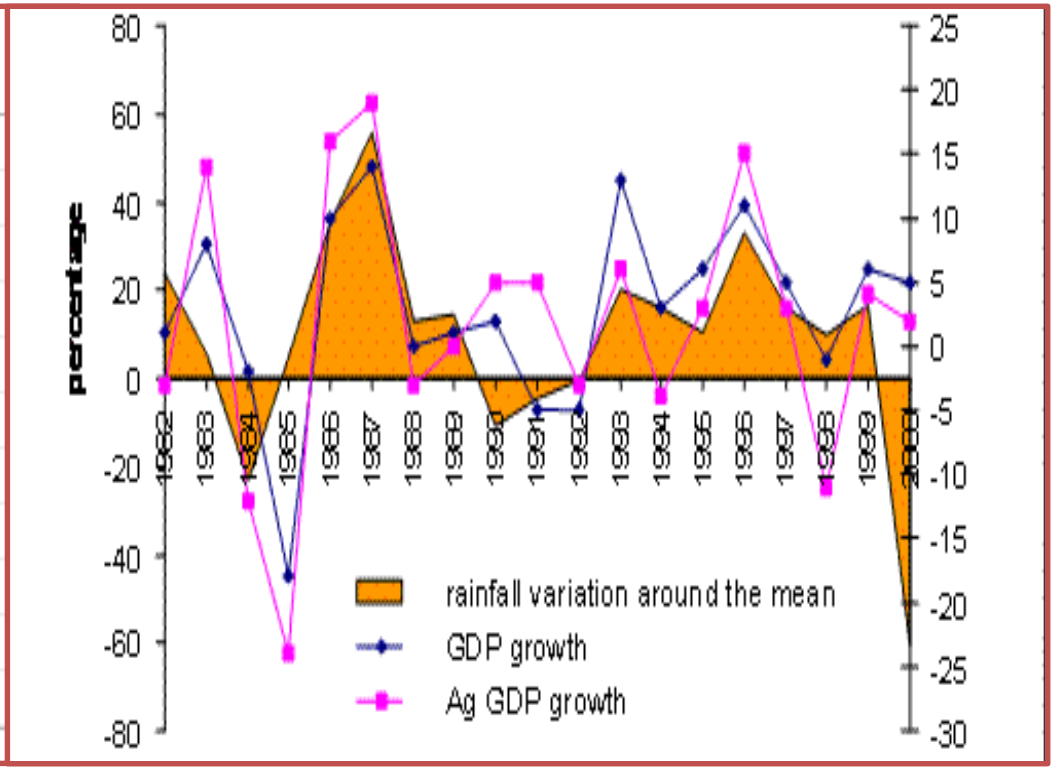
El Niño Years	Drought/Famine	Regions affected	Impact on human life and property
1539-41	1543-1562	Hararghe	
1618-19	1618	Northern Ethiopia	
1828	1828-29	Shewa	
1864	1864-66	Tigray and Gondar	
1874	1876-78	Tigray and Afar	
1880	1880	Tigray and Gondar	
1887-89	1888-1892	Ethiopia	
1899-1900	1899-1900	Ethiopia	
1911-1912	1913-1914	Northern Ethiopia	
1918-19	1920-1922	Ethiopia	
1930-32	1932-1934	Ethiopia	
1953	1953	Tigray and Wollo	
1957-1958	1957-1958	Tigray and Wollo	
1965	1964-1966	Tigray and Wollo	About 1.5 million people affected
1972-1973	1973-1974	Tigray and Wollo	About 200,000 people and 30% of livestock dead
	1978-79	Southern Ethiopia	1.4 million
	1982	Northern Ethiopia	2 million People affected
1982-1983	1983-1984	Ethiopia	8 million affected One million dead and Many livestock lost
1986-87	1987-1988	Ethiopia	7 million people affected
1991-92	1990-1992	North, Eastern, Southeastern Ethiopia	About 0.5 million people affected
1993	1993-94	Tigray and Wollo	7.6 People affected
2000		Ethiopia	About 10.5 million people affected
2002/2003	2002/2003		About 13 million people were in need of food assistance

Rainfall Variability (World Bank, 2006)

- **Livelihood Impact**
- **Macro Economic (World bank, 2006)**

Affected People

Disaster	Date	Affected (no. of people)
Drought	2003	12,600,000
Drought	1983	7,750,000
Drought	1987	7,000,000
Drought	1989	6,500,000
Drought	2008	6,400,000
Drought	2009	6,200,000
Drought	1999	4,900,000
Drought	2005	2,600,000
Drought	1997	986,200
Flood	2006	361,600

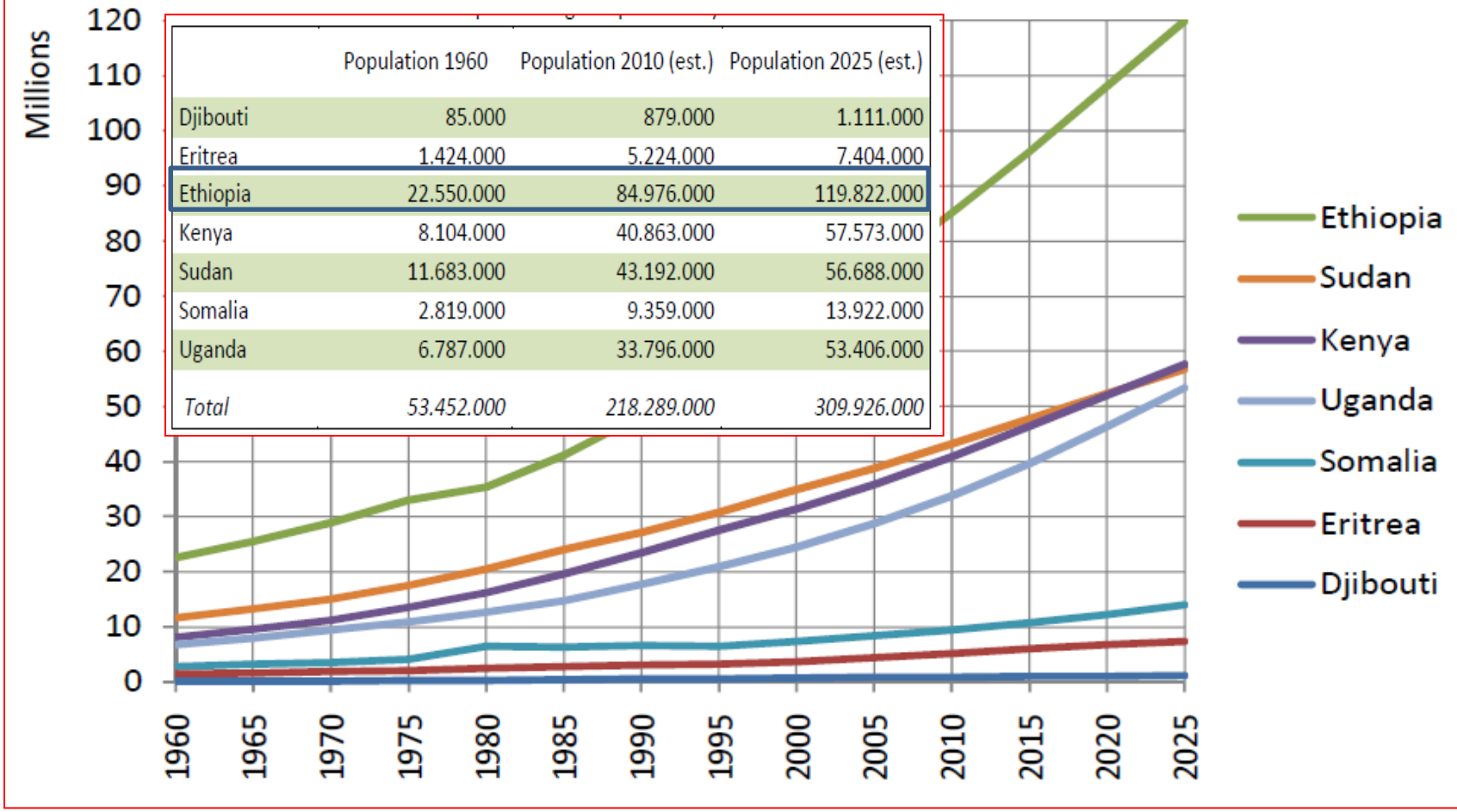


Nine drought Disasters (1983-2009)
On average: 1:3 year drought disaster

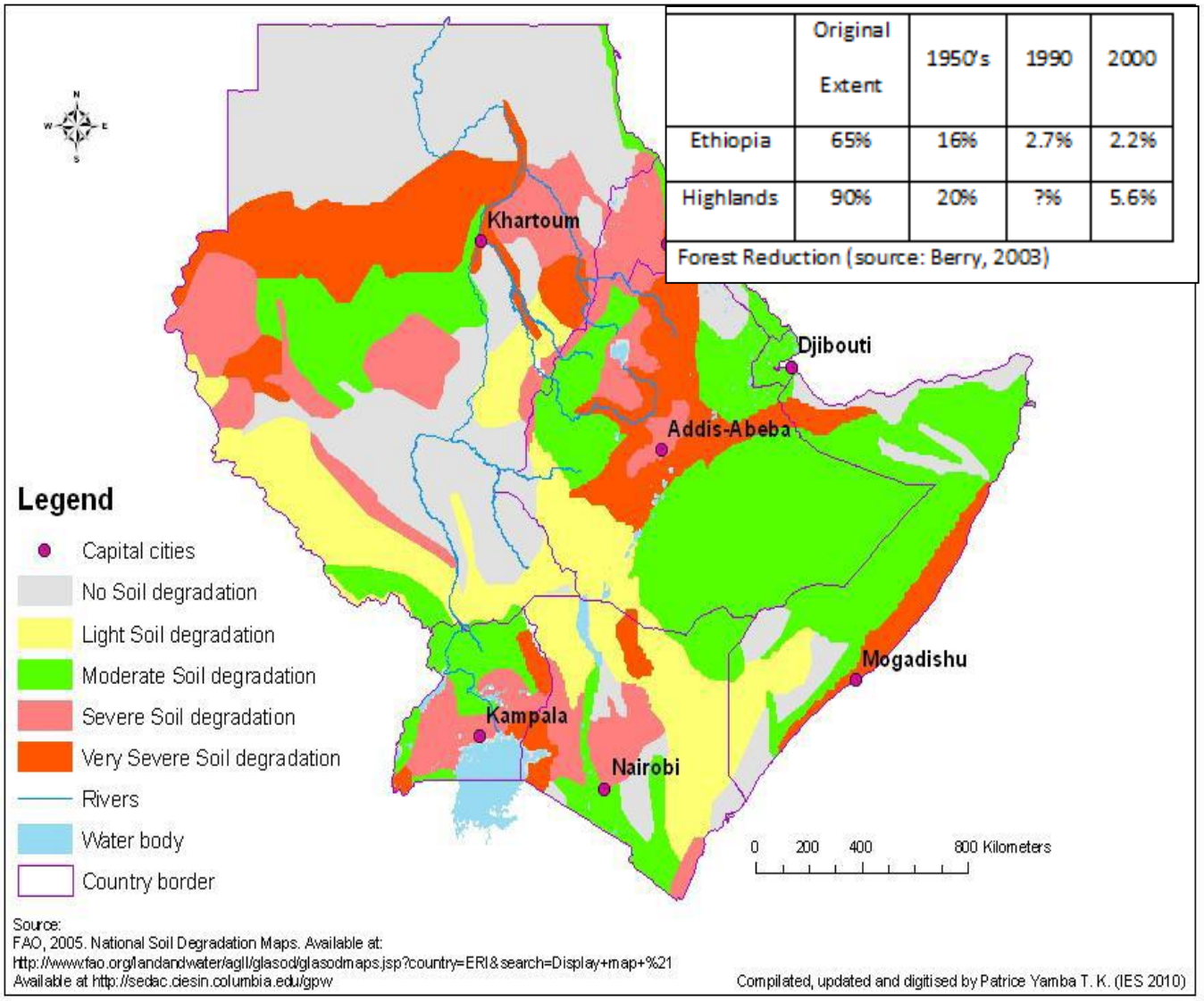
Population Increase

From 1960 to 2010 – population growth is 4 times

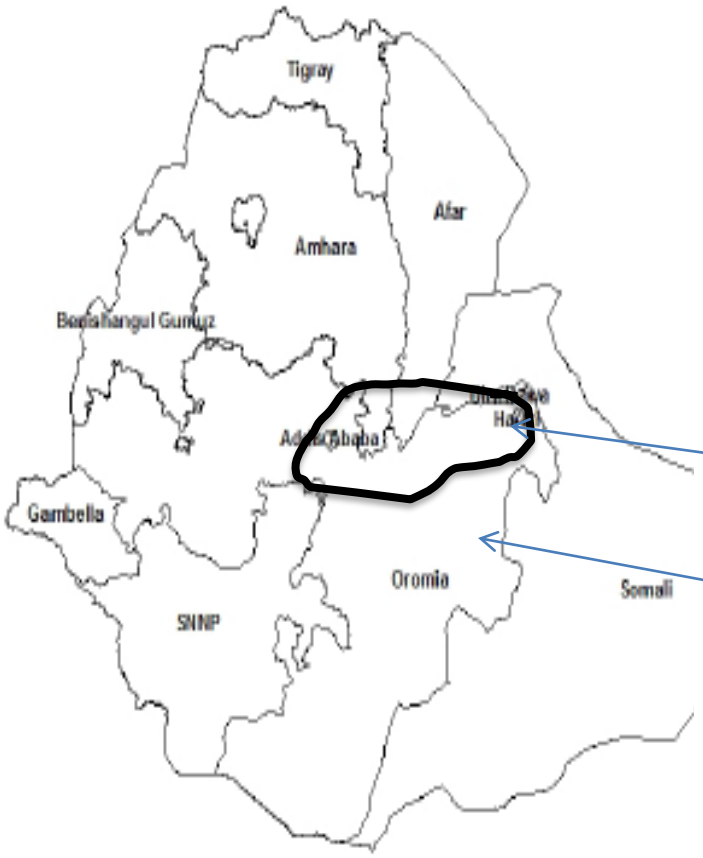
	Population 1960	Population 2010 (est.)	Population 2025 (est.)
Djibouti	85.000	879.000	1.111.000
Eritrea	1.424.000	5.224.000	7.404.000
Ethiopia	22.550.000	84.976.000	119.822.000
Kenya	8.104.000	40.863.000	57.573.000
Sudan	11.683.000	43.192.000	56.688.000
Somalia	2.819.000	9.359.000	13.922.000
Uganda	6.787.000	33.796.000	53.406.000
Total	*53.452.000*	*218.289.000*	*309.926.000*

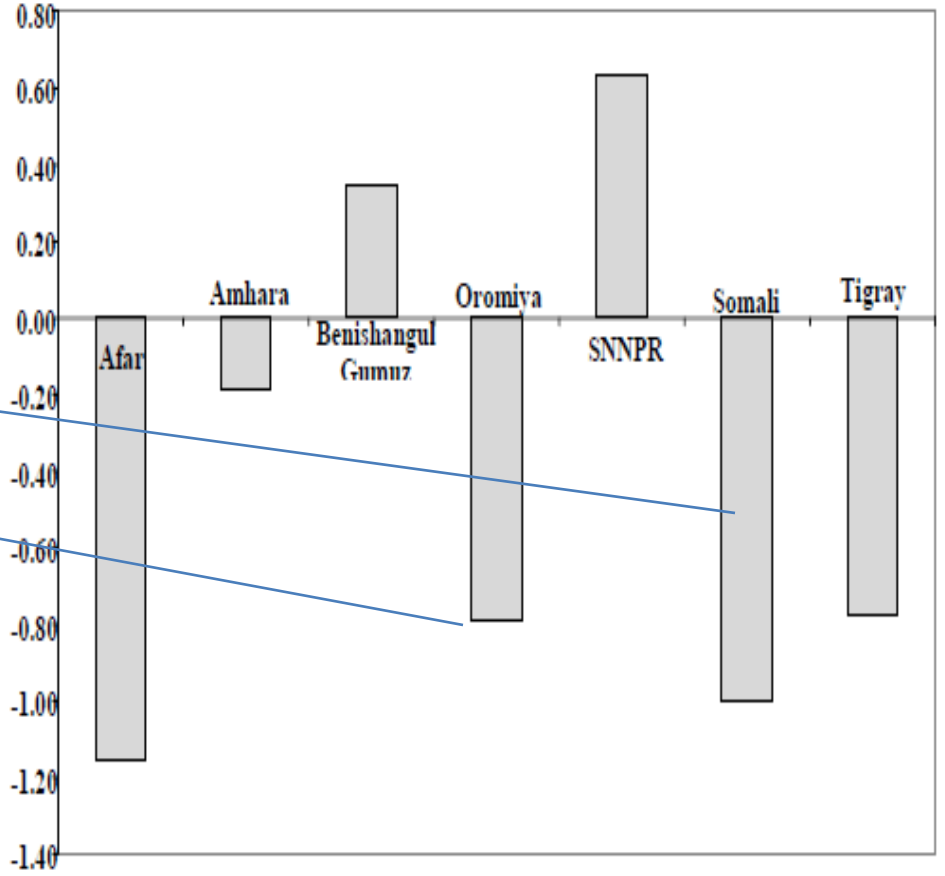


Land degradation Reducing Productivity



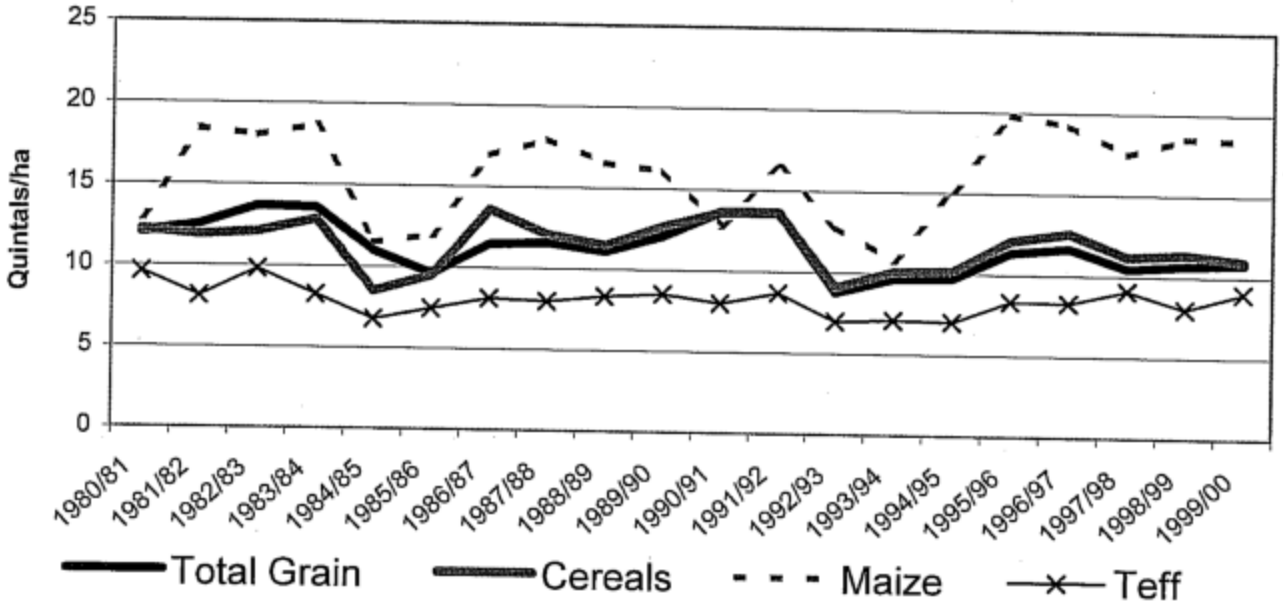
Increased Vulnerability





Stagnant Productivity per Hactare

Figure 1. Trends in Agricultural Yields, 1980-2000 (quintals/hectare)



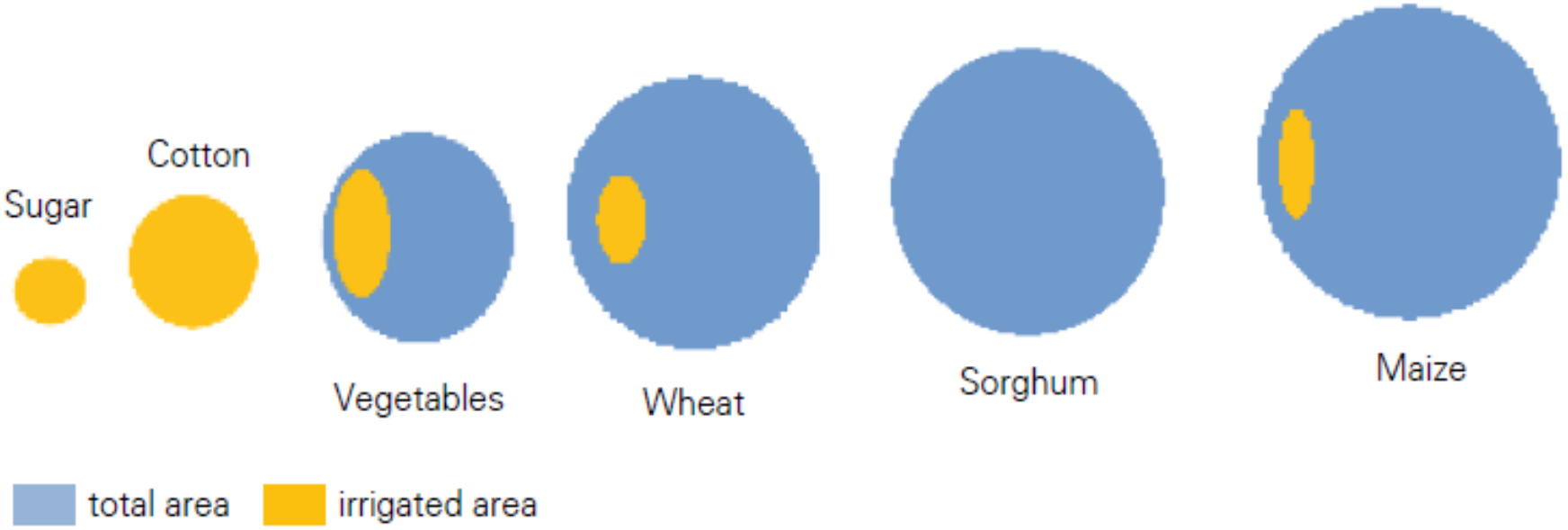
Crop Productivity per Hactare (Kuma, 2004)

While Agricultural Productivity remains more or less the same, the population increased almost 3 to 4 times 1960 to 2010

Slow Irrigation Development in Ethiopia

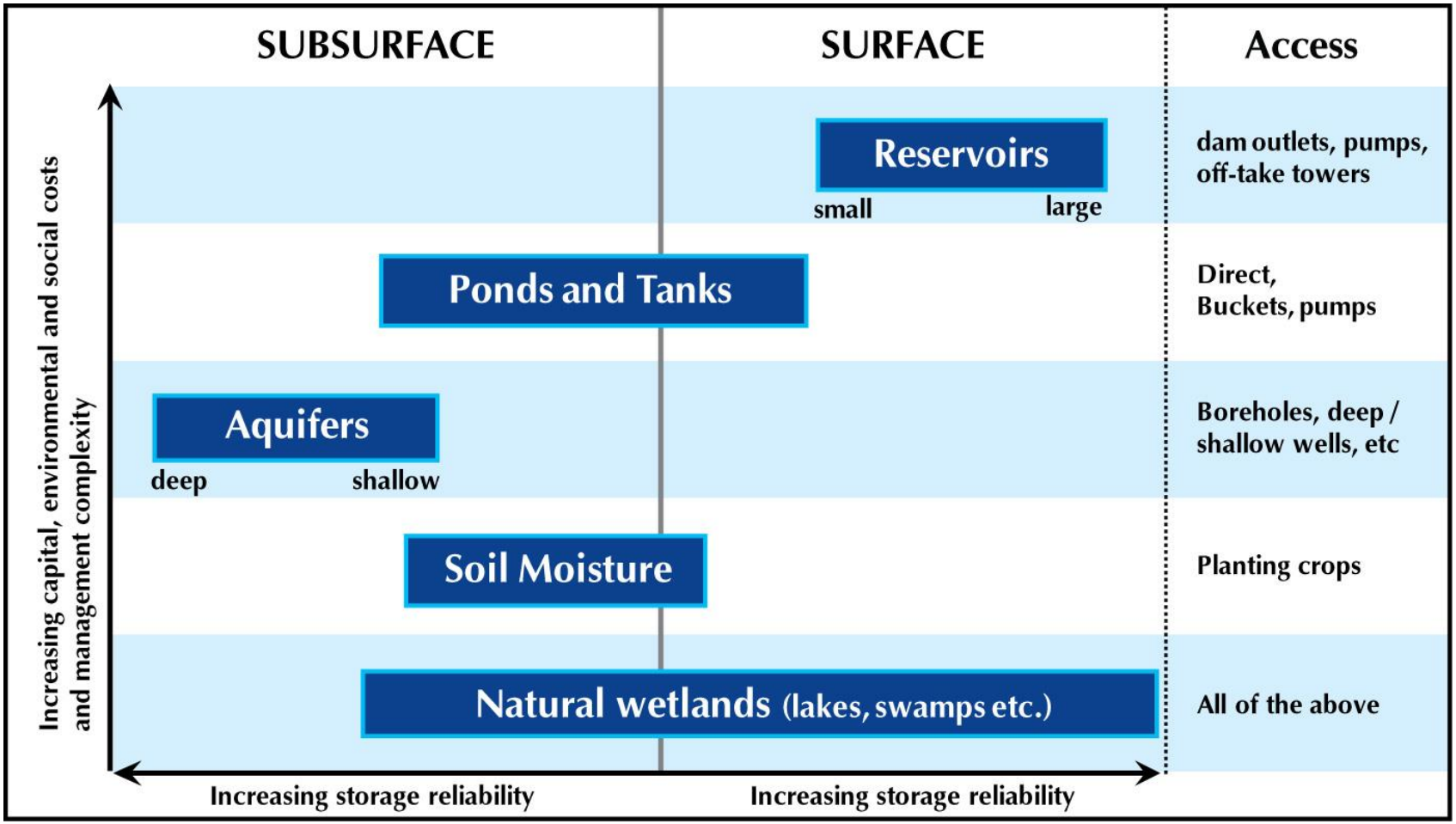
Irrigation development increased from less than 5% 10 years ago to 10%

Figure 5: Estimates of the relative size of irrigated area by crop in Ethiopia, 2013

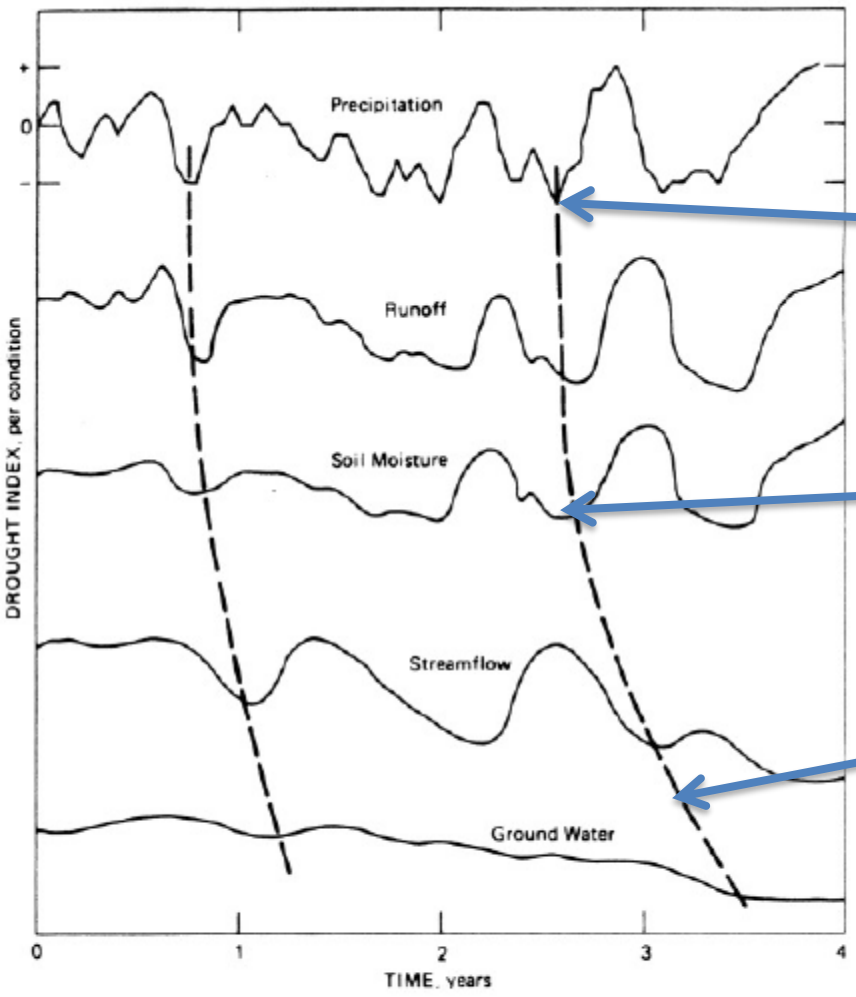


Source: FAO Aquastat.

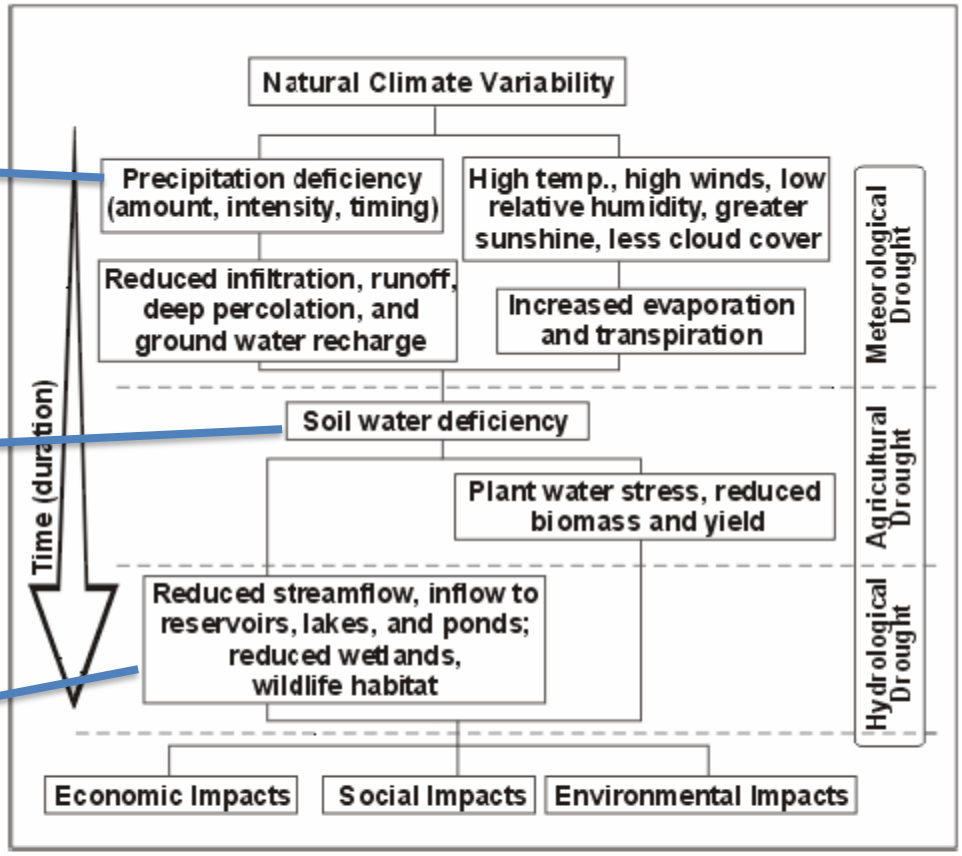
Action: Storage Continuum



Action: Forecasting what?



Proceeding of precipitation deficit throughout the hydrological cycle (Rasmusson, 1993)

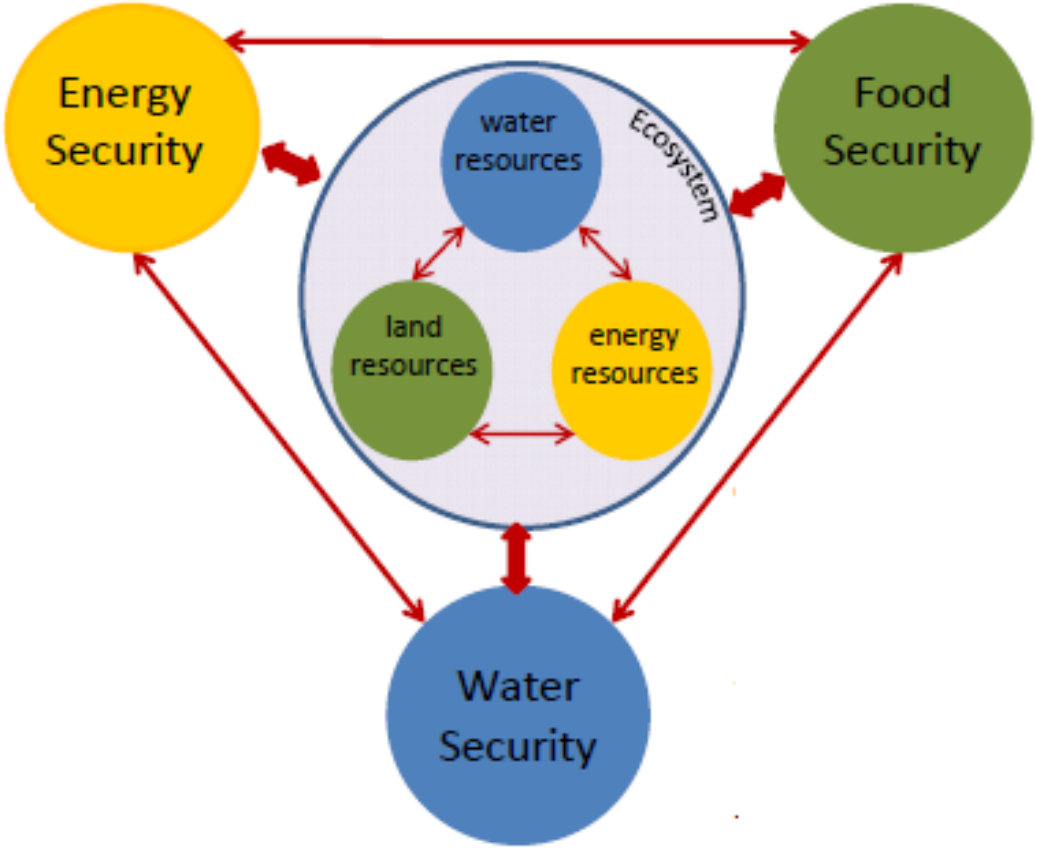


Influence of precipitation deficiency and other factors on drought development (National Drought Mitigation Center)

Action: Knowledge and Technology

- Integrating
  - knowledge, technology and finance from external/internal source and;
  - labor, land and indigenous knowledge from the community
  - For Wide Area Irrigated Agricultural and Productivity enhancement

Action: Integrating Other Sectors
Water-Food-Energy Nexus



Challenges

- Limited qualified human resources
- Weak institutional capacity
- Irrigation company presence concentrated in Addis or travelling into the country on an ad hoc basis
- Inadequate land governance and tenure conditions
- High power tariff limits
- Limited agro-industries and value chain linkage
- Lack of investment in extension,
- History of delays in design, contracting, and construction of irrigation infrastructure

PIRE Research Input

- Improving predictive ability of
  - Precipitation (for irrigation and rainfed agriculture),
  - Runoff (for irrigation, Energy)
  - Soil moisture (Rainfed Agriculture),
- Improving communication skills and adaptability by different actors:
  - farmers, water and agriculture managers, policy makers

Discussion Questions

- What are traditional prediction knowledge for rainfed Agriculture?
  - Are they working? Failed to work
- Can we develop scientific prediction system for rainfed agriculture?
- Can we develop communication systems commensurate to farmers?
- In what way is Irrigation improving the life's of farmers?
- Are Irrigation Schemes like Koga utilizing prediction systems for crop water requirement estimation and inflow forecasting to the reservoirs?

Thanks for listening!