Ethiopia's Water Security and the State of Water Resource Management

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Outline

1. Water resources of Ethiopia
2. Water security – definition, implication & Cases
3. Water resources management institutions genesis
4. Challenges and opportunities in water resource Management – findings of the bottle neck analysis
5. Conclusion and implications

1. Water Resources of Ethiopia

Water, Land, and Labor – are resources Ethiopia has

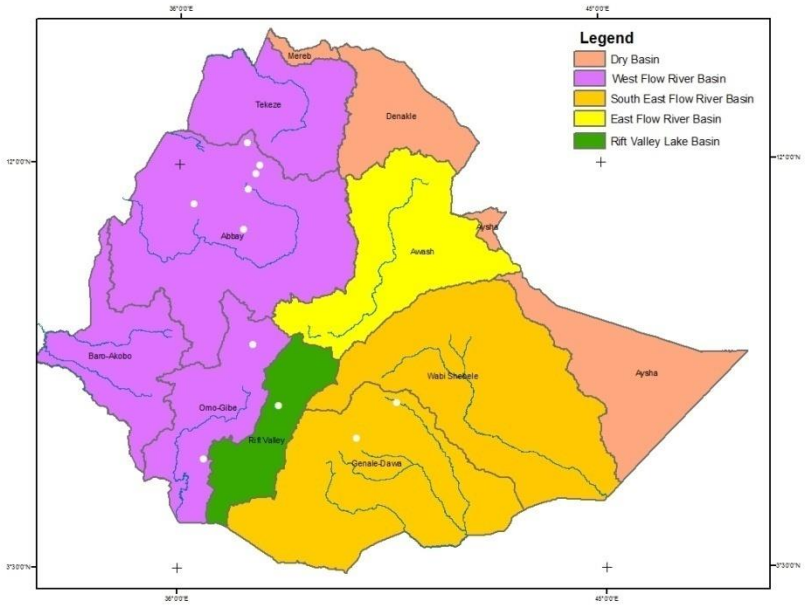
- Is Ethiopia water rich country?
- 12 major river basins with total annual runoff about 122 bn m^3
- Groundwater potential: 2.6, 26, 40 billion m^3

(Figures are very uncertain)

Ethiopia is the water tower of (east and north) Africa. Anything wrong in that statement?

The Dome shaped physiographical features of Ethiopia.

No river from neighboring countries enter Ethiopia



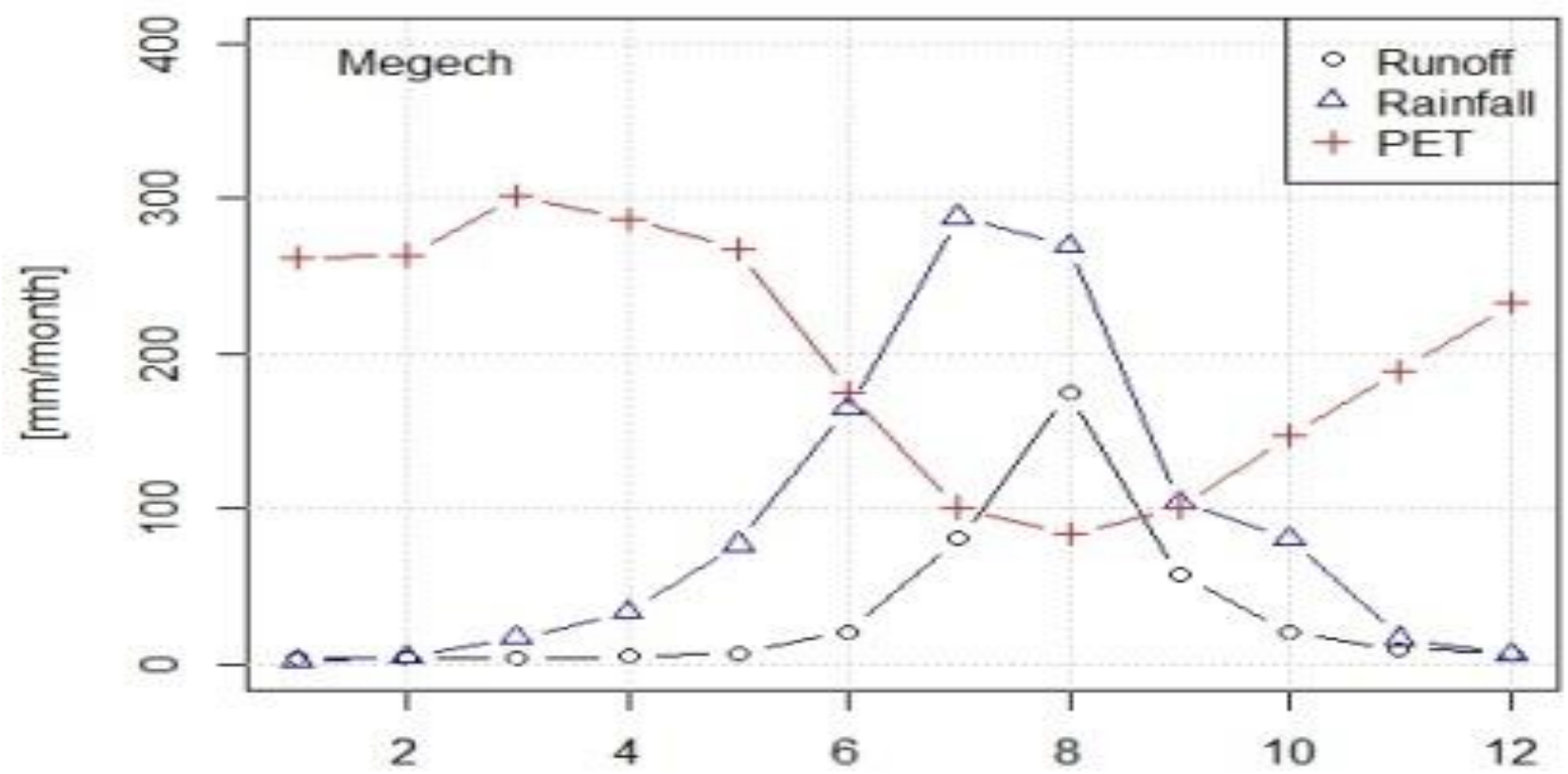
Water scarcity

- **Physical water scarcity** – Water resources development is approaching or has exceeded sustainable limits. More than 75% of the rivers are withdrawn for rivers

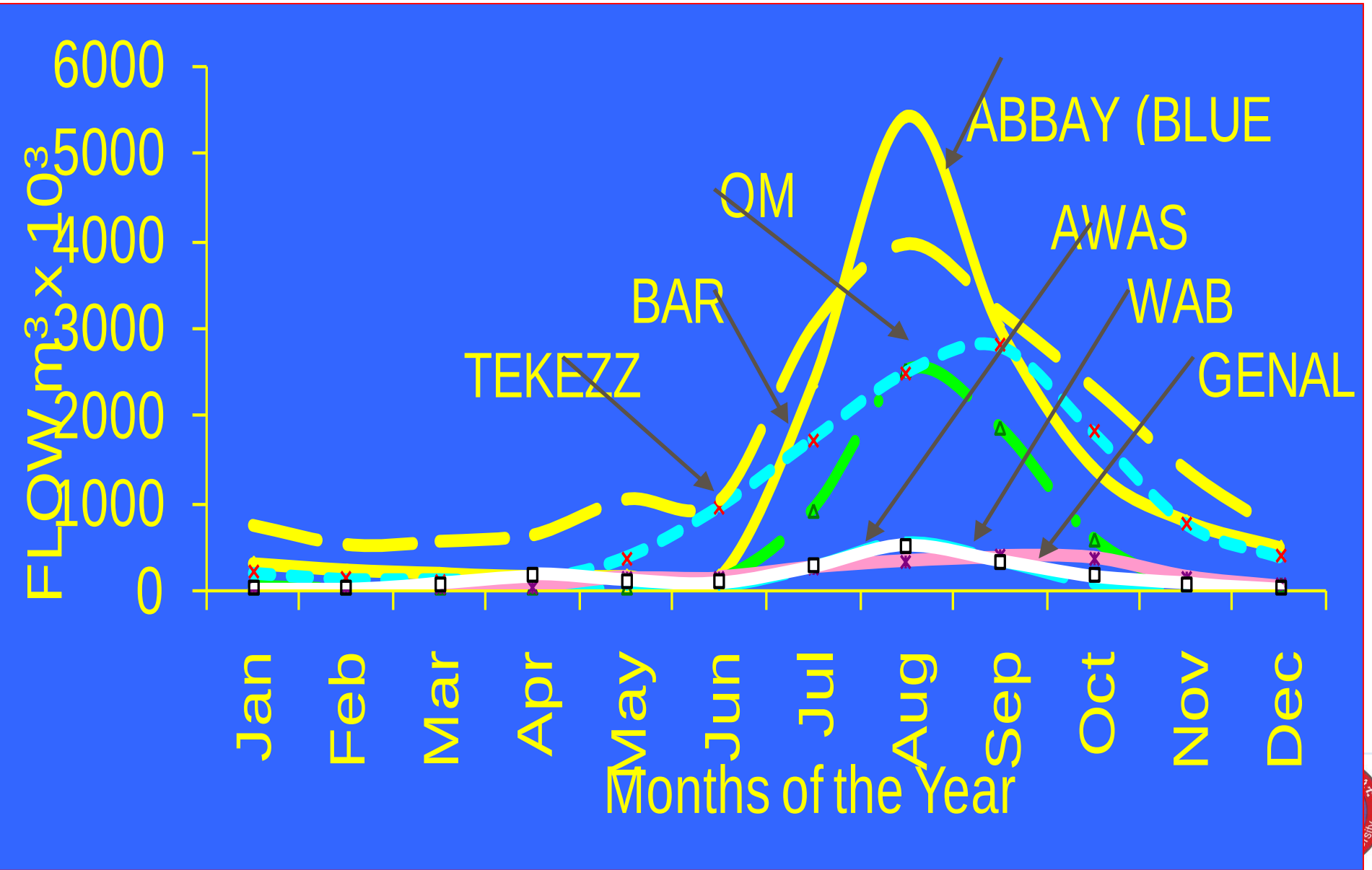
- **Economic water scarcity** – (Human, institutional, and financial capital limit access to water even through water in nature is available locally to meet human demands water resources are abundant relative to water use, with less than 25% of water from rivers withdrawn for human purposes but malnutrition exists.

Ethiopia is grappling with economic water scarcity? How?

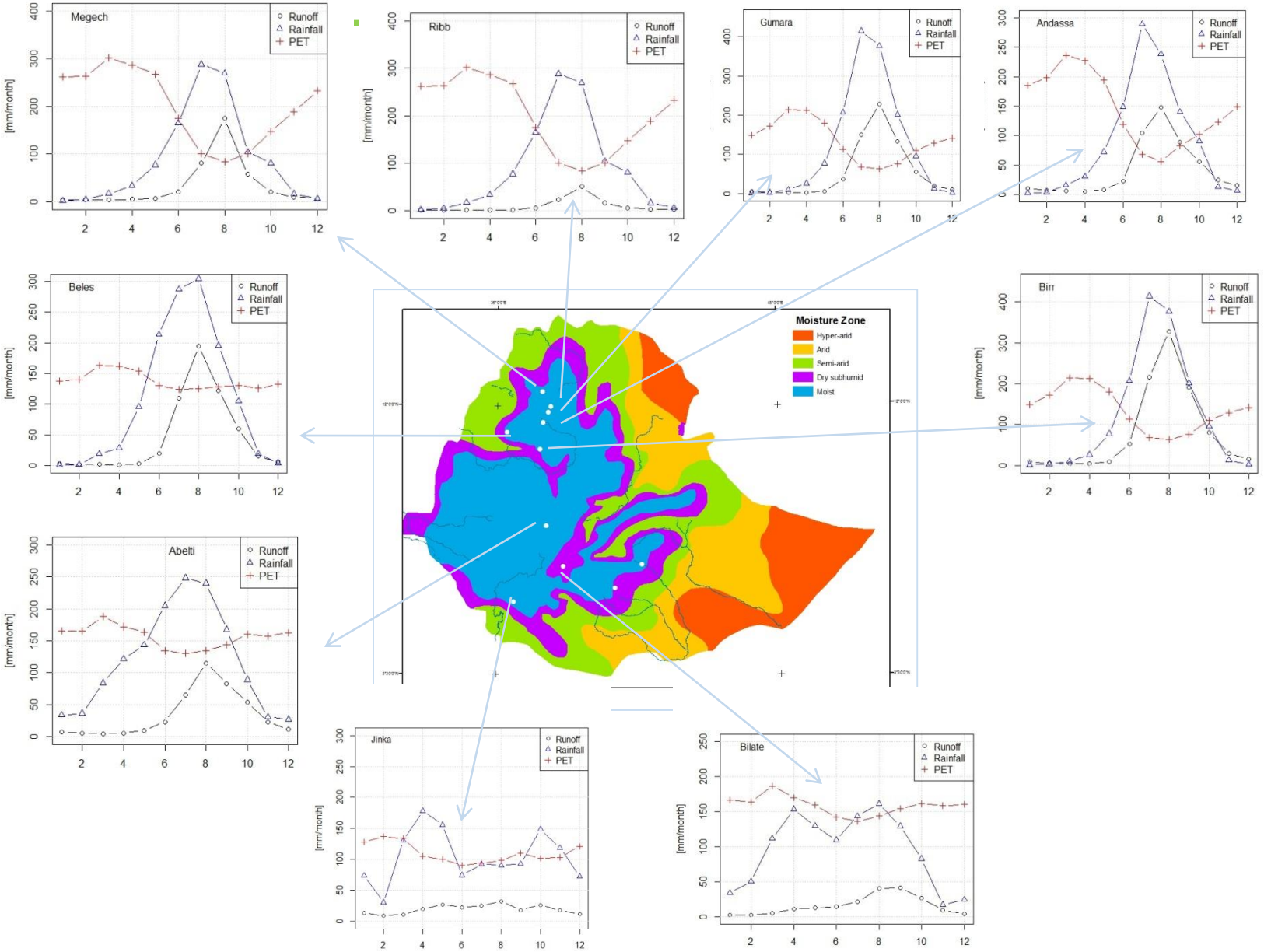
The fundamental challenges:
Rainfall and runoff variability



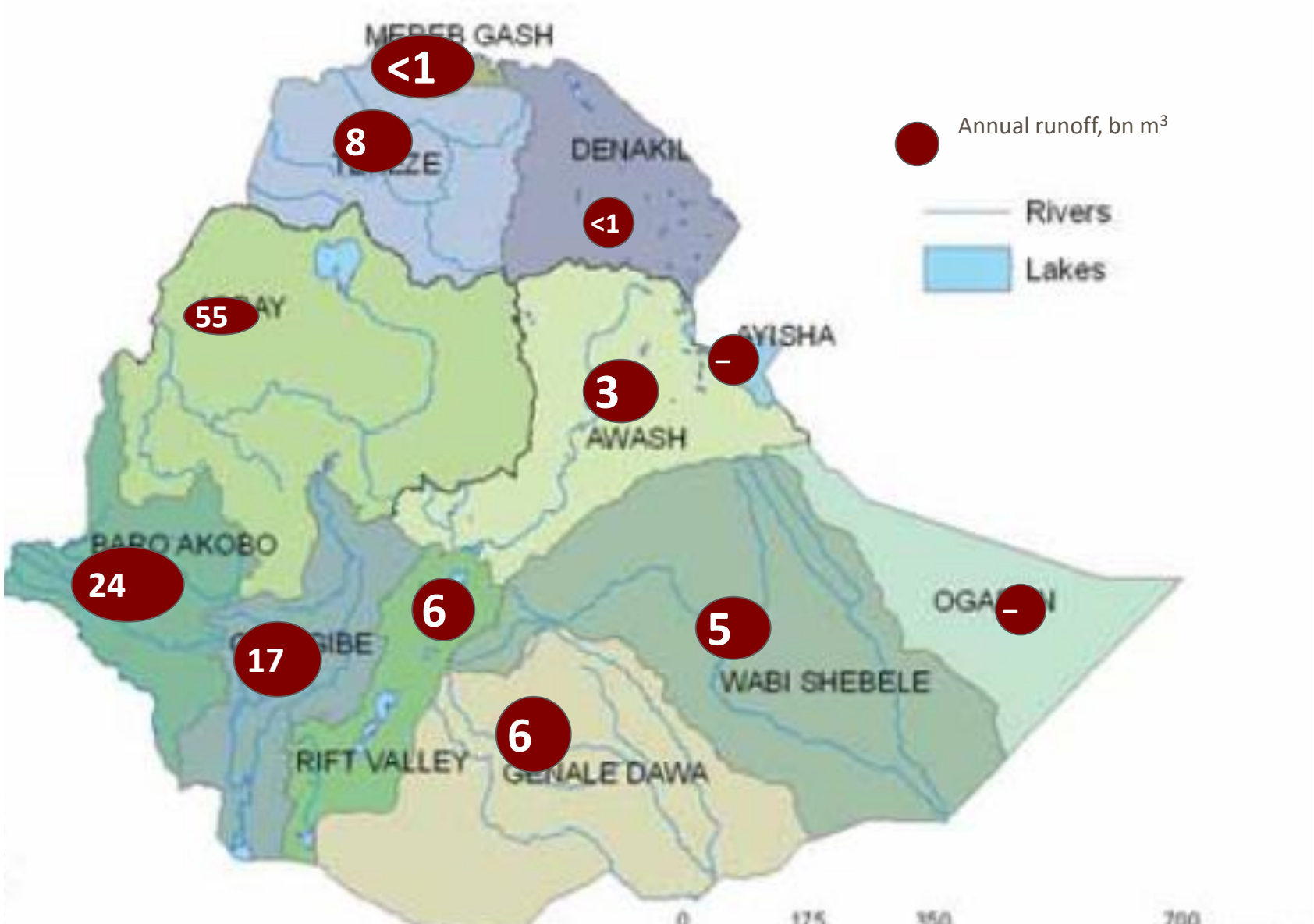
Temporal Variability of Water Resources



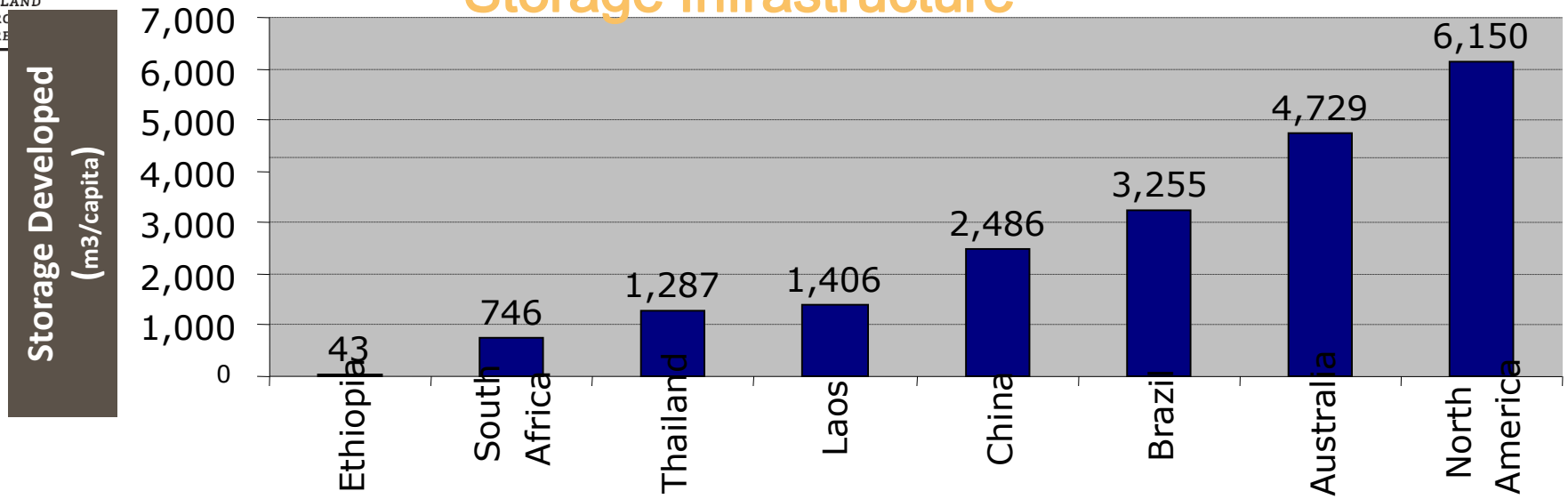
Situation is the same every part of the of the country



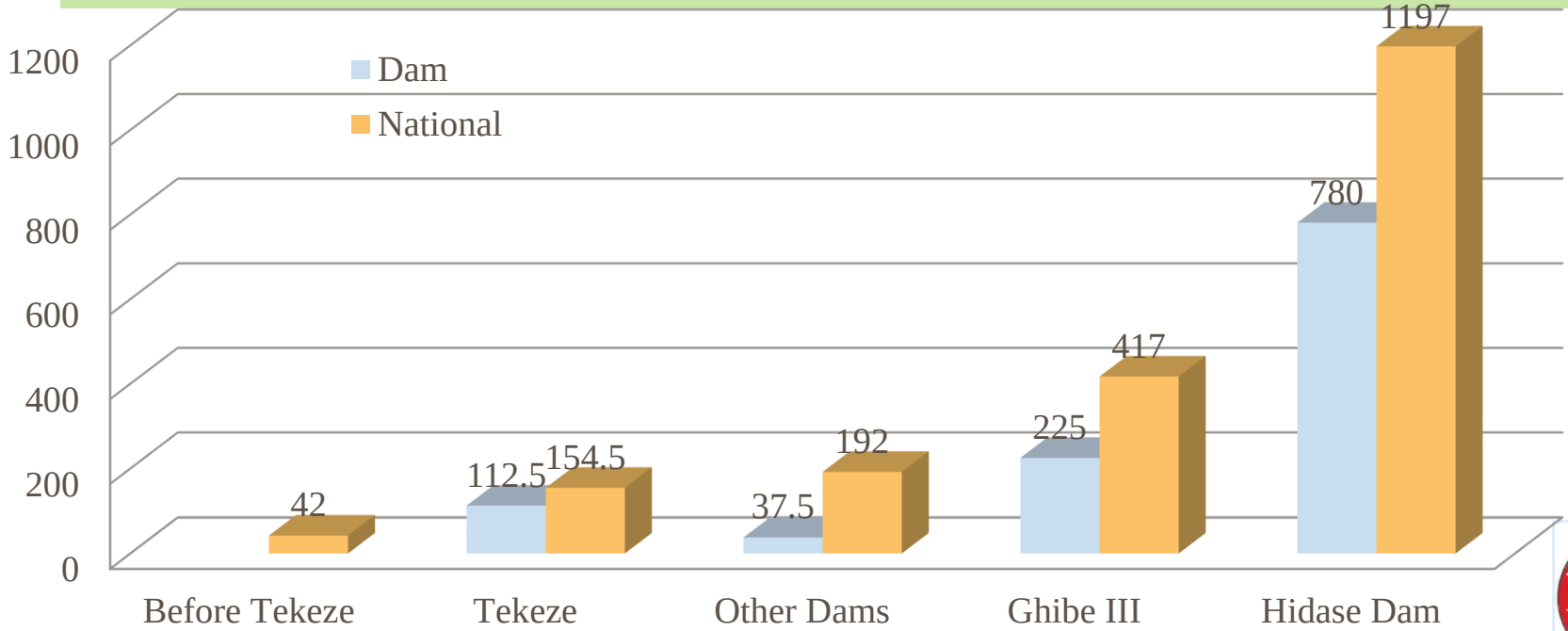
Spatial variability tremendous



Storage Infrastructure



Per-capita Water Storage



Ethiopia is now waking up!

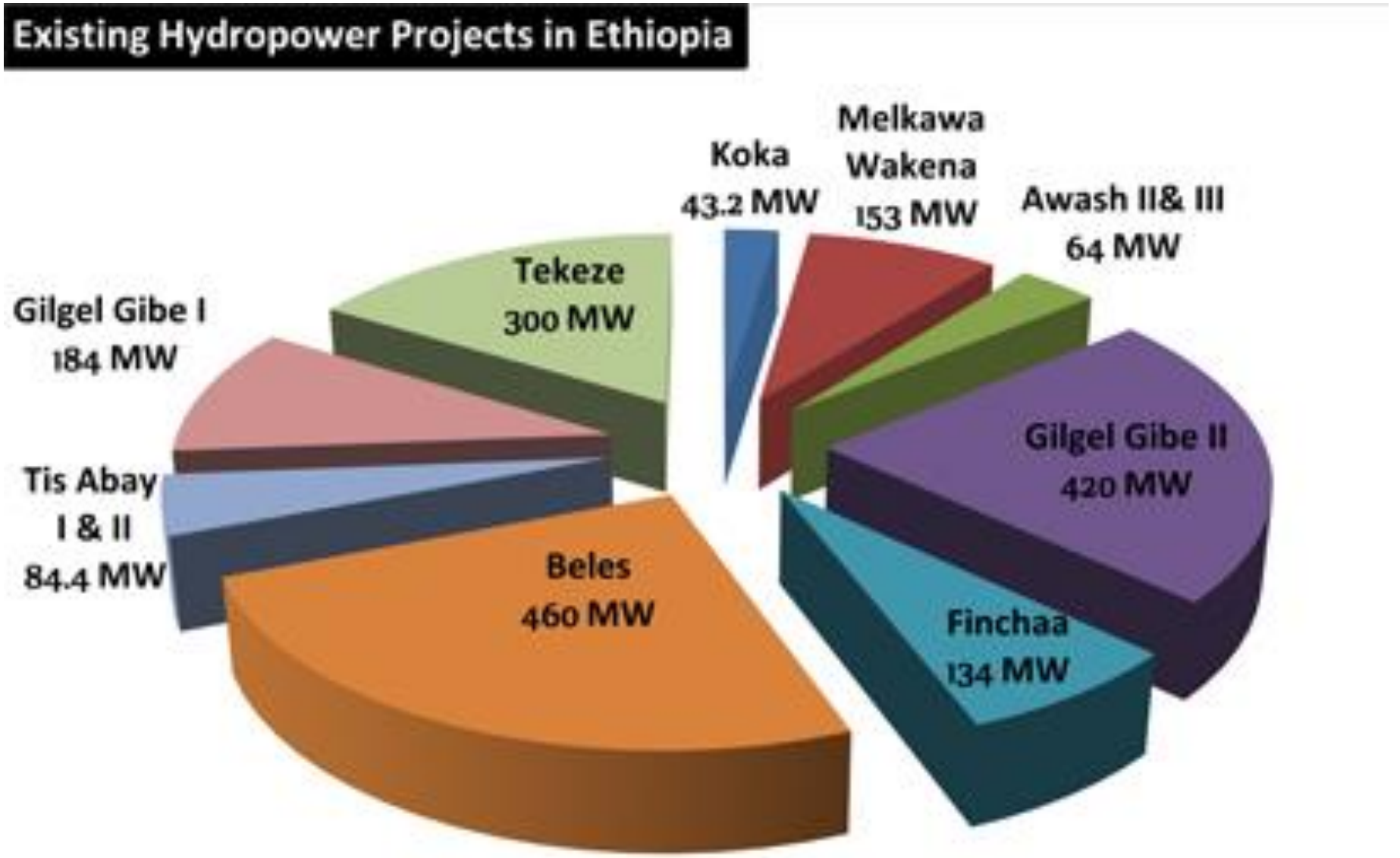
Planned during GTP 1

No.	Sub Sector	2010/11	2015/16
1	**Water Supply & Sanitation**		
	Urban	91.5%	100%
	Rural	65.8%	98%
	National	68.5%	98.5%
	Reduce Mal Function	20%	10%
2	**Irrigation**		
	Rehabilitation	-	6570 ha
	Feasibility and Design	462,114ha	1208448 ha
	Construction	127242.6	785582.2 ha
3	**IWRM**		
	Hydropower Prefeasibility	6447 MW	9227.4 MW
	Hydropower Feasibility	1431 MW	8398.4 MW
	Groundwater (1:50000)	3	22.7
	Hydrological Stations	85.6	90
	Basin Administration	25	63
	Watershed Management		1000000 ha

GTP I Planned

NO	Sub Sector	2010/11	2015/16
4	**Energy**		
	Hydropower Generation	2,000 MW	8,000-10,000 MW
	transmission	11,440 km	17,000 km
	Distribution	126,038km	258,038 km
	No. of customers	2 million	4 million
	Electricity Access	41%	75%

Hydropower developed



Plans during GTP II (2015-2020)

Water Supply	Base Year 2014/15	2020
Potable water supply coverage	58	83
Rural potable water supply	59	85
Urban water supply coverage	51	75
Hydropower		
Power generating capacity (MW)	2267	17346
Electricity coverage (%)	60	90
Irrigation		
Area of land under large and Medium Scale	658340	954000
Area of land developed under modern small scale irrigation	1.3	1.7

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Very soon the pictures will change

2. Water Security: Definition, Implication & cases

Water Security – refers to the nexus between the

Availability, Accessibility, and Use of water.

Water security must be seen interns of:

- **Water for domestic use (WaSH);**
- **Water for food Security; and**
- **Water for hydropower.**

Water security can happen at different scale

- **Regional – Lowland vs highland, Afar vs Oromia**
- **Community – what would happen if wells dry**
- **Household – the poor, women, emerging/pastoral regions**

Drivers of Water Security

- **Climate – Variability and change**
- **Population growth, urbanization/ development**
- **Land degradation – decline baseflow, pollution**

Cases of Water Security Challenges

A. Awash River Basin

Awash is the most used river – for irrigation.
Most prolific aquifer system
Where large, medium and small scale irrigation are concentrated

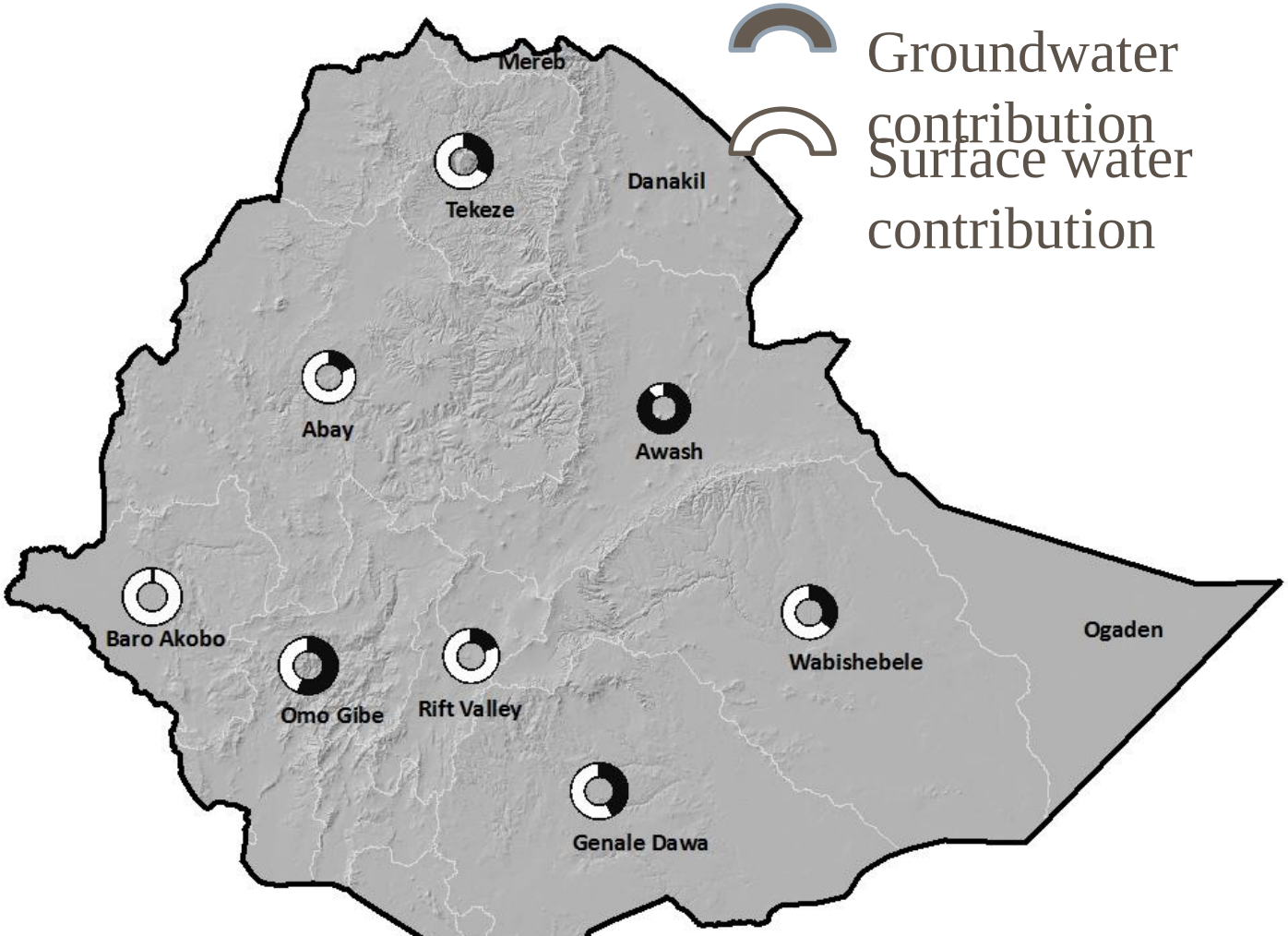
For water supply – Addis Ababa, Adama, etc.

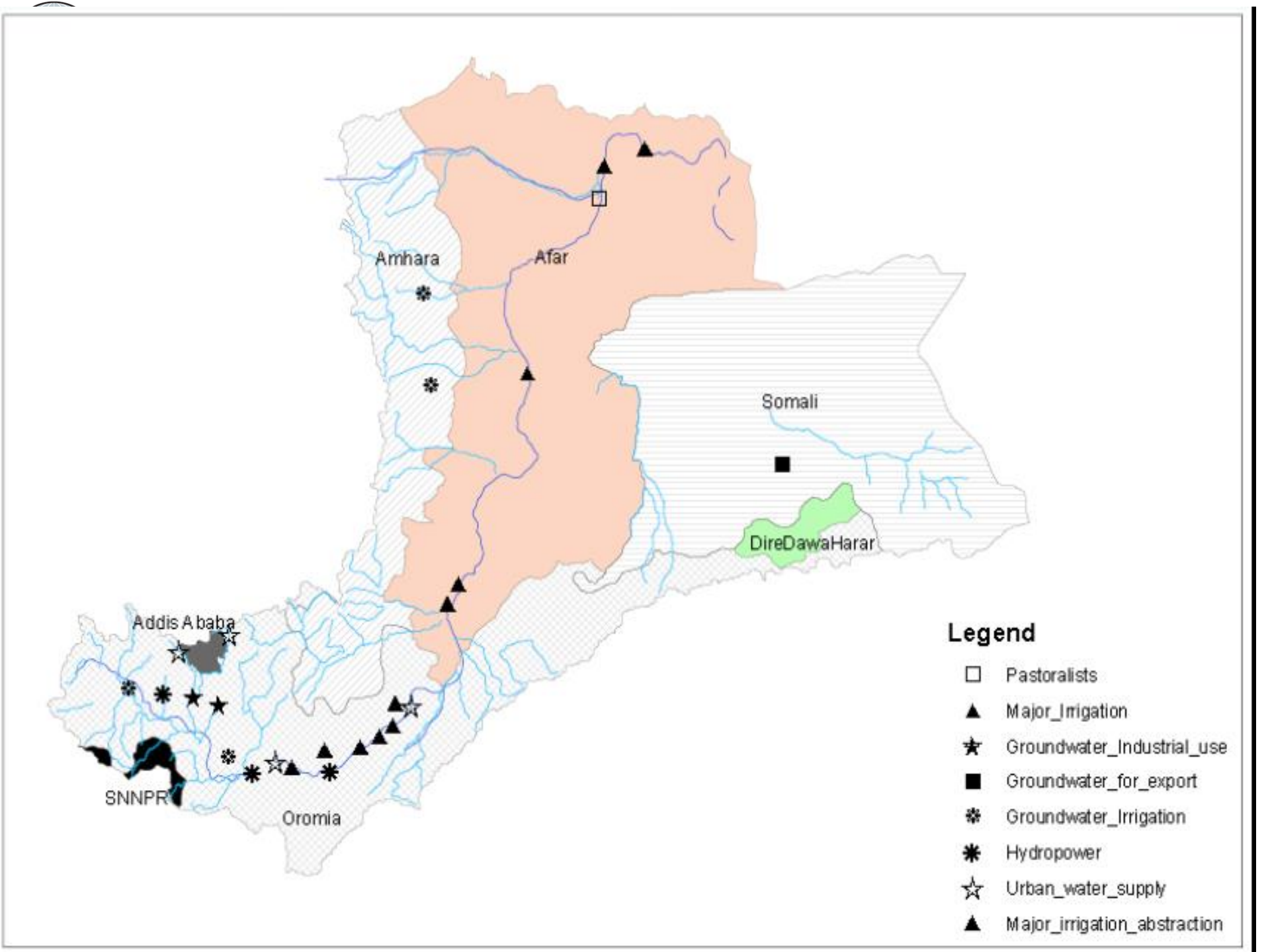
For industry: flower, textile, leather, etc.

Water shortage will be critical problem in no distance time.

Water pollution (industrial/domestic waste,

Awash-High groundwater contribution to surface water flows




Amhara
Afar
Somali
DireDawaHarar
Addis Ababa
SNNPR
Oromia
Legend
Pastoralists
Major_Irrigation
Groundwater_Industrial_use
Groundwater_for_export
Groundwater_Irrigation
Hydropower
Urban_water_supply
Major_irrigation_abstraction

B. Lake Haramaya

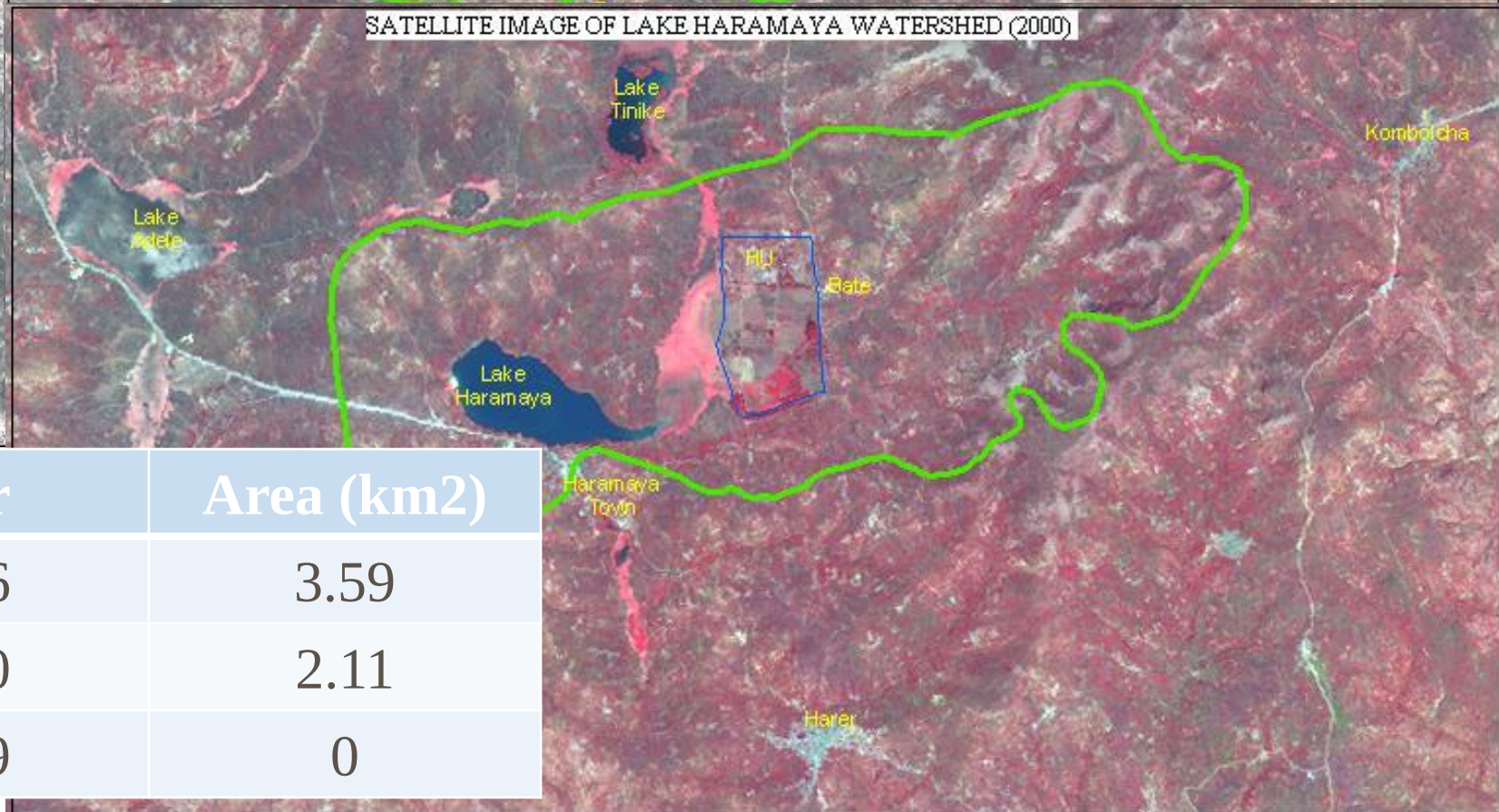
Used to supply water for Harar its environs at a rate of 60 l/s since 1961 to a population of 160000 people

But completely dried and the treatment plant stopped in 2004

Groundwater abstraction started

Causes of the Lake demise

- Mismanagement – no accountability
- Siltation – reducing the storage capacity – it was a growing in the 1980s,
- Unstained Abstraction – Chat irrigation



Year	Area (km2)
1986	3.59
2000	2.11
2009	0

Satellite Image of the three Lakes in 1985

The three Lakes in 2005

Apparently Lake Haramaya is not dead but sleeping Lake

Revive Lake Haramaya initiative

- *Task Force – from National to Woreda Level formed – regular meeting;*
- *Fud being mobilized for Watershed Development;*
- *But lack integration, and did not based on IRM principles*

How did the Lake shows revival:

- Improved watershed management ?
- Good rainfall ??
- **A reduction in water abstraction?**
- **Can we control the proliferation of irrigation pumps**

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3. Water resource management institutions and genesis

Institutional Arrangement

Federal Ministry of Water & Energy
Regional Bureau of Water & Energy Resources Development
Regulatory (Basin organizations, EEA)
Utilities (WSSA, Water Boards, EEPCO)
Contractors and Consultants (EWWCE, WWDSE)

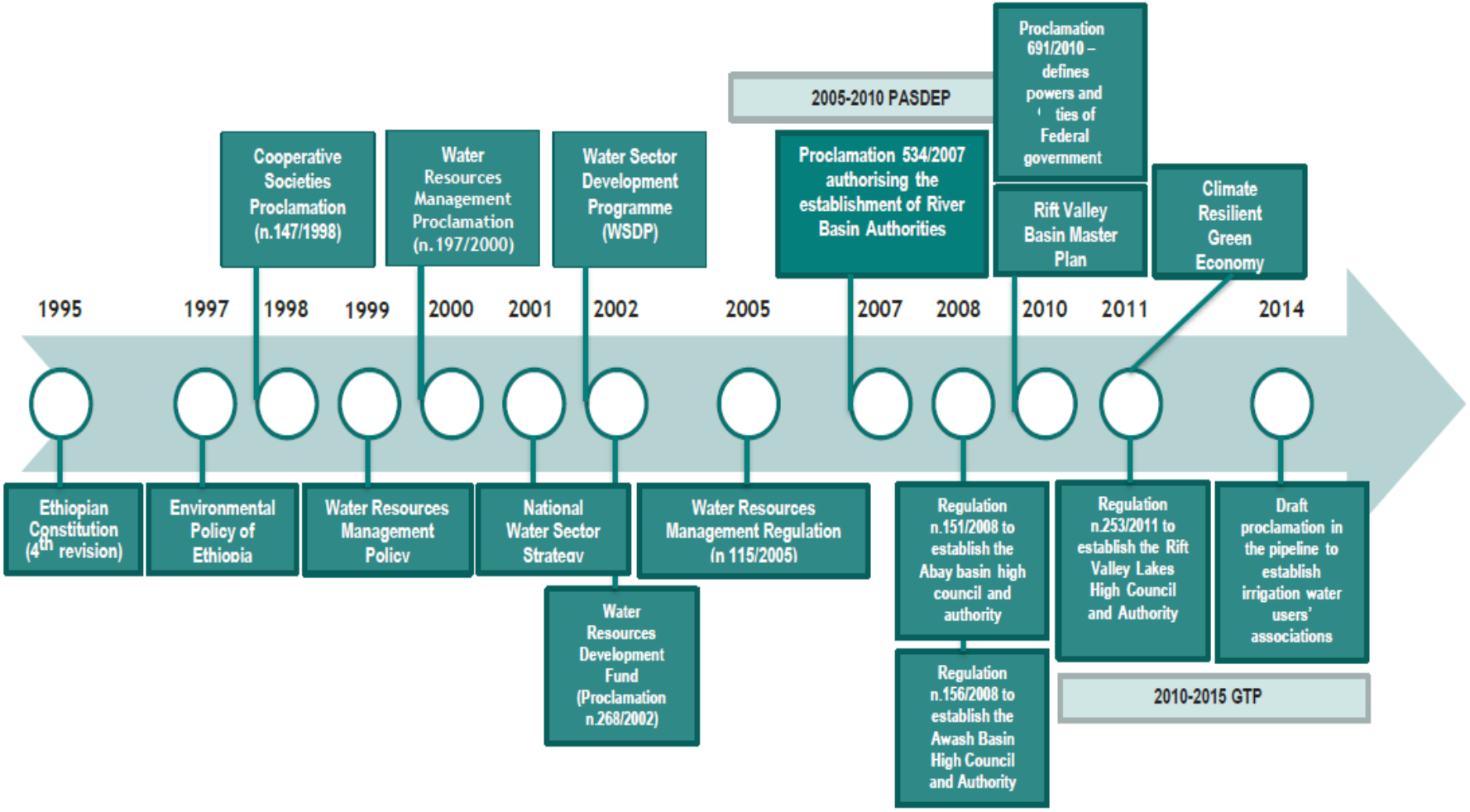
Legal Framework

1. **Ethiopian Water Resources Management Policy 1999**
2. **The Ethiopian Water Resources Management Proclamation**
3. **River Basin High Council and Authorities Proclamation**
4. **Ethiopian Water Resources Management Regulation of**
5. **Irrigation Development Incentive Regulation of 2009**
6. **Abbay and Awash Basins High Council and Basin Authority Establishment Regulations**

Metamorphosis of MoWIE

- **Pre 1956 Situation**
- **1956 Water Resources Department within the MoPWC – Blue Nile**
- **1962 Awash Valley Authority – All aspects of water in Awash Basin**
- **1971 National Water Resources Commission /the MoPW &WR**
- **1975 Ethiopian Water Resources Authority /the MoMWE**
- **1977 Valley Agriculture Development Authority - AVDA**
- **1981 NWRC (WRA, AWSSA, EWWCA, NMA) /WRDA**
- **1987 Ethiopian Valleys Development Studies Authority**
- **1993 MoNR&EP (WRDA, AWSSA, EVDSA, NMA)**
- **1995 Ministry of Water Resources**
- **2010 Ministry of Water and Energy**
- **2013 Ministry of Water Irrigation and Energy**
- **2015 Ministry of Water Irrigation and Electricity**

We are fine in establishing institutions at high level:



Source: authors.

But who cares:

When Lake Haramaya dried?

If Lake Zeway dries or polluted?

If groundwater in Awash Basin is depleted?

If Awash river is polluted and Metehara town Water treatment plant can't treat?

If water doesn't reach Tendaho dam?

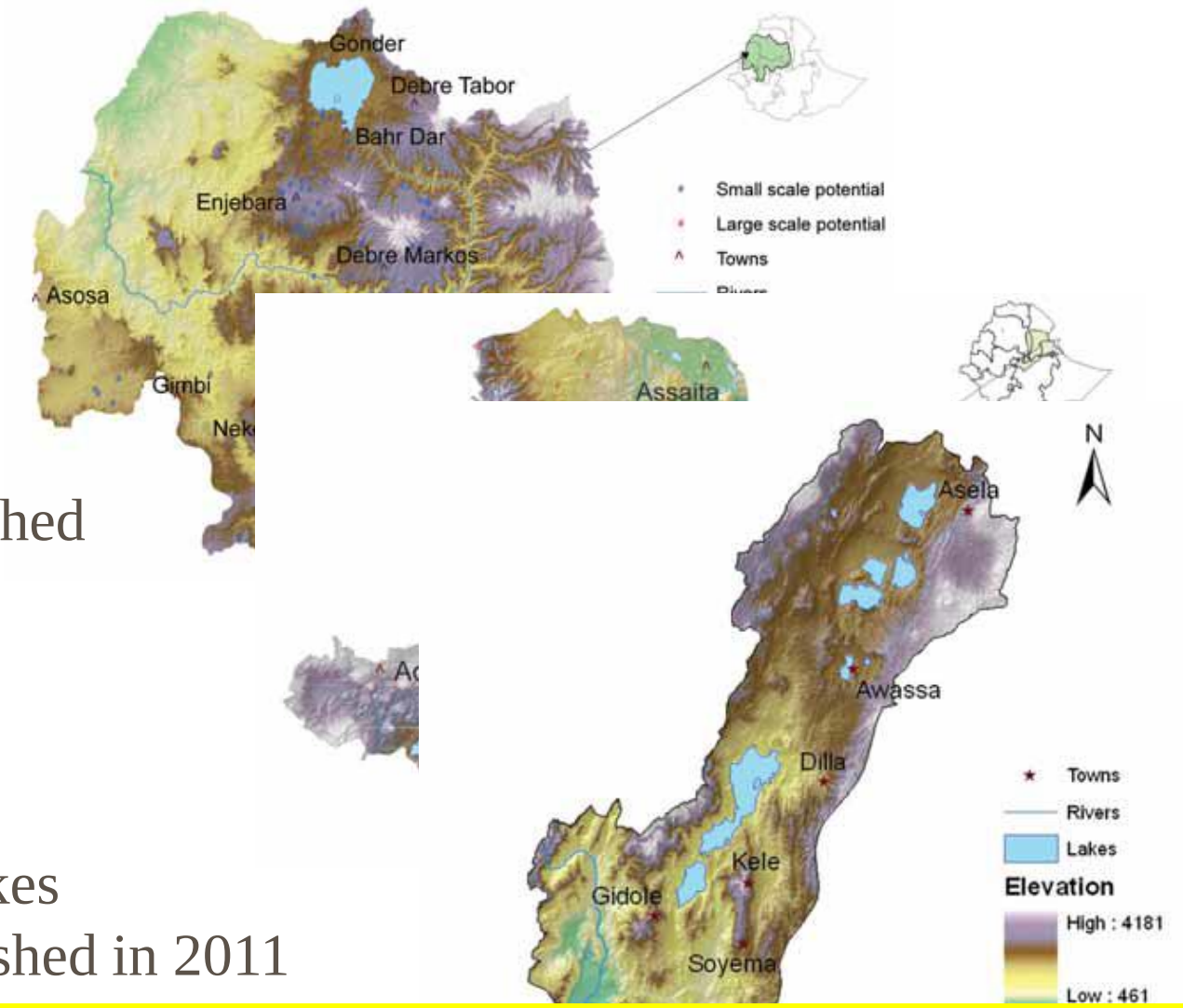
That is when our river basin organizations role comes into full picture.

River Basin Authorities

Abay Basin
Established 2008

Awash Basin
Established

Rift Valley Lakes
Established in 2011



What have the RBA authorities have achieved since their establishment!

4. Water Resource Mgmt challenges – Bottle-Neck Analysis.

Legal framework – adequate but harmonization is still required between the regional and federal mandates.

Policy/strategy and laws – comprehensive but strategy is getting outdated and overtaken by GTP

Support for WRM – little commitment for WRM Is using sectors due to lack of horizontal coordination and communication between ministries and within MoWIE

Finance – Budget allocated for RBA is in adequate, and unpredictable; fee collection is not in practice,

Information base – data (surface and groundwater) is in adequate,

Human Capacity – deficiency in staff profile

Equipment and systems – monitoring equipment in adequate, information systems non existent.

Basin planning – limited connections between sctoral lans and basin plans and between basin plans and federal-regional level

Stakeholder Participation – no strong evidence in representation, information shared and confilict resolution

Water allocation – unclear criteria for water allocation

Pollution control – no integrated pollution reduction strategies basin level

Monitoring – limited monitoring of water quality

Economic management – charges for water use and pollution permit are non- existance /inadequate

Flood and drought – Little evidence from learning in the past.

Adaptive management – no evidence that trends and future projections of water availability, demand and pollution are systematically considered in planning.

Enforcement – permit for abstraction and pollution only applied at times

Institutional and technical sustainability- staff turnover, shortfalls in long term financing for WRM institutions

Environment and social development – no evidience that environmental flow for eco-sytems services are collected

5. Conclusion and Take-home message

- Water plays and will continue to play an imperative role in growth, development and poverty reduction effort of Ethiopia.
- Water utilization in Ethiopia by all standards is very poor because of economic water scarcity.
- Due to emerging drivers (development and climate change induced variability), water insecurity is affecting many regions/ communities.
- Water insecurity is aggravated due to absence of effective institutions to manage water resources;
- The establishment of River Basin Organizations in the effective management of water resources is action in the direction.

- But river basin organizations must be effective, proactive, accountable and for which they need to be empowered and capacitated.
- Effort to develop and sustainable manage water and land resources need to be properly integrated – water doesn’t come to from the tap, it doesn’t come from the reservoir, it actually comes from the watershed.

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Take home-message

Inability to develop water resources has been the cause of water insecurity in Ethiopia;

soon

Absence of effective water management will be the cause of water insecurity;

Hence

the development of effective water management institutions is imperative

for which

the commitment of the leadership is a prerequisite.

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Thank you

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