

*Kickoff Workshop*  
*Harnessing Floods to Enhance Livelihoods and  
Ecosystem Services*

*28-30 April, 2015 – Kassala – Sudan.*

**Spate Irrigation in Sudan:  
Opportunity for Development**

*Abu Obieda B. Ahmed*

*hrs\_abdo@hotmail.com*

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ قَالَ تَعَالَى: وَ نَزَّلْنَا مِنَ السَّمَاءِ مَاءً مَبْرُكًا

فَأَنْبَتْنَا بِهِ جَنَّاتٍ وَ حَبَّ الْحَصِيدِ (9) وَ النَّخْلَ

بِاسْقَاتٍ لَهَا طَلْعٌ نَضِيدٌ (10) رِزْقًا لِلْعِبَادِ وَ أَحْيَيْنَا

بِهِ بَلَدًا مَيِّتًا كَذَلِكَ الْخُرُوجُ (11) - سُورَةُ ق.

# Objectives

*To Shed light on some issues regarding SPATE Irrigation in Sudan.*





**SPATE = FLOOD**





Destructive



Threatening Life

Gash 2007

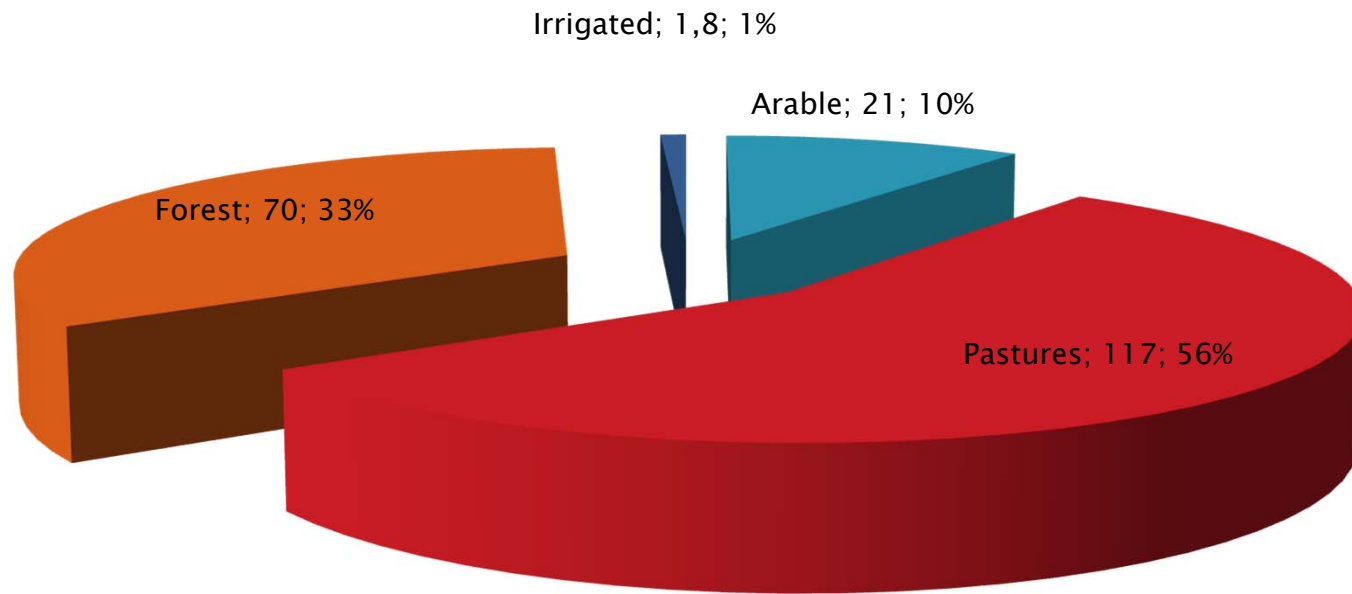


Abu Habil 2007

# Country Profile

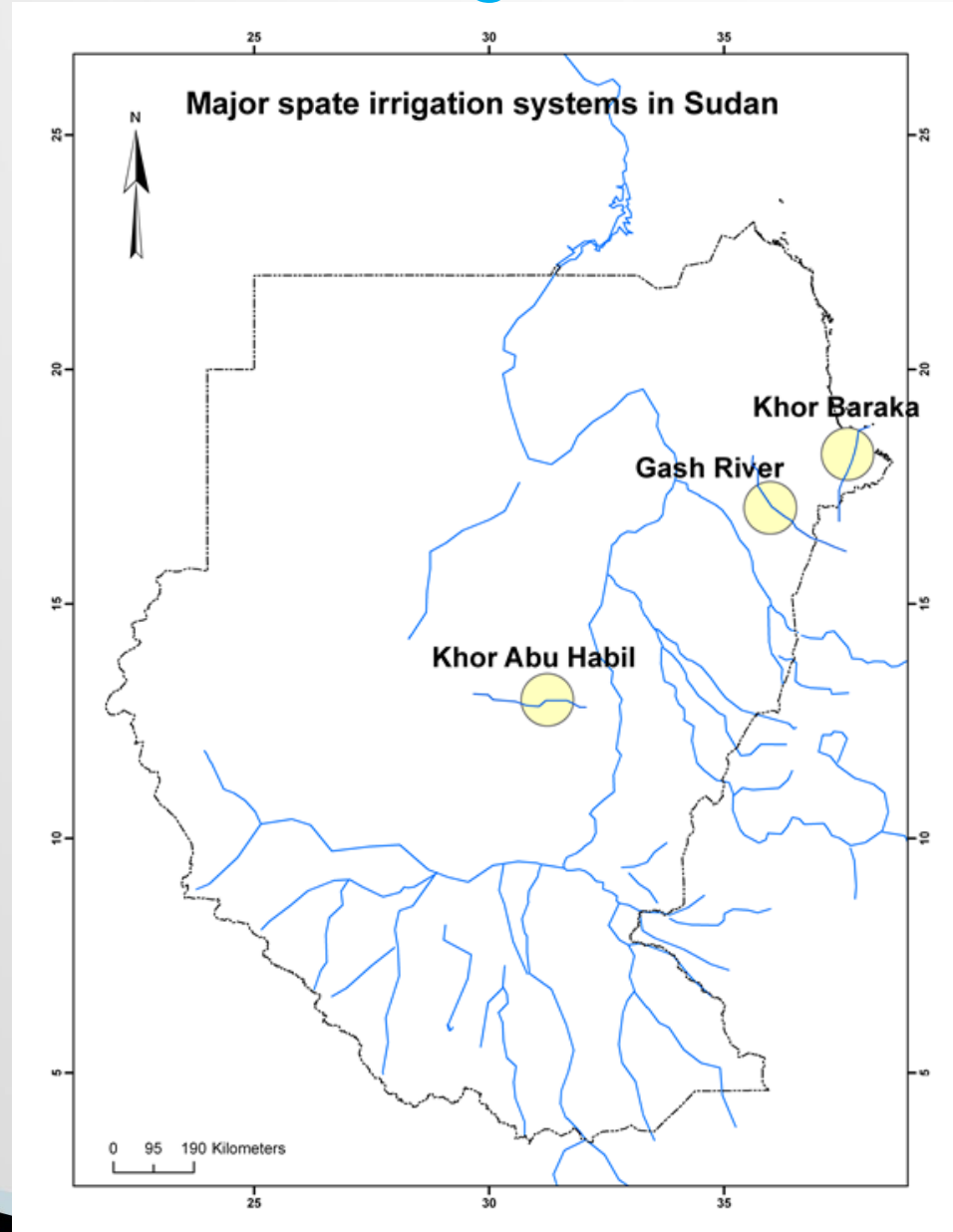
- ◆ Total population : 43.2 M
- ◆ Agricultural population: 22 M
- ◆ Land area: 238 M ha
- ◆ Arable land: 21 M ha
- ◆ Permanent crops: 208 000 ha
- ◆ Pastures: 117 M ha
- ◆ Forest area: 70 M ha
- ◆ Irrigated land : 1.8 M ha





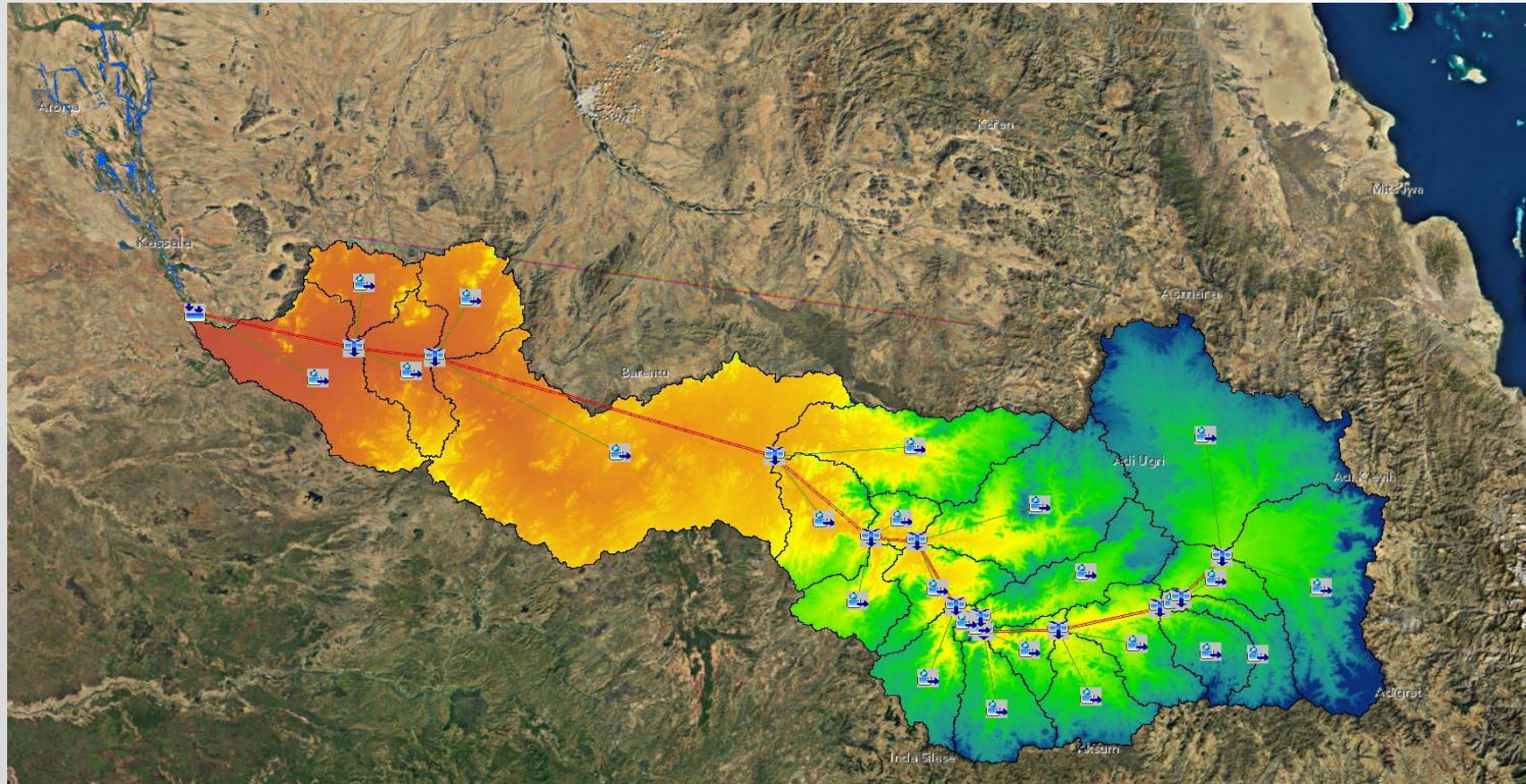


# Three Distinguished Area





# GASH



Source: IWMI

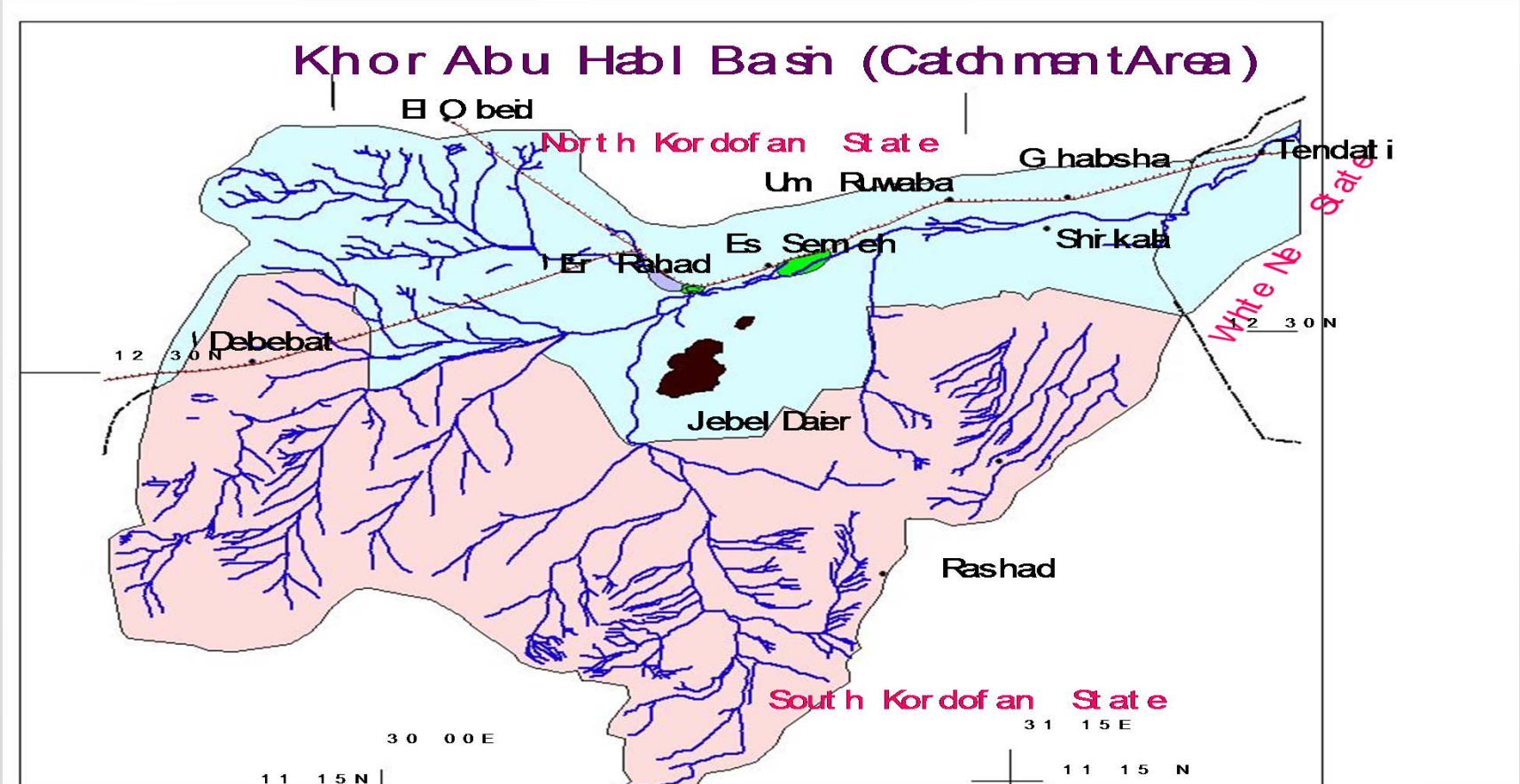
Trans-boundary – Regional







# Abu Habil

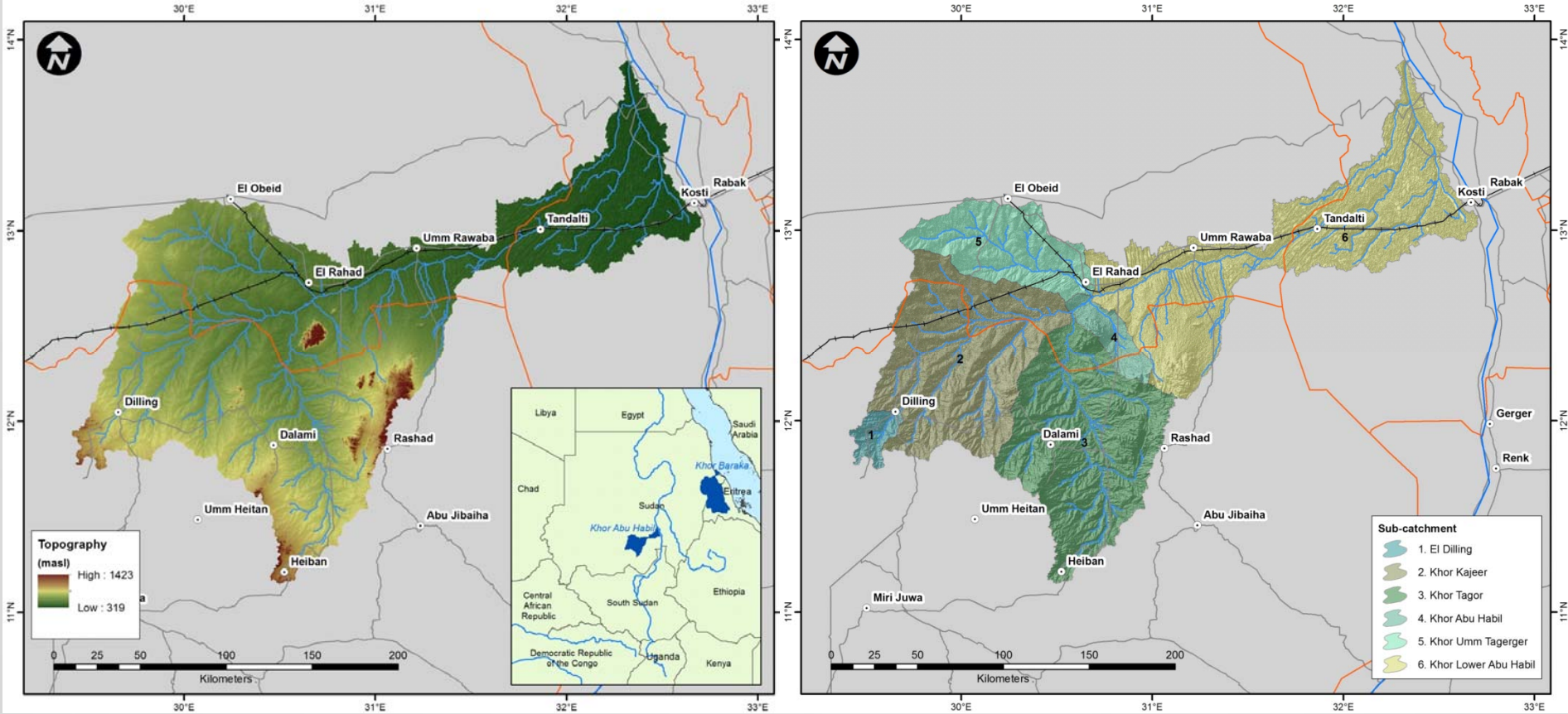


Source: YAM (2004), IFAD.





# Abu Habil



Source: Shoura & SWEEO (2013).

Trans-boundary – Statal





# Main Common Features

- Flushy (high flow variability)
- Seasonal
- Steep slope
- Sedimentation (high rate)
- Weeds ... etc

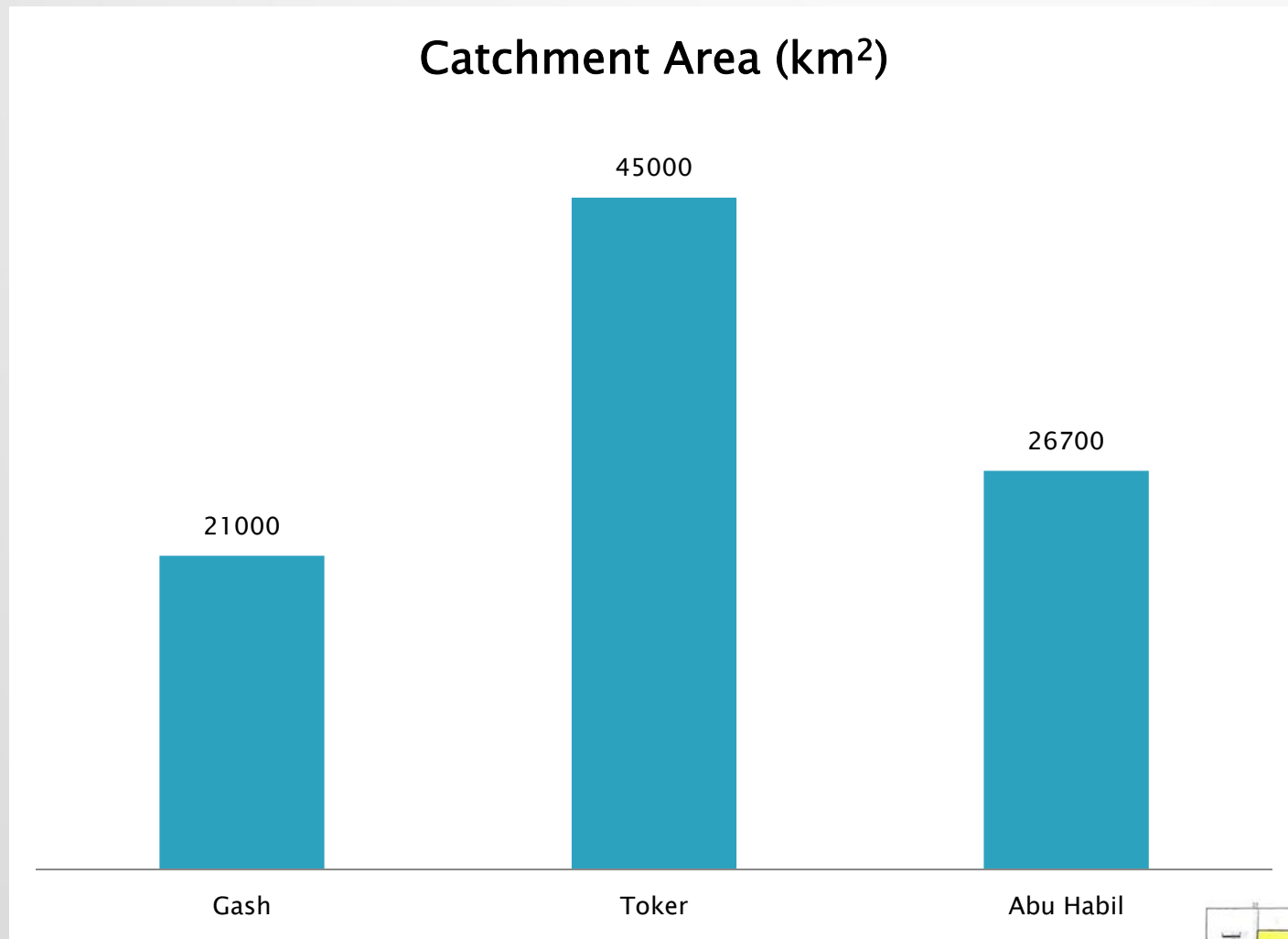


# Economic Activities

- Agriculture
- Livestock
- Charcoal
- Bricks
- ... etc

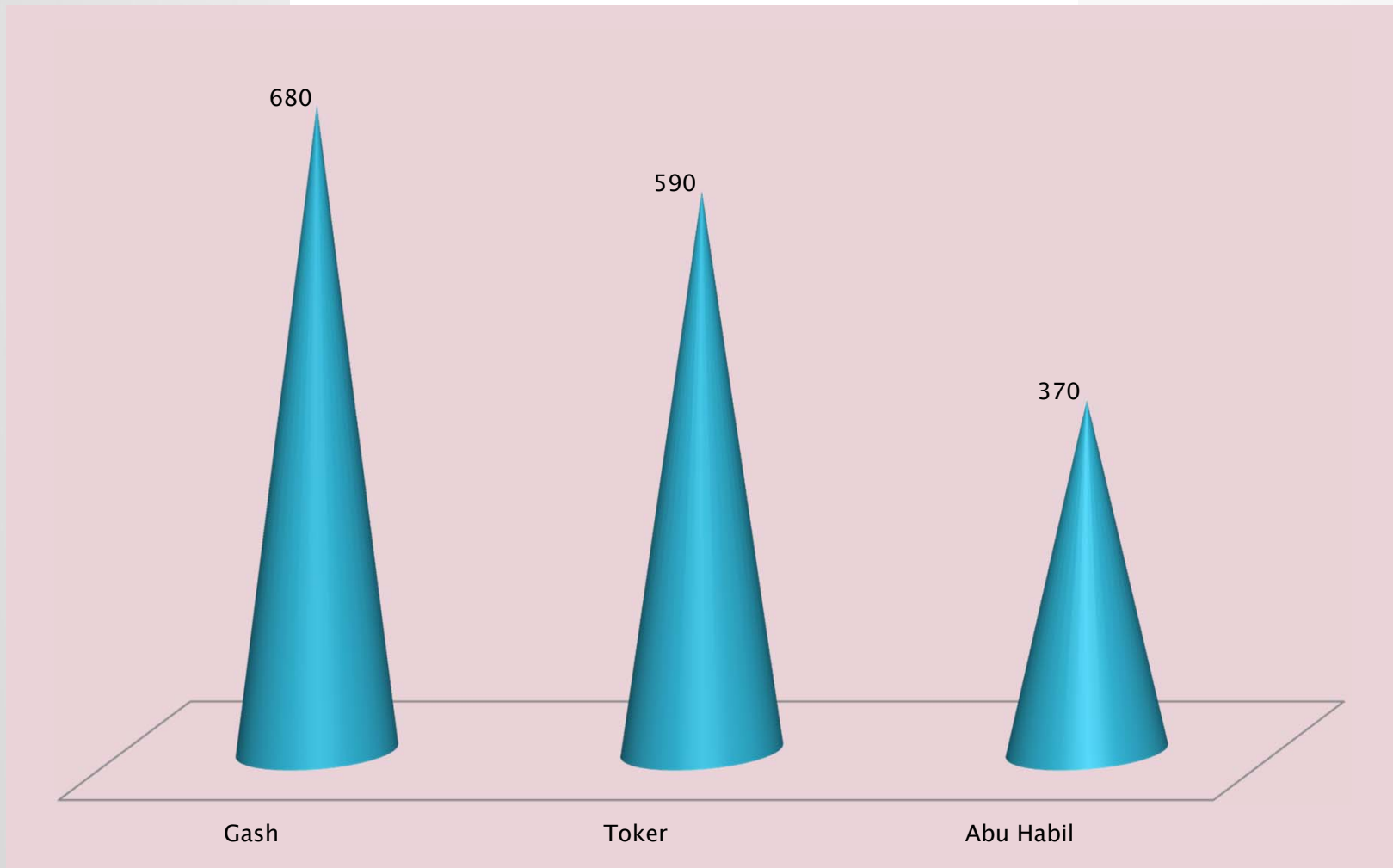


# Catchment Area (km<sup>2</sup>)



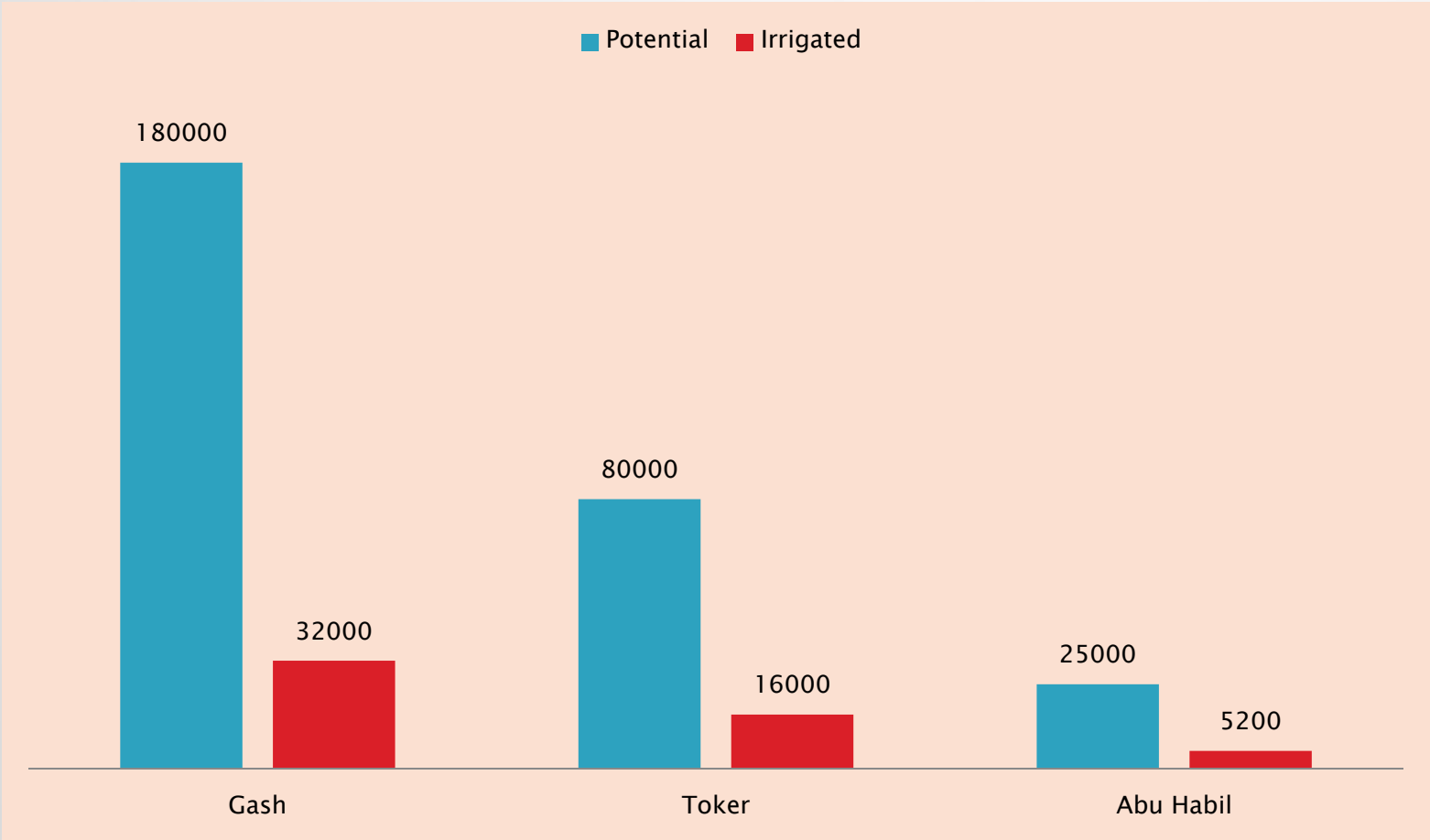


# Water Availability





# Potential Versus Irrigated Area (ha)



# Main crops

- Cotton;
- Sorghum
- Millet
- Vegetables
- Fruits
- Sun flour
- Forest ...



# Main Crops





# Associate Problems

- Upstream intervention:  
(e.g construction of 6 earth-dams u/s khor Abu Habil)
- Rapid change in topography:  
(high sediment concentration?, weeds)
- Lack of holistic thinking  
(water diverging, increase of retention time in u/s side)



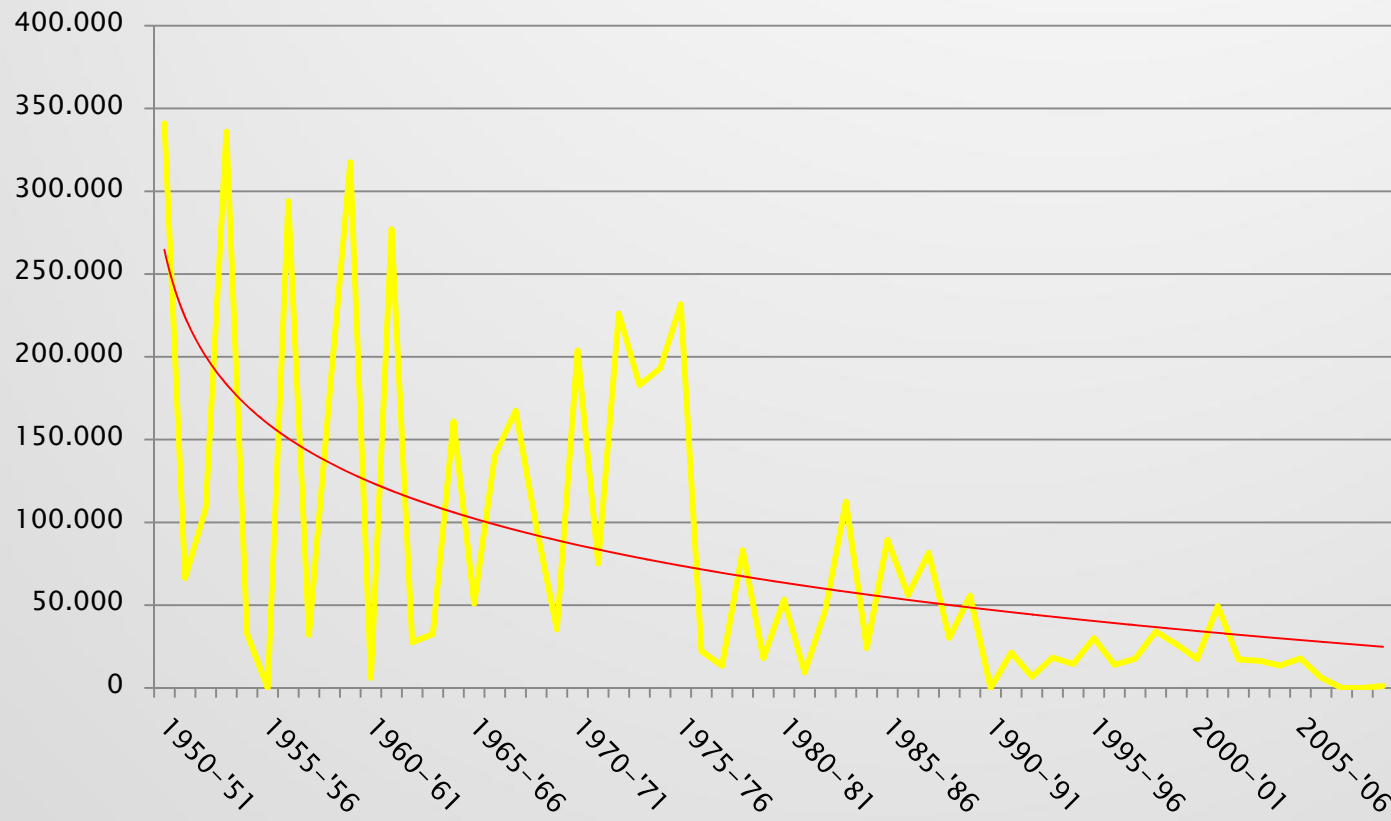
➤ Irrigation methods and practices ?

Site	Yield (ton/ha)	Water (mm)	Productivity (kg/mm)
Upstream	1.34	663.60	2.02
Middle	1.90	542.01	3.51
Downstream	2.79	412.80	6.76

- ▶ The water lost was:
  - ✓ 50% at head
  - ✓ 22% at middle section.

*Source: Adeep, IGAD Water Dialogue Forum, 2015)*

## Total Cotton Production in Kantar for Tokar Delta 1950-2010

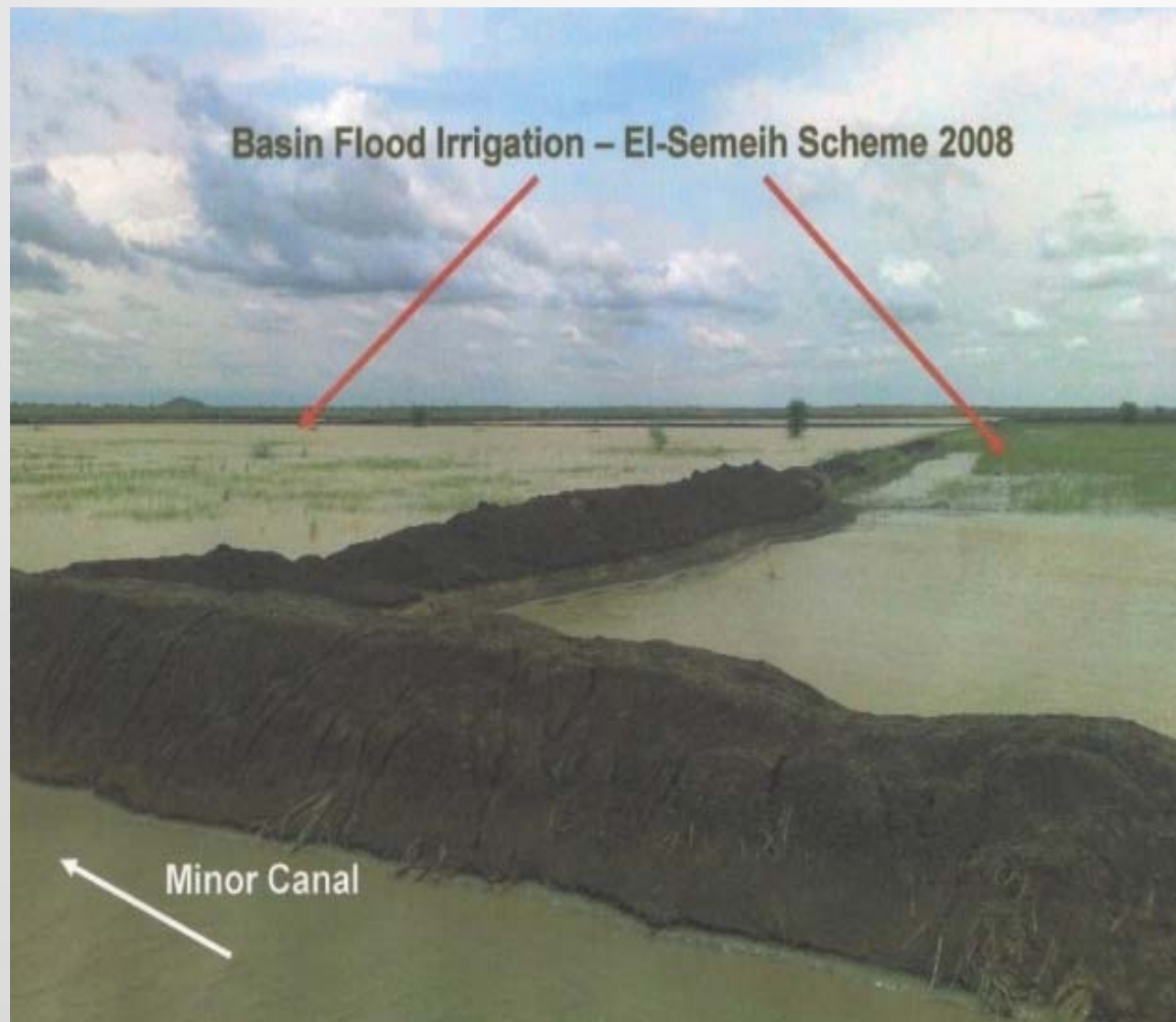


# Is it a problem of Productivity or Production?

Productivity =  $f$  (Crop, Soil, water, Climate, Practices ... )

Production =  $f$  (Area) --> Policy, Opportunity, Attitude, Market ... )

## ➤ Accessibility





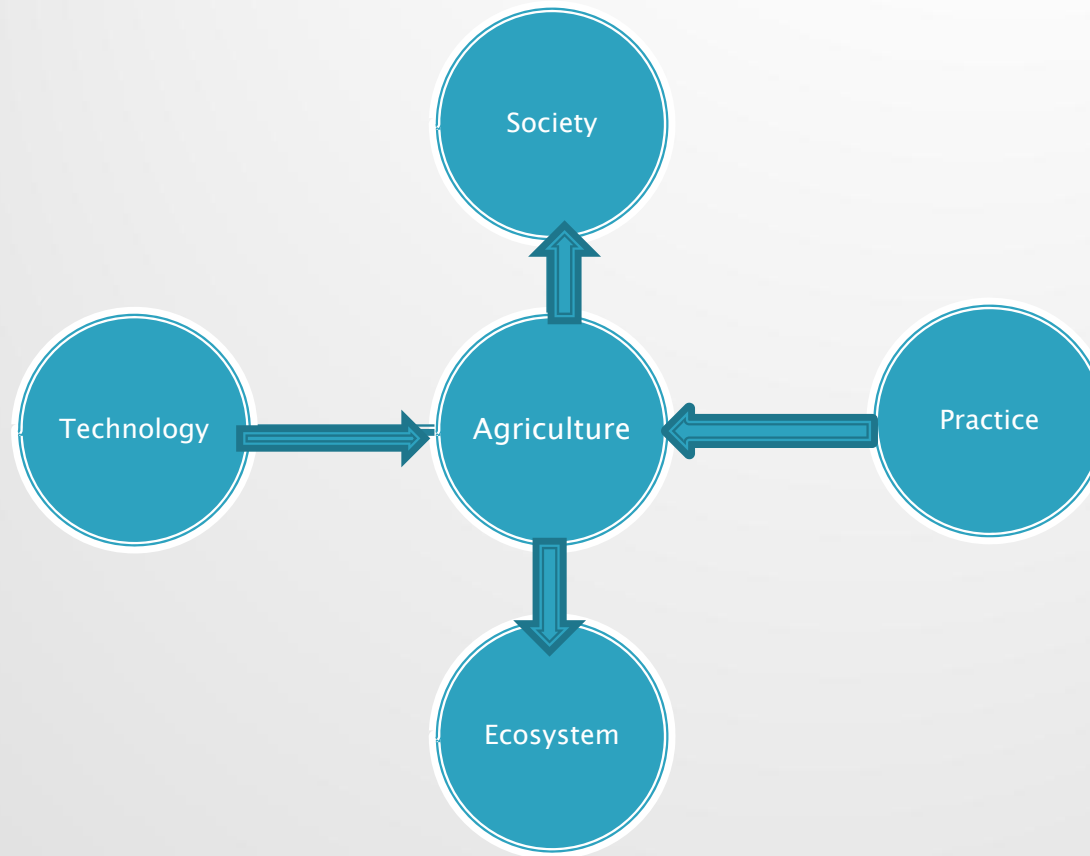
➤ Over abstracting (Depletion)



# Why FBFS? S P A T E

- **S** Society
- **P** Practices
- **A** Agriculture
- **T** Technology
- **E** Ecosystem





*Through **P**racticing appropriate **T**echnology in **A**griculture, **S**ocial Equity and Sustainable **E**cosystem become reality.*



Traditional method of river training.

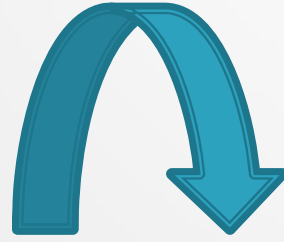


Sometimes machine doesn't work.

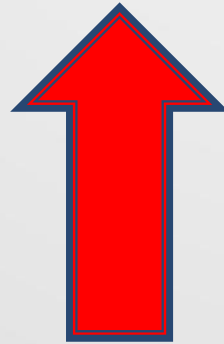


**Encourage Innovation**





$$XI + I = X$$



**Look from different Angle**



**Accommodate Diversity**



# Opportunity

- Good soil
- Abundant of water
- Different activities



# Resultant

- Achieving food security and Poverty alleviation.
- Better Social services.
- Improving livelihood of households
- Livestock fodder.
- Increasing incomes.
- Employment opportunities for State people
- The low cost of production, decreases cost per unit produced and consequently increases its competitive advantages.
- Devoid of use of chemicals increases its marketing features among competitors.
- Improving the productive capacity of the rural environment.





# Conclusion

The current spate irrigation methods resulted in significant loss of benefits due to lack of Integrated water Resources management approach.



*Thanks for your Attention*