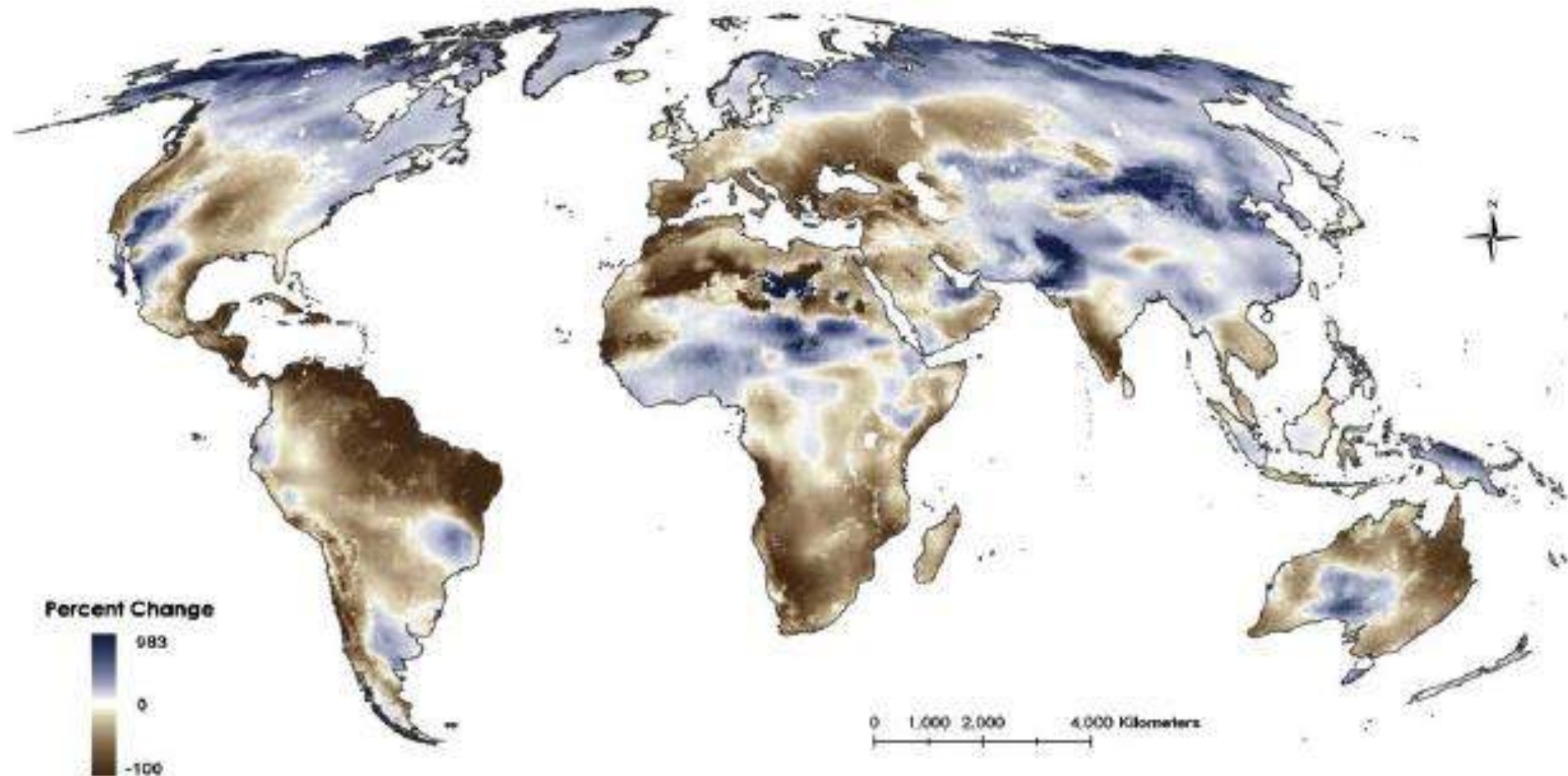


The PSIPW Research Chair at King Saud University

Using Satellite Imagery and DEM to Optimise Water Harvesting
and Storage under Climate Change Uncertainties



Water Yield Change Between 1990-2060 Using HadCM3



Urban Flooding in Jeddah, Saudi Arabia



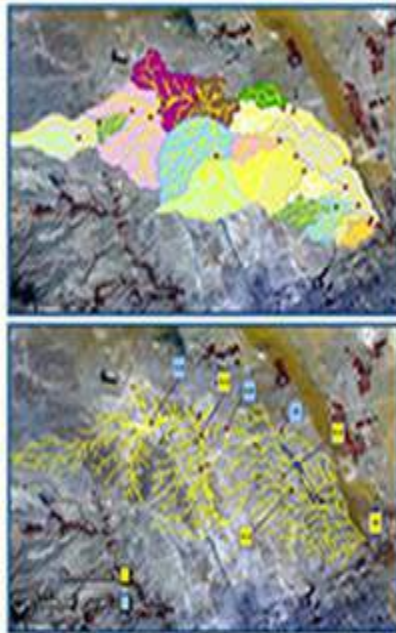
King Fahad Water Harvesting and Storage Project



Prince Sultan Project for the Rehabilitation of Villages & Hamlets



Riyadh Flood Control Project



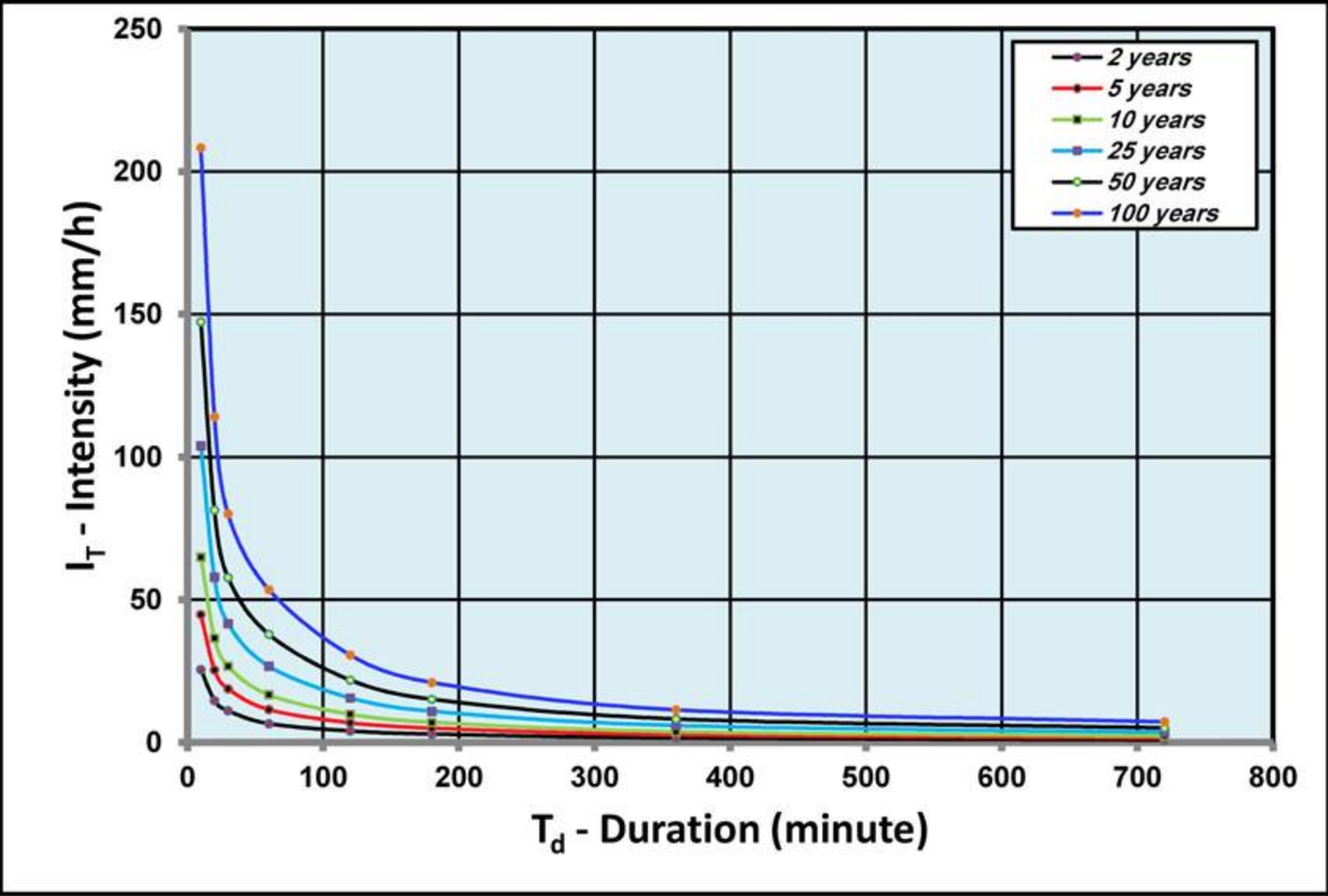
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مشروع دراسة
التقليل من مخاطر السيول
على مدينة الرياض



Prediction of 100-Year Trend in Sporadic Intense Precipitation



Topography & Infrastructure



Three Strategies:



- [1] Rainwater harvesting behind existing dams
- [2] Rainwater harvesting behind purpose-built dams
- [3] Artificial ponds for community use

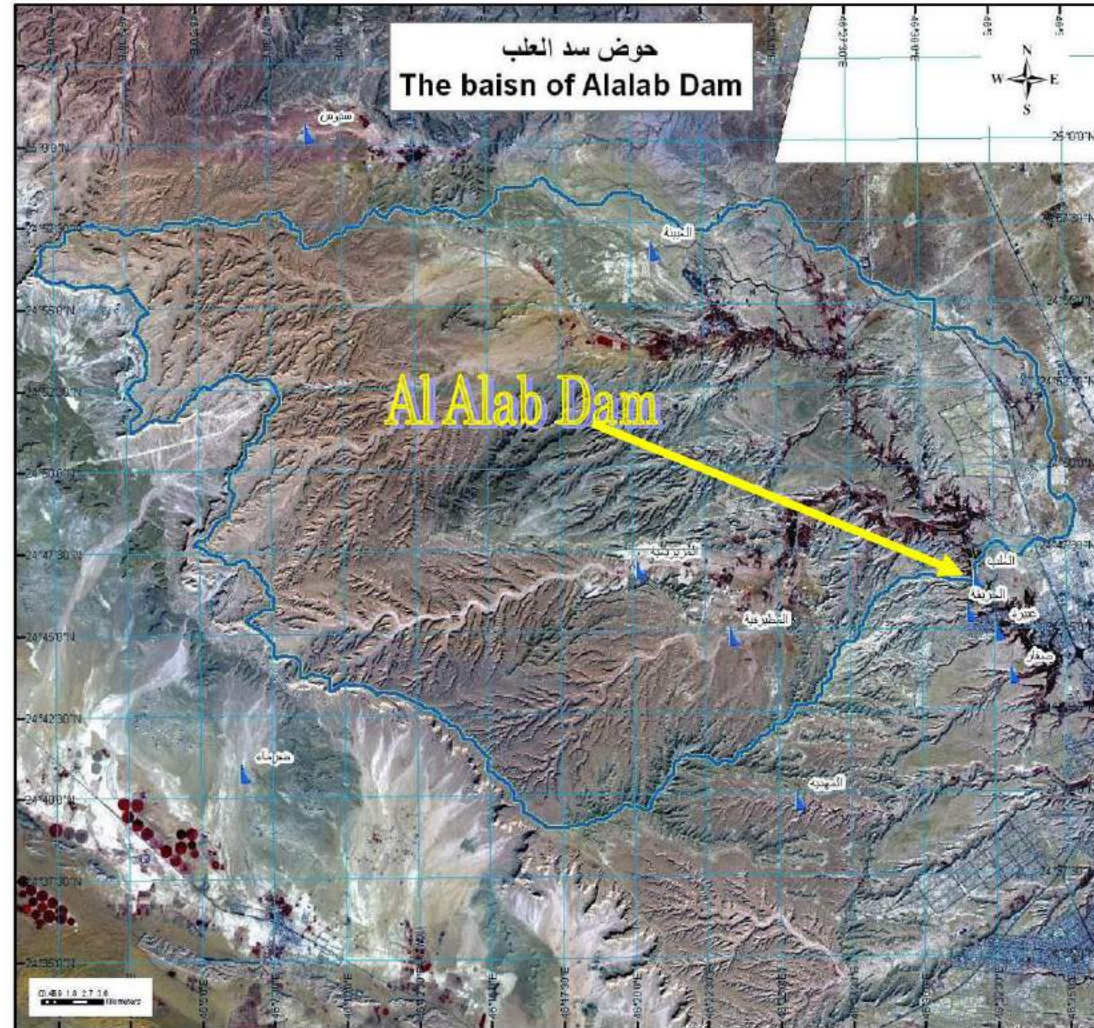
Using Satellite Data to Assess the Dam Basin



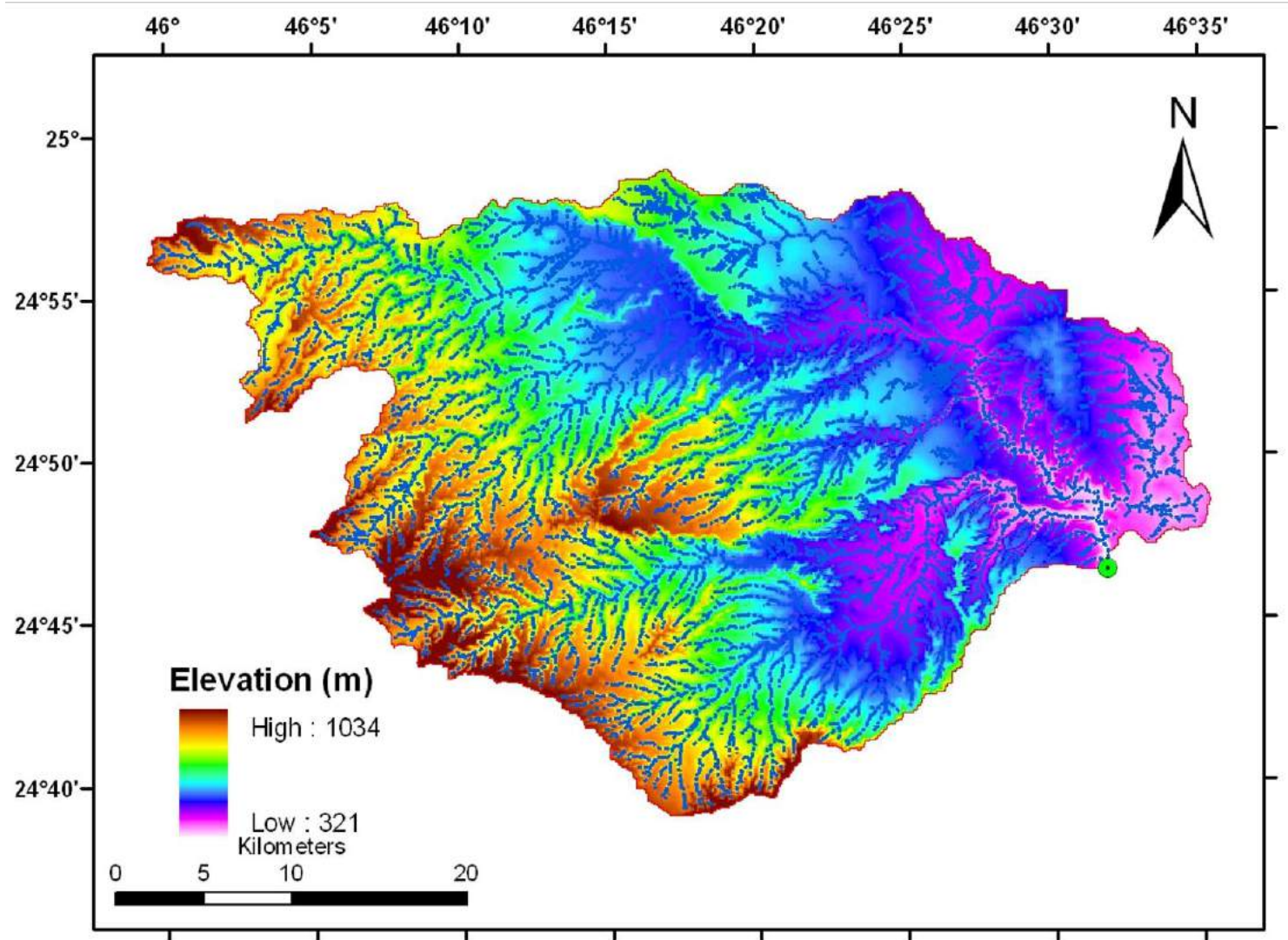
اسم السد : العلب
Dam Name : Alalab
نوع السد : خرساني
Dam Type : Concrete

الموقع Location
 $46^{\circ}31'50.956''\text{E}$
 $24^{\circ}46'26.984''\text{N}$

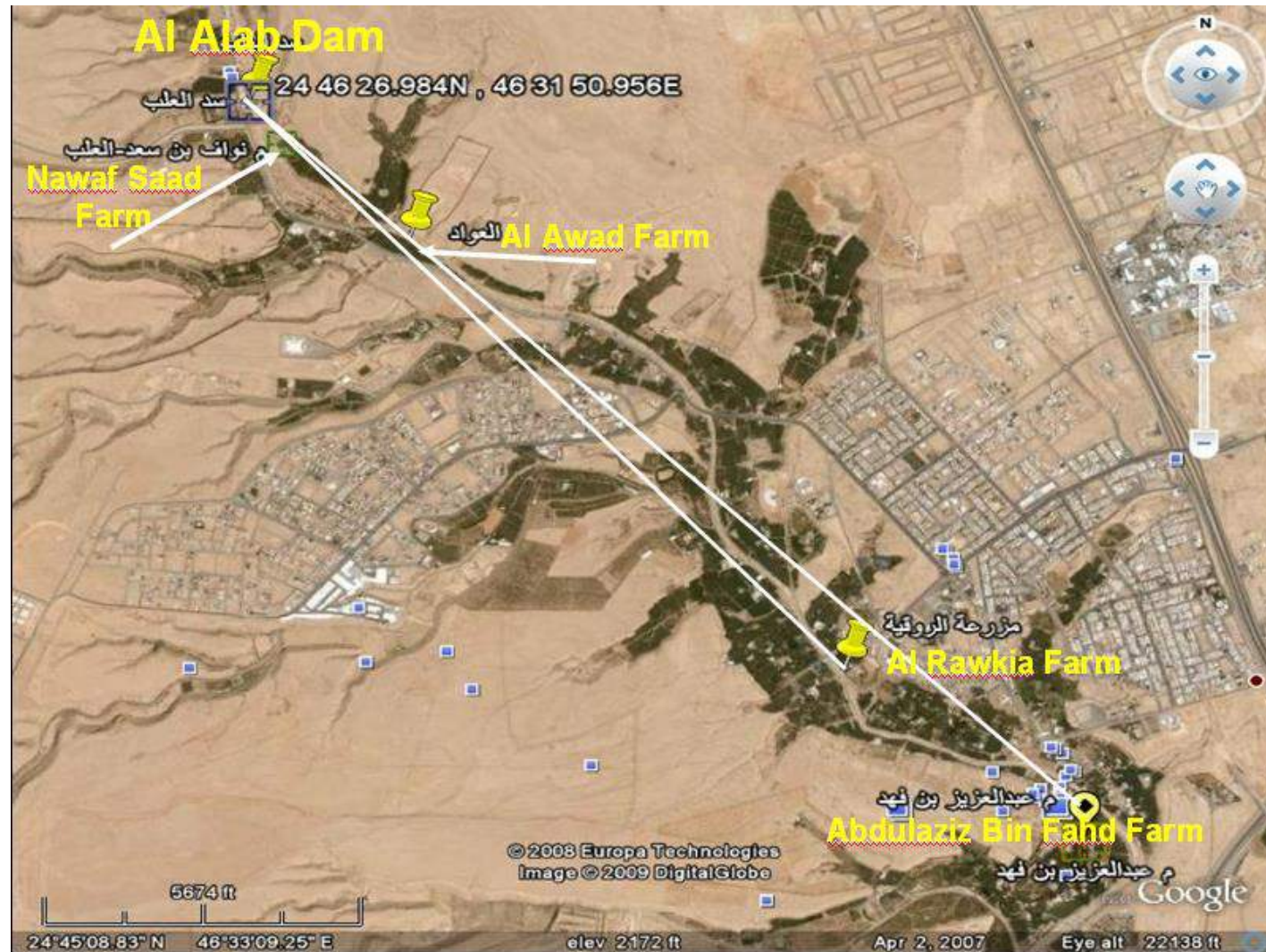
 Dam Location
 Basin



Applying DEM to Satellite Data for Morphometric Parameters



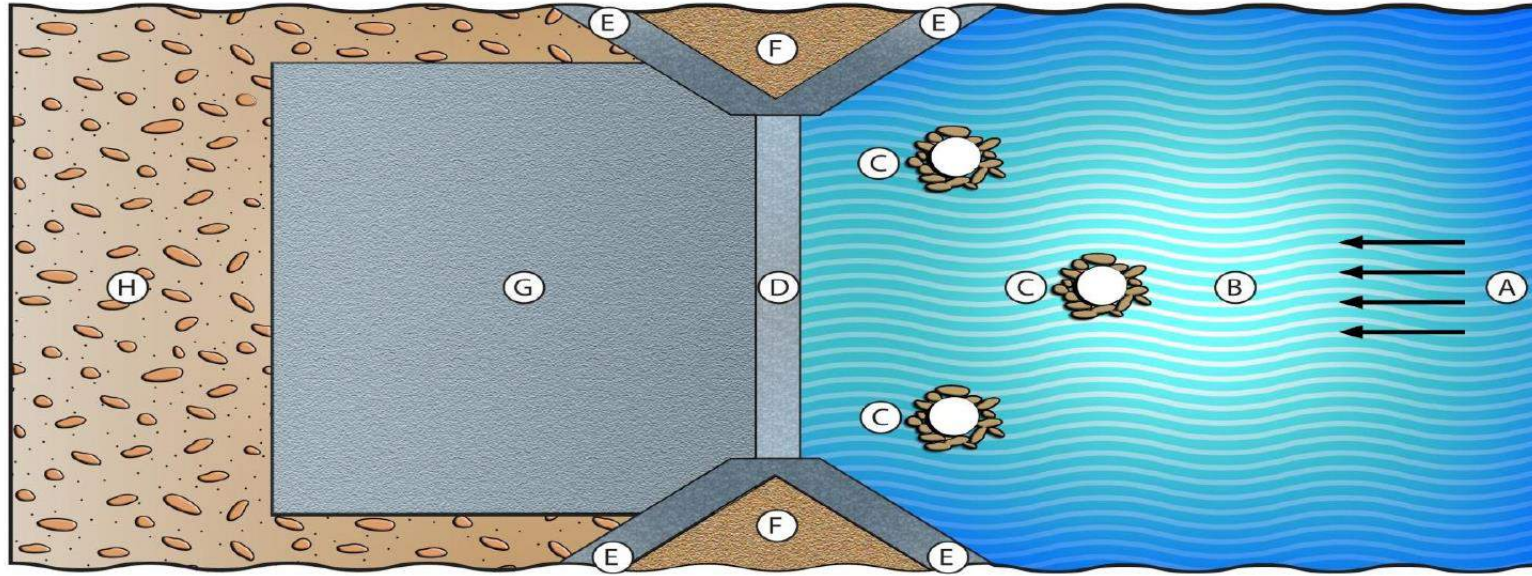
Assessing Downstream Impact on Beneficiaries



Recharge Pipes at Al-Hareeq Dam



Artificial Recharge Pipes behind Small Purpose-Built Dam



A. Water flow channel between 10 & 50m wide

B. Excavated & leveled area for water storage at a proposed length of double the width of (A). For example, if (A) is 12m, then B will be 24m.

C. Recharge well with double-valve pipe built over it, not to exceed the dam in height. The number of wells in (B) will range from 2-4, depending on the width of (A).

D. Concrete dam 1 m in height, 1/2m thick, whose length = $\frac{2}{3}$ the width of (A).

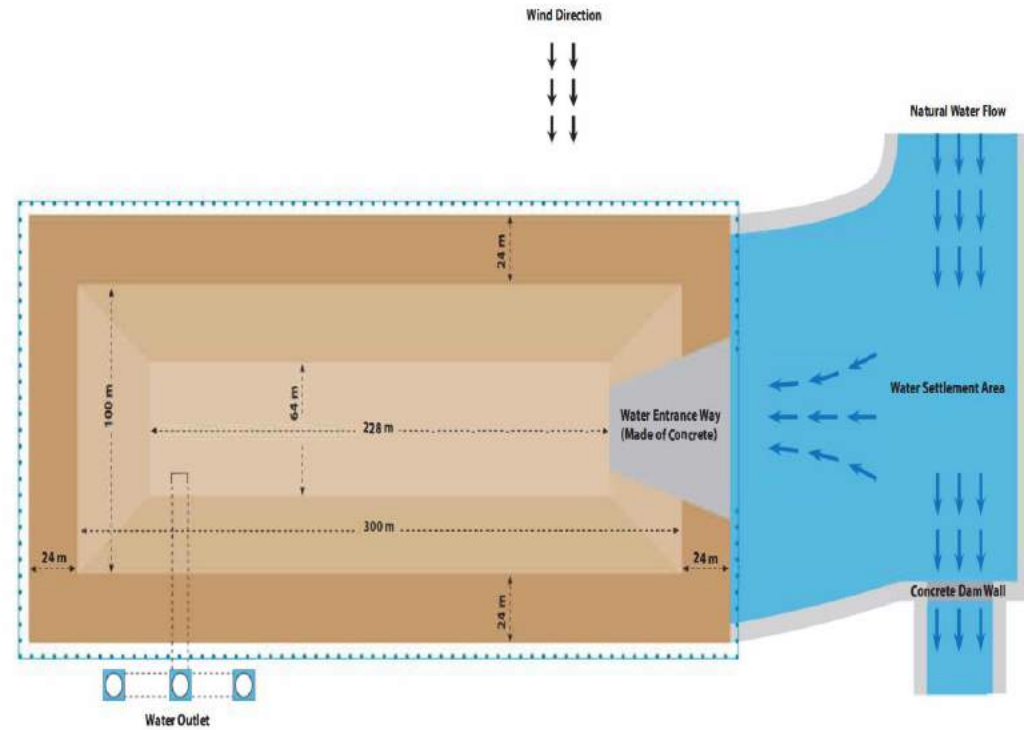
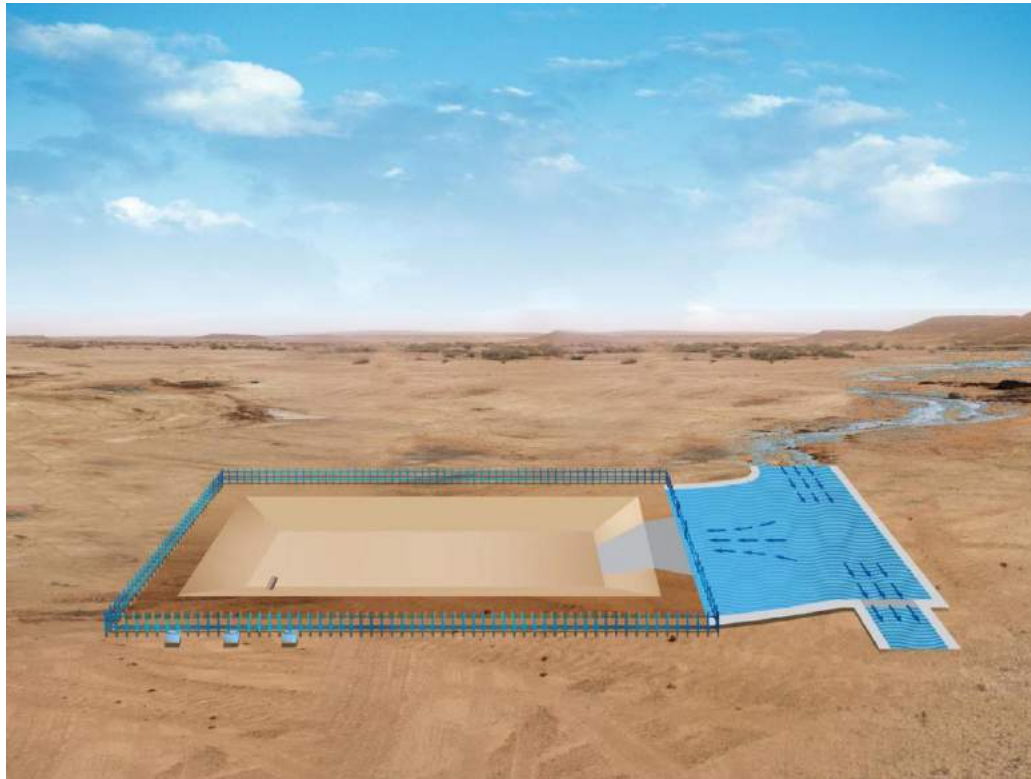
E. Support walls of equal thickness to the dam and with a height 1m higher than the dam.

F. Excavated soil from Area (B).

G. Primary overflow area covered by 15cm-thick layer of concrete extending away from the dam to half its length with a width exceeding the length of the dam by 2m.

H. Secondary overflow area covered with gravel.

Artificial Ponds for Rainwater Harvesting



Artificial Pond for Rainwater Harvesting



Dhurma Artificial Pond Diversion Dam



Locals Retrieving Water from Dhruma Artificial Pond



THANK YOU!



Prince Sultan Bin Abdulaziz
International Prize for Water



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