

Fact sheet:

## Assessment of the October 24th 2008 Flood in Wadi Doan, Hadhrmout towards Realization of IWRM

*By: Abdulmoghni Algafari*

### Background

- Yemen and in particular Wadi Hadhrmout is a flood prone area.
- The area has been subjected to frequent big flood damages in 1977, 1981, 1989, 1992, 1996 and 2008.
- Many tributary Wadis in Wadi Hadhrmout such as, Wadi Doan were damaged of their water diversion structures, lashing of agricultural lands and crops, uprooting of Palm trees and damaged of public infrastructures.
- Wadi Doan was selected as case study because it is considered the most important and famous of all and the largest Wadis of Hadhrmout has the largest population, and exposed to significant damage of its infrastructure through the last floods.



### Main findings

- The 2008 Yemen floods were caused by the 2008 Yemen Cyclone, officially known as Deep Depression, Large catchment area with limited vegetation covered areas and lack of protected flood structures like dams, dikes, bunds and diversion works.
- The study area was subjected to heavy storms during 22nd, 23th and 24th of October-2008 which reached to 75.5 mm at Doan area.
- The 2008 observed flood magnitude at the outlet of Wadi Doan amounted 3850.2 (m<sup>3</sup> /s), with volume 164.65 Million m<sup>3</sup>.

- The banks at the outlet of the Wadi widen of 4.0 m of each bank as shown in the above photo.
- Several agricultural lands and water diversion works were eroded and leached out by the flood.
- The suitable structures which can be constructed to reduce and manage the floods at the outlets of sub catchment areas of the Wadi Doan are check dams as incomplete low rocky dams or using oqum systems.
- Wide arable lands located on the two banks of the main stream of Wadi Doan can be reclaimed and cultivated and that will contribute to reduce floods peak flow through exploitation of the floods water for irrigation.
- Estimates of flood peaks based on flood hydrographs are essential to safe design of the water structures.
- Wadi Doan has occasional high flood potential which may at any times cause human life losses and property damages at the same time there is no any early warning system either in Wadi Doan or Wadi Hadhramout.
- The weak role of community people in managing the floods through their traditional structures lead to increase the probability of floods risks on their properties.
- Lack of flow and rainfall stations over the catchment area of Wadi Doan.
- Lack of floods related studies on the level of Wadi Hadhramout in general and Wadi Doan in particular.

### **Recommendation**

- To reduce and manage the floods at Wadi Doan it is recommended to construct check dams/diversion works at the outlets of sub catchment areas of the Wadi Doan, and protection walls and terraces along the agricultural land banks at Al Mashhad Area and stopping farmers of cultivating the flood streams, activating farmers of cultivating the arable lands which located on the banks of the main stream of the Wadi with introduction of the agricultural extension services based on application of land use program.
- Considering the importance of flood prediction in order to reduce flood risks and also for the purpose of water resources assessment and management, it is recommended that a center of flood monitoring, prediction and early warning system shall be established.
- It is recommended to install a flow gauging station at the outlet of Wadi Doan near AL Mashhad area at coordinates  $X=855.277$  km ,  $Y=1723.751$ km, and install rainfall station in the mid catchment of the Wadi at Al-Hujrain village at coordinates  $X=861.870$  km,  $Y=1671.000$  km.
- Activation of the community role to be involved in flood reduction and management actions through participation in planning, constructing, operating and maintenance of the different flood reduced and protected structures.as well as promotion of their traditional customs and rules through formation of WUGs/WUAs and IC in the Wadi to divert and distribute flood irrigation water based on equitable manner.
- Carry out more studies about flood prediction, control and management in Wadi Hadhramout in general and Wadi Doan in particular as to determine the floodplain for 100 year flood event by using HEC-RAS model.