

# Ways and Means for Reducing Flood Risks in Arid Zones Case Study Kashan

**-Dr. Javad Sadatinejad, President,  
University of Kashan**

**-Mr. Mohammad Sadatinejad, UN/ISDR  
Special Coordinator in Tehran( As an  
Iranian not in ISDR capacity)**

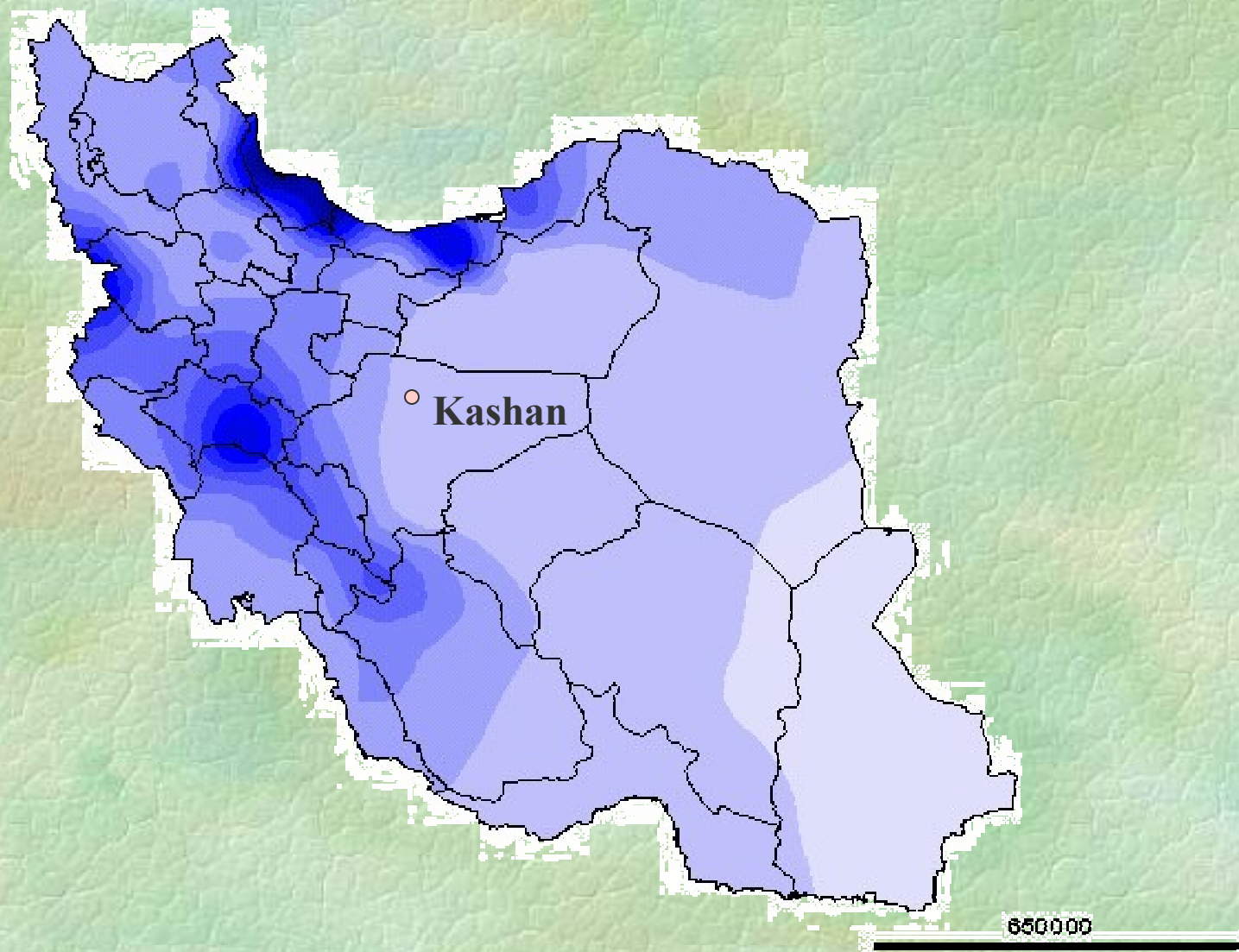




**The Global Annual Raining  
Average is 860 mm .**

**Iran's Annual Raining Average is  
240 mm.(30% Comparing to  
Global Average)**

# Raining Distribution Model in Iran





# Risks

## **Floods:( impacts on)**

- **400.000 population of kashan**
- **Human heritage: Sialk Hill as one of the great ancient urban civilization of the world (7000 years B.C)**
- **About 2500 Industrial Factories with billions investment**
- **Three big universities**

## Other risks:

1- **(Drought risk)** Water level is consistently reducing. Water level has reduced 28 Meters in kashan area due to irregular consumption and less raining. The less water, The more risk of drought

2- **Water crisis( Lack of drinking water)**

Changes in water availability are what hit the people first

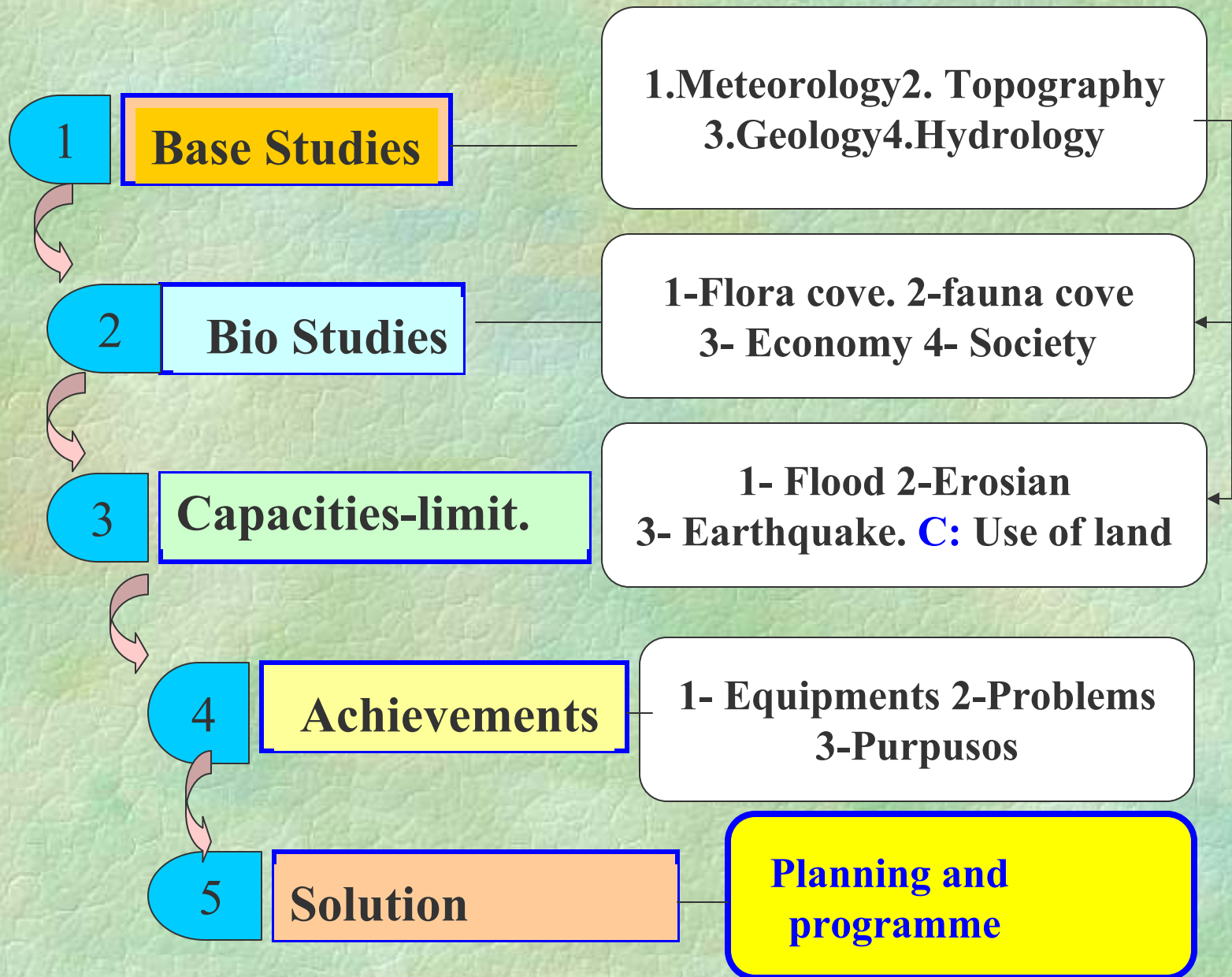
- Too much water or too little water, water at the wrong time or in the wrong place, floods in certain regions but droughts in others



**How we can change  
the challenges into opportunities**

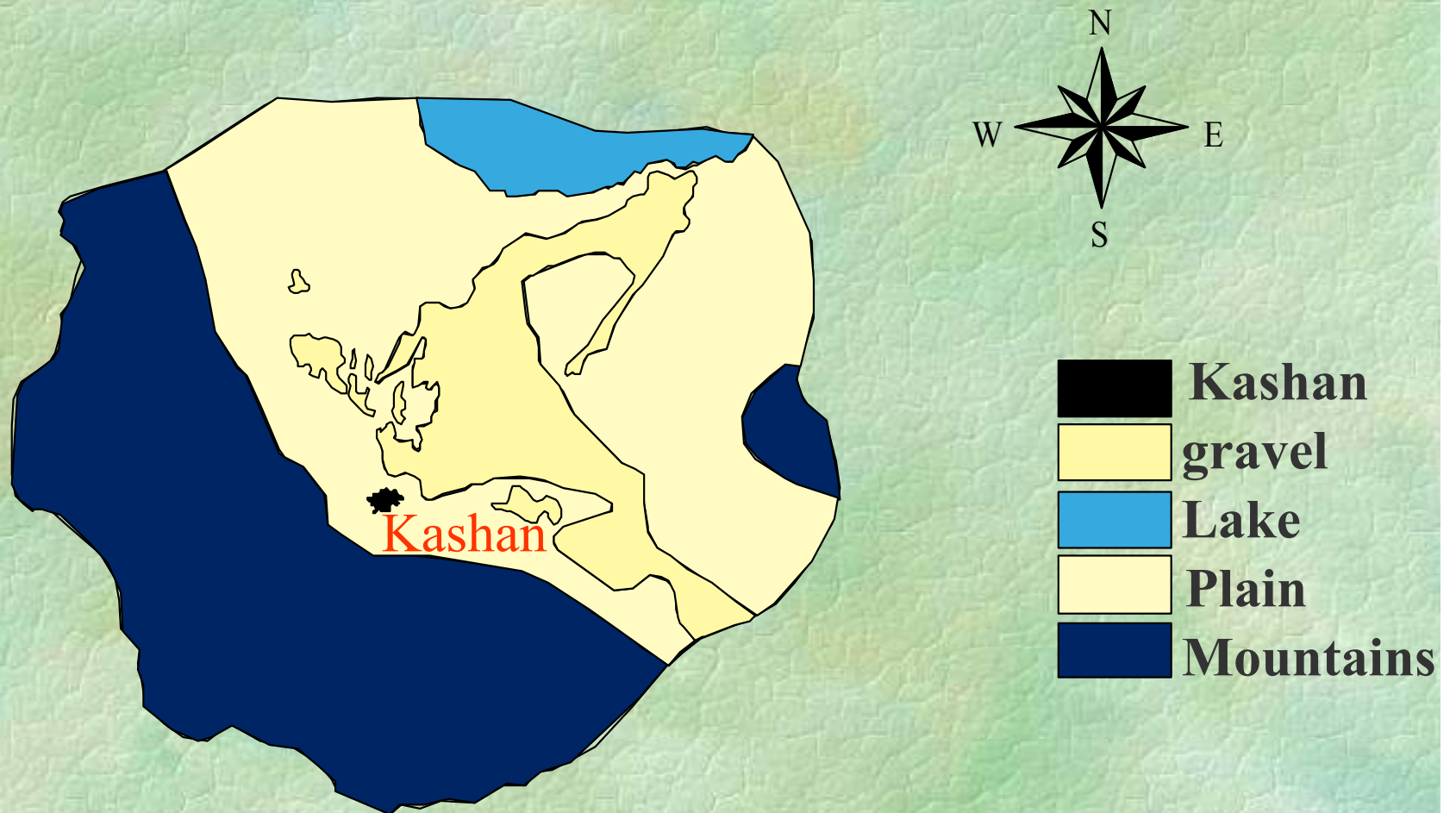
**Watershed Management and  
flood risk Management**

# Systematic Management Model in Watershed Basins

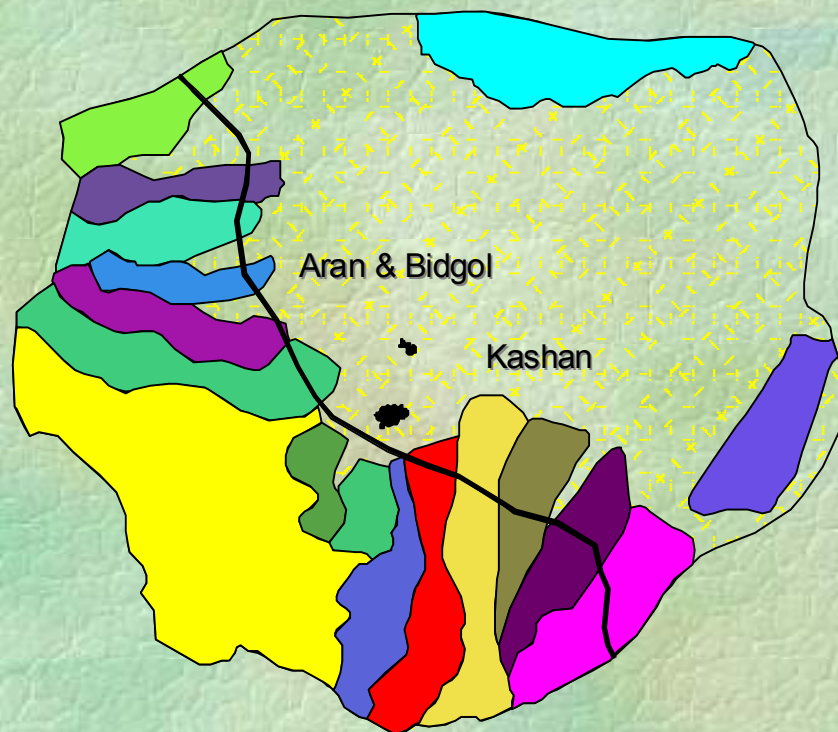




# Topographic Map of Watershed Basin of Kashan



# Map of Kashan Basin

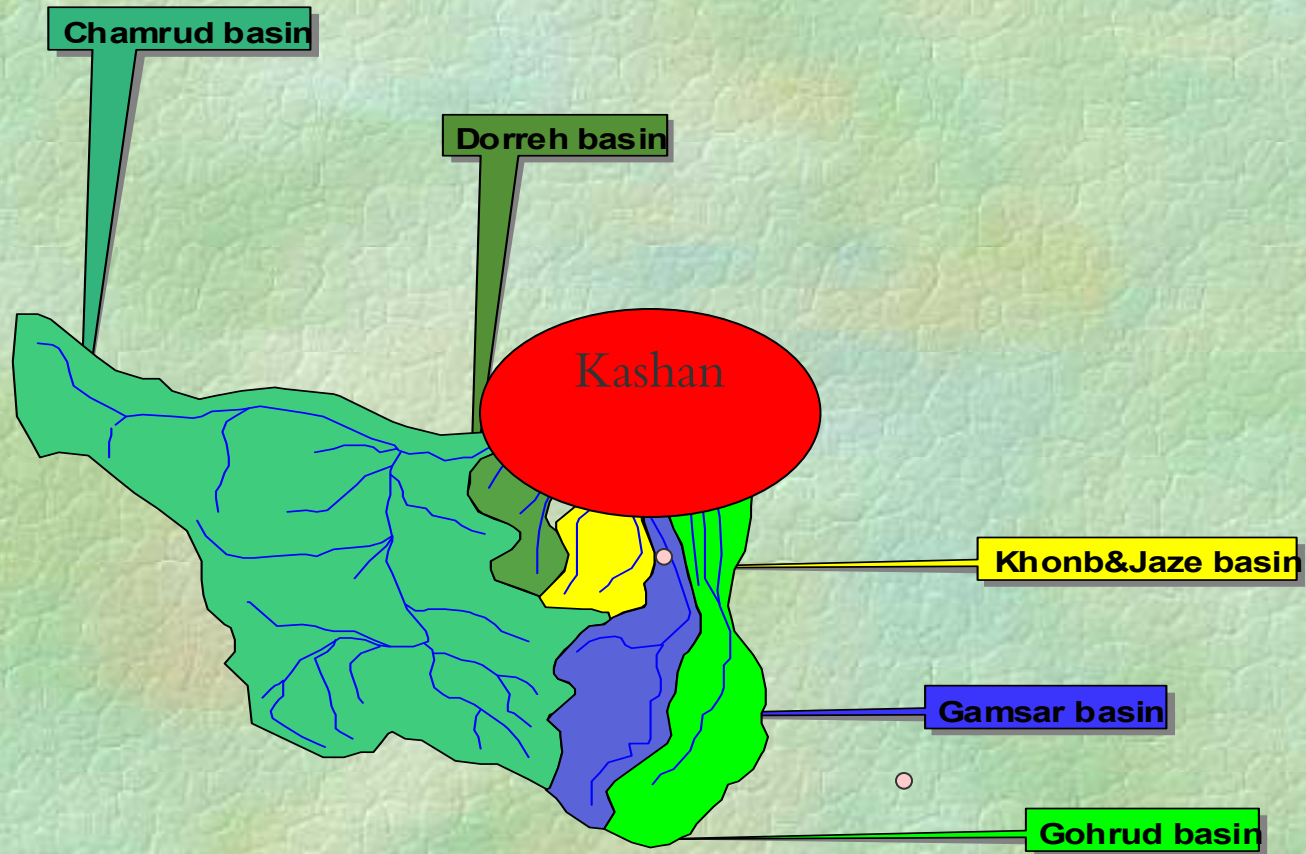
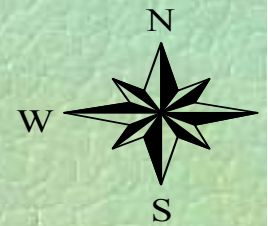


-  Free way
-  City
-  Hosin Abad
-  Deh zire
-  Khoram dasht
-  Fakhre
-  Mohammad abad
-  Ghohrud
-  Ghaamsar
-  Khonb v jazeh
-  Doreh
-  Chamrud
-  Jant abad
-  Van
-  Daram
-  Hamzar
-  Sensen
-  Shurab
-  More of Salin

Scale: 1:250000



# KASHAN UPPER BASINS



# Ways and means to reduce flood risks in arid zone of Kashan:

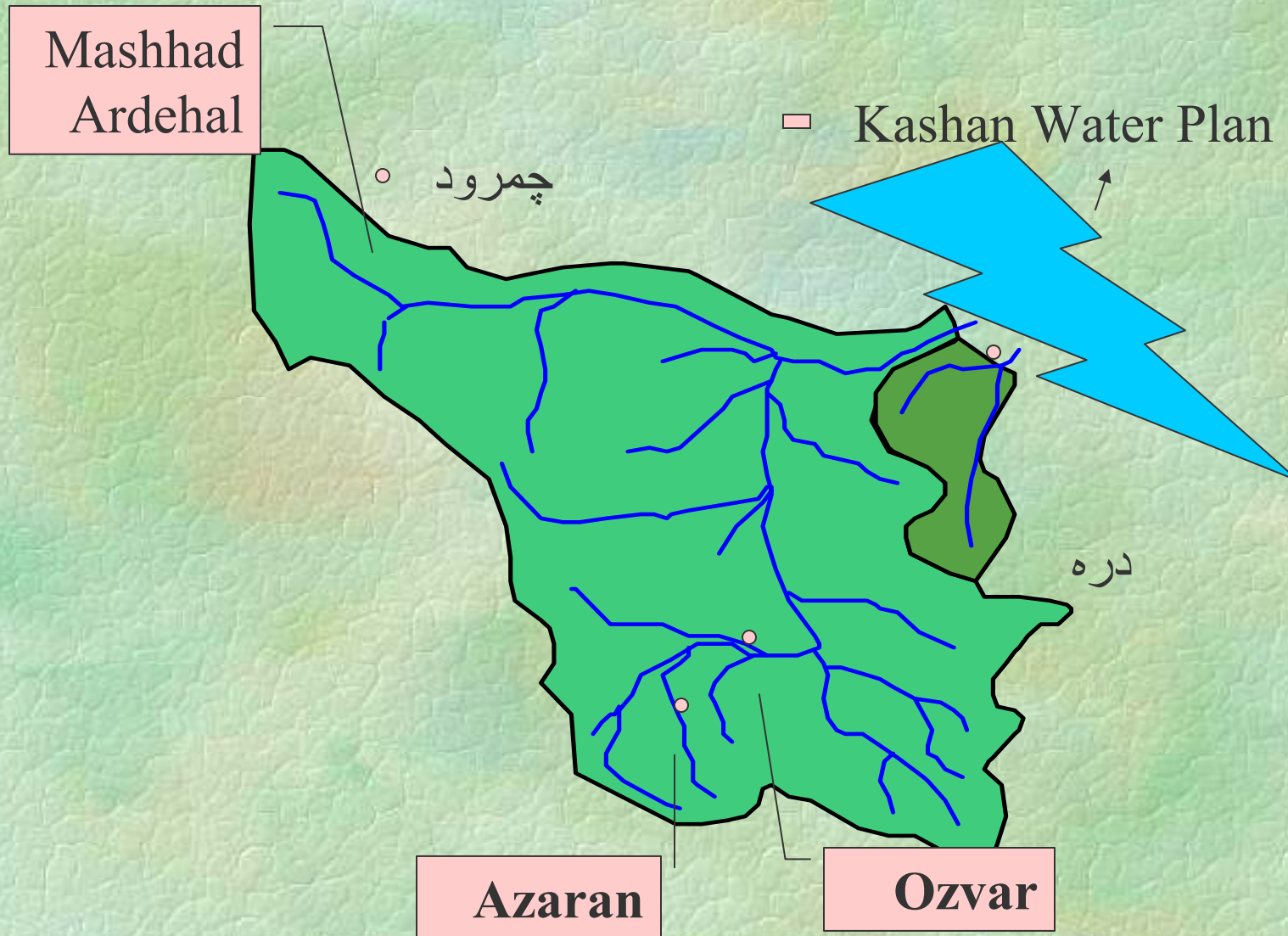
- **1- Watershed management in the upper Kashan Basins in order to keep the water in the upward tributary of the rivers of those 5 basins to infiltrate water the earth**
- **2- Floods management in the alluvial fan of the rivers by creating a water spreading belt system in order to gather the water and make artificial lakes to infiltrate the alluvial plains**
- **3- Observing the right of way of the rivers in construction activities**



# Other benefits of this project:

- **1- Increasing the recreation areas in the region around artificial lakes**
- **2- Increasing and Strengthening the flora coverage by planting trees and floras around the lakes**
- **3- Increasing water level in the Kashan Plain and avoid potential drought**

# Chamrood and Dorreh basin





# Characteristic of Chamrood Kashan water plan

- **Scope:1000 Hectare**
- **Aims:**
- **Controlling Chamrood floods**
- **Safety of Kashan**
- **Protecting three universities of Kashan**
- **Safety of industrial cities**
- **Safety of Beheshti hospitals**

# **Azaran watershed comprehensive plan**

- 75 small dams with stone and cement components**
- 4 big dams**
- Volume of water saving:1.200.000 mc**

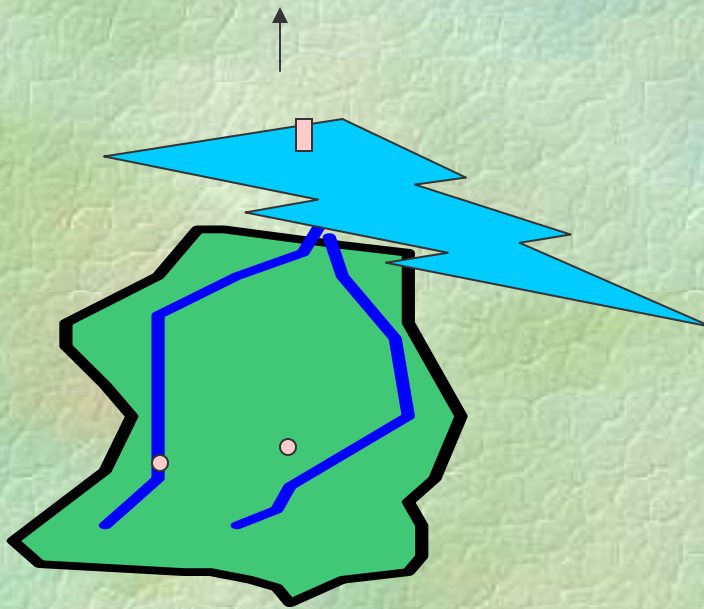
## **Aims:**

- strengthening water level**
- flood risk management**
- Protecting the land**
- strengthening the flora coverage**



# Khonb and Jaze basin

Sefidab water spreading



**Area: 150 Hectare**

**Purposes:**

- 1-Flood control and reduce the risk**
- 2-Increase water level**
- 3-Creating entertainment areas around the lake**

# Way and means for General water crisis management in Kashan Area

- 1- Strengthening watershed programs
- 2- Artificial water infiltrate plans
- 3- Controlling water consumption
- 4- Monitoring and stopping illegal wells
- 5- Changing the model of irrigation
- 6- Reprocessing of sanitation system
- 7- Transfer of water from one basin to another basin



# Recommendation

- We think this model can be a very useful model in arid zone areas which could
  - - Reduce the risk of floods
  - - Increase the level of underground waters and avoid potential droughts
  - - Increase flora coverage of the area
  - -Change the environmental aspects of arid areas by creating artificial lakes





با تشکر از توجه شما