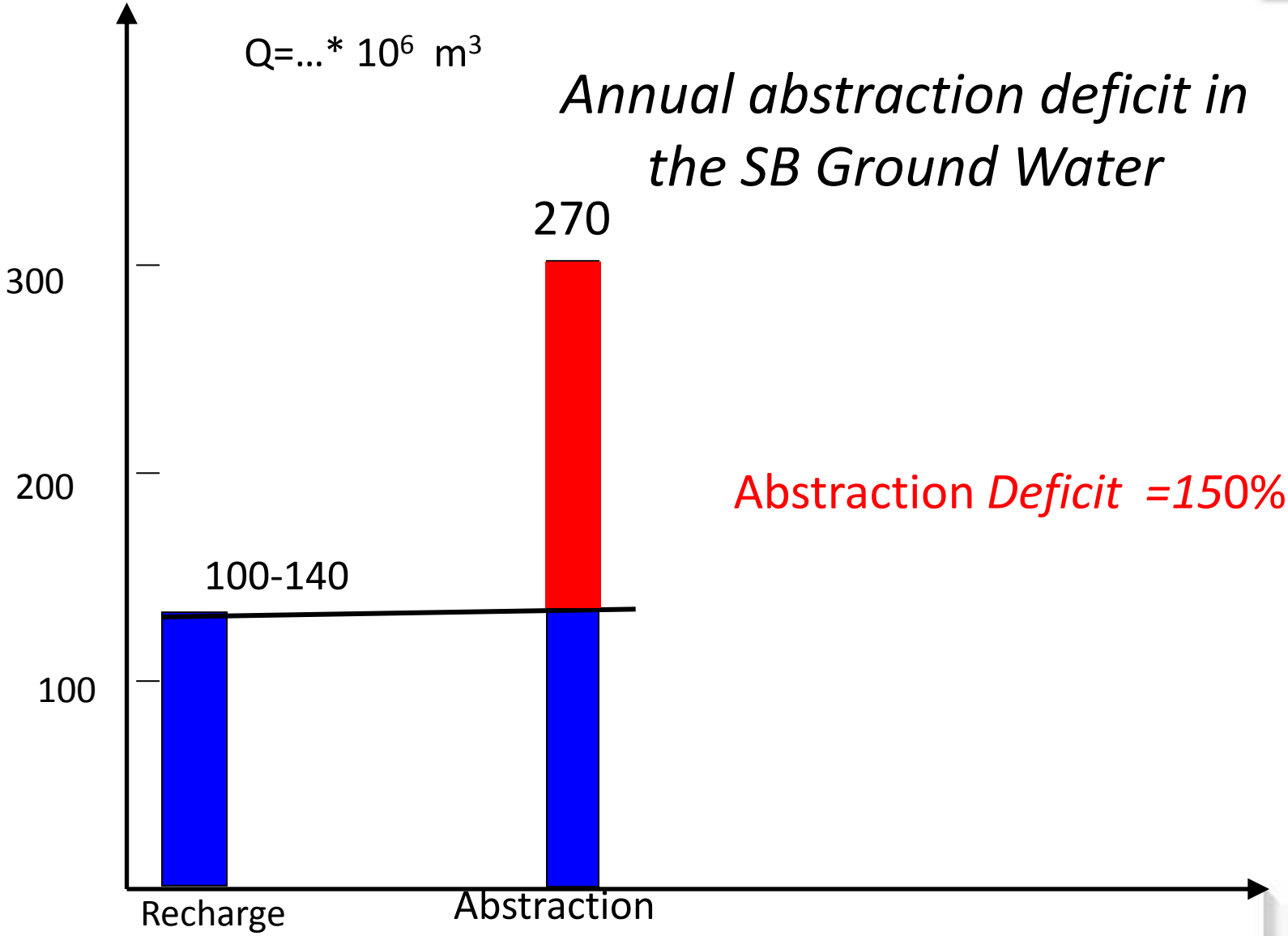
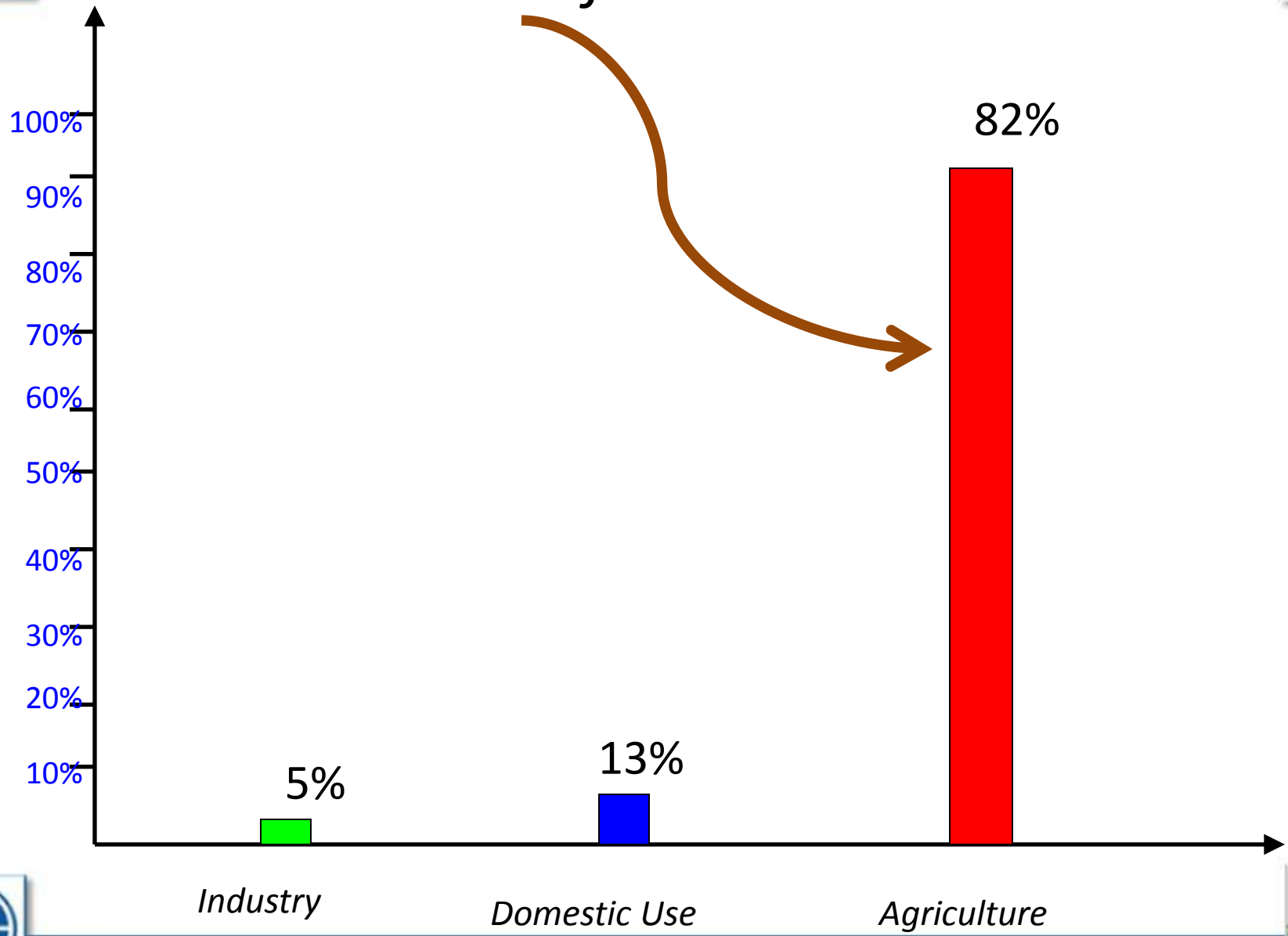
# Demand Management and Irrigation Improvement

# Climate and Geographical Characteristics

- Sana'a Basin are is 3200 $km^2$ , located in Arid and Semi-Arid zone
- Annual Rainfall range is about 125 to 450mm
- The Basin comprises 8 districts (Bani-Husheish,Bani-Alhareth,Hamdan,Bani mater,Arahb,Senhan ,part of Khawlan,as wellas Sana'a Municipality)


Q=…* 10^6 m^3
Annual abstraction deficit in the SB Ground Water
270
300
200
100-140
100
Abstraction Deficit =150%
Recharge
Abstraction

# Q *Main reason of Water Crisis in SB*



# 3-Prevailing Agricultural Types

| S/n | Crops | Area | % |
|---|---|---|---|
| 1 | Qat | 10800 | 45 |
| 2 | Grape | 8400 | 35 |
| 3 | Vegetables | 3840 | 16 |
| 4 | Fruits | 720 | 3 |
| 5 | Others | 240 | 1 |
| | Total | 24000 | 100 |

# Challenges

1) Irrigated agriculture is one of the most important Rural Development component and constitutes main source income of about 70% of the rural population
2) It is impossible to maintain stable planting without supplementary irrigation due to insufficient rainfall (rain fall range is about 200 mm/year)
3) Adopting more effective Modern Irrigation System .

Rationalizing GW usage in the agriculture sector by improving irrigation efficiency and not expanding irrigated areas.

# Objective

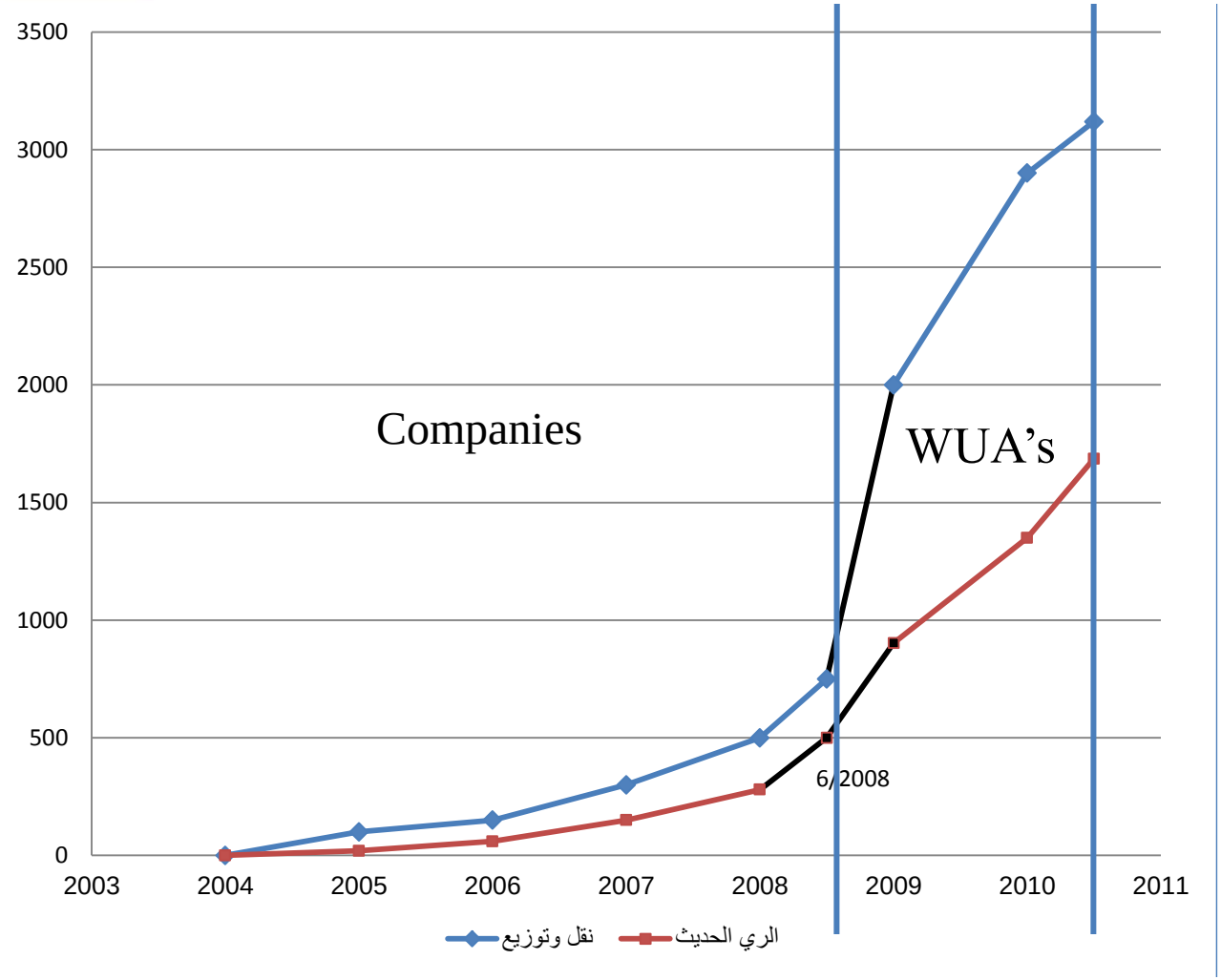
## Approach

- Improve irrigation methods and water extension
  - Encouraging less water consuming high cash crops
- Capacity Building of the local Community
  - Introducing intensive agriculture (Green House)

# Component Plan and Achievements

| % | Achieved | Planned | Unit | Activity | S/n |
|---|---|---|---|---|---|
| 117 | 3,119 | 2,660 | ha | Conveyance irrigation system | 1<br>2 |
| 104 | 1,687 | 1610 | ha | **Pressurized On-Farm Systems** | 3 |
| 100 | 58 | 58 | No. | Green Houses | 4 |
| 100 | 3 | 3 | No. | Nuts Nursery houses | 5 |
| 100 | 10,000 | 10,000 | $m^3$ | Gabions | 6 |

# Methods of irrigation Networks installations



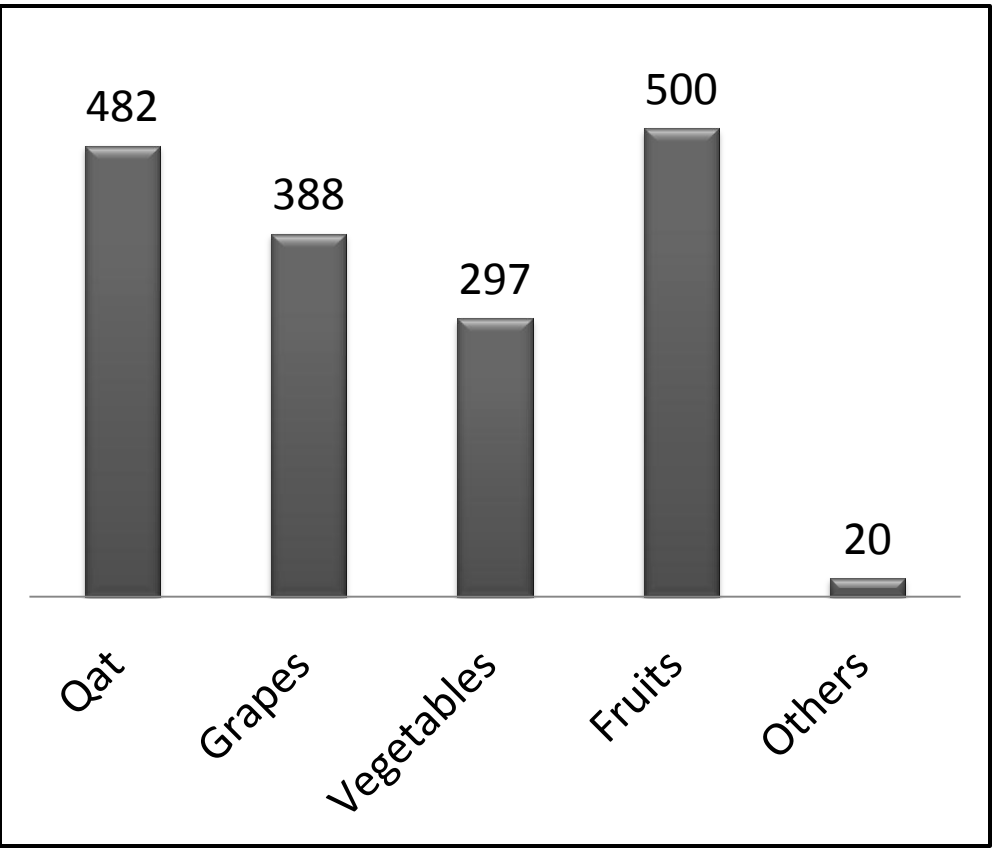

Installation by Companies slow rate

Installation by Farmers WUA's extremely high rate

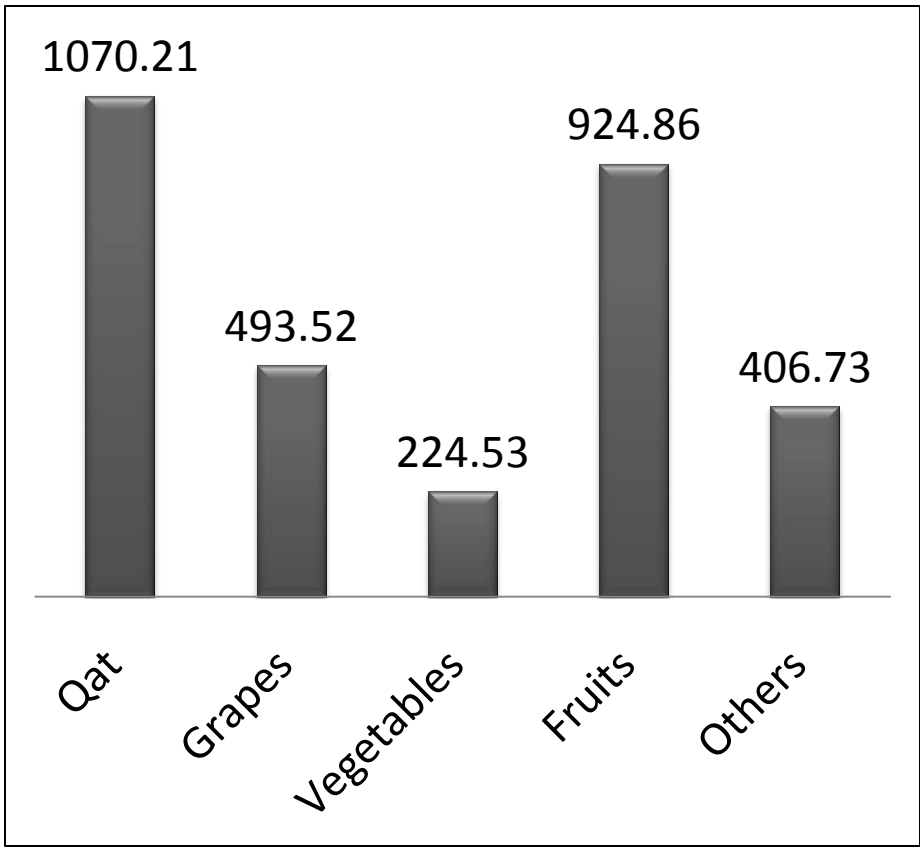
| Conveyance | | | | | | On-farm modern irrigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | Crops | Vegetables | Fruits | Grapes | Qat | Total | others | Vegetables | Fruits | Grapes | Qat | |
| 387.22 | 14.9 | 76.52 | 43.2 | 31.2 | 221.4 | 306.23 | 5.1 | 86.13 | 88.6 | 24.1 | 102.3 | **Hamdan** |
| 781.69 | 120.4 | 410.75 | 81.22 | 81.02 | 88.3 | 632.14 | 5.62 | 259.1 | 148.17 | 135.44 | 83.81 | **Bani-Alhareth** |
| 857.68 | 54.48 | 94.56 | 10.44 | 339.9 | 358.3 | 434.03 | 2.36 | 14.67 | 13.9 | 199.52 | 203.58 | **Bani-Husheish** |
| 446.09 | 141.95 | 174.89 | 69.39 | 0 | 59.86 | 62.84 | 0 | 3.4 | 32.34 | 0 | 27.1 | **Bani-Meter** |
| 26.64 | 0 | 4.7 | 0 | 15.94 | 6 | 21.28 | 0 | 5.8 | 0 | 9.85 | 5.63 | **Khawlan** |
| 229.19 | 46.5 | 87.36 | 15.28 | 6.3 | 73.75 | 31.46 | 0 | 12.24 | 7.7 | 3.2 | 8.32 | **Senhan** |
| 359.24 | 28.5 | 76.08 | 5 | 19.16 | 230.5 | 69.86 | 0.1 | 3.85 | 0.58 | 15.14 | 50.19 | **Niuhm** |
| 32.1 | 0 | 0 | 0 | 0 | 32.1 | 129.05 | 6.55 | 115.1 | 6 | 0.6 | 0.8 | **Al-Sebeen** |
| 3119.85 | 406.73 | 924.86 | 224.53 | 493.52 | 1070.21 | 1686.89 | 19.73 | 500.29 | 297.29 | 387.85 | 481.73 | **Total** |

# Interment according to grope type

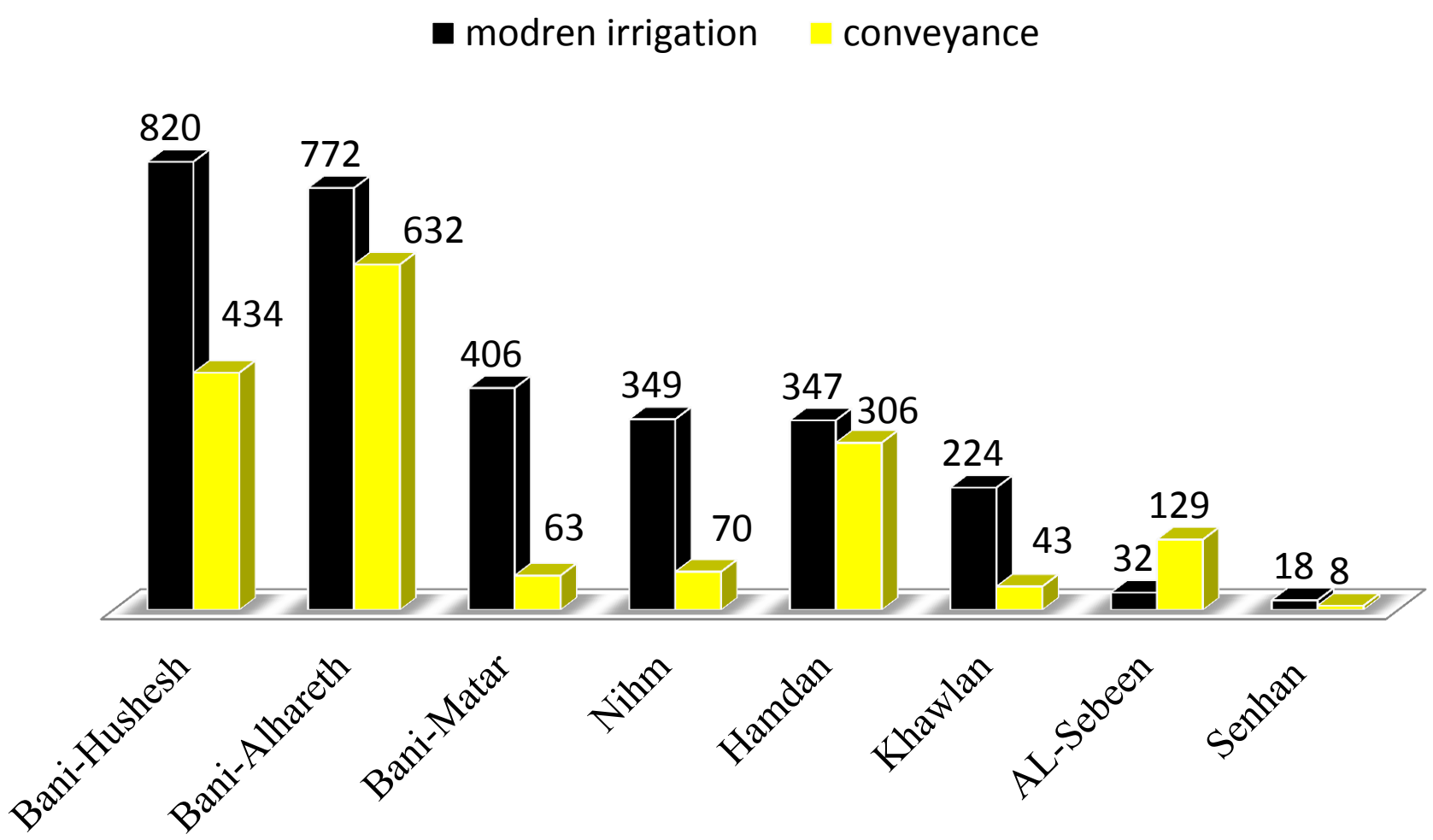
## modern irrigation




## conveyance

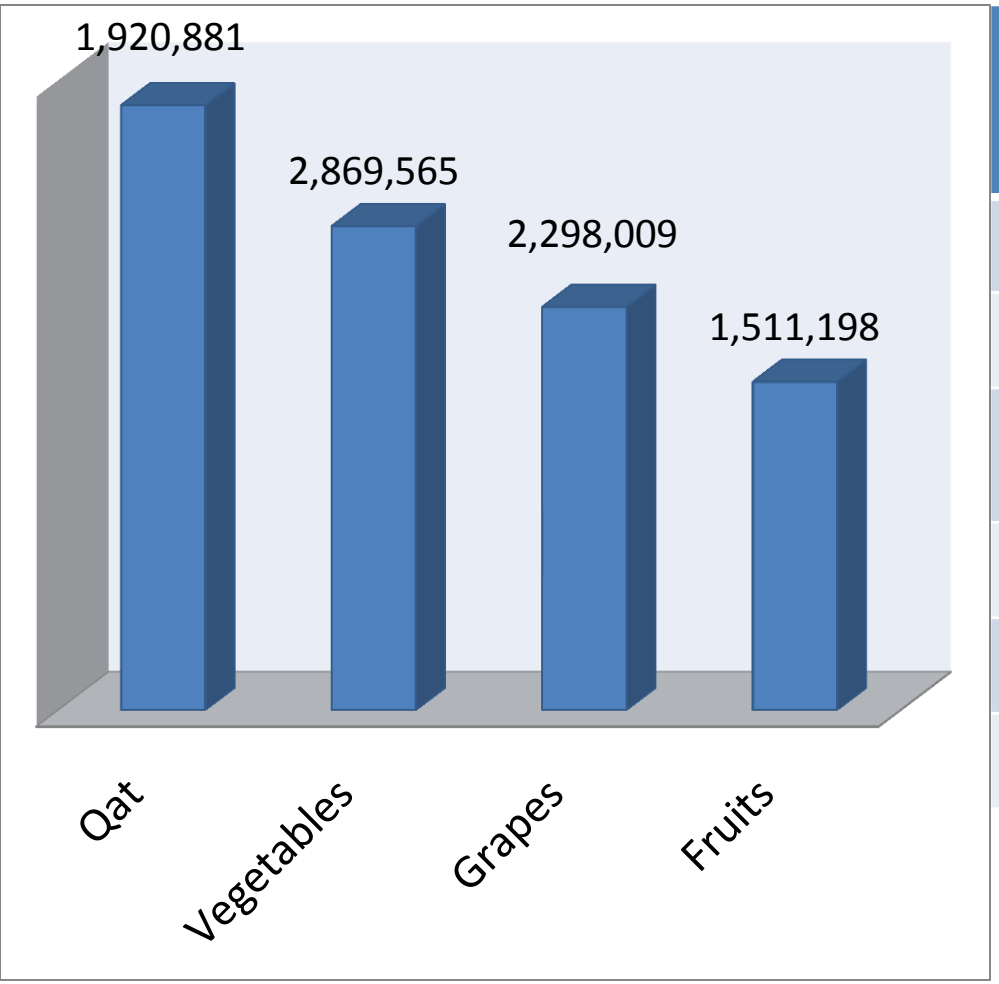


# (Areas of Project Interventions in Irrigation per District(ha



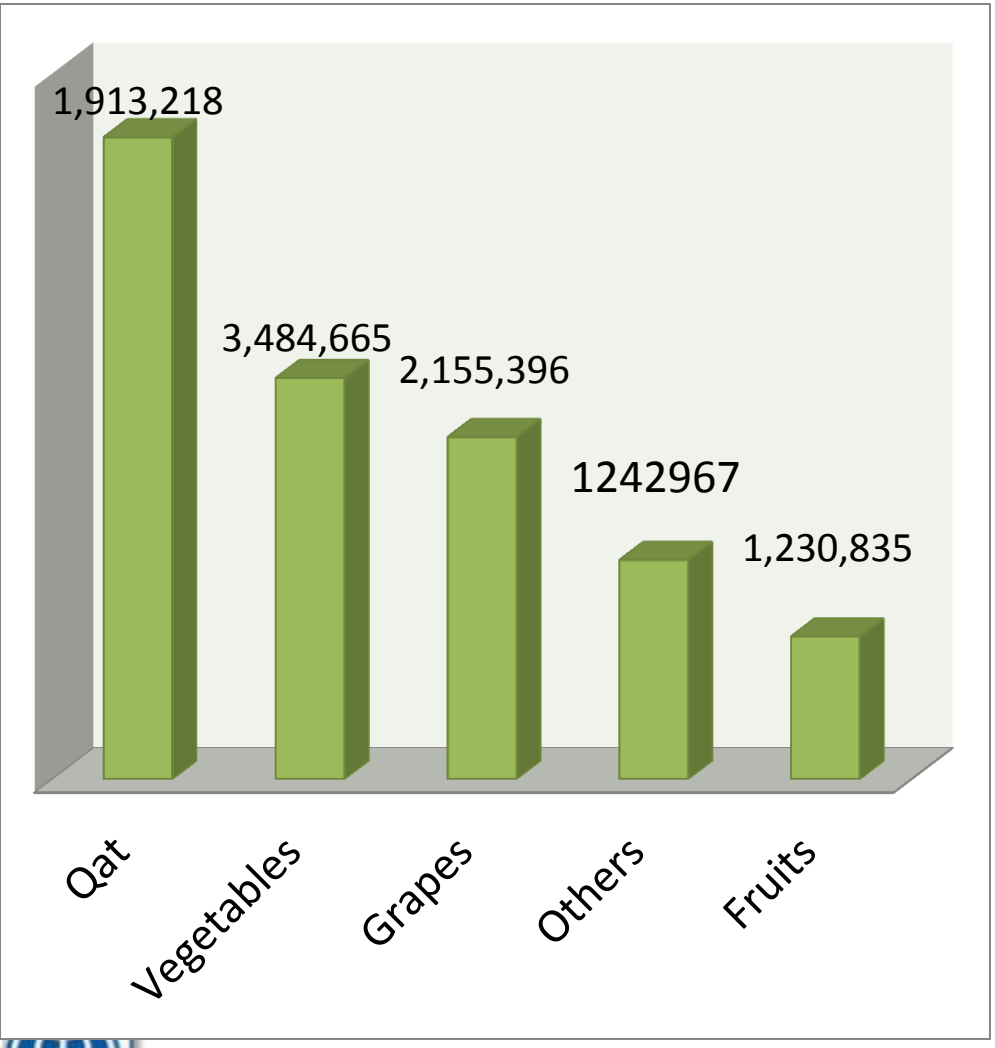
# Outputs

# Water Savings due to on -farm irrigation system



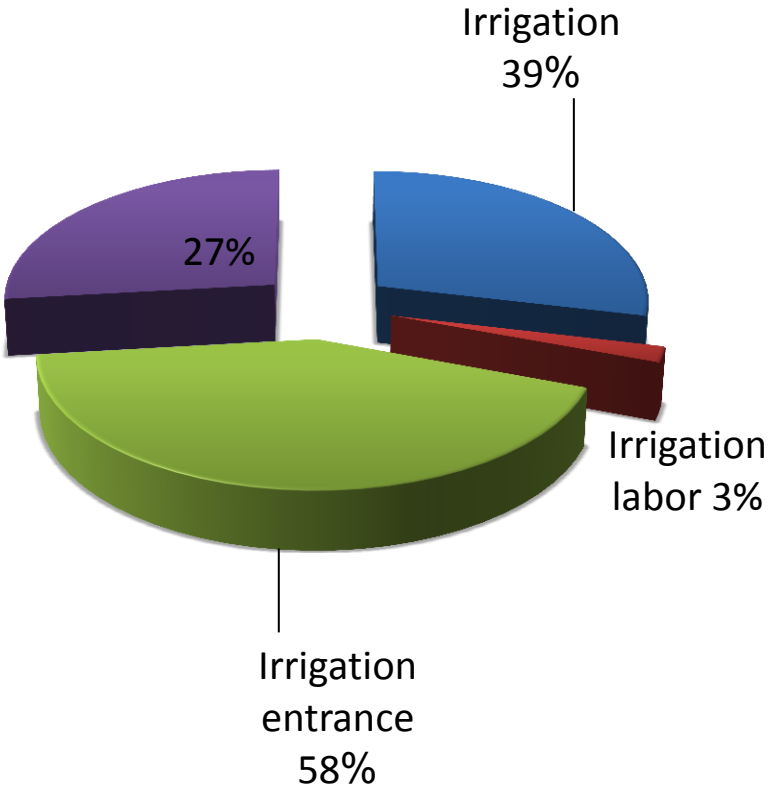

| Total Water Savings | Water Savings (m3/ha) | Area/ha | Crops | م |
|---|---|---|---|---|
| 1920633 | 4952 | 387.85 | Grapes | 1 |
| 2881709 | 5982 | 481.73 | Qat | 2 |
| 2305336 | 4608 | 500.29 | Vegetables | 3 |
| 1563745 | 5260 | 297.29 | Fruits | 4 |
| ----- | ---- | 19.73 | Others | 5 |
| 8,671,424 | | | Total | |

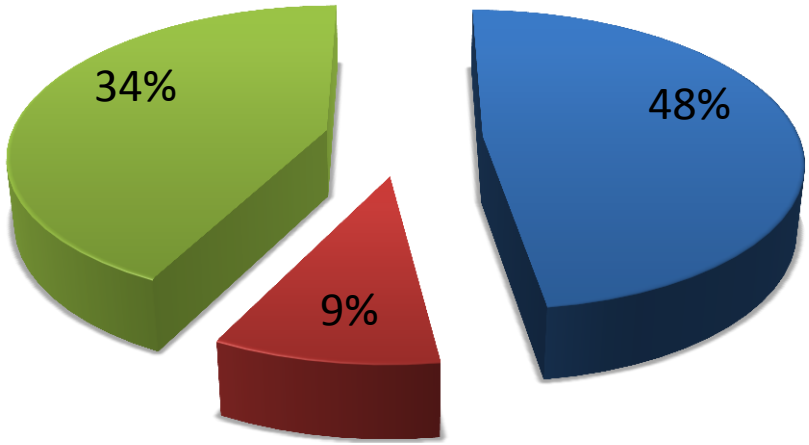
# Water Savings due to Conveyance irrigation System




| Total Water Savings | Water Savings /m3/ha | Area/ha | Crops | م |
|---|---|---|---|---|
| 1940027 | 3931 | 493.52 | Grapes | 1 |
| 3639784 | 3401 | 1070.21 | Qat | 2 |
| 2274231 | 2459 | 924.86 | Vegetables | 3 |
| 809655.2 | 3606 | 224.53 | Fruits | 4 |
| 1242967 | 3056 | 406.73 | others | 5 |
| 9,906,664 | | | Total | |

# Financial Revenues




| Item | % |
|---|---|
| Fuel | 30-50 |
| Irrigation Labor | 80-90 |
| Over crop | 30-40 |

# THANK YOU FOR ATTANTIO ...