Challenges Facing Agricultural Water Management

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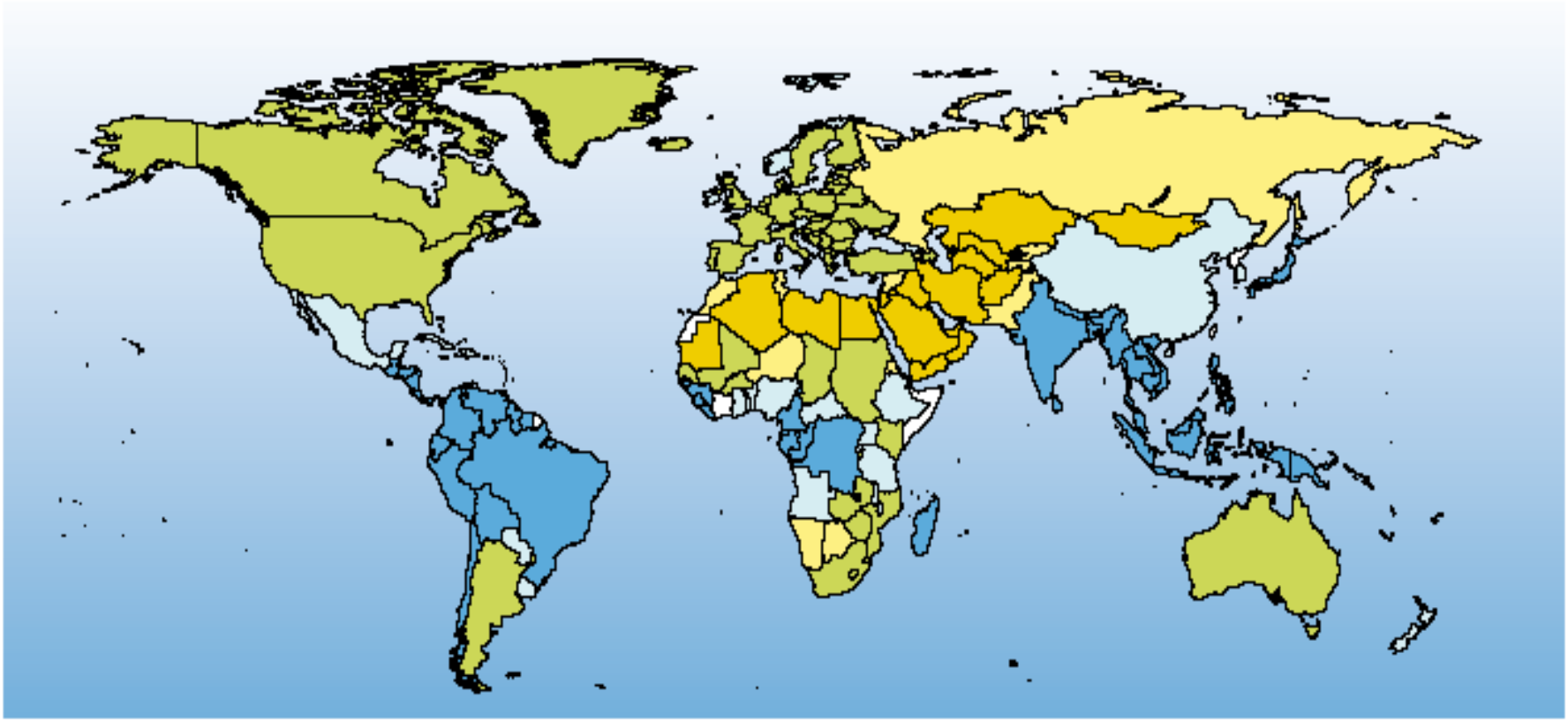
Map 2

FAOSTAT

المؤشرات القطرية لسقوط الأمطار
国家降雨指数
National rainfall indices
Indices pluviométriques nationaux
Índices de precipitaciones nacionales



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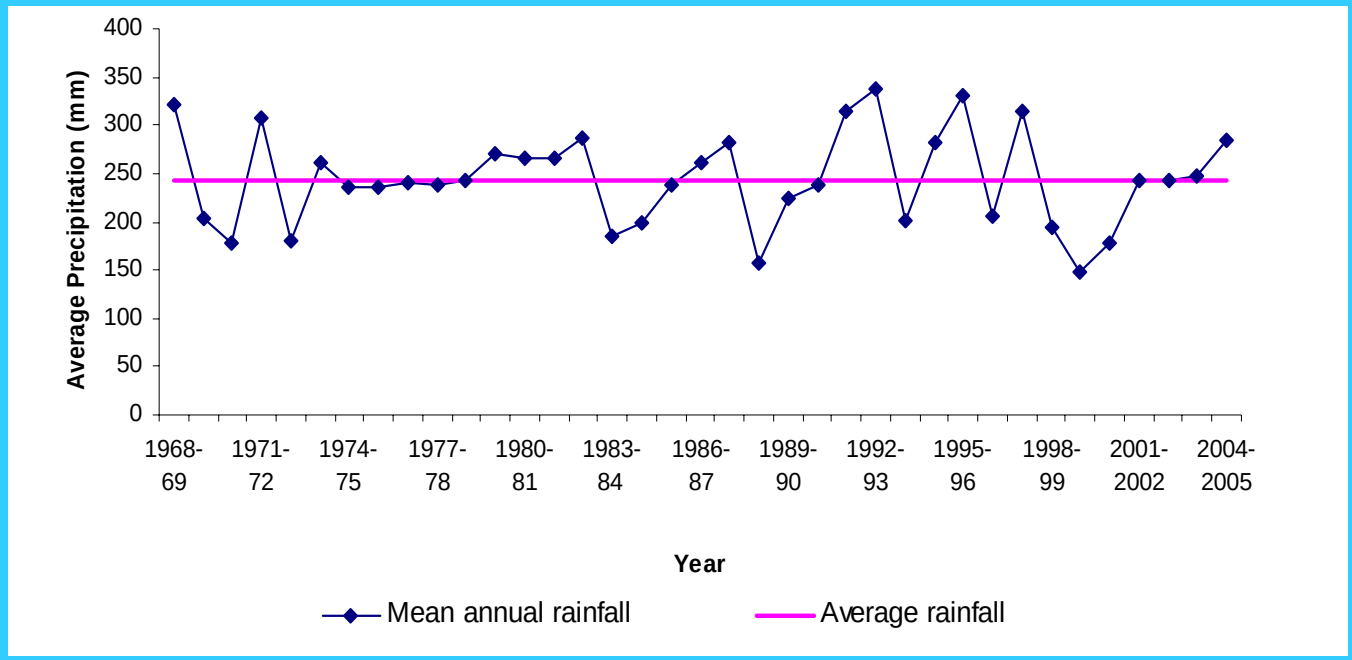
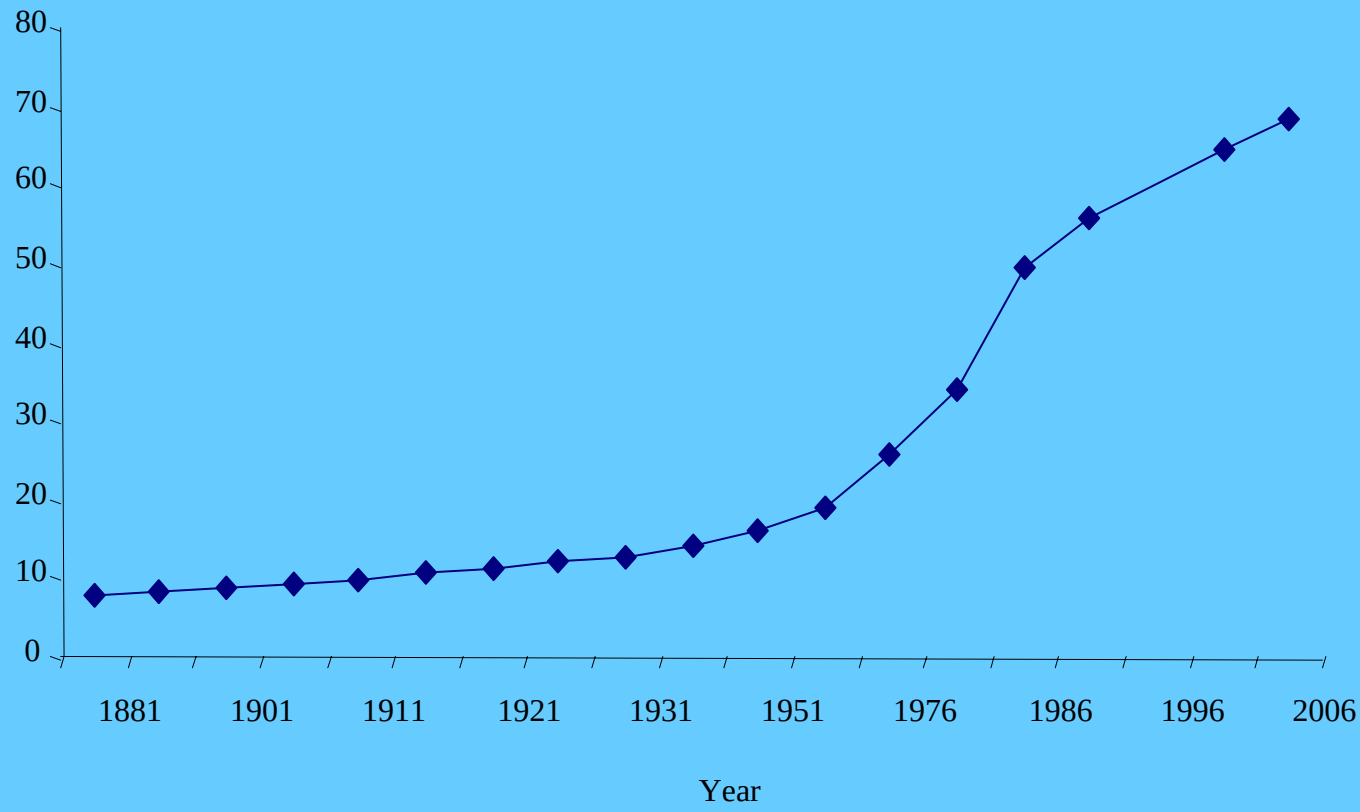
mm of rainfall per year, 1991–2000



Mean annual rainfall of Iran during 1968-2005.

INTRODUCTION

- ✓ **Producing enough food in Iran to better feed the people and generate adequate income for the farmers is a great challenge.**
- ✓ **This challenge will be intensified with a population that is projected to be 100 million in 2030.**



Population of Iran (million) during 1881-2006.

- ✓ **Irrigation accounts for about 72% of global (93.5 % in Iran) water withdrawals.**
- ✓ **Water availability for irrigation will be reduced.**
- ✓ **Because water uses for industry, drinking and environmental purposes is increasing.**

Map 1

FAOSTAT

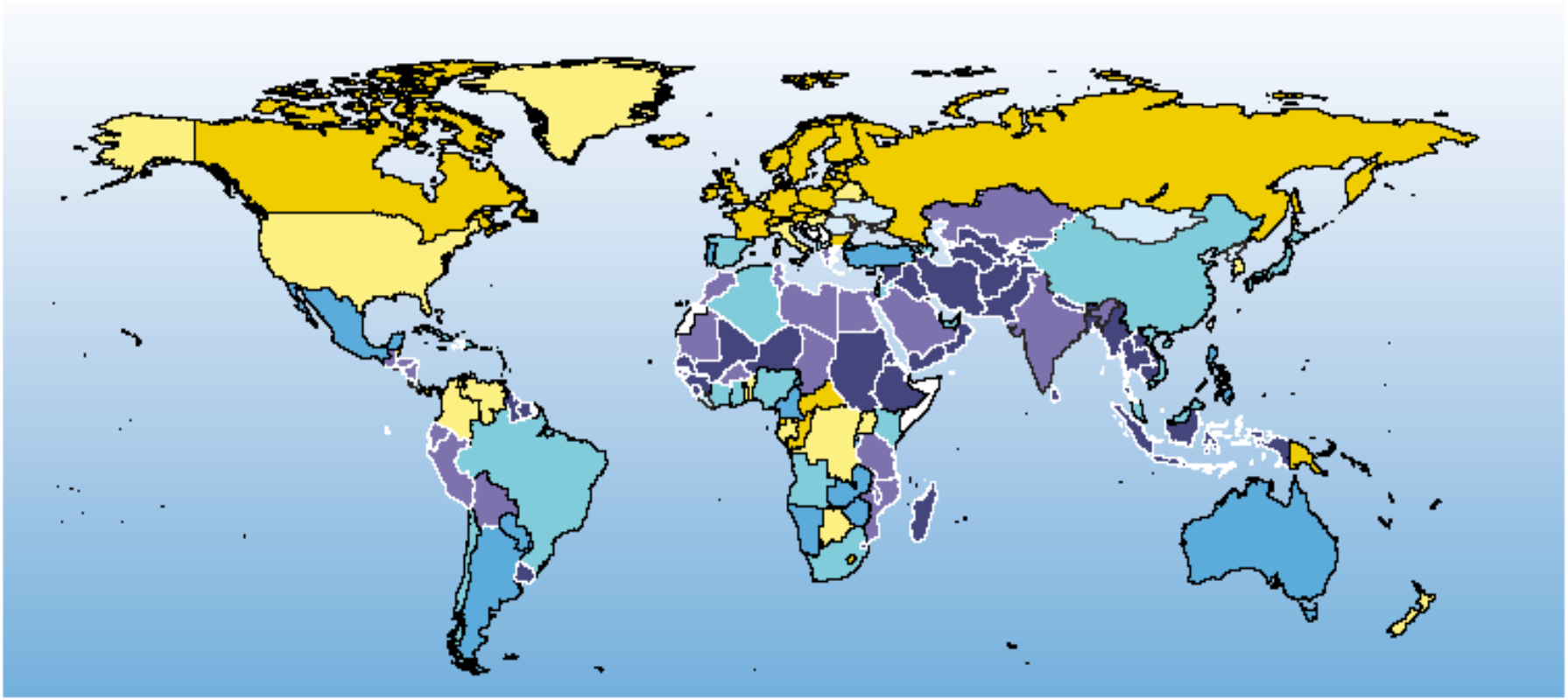
حصة الزراعة من استخدام المياه

农业用水所占份额

Share of agriculture in water use

Part de l'eau utilisée par l'agriculture

Proporción de la agricultura en el aprovechamiento del agua



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Percent of water use, 2000

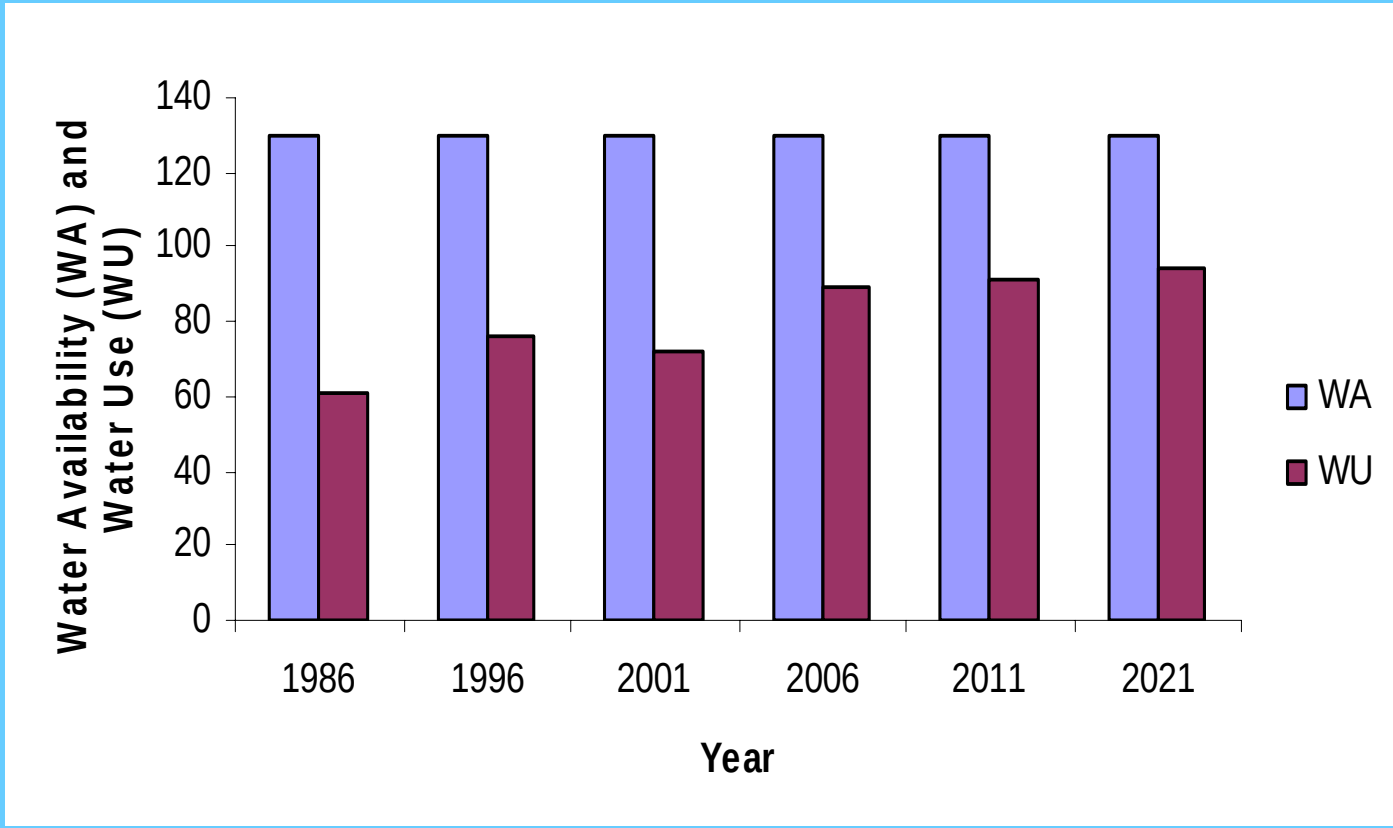
- ✓ **By 2012 about 100 million tons of food will be needed.**
- ✓ **To meet this demand, water use will have to increase.**
- ✓ **By the year 2021 water use will exceed 150 BCM, which is 15% in excess of renewable freshwater resources (130 BCM).**

The average crop water requirement (CWR) and crop water productivity (CWP)

Crop	CWP (kg m^{-3})	CWR (m^3 ha^{-1})
Pistachio	0.09	7267
Oilseeds	0.20	6220
Date	0.31	15432
Barley	0.39	4183
Wheat	0.43	4208
Rice	0.53	7800
Potato	3.21	6776
Sugar beet	3.27	9001
Cane	5.38	16655

Changes in cultivated areas (1000 ha) in Iran 1983-2003

Year	Irrigated	Rain-fed	Total	Irrigated area as percent of total crop land
1983	6000	8400	14400	42.0
1988	7000	8580	15580	44.9
1993	7264	10068	17332	41.9
1998	7562	9275	16837	44.9
2003	7650	8467	16117	47.5



Water availability (WA) and agricultural water use (WU) in Iran

Challenges Facing Agricultural Water Management

1) Policy

2) Economic and financial

3) Declining of investment

4) Technology and water resources to supply growing demand

5) Lack of proper link between researchers and the producers

6) Poverty, illiteracy and farmers' income

7) Environmental concerns and sustainability

1- Policy Challenge

- ✓ Government is the main investor and service provider
- ✓ Top-down solutions often lead to high costs, poor service, low cost recovery and a culture of dependency

2- Economic and Financial Challenge

- ✓Agriculture generates the lowest value-added per unit of used water.
- ✓The key economic challenge is to have incentives that encourage efficient water use and profitable agriculture.
- ✓Many agricultural productions are characterized by noncompetitive markets, supported by governmental subsidies, and food self-sufficiency goals

3- The Issue of Declining Investment

Government investment in irrigation and drainage projects has declined :

1) Investment costs have risen sharply

2) The performance of large schemes has been disappointing

3) Rehabilitation and management have priority

4- Technology and Supply Challenge

- ✓ Water productivity is about 0.7-1.0 kg/m^3.
- ✓ To feed the population of Iran this number should increase to 1.9 kg/m^3 in year 2020.
- ✓ Water resources are fully developed
- ✓ Innovations in technology have slowed down
- ✓ Not all the new imported technologies are used efficiently

5- Lack of Proper Link between Researchers and Producers

- ✓There is a gap between researchers and the farmers (or producers.
- ✓Many new technologies or ideas in agricultural water management (e.g., deficit irrigation, surge irrigation, partial root-zone drying) are not properly understood or implemented by the farmers.

6- Poverty, Illiteracy and Farmers' Income

✓Agricultural growth is central to poverty reduction. More than 33% of poor live in rural areas (world average is 70%).

✓They are vulnerable to droughts, groundwater depletion, floods, salinization, water quality deterioration.

✓The older farmers are usually illiterate and younger ones may not have university education or proper skills.

✓Thus the key agricultural water challenges for the villages are food security, risk mitigation and income growth.

7- Environmental and Sustainability Concerns

- ✓Rural people are owner or user of much of the land and water resources.
- ✓The tension between production and protection of natural resources is increasing.
- ✓In some basins, water no longer reaches the sea, lakes or swamps.
- ✓Disposal of agricultural drainage water into surface or ground waters and reuse or recycling of water are causing environmental and health problems.

Improving water productivity

All levels in a river basin are vital:

1. ***Plant level*** - improved crops and varieties

2. ***Field level*** - more effective management and application methods

3. ***System level*** - better management and reduction of non-beneficial use of water within the boundaries of irrigated areas

4. ***Basin level*** - minimizing water that is lost and not needed by agriculture or other water users.

Sustainable Development of Water

1. Focus research on problem solving

- ✓ Knowledge must be shared globally and packaged appropriately for target audiences.
- ✓ All countries should provide basic data for research and assessment.
- ✓ River basin organizations, provincial water authorities, research centers and universities could start data and knowledge sharing with farmers and stakeholders.

2. Manage water at the lowest appropriate level

- ✓ People need to be involved in management and governance decisions concerning water resources.
- ✓ Local organizations, NGOs and communities are the appropriate frame of reference for water resources management.


Thank you for
your attention