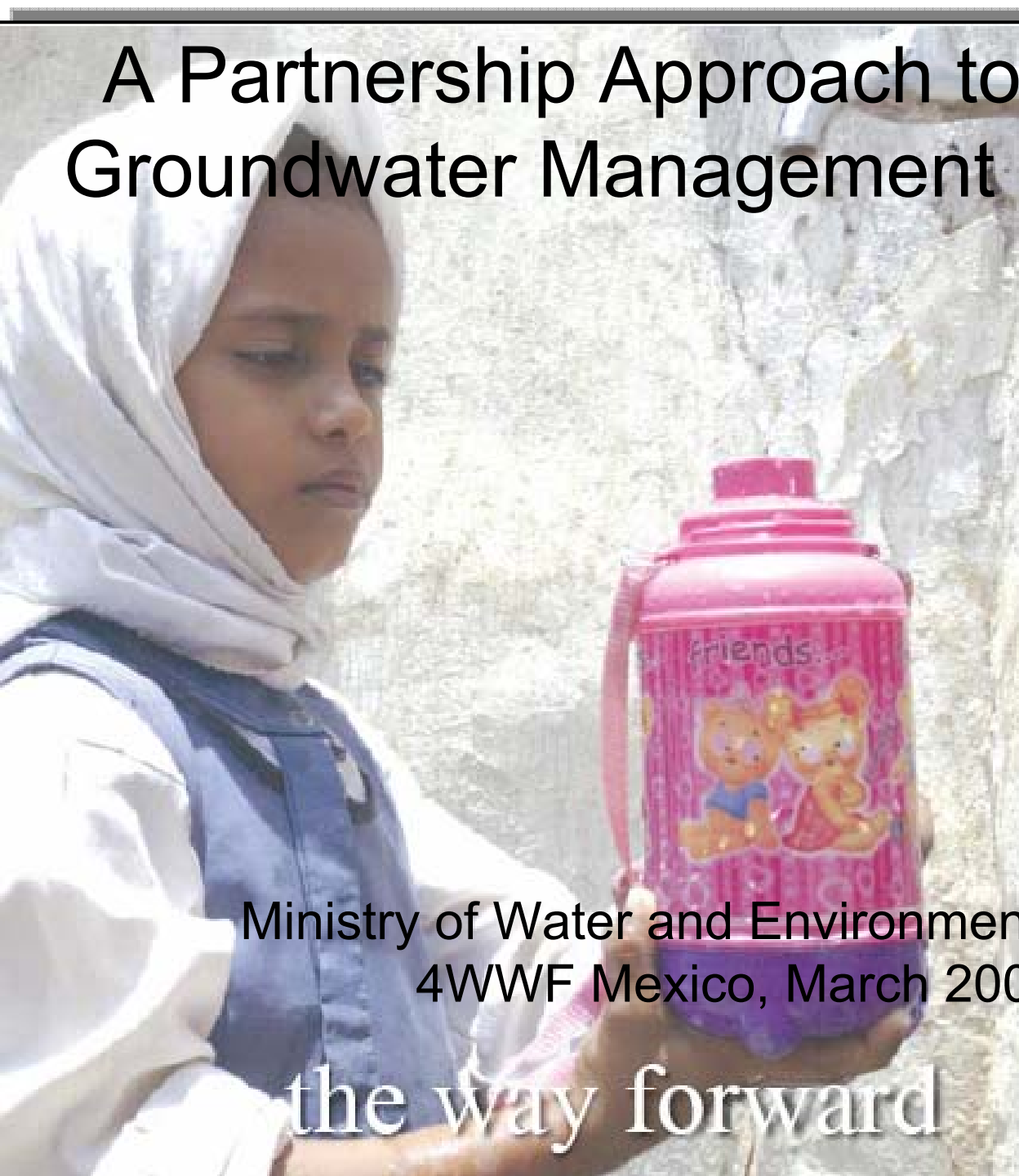


A Partnership Approach to Sustainable Groundwater Management in Yemen



Republic of Yemen • Ministry of Water and Environment

National Water Sector Strategy and
Investment Program, 2005-2009 (NWSSIP)



Ministry of Water and Environment, Yemen
4WWF Mexico, March 2006

the way forward

Structure of the presentation

- Groundwater challenges in Yemen
- Recent reforms in the overall water sector
- Groundwater legislation and enforcement measures
- Use of economic incentives & cost-sharing measures for sustainable groundwater management
- Stakeholder participation and capacity-building in groundwater management

Water Resources Challenges in Yemen

- Most water constrained country in the world: 120m³/capita/year, 10% of regional average and 2% of global average
- Over-exploitation of GW (Water tables drop up to 8 meters/year in some areas)
- Low irrigation water use efficiency (around 20-40%)
- Institutional and implementation capacity challenges for groundwater management

Recent reforms in the water sector

- Creation in 1995 of a single water resource agency: NWRA
- Creation in 2003 of a new Ministry of Water and Environment
- Approval by Parliament of a Water Law in 2002
- Restructuring of the urban water supply sector and tariff reforms
- Adoption of a National Water Sector Strategy and Investment Program (NWSSIP) in 2004

Groundwater legislation and enforcement measures

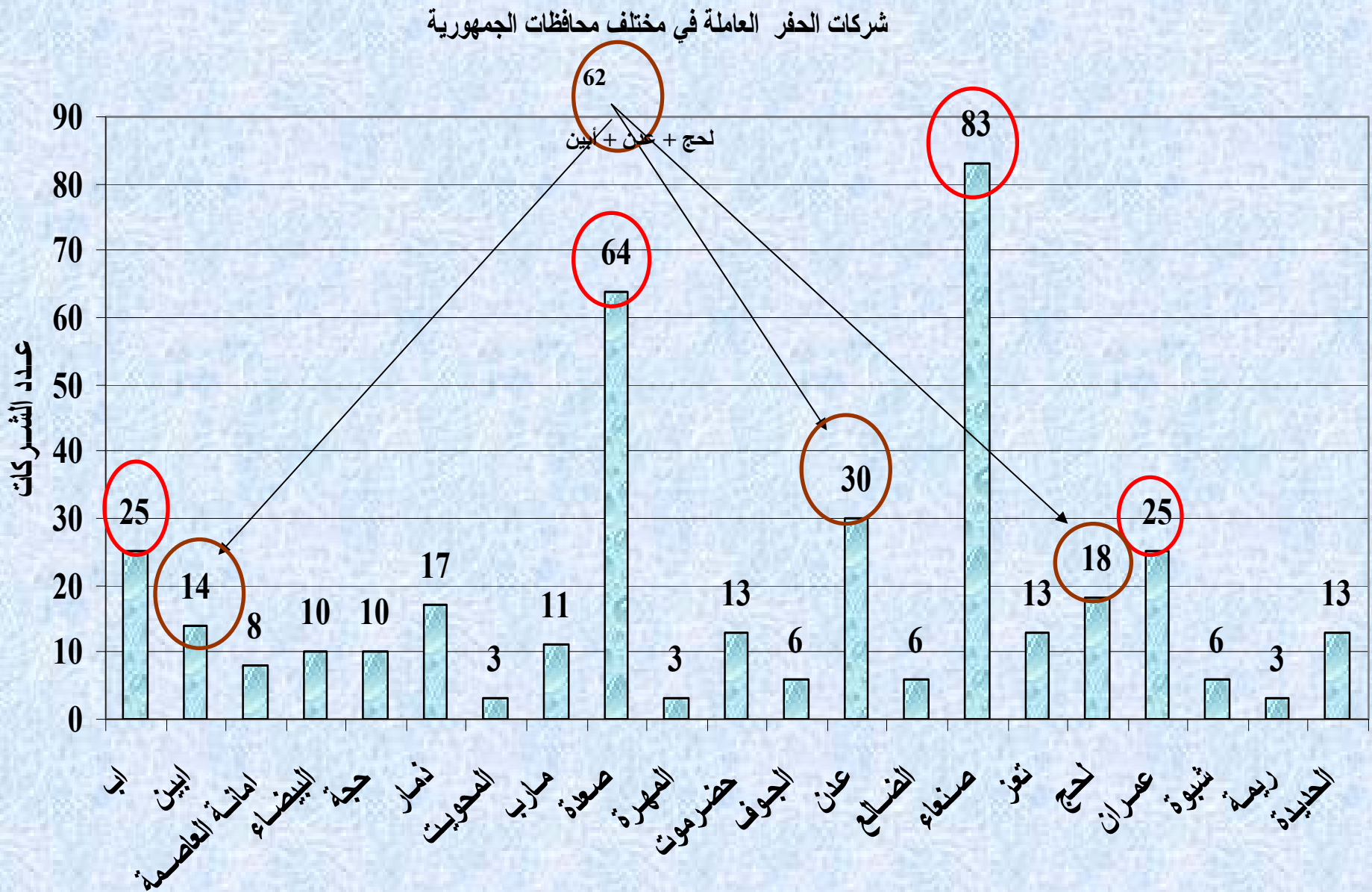
1. Enforcement of a licensing system for drilling contractors (DC's)
2. Enforcement of a well permits system (WP's)



Enforcement of a licensing system for drilling contractors

- Completed in 2004 an inventory of all DC's in the country (381 DC's who operate 656 rigs), electronic Db.
- Enforced a “No government contract” for unlicensed DC's
- By Feb. 2006 >90 rigs have been granted drilling licenses.
- More and more licensed DC's are refusing to take jobs unless the owner has a well permit
- Introduction of a Performance Bond system for rigs (up to \$5000 for rotary rigs, about 1000 for cable tool)

Inventory of well drilling contractors in each governorate



Enforcement of a licensing system for DC's

- Procurement of GPS instruments to fix on drilling rigs to monitor location in the field
- Data on drilling operations sent to Taxation Department to encourage farmers to share wells
- Stronger partnerships with local authorities to control illegal well drilling...
- Newspaper announcement of violators, including location/ governorate where violation is cited.
- Number of cited violations has increased from 61 violations in 2003 to 155 in 2004 and 571 in 2005
- Establishment of more NWRA branches to enforce DC licensing and WP systems
- Operations room to receive calls from public on violations (31 reports in 2005).
- Special “Park’s” for drilling rigs (under preparation for Sana’a Basin) For control of movement.
- Agreement with Attorney General for special legal powers to selected NWRA staff to write citations and have legal weight (20 staff in several branches)

Well Permit System

- New well permit (WP) system with water meter to monitor pumped quantity & WP bond
- No more individual WP's (only Group Permits for users)
- > 800 applicants for WP's in 2005. About 500 granted.

Use of economic incentives & cost-sharing measures

1. Introduction and expansion of piped water delivery and localized irrigation system on a cost-sharing mechanism
2. Reduction of diesel fuel subsidy



The Land and Water Conservation Project (LWCP)

- Introduction of technical improvements package to reduce irrigation water use (piped water distribution and localized irrigation systems (dripper, bubbler, etc.)
- Cost sharing basis (30-50 % from farmers and the balance from the government)
- Farmer contributions were required up-front, with a credit facility available
- Decentralized implementation structures through governorate agriculture offices

The LWCP: achievements

- Reduction in irrigation water use estimated at 20-35% through pipe delivery and localized irrigation systems
- Water savings estimated at around 20 million m³ a year (around 10,000 ha)
- Farmer incomes improved through reduction in labor and fuel costs and increased agriculture productivity
- Creation of a revolving fund of about \$2 million to continue financing the program

Scaling up through follow-on projects: Sana'a Basin and GSCP Projects

Reduction of diesel fuel subsidy

- In July 2005, diesel fuel prices were doubled (from 17 to 35 YR/litre) to bring them closer to import parity
- Increased number of applicants for the cost sharing program
- Expanding the improved irrigation area with own means
- Encouragement for higher value crop cultivation per drop of water

Stakeholder participation and capacity-building (Bottom-Up Approach)

- Establishing Water Users Associations (in Sana'a Basin: water user groups were established for each well)
- Supporting community-groups for local water management (informal WUGs, local council, etc.)
- Information sharing on water use and aquifer conditions
- Establishing Water Basin Committees (Sana'a, Taiz, Sa'adah)
- Enhancing support for users through research and extension services (use of "clay pot" for irrigation for selected crops at national level, etc.)

New Features in Sana'a Basin and Groundwater & Soil Conservation Project

- Encouraging community-based water management through WUAs and informal WUGs
- Tripartite agreements between beneficiary, project and local entity (local council, WUAs, agri. cooperatives)
- Controlling horizontal irrigation expansion through the tripartite agreements and peer pressure
- Intensive monitoring and evaluation (flow meters, pressure transducer at randomly selected wells)
- Establishment of Irrigation Advisory Service for better O&M and agronomics and demonstration farms
- Massive public awareness campaign on the benefits of common aquifer resources and efficient water use

مع خالص شكري وامتناني

Thank you

