KfW Development Bank

Financing Resilient Development

Stockholm Water Week, 29.8.2018

Closing Urban Water Cycles

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››› KfW Banking Group and KfW Development Bank

››› KfW Banking Group

- Promotional bank of the Federal Republic of Germany

› **KfW = Kreditanstalt für Wiederaufbau** was established in 1948 to ensure financing of the post-war reconstruction of the German Economy – predominantly through funds from the European Recovery Program, i.e. the so called ***Marshall-Plan***

› 80% owned by Federal Republic of Germany, 20% owned by the federal states

› Headquarters: Frankfurt am Main
Branches: Berlin, Bonn and Cologne

› Representative offices: more than 80 offices and representations worldwide

› 6,284 employees (2017)

› Best long-term rating: AAA/Aaa/AAA

› Total financing volume of KfW in 2017 amounts to EUR 76.5 billion

› Both in ***Domestic Promotion*** and ***International Financing***

› ***Since 1961*** KfW is assigned as ***Executing Agency*** of the German Federal Government for Financial Cooperation with cooperation partners in development countries

KfW Development Bank as part of the KfW Group

KFW

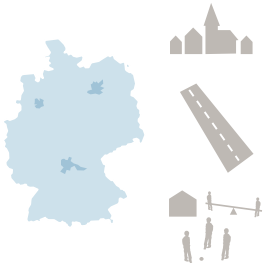
Domestic promotion

We promote Germany

SMEs

Private clients

Municipalities



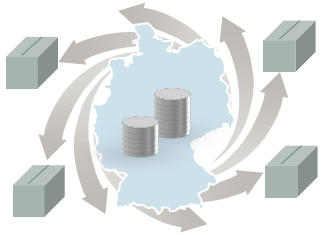
KFW

Financing volume (FV): 51.8 billion €

International financing

We support internationalisation

Export & project finance



KFW IPEX-Bank

FV: 13.8 billion €

We promote development

Developing countries & emerging economies

KFW Development Bank

Financial Cooperation with public sector

FV: 8.2 billion €

KFW DEG

Supporting private sector investment

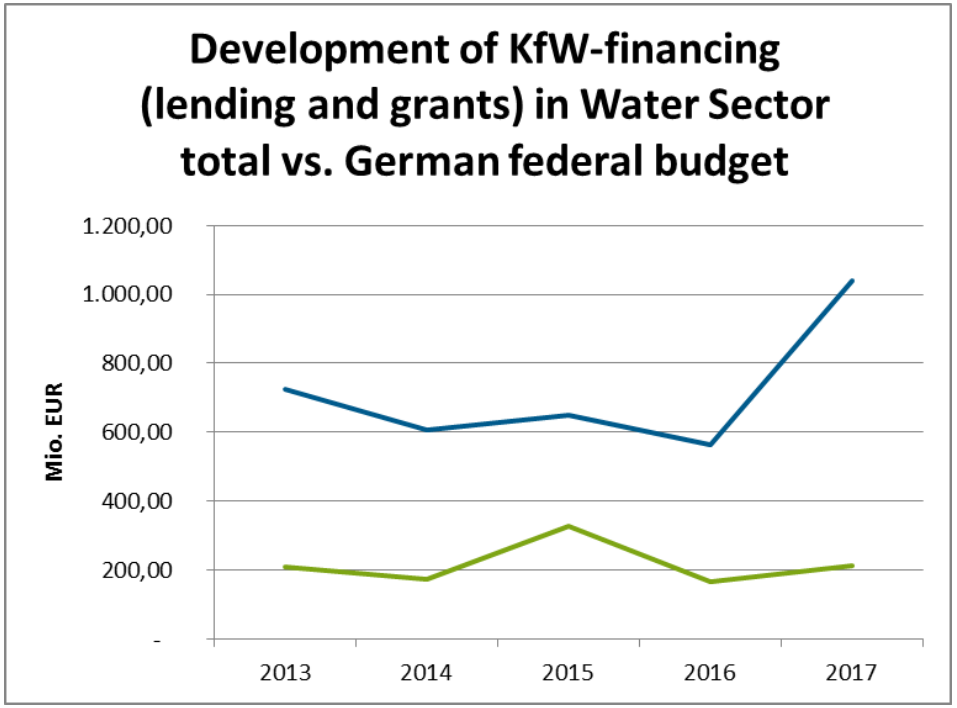
FV: 1.6 billion €

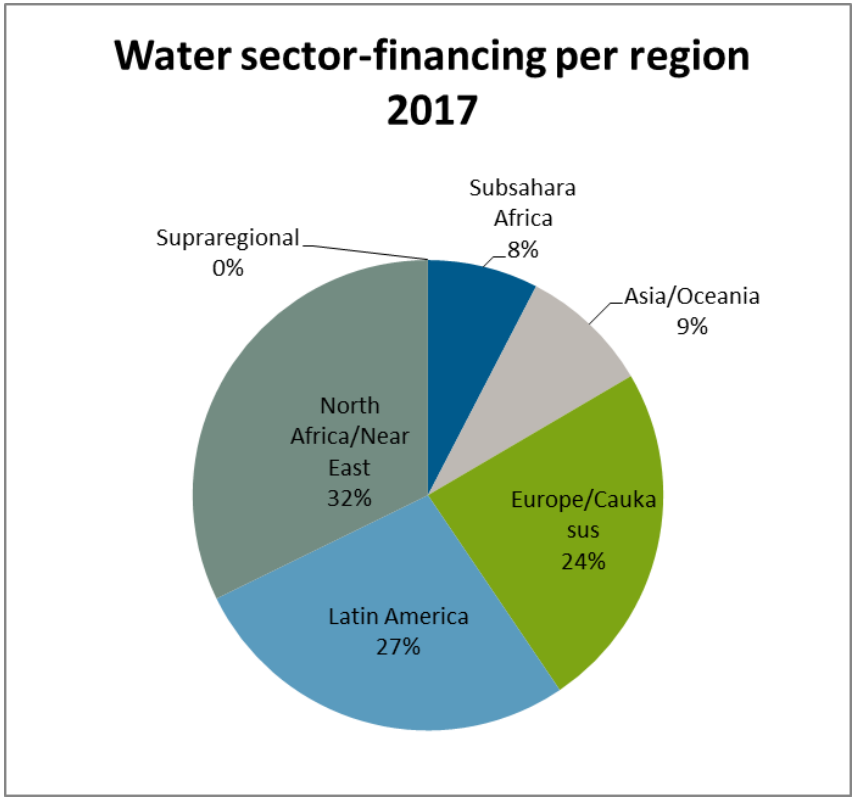
Support for climate and environmental protection

› All figures are from 2017

KfW is supporting water & sewage projects world wide

› Water sector portfolio 2017





››› KfW Financial Support to Water Cycle Projects
Showcases from current portfolio

CLOSING URBAN WATER CYCLES

Selected typical characteristics of KfW involvement

Framework conditions

- Important demographic growth
- Rapid urbanization
- Particular exposure to climate change:
  - *droughts*
  - *inundations*
  - *thunderstorms*
  - *extreme rainfalls*
- Water Scarcity:
  - *Insufficient water resources for drinking water supply*
  - *High demand in irrigation water for agriculture*

Added-value in KfW-cooperation

- Long-term partnership
- Holistic approaches – multi-sectoral interventions
- KfW´s robust techincal expertise provided to partners along entire project cycle:
  - *Project identification and preparation*
  - *Financing arrangements*
  - *Implementation*
  - *Accompanying measures (TA)*
- Mix of various financing instruments can be made available:

  grants, delegated funds, development loans, promotional loans

CLOSING URBAN WATER CYCLES

Showcases of KfW financed projects – in a nutshell

NAMIBIA
New Goreangab Water Reclamation Scheme & Extension and modernization of Gammans WWTP

LONG TERM PARTNERSHIP

- Water Reclamation Plant New Goreangab dedicated for Direct Potable Reuse of treated wastewater, in operation since 2003
- Currently under preparation: upgrade & extension of Gammams WWTP and construction of a new direct potable reuse plant, tapping treated wastewater from Gammams WWTP

TUNISIA
IWRM approach for MORNAG agricultural irrigation

Reuse of treated wastewater for groundwater recharge

LONG TERM and MULTI-SECTORIAL PARTNERSHIP

- Increasing water demand for agricultural irrigation and drinking water supply
- Negative water balance = water stress
- Recharge to avoid seawater intrusion by means of surface water and treated wastewater
- Multi-stakeholder consultation and cooperation is a key success factor
- IWRM approach needed – coherence in planning&action is crucial, incl. well targeted TA

INDIA
Chennai City Corporation

Sustainable stormwater management in coastal areas

MULTI-SECTOR PARTNERSHIP : water supply, network management, stormwater

- Comprehensive stormwater management encompasses technical infrastructure for drainage and flood protecion PLUS adequate urban planning and urban management to coordinate planning and to integrate action of numerous administrative entities
- Stakeholder involvement incl. civil society & efficient communication strategies required
- Reduce dammage (human, material) & tapping on unused resource (retention, recharge)

JORDAN
Jordan Valley Authority

Reuse of treated wastewater for agricultural irrigation

LONG TERM and MULTI-SECTORIAL PARTNERSHIP

- Wastewater treatment infrastructure in 3 agglomerations upstream of Jordan Valley
- Production of 15 million m^3/year of treated wastewater (@0,25 EUR/m^3) to substitute the currently used freshwater supply for irrigation purposes
- → availability of additional freshwater for drinking water purposes for 500.000 persons
- Investment financing through interest reduced loan + grant for accompanying measures

››› Get in touch

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›KfW

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››› Annexes – Project Information Sheets
Showcases from current portfolio

››› KfW Support to the City of Windhoek

A long-term partnership in Water Resources Management

Goreangab Water Reclamation Scheme (direct potable reuse)

1996 – 2003

New Goreangab DPR

Goal: Contribute to economic and social development of Windhoek and protect the city's scarce water supply resources

Measures: Construction of New Goreangab DPR Plant, support implementation of private O&M contract (WINGOC)

Funds: total cost: 16 mio € (8.2 mio € KfW concessional loan; co-financed by European Investment Bank and by CoW;
In addition: 1.0 mio KfW grant for Feasibility Study)

Under preparation:

Gammams WWTP

Goal: Securing drinking water supply for Windhoek – Increase the capital's resilience against severe droughts (climate adaptation)

Measures: Upgrade & extension of Gammams WWTP, support to foundation of an SPV, increase CoW's capacities in loss reduction

Funds: up to 40 mio € KfW interest reduced loan; in addition a grant of 450.000 € for feasibility study and grant of 1.5 mio € for loss reduction / institutional setup

Pipeline:

Additional Gammams DPR

Goal: Securing drinking water supply for Windhoek – Increase the capital's resilience against severe droughts (climate adaptation)

Measures: Construction of a new direct potable reclamation plant (using extended outflow from Gammams WWTP)

Grant: partial financing of pilot plant study (grant EUR 1 million)

Estimated Investment : EUR 35-40 million (starting 2019)

››› KfW Support to the Republic of Tunisia

A long-term partnership in IWRM

IWRM-approach for Mornag agricultural irrigation

A concept of water reuse for groundwater recharge

- **Success factors of a reuse-groundwater recharge approach**
  - valuable approach in vicinity of large cities or relevant WWTP
  - presence of existing or potentially usable irrigation areas
  - existing water balance deficit (arid areas) in combination with an aquifer suitable for groundwater recharge
  - In depth studies → feasibility, environmental impacts, risk assessment and risk minimization
  - Assess crucial physical factors (aquifer and soils), and, above all, social and institutional aspects
  - Early and intensive incorporation of all actors / stakeholders

KfW is supporting the development of the agricultural perimeter of MORNAG (project area 6.800 ha)

- Agricultural production (vegetables, fruits, wine) economically important → metropolitan region of Tunis / Export
- Irrigation water tapped from 2 layers of aquifer, located in vicinity to the coastline
- Drinking water demand of agglomeration of Tunis partly also covered in from same aquifer
- Aquifer layers are overstressed: negative balance of 15 million m³/year – tendency to salty water intrusion
- However: technical/institutional obstacles – illegal industrial wastewater discharge not fully under control, risk for contamination that could not be eliminated by conventional mechanical-biological treatment
- KfW is financing (grants) extended studies on overall scheme, salt water intrusion, temporary interventions to block salt water intrusion and on technical/institutional solutions for WW treatment
- KfW and Tunesian partner ensure each 50%-financing of infrastructure works and accompanying measures (30 million EUR total investment and 4 million EUR accompanying measures).

IWRM-approach for Mornag agricultural irrigation

A concept of water reuse for groundwater recharge

- **Success factors of a reuse-groundwater recharge approach**
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  - existing water balance deficit (arid areas) in combination with an aquifer suitable for groundwater recharge
  - in depth studies → feasibility, environmental impacts, risk assessment and risk minimization
  - assess crucial physical factors (aquifer and soils), and, above all, social and institutional aspects
  - early and intensive incorporation of all actors / stakeholders

KfW is supporting the development of the agricultural perimeter of MORNAG (total project area 12.500 ha)

- Agricultural production (vegetables, fruits, wine) economically important → metropolitan region of Tunis / Export
- Irrigation from surface water plus water tapped from 2 layers of aquifer, located in vicinity to the coastline
- Drinking water demand of agglomeration of Tunis partly also covered from same aquifer
- Aquifer layers are overstressed: negative balance of 15 million m^3/year – beginning of sea water intrusion
- Technical/institutional obstacles to overcome: illegal industrial wastewater discharge not fully under control, risk for contamination that could not be eliminated by conventional mechanical-biological treatment
- KfW is financing (grants): a) extended studies (overall scheme, temporary interventions to locate and block salt water intrusion, technical/institutional solutions for WW treatment) b) extended TA (control/ reduction of ground-water withdrawal, tariff studies, M&E of groundwater quality and quantity, support for scheme exploitation,…)
- KfW and Tunisian partner ensure each 50%-financing of infrastructure works and accompanying measures (30 million EUR total investment and 4 million EUR accompanying measures).

››› KfW Support to Chennai City Corporation (India)

An approach to sustainable Stormwater Management

Chennai – Kovalam Basin

Storm water Drainage and Management in coastal area

Context:

- Kovalam Basin (mostly southern Chennai), catchment area of 117 km², approx. 600.000 population, growth expected to reach 1.9 mio population by 2050
- flooding during monsoon period, area exposed to effects of Climate Change (cyclones, sea level rise, increasing frequency and intensity of extreme rainfall)

Status:

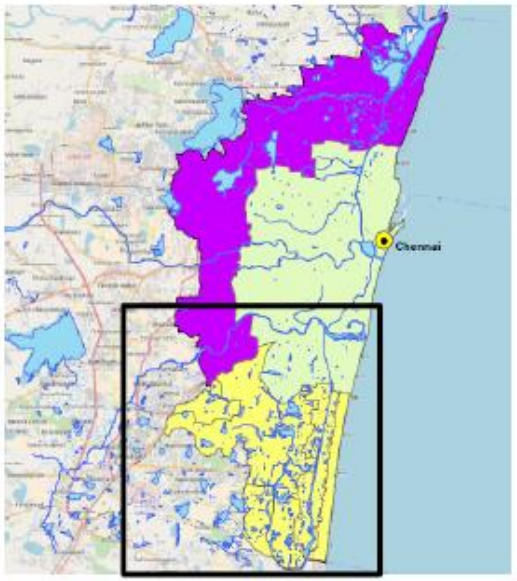
- Storm water drainage system consists of numerous natural water tanks interconnected by open drains mainly discharging into Pallikaranai Swamp
- almost no drainage system in urbanized areas
- no storm water management concept established and validated
- very poor maintenance of existing drainage infrastructure

Challenge: ensure adequate storm water management

- comprehensive discharge of excess rainwater (drains, pumping stations)
- use of natural water resource from precipitations (retention, infiltration)
- protection of biodiversity in natural Pallikaranai Swamp
- prevention of human/material damages during future extreme weather events

Current activities:

- Sub-Basin M1&M2 (107 km²) – Feasibility Study ongoing
- Sub-Basin M3 (10 km²) - construction works in tendering phase



Funding by KfW:

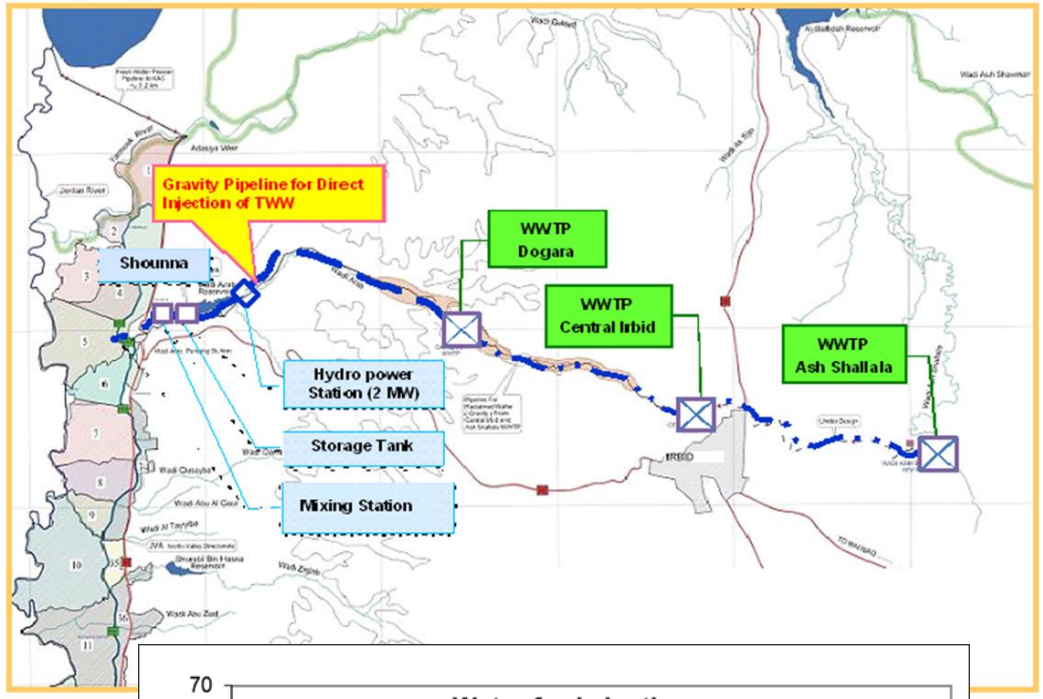
- 150 mio € interest reduced loan;
- 4.0 mio € grant for accompanying meas.
- 1.2 mio € grant for Feasibility Study

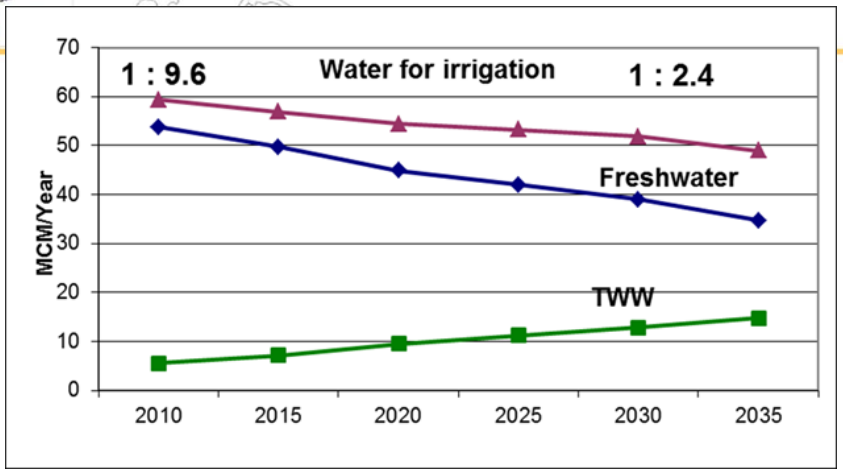
››› KfW Support to Jordan Valley Authority

Water Reuse for Agricultural Irrigation

Northern Jordan Valley

Reuse of Treated Wastewater for Irrigation – ***Scheme & Effects***





- additional water resource from Reuse for Irrigation: approx. 15 Mio. m³/a
- substitutes freshwater supply to irrigation scheme
- allows to cover drinking water demand of approx. 500 000 persons from freshwater resource
- by- product: power supply for approx. 15 000 persons
- specific cost (Investment and operation): approx. 0,25 €/m³
- completion scheduled 2018/2019

Operators:

- Yarmouk Water Company (WWTP)
- Jordan Valley Authority (irrigation)

Total Investment:

- 20 mio € for rehab./extension of 2 WWTP, 21 km pipelines + associated infrastructure;

Funding by KfW:

- Major portion of investment through interest reduced loan;
- Grant for accompanying measures