

RAINWATER HARVESTING

Reference: CS-36

The collection of rainwater directly from the surface it falls on, known as rainwater harvesting (RWH), can be used for non-potable purposes, reducing demand on the mains water supply and providing dry season water resilience.

RWH is a sustainable approach to the provision of a reliable water supply which reduces the pressure on drainage systems, whilst mitigating flood risk and pollution. Population increase and climatic change are causing the water demand to rise worldwide, therefore efficient planning and innovative solutions are increasingly required to ensure a sustainable future for water resources.



GWP Consultants LLP have experience working on a range of RWH schemes worldwide, ranging from small-scale schemes for private developments in the UK, to comprehensive, community based water security projects overseas. In association with these schemes, GWP provide water quality assessments, material and contractor procurement services, evaluating the adequacy of existing materials, construction supervision, as well as operations and maintenance advice.

Our Water Resources department combines expertise within hydrology, hydromorphology and hydrogeology,

Related expertise:

- Detailed topographic surveying
- Geographic information systems (GIS)
- Rainfall probability analysis
- Flood Estimation Handbook techniques
- Rainfall runoff modelling
- Water balance analysis
- Hydrological catchment modelling and flood routing
- Hydraulic modelling and flood water elevation prediction
- Flood risk mapping
- Sustainable drainage systems (SUDS) design
- Design of flood water storage facilities

supported by a team of geotechnical engineers, surveyors and GIS specialists. An integrated scheme can therefore be provided, assessing the most appropriate mitigation approach within both surface water and groundwater resources.

GWP also offer expert assistance within water governance and drought preparedness to aid climate adaptation within Small Island Developing States (SIDS), often forming an accompanying facet to our technical assistance to ensure a sustainable approach.

Selected projects

Case Study: Kiribati Climate Adaptation Rainwater Harvesting

Climate adaptation RWH projects based in the Pacific atoll island state of Kiribati have been undertaken in collaboration with the Government of Kiribati and the World Bank as part of the water sector climate adaptation response under the Kiribati Adaptation Project Phase II (KAP II).

RWH assessments were undertaken in South Tarawa and 25 outer islands over a two year period. The detailed design and construction specification of each system was provided, ensuring efficiency for extended drought periods and high rainfall intensities.

Integrated RWH at a range of scales (households, communal buildings and larger strategic options) was implemented, whilst RWH guidelines were developed for community awareness and to assist local contractors with design, specification and construction supervision.



Case Study: Hydrological Environmental Impact Assessment and Surface Water Management Strategy, Coal Colliery

A detailed surface water management strategy forming part of the environmental planning application for a proposed open cast coal colliery in Yorkshire, UK. Based on sustainable drainage principles and utilising drainage software, a drainage scheme including attenuation ponds, ditch designs, settlement lagoons, and hydrocarbon interceptor was designed and specified for construction.

A rainwater harvesting system was designed using an hourly water balance model, whilst incorporating greywater re-use to supplement the onsite water supply. The proposed strategy included a foul-water drainage system, comprising the sizing and specification of a septic tank and drainage field.

Case Study: Water Resource Assessment

Assessment and quantification of water requirements for dust suppression and firefighting at a recycling plant in Hampshire. A simple lump parameter model was developed to determine water availability for dust suppression based on rainfall capture. Dry season rainwater harvesting from on-site buildings and landform slopes was found insufficient for dust suppression.

Although a licensed groundwater abstraction was not permitted, in order to maximise rainwater harvesting, an abstraction borehole was specified to remain below the licensing requirement.



Case Study: Water Supply and Drought Resilience Improvements

Water conservation and water supply improvements have been incorporated within an integrated approach to water scarcity and drought vulnerability at a private lodge within Lewa Conservancy located immediately north of Mount Kenya.

Groundwater investigations ensured a sustainable water yield from the basalt aquifer underlying the site, supplementing the domestic water supply by 200m³/day.

The water supply for staff and wildlife was increased through the design and construction of a RWH system, developed through a numerical water balance analysis.

Grey water treatment and re-use supplemented the supply, ensuring a sufficient supply for two waterholes. Construction supervision and the procurement of local materials were also undertaken.



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