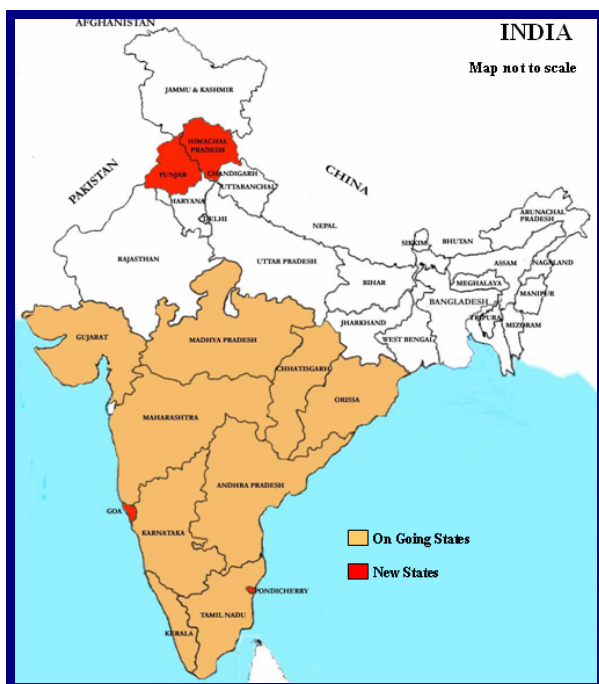


OVERSEAS WORK

India Hydrology Project Phase II

Frank Farquharson is part of a team acting as Technical Assistance and Management Consultants [TAMC] to the Ministry of Water Resources in India helping to implement World Bank funded programme to upgrade hydrology throughout Peninsular India. The TAMC consultancy, led by Mott Macdonald, began in Dec-2008 in the area shown in the map.



The first 6-year phase of the project began in 1996 and the second 6-year consultancy started in 2006. The project promotes the sustained and effective use of the Hydrological Information System [HIS] developed under the first phase of the project. The technical assistance takes the form of technical and institutional development support to the Project Coordination Secretariat [PCS] of the Ministry and the various Implementing Agencies [IA] - comprising eight Central Agencies and agencies in 13 participating states. Frank has a varied role as a "hydrological and hydrometeorological data analysis expert", with his main input being to help the IAs develop and carry out a series of Purpose Driven Studies. These are aimed at using the data collected under the project to address a wide range of real practical problems, something that has been lacking in India. These studies range from regional flood and low flow studies, through water quality modelling of surface and groundwaters, artificial recharge and improving water resources

assessment and management. In addition, Frank is advising on new data acquisition systems and instruments, on design and implementation of real time flow forecasting systems and on training.

He has made four one-month visits to India during the past year and will continue to be involved during the remainder of the project lasting until 2012.

BP Azerbaijan

WRA has been working for BP Exploration for a number of years, completing a groundwater survey of the Serenja hazardous waste management facility in 2009, with the support of Margaret Cliff [Roundhay Environmental Consultants]. In 2010, work continues at Sangachal terminal, with an update of the hydrological studies carried out in 2008. In April, WRA joined up with the KBR design team, engaged on the Phase 2 terminal expansion.



Abandoned oil well near the Serenja HWMF

The Sangachal catchment is dominated on the northern side by a large mud volcano [Qaraqush], which dominates hydrological processes in that sector. A particular novelty is the formation of swallet holes and mud caves, on the steep side-slopes of the volcano.



At the Centre of Mt Qaraqush crater, a 403 m high volcano, which last erupted in 1920, sending a large mudflow in the direction of BP's hub terminal at Sangachal.

UK WORK

Woburn Ecology

WRA has been involved in strategic planning of water for the Bedford Estates, since 2008. The current year sees the culmination of the studies with the submission of applications for new abstraction licences using both groundwater and surface water. The Woburn Lakes were identified as a potential non-potable water supply source for Woburn Safari Park, so hydrological, and ecological studies have been carried out to investigate feasibility of this option, and the results have been submitted to the Environment Agency.



Sampling in Lower Hop Garden Pond

Debbie Snook has led the ecology team, in preparing an environmental appraisal report to assess potential impacts of the proposed abstraction scheme on the lake system and stream habitats. Baseline conditions for aquatic and wetland habitats were established through a series of ecological surveys. An extended Phase 1 habitat survey identified habitats of ecological interest and those suitable to support protected species; this work was done by Corylus Ecology Ltd. A desk-based assessment of the fish assemblages of the waterbodies in the study area was undertaken with the support of Framlingham Fisheries, to establish likely implications of a drawdown scenario in the various ponds.



Sampling in Lower Drakeloe and the Broughton Brook

Macroinvertebrate and macrophyte surveys of the Woburn Lakes, using a combination of National Pond Survey and Predictive System for Multimetrics [PSYM] methodology, established their current ecological status and assessed potential impacts of drawdown scenarios. Since 2007, ponds of high

ecological quality have been identified as a UK Biodiversity Action Plan priority habitat. Using established metrics, the Lower Drakeloe Pond met the criteria for Priority Pond status and therefore presents a significant ecological feature within the catchment.



1. Red-eyed damselfly *Erythromma najas* on White Water-lily bed *Nymphaea alba* 2. Lower Drakeloe island

A River Habitat Survey of the Upper Broughton Brook was undertaken to describe the physical structure of the river corridor and assess its habitat potential for aquatic fauna. A survey, using RIVPACS [River Invertebrate Prediction and Classification System] methodology, of the aquatic macroinvertebrate and aquatic and wetland macrophyte species of the Drakeloe Stream and the upper Broughton Brook was undertaken, to assess the ecological quality of the two ephemeral watercourses.

On the basis of the findings from the various surveys, a series of enhancement and mitigation measures were proposed. These aimed to improve the current ecological quality; to create a faunal assemblage more robust to potential drawdown conditions; and to address the implications of a severe drought scenario.

WRA SOFTWARE

Pat Reynolds has developed a new website, focusing on Low Carbon Options, and it is hoped that this will provide a useful resource and discussion point.



www.lowcarbonoptions.net

WRA Board Meeting

9th July 2010.

The WRA Bulletin is a quarterly publication, and relies on contributions submitted by Directors, Associates and Consultants. The document is circulated by email, and published on the WRA web-site, aiming to keep the WRA network, up-to-date with respect to current activities. Please email contributions for future issues to pach@watres.com

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