

## Outcomes from IWMI's Environmental Flows Research

Since 2002, IWMI and its partners have conducted research to estimate environmental flow (EF) requirements under conditions of limited eco-hydrological knowledge, and to use this knowledge to inform water resources assessments and planning at multiple scales. Building on this work IWMI launched The Global Environmental Flow Calculator (GEFC), a software package for desktop rapid assessment of EFs. For the past several years, IWMI has tracked the influence of this research, culminating in some recent, significant outcomes.

At the global scale, in addition to the reproduction of EF research products in a number of reports (e.g., the 2006 Human Development Report) and websites, the EF research, publications and GEFC tool are also informing a number of on-going global and regional analyses including:

- A European Environmental Agency report on Environmental flow requirements for the maintenance of freshwater-dependent ecosystems
- The World Wildlife Fund's development of global water indicators
- The University of Surrey/World Wildlife Fund's refinement of an environmental impact assessment methodology
- The Center for Development Research's (ZEF) water allocation decision support system.
- Global Water System Project Digital Water Atlas (<http://atlas.gwsp.org>)
- Snowy Mountains Engineering Corporation's Environmental Flow Requirements Assessment of the Blue Nile
- Lund University Centre for Sustainable Studies (LUCSS) compendium of research tools to evaluate energy requirements

IWMI's global contribution to the topic is also acknowledged through a growing number of requests for keynote talks and papers at international irrigation and environmental conferences.

At the national scale, IWMI's research on environmental flows is having significant impact in India, where, by all standards, the knowledge, let alone implementation of EF, has been very limited. Through the introduction of IWMI's EF research, methodologies and related training and workshops, the e-flows concept in general as well as the rapid assessment methodology for allocating water to the environment has generated considerable interest among national research and NGO communities as the work provides a scientific basis to quantify the volume of water to be released for the environment. Three recent examples highlight IWMI's influence. First, in 2005 the state of Himachal Pradesh (HP) issued a notification requiring the release of 15% lean season flow from the River Beas for river ecology and pollution abatement (Government of Himachal Pradesh Order on Minimum Flow of Rivers, 2005). The notification followed IWMI's EF research and the communication of the related results during the first National EF workshop jointly organized with the Indian National Institute of Ecology. The notification was subsequently challenged by the National Hydroelectric Power Corporation and the case is being heard by the Indian High Court. The court-appointed experts both approached IWMI to provide all background EF research to answer a range of engineering and ecological questions raised by the High Court. The legal proceedings continue (and are therefore confidential) but the implications are hugely significant as the results could influence both HP's as well as India's future environmental water regime. Second, IWMI EF research is informing the technical discussions surrounding the proposed Polavaram project in Andhra Pradesh (AP), which is being heard by the AP High Court. Third, IWMI was informed in 2008 that its EF

methodology was being used by a High Level Group (HLEG), formed by the Government of India, to calculate the EF requirements for the Bhagirathi River (a source for the Ganges) in the State of Uttarakhand in response to the proposal of several controversial dam sites.

Finally, as result of previous years of research, IWMI has become a point of contact and attention by many organizations and networks concerned with river development and river health in India. IWMI in 2008 joined forces with WWF- India (through WWF-International/HSBC partnership) in a 3-year program “for a living Ganga”. The program, which will include research, NGO and governmental partners, will calculate EF requirements for the upper Ganga—an iconic but rapidly developing river in the country—to assist future basin development plans. IWMI’s involvement in this historic program further demonstrates the broad and significant influence of the institute’s EF research.

### **Citations of IWMI’s Environmental Flows Research**

Polavaram project in legal wrangle. Down to Earth, VOL 16 ,NO 17 Tuesday, January 22, 2008. [http://www.downtoearth.org.in/full6.asp?foldername=20080131&filename=news&sec\\_id=4&sid=18](http://www.downtoearth.org.in/full6.asp?foldername=20080131&filename=news&sec_id=4&sid=18)

KMC committed to clean Ganga. Hindustan Times, Lucknow. February 20, 2009.

Workshop on river Ganga innaugurated. Pioneer, Lucknow. February 19, 2009

Aiming to increase water level. Times of India, Kanpur. February 19, 2009