



## Perceptions of impacts, public participation, and learning in the planning, assessment and mitigation of two hydroelectric projects in Uttarakhand, India

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### ABSTRACT

The hydropower potential of the state of Uttarakhand, in the Indian Himalaya, is an estimated 20,000 MW, of which approximately 3200 MW have been developed. In conjunction with the central government, Uttarakhand is pursuing a policy of rapidly developing its remaining potential. The necessity for careful planning, assessment and mitigation of this development is paramount, requiring meaningful and effective public participation. This study examined two hydropower projects in Chamoli District. Our purpose was to investigate how stakeholders viewed the projects' impacts, how local residents were involved in planning, assessment and mitigation, and what the residents learned from their involvement. We used a qualitative methodology involving a document review, participant observation, and semi-directed interviews. Local residents and nongovernmental organizations emphasized adverse social and environmental impacts. They thought the way of life and social fabric of affected villages were significantly altered and future sustainability was uncertain. Industry respondents emphasized the economic benefits. Government officials were relatively balanced in their perceptions. In one project, the only formal participation opportunity occurred during mitigation: development of the catchment area treatment plan. In the other, opportunities were available during assessment (e.g., hearings) and mitigation (e.g., advisory committees). Both projects involved multiple informal efforts at participation (e.g., legal petitions and public protests). Among local residents, there were notable instances of sustainability-oriented learning. The development of hydropower projects in Uttarakhand can become more participative, to improve decision making, promote equity, and create opportunities for sustainability learning.

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### Introduction

India, like many countries around the world, has a significant need for energy, and has identified hydropower generation as a key component in meeting that need (Sharp, 2000; Alternative Hydro Energy Centre, 2011). While hydropower development produces economic and social benefits, large-scale dams in India cause many of the same social and environmental concerns documented worldwide (Khagram, 2004). One significant criticism of the dam development process in India is a lack of meaningful public participation, which is an especially critical issue for local people directly affected by the projects (Sinclair and Diduck, 2000; Paliwal, 2006; Rajaram and Das, 2006; Diduck et al., 2007).

The steep elevations and numerous fast flowing perennial rivers of the Himalayan region of India provide the area with a high

potential for hydroelectricity (Government of India, 2008). This potential, combined with India's substantial need for energy, make the Himalayan region a crucial source of hydroelectric generation (Rangachari et al., 2000). In recent years, the number of hydro projects in the Himalayan region has increased significantly. In 2003, India's central government announced a 50,000 MW initiative intended to increase the contribution of hydropower from 25% to 40% of the total energy generation in the country (Central Electricity Authority, 2004). Under this initiative, 133 of the planned 162 hydro projects are in the Himalayan region (Agrawal et al., 2010).

The hydropower potential of the state of Uttarakhand, in the Western Indian Himalaya, is an estimated 20,000 MW (Asian Development Bank, 2005; Joshi, 2007). Of this potential, only 3200 MW have been developed (Alternative Hydro Energy Centre, 2011). In conjunction with the Indian central government, Uttarakhand is pursuing a policy of developing its remaining hydro potential as soon as possible. Within the 50,000 MW initiative, there are an additional 33 new hydro projects planned in Uttarakhand alone (Government of Uttarakhand, 2008).

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In the context of this push for rapid development, the necessity for effective environmental planning, assessment and mitigation is paramount (Rana et al., 2007), and careful efforts in this regard require meaningful and effective public participation. Such participation can advance basic sustainability objectives (Goodland and Daly, 1995; Mitchell, 2002; Gibson et al., 2005) and provide excellent opportunities for participants to learn about sustainable human–environmental interactions (Rist et al., 2007; Steyaert and Jiggins, 2007; Tàbara and Pahl-Wostl, 2007; Sinclair et al., 2008; Diduck et al., 2012).

This research thus investigated public participation and learning in the environmental planning, assessment and mitigation of two major hydroelectric projects in Uttarakhand. The objectives of the study were to (1) identify perceptions of the impacts of the projects held by selected members of different stakeholder groups; (2) describe local stakeholder participation in the projects; and (3) explain the learning outcomes (if any) experienced by local stakeholders as a result of their participation.

## Materials and methods

The empirical context of the study was the Vishnuprayag and Tapovan-Vishnugad hydroelectric projects in Chamoli District, Uttarakhand (Fig. 1). Vishnuprayag is a run-of-the-river project (400 MW, €380 million) owned and operated by Jaiprakash Power Ventures Limited, a subsidiary of the Indian conglomerate, the Jaypee Group. Tapovan-Vishnugad is also a run-of-the-river project (520 MW, euro 620 million). It is owned and operated by the National Thermal Power Corporation, a public-sector company 90% owned by the Government of India.

We used a qualitative design guided by an interactive and adaptive approach (Nelson, 1991; Creswell, 2009). Research participants were selected using purposeful, theory-based and snowball sampling techniques (Patton, 2001; Creswell, 2009). The fieldwork occurred between September 2008 and February 2009. The primary data gathering technique was in-depth, semi-structured interviews regarding perceptions, participation and learning outcomes. Nine group and 32 individual interviews were conducted across the two project sites, encompassing 65 participants (18 women and 47 men). The participants were drawn from five villages (Chaien, Dhak, Ravigram, Selong and Tapovan) in Chamoli District, the town of Joshimath, and the city of Dehradun. Joshimath is an important urban center in Chamoli, and Dehradun is the capital of Uttarakhand. Sampling finished when all major questions and validation issues had been reasonably addressed. The interview data were contemporaneously recorded with handwritten notes.

Data collection also involved a review of documents to support the interview data and to shed light on environmental planning, assessment and mitigation processes, and public participation procedures. Data sources included government offices and public registries, government and non-government organization (NGO) Internet sites, NGO records and files, and media reports. Documentary data included dozens of environmental assessment documents, public policy statements, public interest litigation documents, newspaper stories and NGO reports. The third type of data collection was detached participant observation (Merriam, 1998). Observation data were obtained through field visits to project construction and village sites and two NGO-sponsored workshops. These visits allowed us to deepen our understanding of the situation and to verify details given in the interviews. The field visits were recorded with photographs and hand written notes.

Using QSR NVivo 7 (QSR, 2006), we created categories based on the research objectives and other details pertinent to the two projects. We categorized the interview data primarily by stakeholder group. The stakeholders were initially divided into four

categories: local residents, NGOs and individual activists, government employees, and hydro project employees. The interviews were further subdivided based on the participants' roles and affiliations to the projects. These subcategories included local people working as sub-contractors for the projects, members of local governing bodies, members of Village Development Advisory Committees (VDACs) (defined in the section on "Opportunities for participation by local residents"), members of various NGOs, and people who were not local residents (such as representatives of NGOs from outside of the region). We also created a coding system to identify themes and patterns in the data. Learning outcomes were divided into instrumental, communicative, transformative and sustainability-oriented outcomes (defined in the section on "Theory and concepts"). Opportunities for participation were split between proponent-led and civil society-led. Each of these was further sub-divided. Each category of perceptions of impact (economic, social, and environmental) was divided into both negative and positive perceptions.

## Theory and concepts

### *Public participation in resource management*

The importance of public participation in resource management is widely acknowledged in the literature. By resource management we mean the management of human–environmental interactions, including diverse functions such as research, policy analysis, planning, assessment and mitigation (Johnston, 1983; Nelson, 1995; Mitchell, 2002). We define public participation as the involvement in resource management of people and groups who are directly affected by management decisions, along with the involvement of others with an interest in the common good who have important knowledge and concerns. Meaningful and effective public participation in resource management can advance basic sustainability objectives, such as environmentally sound decision making (through, for example, the incorporation of local knowledge), equitable distribution of the costs and benefits of development (by clarifying economic interests), and socio-political empowerment (by facilitating civic engagement in community affairs) (Goodland and Daly, 1995; Mitchell, 2002; Gibson et al., 2005).

In India, public participation in planning, assessment, and mitigation of hydro projects is guided by national environmental assessment legislation. India first enacted such legislation in 1994, and made major changes in 1997, making public hearings mandatory and otherwise strengthening opportunities for participation (Valappil et al., 1994; Banham and Brew, 1996; Government of India, Ministry of Environment and Forests, 1997). In 2006, the assessment legislation was further amended, and more rigorous and expansive provisions for participation were adopted (section 7) (Government of India, Ministry of Environment and Forests, 2006). In addition to this legislation, public participation in mitigation is guided by the terms and conditions of project approvals. In the case of large-scale hydroelectric projects, approval conditions often stipulate that the proponent must fund, and involve relevant government agencies and affected local communities in, the preparation and implementation of a catchment area treatment (CAT) plan to mitigate the adverse impacts of the project (e.g., Jaiprakash Power Ventures Limited, n.d.).

Several studies have inquired into public participation in environmental planning, assessment and mitigation in India. Prior to the 2006 amendments, Sinclair and Diduck (2000), Paliwal (2006), and Rajaram and Das (2006) identified major weaknesses, such as inadequate notice, lack of access to information, absence of timely public meetings, and lack of feedback to community members. Similarly, Diduck et al. (2007) found that opportunities for

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