



Equitable sharing of benefits in Sukhomajri, India

Authors: Anil Agarwal (anil@cseindia.org) and Sunita Narain (sunita@cseindia.org)

Short title: Equitable sharing of benefits in Sukhomajri, India

Key Message: Sukhomajri watershed management demonstrates how to develop market-based approaches for watershed protection and improving livelihoods in India.

Suggested citation: TEEBcase by A. Agarwal and S. Narain (2010) Equitable sharing of benefits in Sukhomajri India, available at: TEEBweb.org



Picture 1: A check dam in Sukhomajri, built to conserve surface water runoff
Courtesy: Centre for Science and Environment, New Delhi



Picture 2: Regeneration of forest land
Courtesy: Centre for Science and Environment, New Delhi

1. What is the problem?

Sukhomajri village located in the foothills of the Himalayas was amongst the first in India to test participatory watershed management (Landell-Mills and Porrás, 2002). The entire agricultural land of Sukhomajri village was under rain-fed single cropping and there was no source of irrigation up until 1975. Small land holdings suffered due to frequent crop failures due to erratic distribution of rainfall (Sengupta et al. 2003). The degradation of agricultural lands forced villagers to bring hill slopes under agriculture and soil erosion increased in the hills. Practices of free grazing of cattles, land clearance and tree-felling created various problems (Porrás & Neves, 2006). In 1975, the continuing problem of silting of the prestigious man-made Sukhna Lake in Chandigarh drew the attention of the Central Soil and Water Conservation Research

and Training Center Institute (CSWCRTI), Chandigarh (ENVIS, 2005) and it was found that over 68.5% of the lake was filled with silt (Sengupta et al. 2003).

2. Which approach was taken?

A scheme was launched in 1979 in response to growing water scarcity. Farmers in Sukhomajri were supported by the CSWCRTI and the Ford Foundation to undertake a programme of checking dam construction and watershed management to tackle heavy siltation and low dry seasonal flows (Landell-Mills and Porrás, 2002). CSWCRTI applied soil conservation techniques developed by combining mechanical and vegetative measures. The mechanical measures reduced the runoff sediment from the highly eroded Shivaliks at a spectacular rate from eighty tonnes to less than one tonne per hectare, within a short span of a decade. The vegetative measures consisted of planting tree species like khair and shisham, in pits and bhabbar grass at mounds of trenches. They also planted *Agave americana* and *Ipomea cornea*. The concept of social fencing gained wide recognition in the effort to control the grazing of cattle. As a result, forest areas were covered with grass and trees within a period of 10 to 15 years. Grass production more than doubled in the same period (from 3.82 t/ha to 7.72 t/ha) (ENVIS, 2005). A Water Users' Association was set up in 1982, charged with implementing watershed management, dam management and the collection of fees from water users (Landell-Mills and Porrás, 2002). Two new earthen dams in the catchment of Sukhomajri village and Sukhna Lake benefited the Sukhna Lake downstream and the inhabitants of Chandigarh as well (Sengupta et al. 2003)

3. What ecosystem services were considered and how?

The ecosystem services considered in this case are soil preservation, afforestation, ground water protection and forest management.

4. What input was required to do so?

The involvement of local people and the effort of CSWCRTI and Ford Foundation were important inputs for implementing the project. The local farmers were given some incentives to develop agriculture and protect soil. The fee on water was Rs. 16 per hour (Porrás and Neves, 2006)

5. What was the policy uptake, and what were the conditions for this effort to actually influence public management?

The case of watershed protection in Sukhomajri village in Haryana is especially relevant from the point of view of developing market-based approaches for watershed protection services and improving livelihoods in India. Moreover, in this case, the potential for payments and market-like arrangements for watershed protection services can be observed at two levels simultaneously, one between the downstream city of Chandigarh and upstream villages like Sukhomajri, and secondly through an "embedded" market for water within Sukhomajri village itself (Sengupta et al. 2003)

Sukhomajri is the first village in India to have tax levied on the income it earns from the ecological regeneration of its degraded watershed (Agarwal and Narain, 1999). The village of Sukhomajri has seen many improvements in its economy since it undertook environmental reforms in the mid-1970s. The yield rates of wheat and maize, the two main staples, increased by more than 50 per cent between 1977 and 1986 (Agarwal and Narain, 2000). Yield of wheat

crop had increased from 8.0 q/ha in 1975-76 to 27q/ha in 1999-2000 and 30.76 q/ha in 2007-08. The numbers of trees in 1980 were 64 trees per hectare and in 1992 it increased to 415 trees per hectare¹.

Sukhomajri watershed clearly emphasized the importance of the water resource development activities in the Watershed programme, through participatory approach. There is no self help groups in village Sukhomajri². As the village has prospered and people have come to enjoy a surplus, women joined together to help each other financially. Women can obtain loans from the fund at 2% interest to start a business or attend other needs (Agarwal and Narain, 2000).

The Departments of Forests, Agriculture and Soil Conservation, the World Bank aided Integrated Watershed Development Project (IWDP), in the North-West Shivalik States, have already implemented hundreds of projects like Sukhomajri in this region. To cite an example, as of 1996 the Forest Department in Haryana built approximately 93 rainwater harvesting dams covering 53 villages and about 70 such dams were built by the Department of Soil and Water Conservation, Punjab. The IWDP (Kandi Project) has adopted this model on a massive scale in the North-West Shivalik States (ENVIS, 2005). Based on the Sukhomajri model, the Forest Department of Haryana constructed 102 water harvesting structures in 61 villages. The success of the project led the Central Government to sponsor 440 integrated watershed-management projects to be developed on the lines of Sukhomajri.

Despite this great transformation, Sukhomajri stands in a precarious position today. As the land generates more wealth, all of the parties have a growing stake in obtaining their share. The village has regenerated the forest, but the Forest Department has refused to give more than 25% of timber to the community. Meanwhile, the neighboring town of Dhamala has sought to expand its rights to forest resources. Sukhomajri has been in prolonged struggles with both the forest department and Dhamala (Agarwal and Narain, 2000).

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¹ Dr. A.K. Tiwari, Central Soil and Water Conservation Research and Training Center Institute Chandigarh, pers. Comm.

² Ibid.

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Acknowledgements: Tamali Chakraborty (tamali.chakraborty@gmail.com) for compiling the case and Dr. A.K. Tiwari for reviewing the case.



Picture 3: Some signs still remain of the erosion in the hills surrounding Sukhomajri
Courtesy: Centre for Science and Environment, New Delhi



Picture 4: Regeneration of forest land
Courtesy: Centre for Science and Environment, New Delhi