



Review

## Soil Conservation Issues in India

Ranjan Bhattacharyya<sup>1,\*</sup>, Birendra Nath Ghosh<sup>2</sup>, Pradeep Dogra<sup>2</sup>, Prasanta Kumar Mishra<sup>2</sup>, Priyabrata Santra<sup>3</sup>, Suresh Kumar<sup>3</sup>, Michael Augustine Fullen<sup>4</sup>, Uttam Kumar Mandal<sup>5</sup>, Kokkuvayil Sankaranarayanan Anil<sup>6</sup>, Manickam Lalitha<sup>6</sup>, Dibyendu Sarkar<sup>7</sup>, Dibyendu Mukhopadhyay<sup>8</sup>, Krishnendu Das<sup>9</sup>, Madan Pal<sup>1</sup>, Rajbir Yadav<sup>1</sup>, Ved Prakash Chaudhary<sup>10</sup> and Brajendra Parmar<sup>11</sup>

- <sup>1</sup> ICAR-Indian Agricultural Research Institute, New Delhi 110012, India; madanpal@yahoo.com (M.P.); rajbiryadav@yahoo.com (R.Y.)
  - <sup>2</sup> ICAR-Indian Institute of Soil and Water Conservation, Dehradun 248195, India; bngghosh62@rediffmail.com (B.N.G.); dogra.pradeep@gmail.com (P.D.); pkmbellary@gmail.com (P.K.M.)
  - <sup>3</sup> ICAR-Central Arid Zone Research Institute, Jodhpur Rajasthan 342003, India; priyabrata.iitkgp@gmail.com (P.S.); sk\_ecology@yahoo.co.in (S.K.)
  - <sup>4</sup> Faculty of Science and Engineering, The University of Wolverhampton, Wolverhampton WV1 1LY, UK; m.fullen@wlv.ac.uk
  - <sup>5</sup> ICAR-Central Soil Salinity Research Institute, Regional Research Station, Canning Town, West Bengal 743 329, India; uttam\_icar@yahoo.com
  - <sup>6</sup> ICAR-National Bureau of Soil Survey and Land Use Planning, Bangalore Regional Center, Bangalore 560024, India; anilsoils@yahoo.co.in (K.S.A.); mslalit@yahoo.co.in (M.L.)
  - <sup>7</sup> Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal 741252, India; dsarkar04@rediffmail.com
  - <sup>8</sup> Uttar Banga Krishi Viswavidyalaya, Cooch Behar 736165, India; dibsm107@gmail.com
  - <sup>9</sup> National Bureau of Soil Survey and Land Use Planning, Kolkata Regional Centre, Kolkata 700091, India; das\_krishnendu@hotmail.com
  - <sup>10</sup> ICAR-Indian Institute of Farming System Research, Modipuram 250110, India; vp\_ch@yahoo.co.in
  - <sup>11</sup> ICAR-Indian Institute of Rice Research, Hyderabad 500030, India; birju1973@gmail.com
- \* Correspondence: ranjan\_vpkas@yahoo.com; Tel.: +91-7838781447

Academic Editor: Marc A. Rosen

Received: 16 April 2016; Accepted: 30 May 2016; Published: 18 June 2016

**Abstract:** Despite years of study and substantial investment in remediation and prevention, soil erosion continues to be a major environmental problem with regard to land use in India and elsewhere around the world. Furthermore, changing climate and/or weather patterns are exacerbating the problem. Our objective was to review past and current soil conservation programmes in India to better understand how production-, environmental-, social-, economic- and policy-related issues have affected soil and water conservation and the incentives needed to address the most critical problems. We found that to achieve success in soil and water conservation policies, institutions and operations must be co-ordinated using a holistic approach. Watershed programmes have been shown to be one of the most effective strategies for bringing socio-economic change to different parts of India. Within both dryland and rainfed areas, watershed management has quietly revolutionized agriculture by aligning various sectors through technological soil and water conservation interventions and land-use diversification. Significant results associated with various watershed-scale soil and water conservation programmes and interventions that were effective for reducing land degradation and improving productivity in different parts of the country are discussed.