H. P. State Council for Science, Technology and Environment, Shimla

Forestry Research Programme (FRP)
Department for International Development (DFID)
U. K.

Centre for Land Use and Water Resources Research

Indian Institute of Technology Delhi

Towards Implementing Environmentally Sustainable Water Policy for Himachal Pradesh

28th August – Shimla

Contents

Executive Summary

The main purpose of this workshop was to initiate discussion as to how the water policy framed by the State of Himachal Pradesh can be implemented in environmentally sustainable manner. The participants for the workshop were drawn from all the HP state line departments and other stake holders associated with the water sector.

The workshop was divided into three segments. It started with an inaugural session. A session for technical presentations and another session for panel discussion and formulation of recommendations

About 120 participants from various Central and State departments and other organizations took part in the inaugural and technical presentation sessions. A few prominent departments/organizations represented include Irrigation and Public Health, Agriculture department, Forest department, State Council for Science Technology and Environment, department of Information Technology, department of Bio-technology, DRDA, Regional Research Laboratory (Bhopal), Department of Science and Technology Delhi, Planning Commission, Central Water Commission, CSIR, IIT Delhi, DFID India, CLUWRR UK.

NGO's namely Sandesh, HP Gyan Vigyan Samiti, Himurja and Winrock International India Delhi were also present along with representative from private organizations such as INRM consultants Pvt. Ltd, Tech House, and Sai Engineering.

Mr. Sanjeev Gupta, Secretary (ST, IT & BT) in his welcome address elaborated on the purpose and need of such interactions to prepare the society to face present and future water issues. This was followed by a message of "Mr. John Palmer, Manager DFID's FRP programme" read by Mr. Virendra Sharma, Advisor, DFID India.

Mr. R. K. Gupta, Director (Hydrology), CWC, New Delhi, presented an overview of the salient features of the National Water Policy.

Prof. A.K. Gosain, IIT Delhi in his keynote address emphasized on creating a national framework for implementing an integrated approach for water resource management. He also explained how such a framework can be formulated and implemented for the state of Himachal Pradesh.

Mr. Jaime Amezaga from CLUWRR talked about the initiatives being taken under the cluster projects which has four projects running including "low flows" R8171 under which this workshop was being organized. He also shared with the audience the new initiative been taken in the form of FAWPIO (forest land and water policy; improving outcome) which is aiming at BRAP – Bridging gap between research and policy and improved framework for Policy formation.

Honourable IPH Minister, Thakur Kaul Singh highlighted the significant role of water as prime resource of the mountain areas to develop their economy and talked about water conservation techniques as a step towards meeting the ever increasing demand.

Hon'ble chief minister of Himachal Pradesh Shri Vir Bhadra Singh on this occasion pointed out the effects of climate change on water availability. He stressed on formation

of separate policies for the hilly regions like Himachal taking into account the topography and climate.

Mr. Bharat Khera, Member Secretary, SCST&E, proposed vote of thanks to conclude the inaugural session.

The technical presentation session started with the first technical presentation made by Mr. Sharma, Chief Engineer (South), Irrigation and Public Health (IPH) Department. He shared with the participants the State water sector statistics and the information on some of the ongoing and future initiatives.

Mr. Sunandan Tiwari Winrock International India, Delhi made his presentation on impact of forest and land uses on water resources, with clear connection between land use and water.

Dr. D. Dutta, Additional Director, NRDMS, Department of Science and Technology, New Delhi, made a presentation on the National Spatial Database Infrastructure (NSDI).

Dr. Sandhya Rao presented the excerpts of the work being done at IIT Delhi under the "LOWFLOWS" project. The project is developing an "integrated framework" to improve watershed management based on interdepartmental cooperation, data collection and modeling.

The afternoon session was dedicated to panel discussion and formulation of recommendations. This session was attended by about 40 participants including managers, planners, policy makers from various line departments of the State, representatives of the Central Government organizations and researchers. It was chaired by Mr. S.C Gupta, Chief engineering Central Water Commission (Chandigarh), and Prof. A.K. Gosain, Dr. R.K. Sood, and Mr. Jaime Amezaga were the facilitators.

After a brief comments by the chairman and the other panelist, discussions were focused towards recommending formulation of a common framework for data sharing and data gathering for which there was unanimity amongst the participants. A lively debate on what steps needs to be taken for collection and collation of data, what data elements to be incorporated and identification of the jurisdiction and responsibility of line departments for each data element took place. In the situation where overlap prevails for certain entities of data, one agency was recognized which shall take lead for carrying out specific tasks and co-ordinate with other line departments. These recommendations will be taken up by the SCST&E with the state government for the next level of action in the form of specific workshops for standardization of entities in the purview of the specific line departments on the basis of their recognized role. IIT Delhi shall facilitate such workshops.

Inaugural and Technical Presentations Session

This is a summary report of the workshop held at Shimla on 28th August, 2004 on the topic "Towards implement an environmentally sustainable water policy for Himachal Pradesh". The workshop was organized by State council for Science and technology supported by Indian Institute of Technology Delhi, CLUWRR, and University of Newcastle upon Tyne, U.K. under the "Low Flows" (R8171) project sponsored by Forestry Research Programme (FRP) Department for International Development (DFID), U.K.

The purpose of the workshop was to facilitate the policy makers, researchers and the representatives of the various line departments to formulate strategies for the implementation of environmentally sustainable water policies.

People from a wide spectrum of the water arena were invited for the workshop. The workshop was divided into two sessions, the forenoon and the afternoon. Besides the inaugural session, the forenoon session covered technical presentations by the area experts drawn from Central, State and research organizations. The Hon'ble Chief Minister of Himachal Pradesh, Mr. Virbhadra Singh was the chief guest for the Inaugural Session. The other dignitaries who shared the dias with Hon'ble Chief Minister were, Hon'ble IPH Minister, Thakur Kaul Singh, the Chief Secretary, Kanwar Shamsher Singh, the Principal Secretary (Irrigation and Public Health), Madam Harinder Hira, the Secretary (ST,BT & IT), Mr. Sanjeev Gupta, Prof. A.K Gosain (Professor, Department of Civil Engineering, IIT Delhi), and Mr. Jaime Amezaga, CLUWRR, University of Newcastle upon Tyne, U.K. There were about 140 participants from State and Central organizations, research and educational organizations and also from non-governmental organizations in the morning session.

Shri Sanjeev Gupta, Secretary, Science & Technology, Govt. of Himachal Pradesh, in his address welcomed the dignitaries, sponsors and the participants for their positive response. He elaborated on the purpose and need of such interaction for positioning the society to face the challenges of present and future scarcity in water resources and the need for evolving environmentally sustainable solutions.

Mr. Virendra Sharma, Advisor, DFID India, read the message sent by Mr John Plamer, Manager of DFID's centrally-funded Forestry Research Programme (FRP). He also touched upon some of the activities of DFID India.

Professor A. K. Gosain, IIT Delhi, while delivering his keynote address stressed on the need of using the integrated approach for proper planning and management of this very precious resource. He emphasized that the real bottleneck in this approach is the lack of framework to collate the available date residing in various line departments. He demonstrated how such integration is possible using the latest IT tools. Creation of such infrastructure which shall help all line departments in using common information on water resources is going to serve the State in implementing the water resources policy in an environmentally sustainable manner.

Mr. R. K. Gupta, Director (Hydrology), Central Water Commission, New Delhi, provided an overview of the salient features of the National Water Policy. He also stressed upon the need for having a common framework if the integrated approach is to be implemented.

Mr Jaime Amezaga, shared with the audience some of the recent initiatives being taken by the CLUWRR, University of Newcastle upon Tyne, UK, with the help of the Department for International Development (DFID), UK. These initiatives are geared towards generation of improved outcomes on land and water policies in a network of countries.

Honourable IPH Minister Thakur Kaul Singh while delivering his presiding address highlighted the problems of water conflict of twenty first century and the need to be better prepared for such eventualities. He also highlighted the critical role of water as prime resource of the mountain areas as it has potential to transform the economy of the State. He emphasised the need to explore the feasibility of deploying snow harvesting as a viable solution for meeting the water demand at the household and community level. He appreciated the effort of the organisers in choosing the most appropriate theme for discussion and assured the support of IPH department for implementing the recommendations of the workshop.

Honorable Chief Minister of Himachal Pradesh, Shri Virbhadra Singh in his inaugural address highlighted the necessity of evolving and implementing environmentally sustainable water policy in the State. He also drew the attention of the experts to the specificities of mountain regions and their unique problems. He further pointed out the uncertainties of climate and its bearing on the availability of water resources. He stressed the need to resort to the practices of rainwater harvesting and integrated watershed development in a scientific manner. He concluded his inaugural address with the observation made by Late Smt. Indira Gandhi, *"Our hill areas have been known for their beauty, for their controlling the weather, their ecological significance and, of course, their strategic value so far as defense is concerned. It is true however that they have remained insulated from the full impact of development activities. There have been some efforts to break this vicious circle but, they have not made the impact which we all desired. So we have to make a more concerted, determined effort, not only in the quantitative sense but also qualitatively better-oriented, to diagnose and find cures for the deeper problems of these areas including road infrastructure, health, education, ecology and safe drinking water*". He announced that environmental cell will be constituted in each department to harmonize development in an eco-friendly manner.

Mr. Bharat Khera, Member Secretary, SCST&E, proposed vote of thanks to conclude the inaugural session.

After the short tea break, a session was held where four technical presentations were made. Mr. R. A. Singh, Principal Chief Conservator of Forest Department, Himachal Pradesh was the chairman of this session. The first presentation was made by Mr. Sharma, Chief Engineer (South), Irrigation and Public Health (IPH) Department. He shared with the participants the water sector statistics of the State and the information on some of the ongoing and future initiatives. The presentation focused on the participatory approach

being followed in State for water management. The scope of the World Bank funded Hydrology Project II being taken up in the State was also shared.

Each Presentation was followed by a 5 minute question answer session. Some very lively debates took place after some presentations. Some of the important observations and suggestions made after the HP presentation included, the need to establish/create basic water reserve, keep the per capita demand of water in the State at 70 lcd (liters/capita/day). It was pointed out that the State water policy is oriented towards irrigation and canal irrigation in particular. There was also a debate on what should be byelaw regarding the minimum flow to be released on the downstream after the construction of a storage structure on the drainage system. It was felt that debate should be held to establish the environmental release for the ecosystems to survive.

This was followed up with a presentation by Mr Sunandan, Winrock International India, New Delhi. The presentation enumerated the impact of forest and land uses on water resources, with clear connection between land use and water. He presented the initial findings of the socio-economic survey conducted in the Khalasi Khud watershed and emphasized the role of using a scientific backup for making the appropriate decisions which are pro-poor while implementing the watershed management programme. The presentation was stated to be a "Thought Provoking" one by the Chairman.

Dr. D. Dutta, Additional Director, NRDMS, Department of Science and Technology, New Delhi, made a presentation on the National Spatial Database Infrastructure (NSDI), which is a new initiative taken collectively by DST and Department of Space (DoS) in India. He emphasized how timely this workshop is to debate on the strategies to implement the philosophy at the state level. His presentation also informed about the concept of electronic clearing house for data dissemination. During the question answer session after the presentation, it was pointed out that there should be some method to capture the cultural/ traditional water conservation practices/techniques in data as they can be useful to find viable solutions.

The last of the technical presentations was made by Dr. Sandhya Rao who presented the excerpts of the work being done at IIT Delhi under the "LOWFLOWS" project. The project is developing an "integrated framework" to improve watershed management based on interdepartmental cooperation, data collection and modeling. She also talked about and demonstrated some of the important elements of the framework such as Digital Elevation Model (DEM), drainage network, landuse, soil, etc., which are already available in the digital form and can serve as initial macro level framework.

Panel Discussion

The panel discussion, as planned, was attended by about 40 participants drawn from various line departments and other allied organizations. The complete list of participants is given in Appendix – II. Mr. S.C Gupta, Chief engineering Central Water Commission (Chandigarh) chaired the session, and Prof. A.K. Goasin (Department of civil engineering, IIT Delhi), Dr. R.K. Sood (State Council for Science and Technology), and Mr Jaime Amezaga, (Senior researcher, CLUWRR, UK) were the facilitators.

The Chairman mentioned that although spatial inputs have been used intermittently in the past for implementation of the water policies in Himachal Pradesh, yet the present exercise is geared towards taking up a more holistic perspective plan.

Prof. Gosain informed the participants that one of the major requirements for integrated water resource management is to establish linkages between the line departments which shall in turn help in the development of a framework to incorporate all the aspects which influence water. However, the main question is, how best to implement such framework without changing the exiting administrative framework.

Dr. D.Dutta, Additional Director, DST, raised a question about what should be the target. A bottom up approach to integrate the system of data needs to be developed. But how to integrate all the various scaled data starting from cadastral to 250000 scale. Standardization of scales was recommended for integration of various data layers.

Ms Aparna Negi (Reader, Department of Economics, Himachal University) pointed out that similar kind of work for Himachal Pradesh is already being done by Census of India, in which Census of India has started digitization of cadastral level maps of Himachal Pradesh villages and attaching with it the census attribute data. Many other members were aware of the effort but were concerned about the pace at which the work was progressing.

The major problem which most of the participants felt was the lack of dissemination of data. It takes lot of efforts to get the data. Mr. Vinay Tondon, Winrock International India, suggested that an agency should be made nodal for dissemination of all kind of data.

The representative of IPH was of the view that as far as water utilization in the State is concerned, prioritizing the uses will be a step in the right direction (The national water policy has already done it, IWP #5). May be the priority use of water can be – drinking, irrigation, Hydro-power, ecology, industries, navigation etc. Ground water contamination, pesticides and quality of water also need looking into. Prof. Gosain reiterated that in order to keep vigil on the quality aspects of water the first step is to quantify water resource availability.

Mr. R.C. Thakur, Director Research, Horticulture University, Palampur pointed out that there was not much reliability of the available data on which policy making is usually done. The panel felt that in earlier times data was inflated to get projects and grants but now things have changed and with consistency checks put in position such anomalies can be tackled.

After this brief general debate, it was decided to formulate the specific recommendations of the workshop which can be submitted to the appropriate authorities in the State for possible implementation.

Recommendations

- ***The implementation of State Water Policy in environmentally sustainable manner is a collective responsibility of all the stake holders***

  All the participants were unanimous on this requirement. There were some questions which will need elaboration such as which should be the lead agency? Although there were some concerns put by various departments but ultimately consensus was reached that IPH be the lead agency for water resource availability with the involvement of other associated departments like Agriculture, horticulture etc., and SCST&E should be the lead agency for keeping track of the health of the environment in the State.

- ***Use watershed philosophy by making appropriate use of the hydrological boundaries during the planning and management process***

  This requires standardization of watersheds and other base layers on the lines recommended by NSDI (National Spatial Database Infrastructure). State council for science, technology and environment has been identified to take lead in this, but with help from agriculture, horticulture, irrigation, rural developments.

  Place a common framework on the lines of the NSDI to collect data and collate information required for integrated planning and management at the scales varying from river to the watershed

- ***Identify the elements of data under the jurisdiction of each line department for collection and updation***

  The general data requirement and availability was discussed with a view to identify the line department who should be given the responsibility of the respective elements for creation and updation. The following emerged.

Data for river networks, drainage basins, watershed etc. (SCST&E).

Hydometeorological data - The state has a reasonable network of rainfall data which is further being strengthened through the World Bank funded Hydrology Project (HP II) under operation with IPH department. The hydrological data network shall also be strengthened under this project. The IPH shall take lead and coordinate with other organizations collecting hydrometeorological data in the State, such as HPSEB, Forest and Revenue department, HPKV Palampur and Dr. YS Parmar Horticulture Universities, CWC (regional office), etc.

Infrastructure data

It includes a large range of infrastructural projects connected with water resources. Some of the salient ones have been identified with the department responsible for its development and upkeep

IPH Deptt. - Hydropower projects, Irrigation, water supply, sewerage, flood control measures, ground water recharge structures

Agriculture Deptt. – minor irrigation schemes, water storage structure, soil conservation measures, individual irrigation schemes (individual farmers)

Forest Deptt. - Soil conservation and water harvesting structure, traditional water supply structures

Revenue Deptt. – traditional water supply structures

Rural Development Deptt. - Soil conservation and water harvesting structures.

- Base Layer Information – SCSTE and IPH
- Hydrogeology - SCSTE
- Water Quality – IPH, SEPPCB
- Landuse – State Landuse Board, Land Records Deptt., SCSTE
- Soil – Agriculture Deptt., State Universities
- Water user industries - SCSTE
- Wetland and Ecology – SCSTE, Forest
- Fisheries – Fisheries Deptt.
- Animal husbandry – Animal Husbandry Deptt.,
- Demography – Statistical deptt.,

- ***Through the common framework, develop linkages between all line departments dealing with various aspects of water such as the rural and urban water supply, minor irrigation, major and medium irrigation, the watershed development, agriculture and horticulture, forests, hydropower, health, environment, etc.***

  The present 5 levels of flow of information prevalent in majority of the line departments are:

  - Junior Engineer (JE)
  - Assistant Engineer (AE)
  - Executive Engineer (EE)
  - Superintending Engineer (SE)
  - Chief Engineer (CE)

  It was felt that this needs to be reexamined to bring workflow strategy for the state line departments to a common level. Once this is achieved then the implementation of cross-linkages at various levels and scales shall become comparatively easy.

- ***Take account of the inter-connectivity between watersheds and recognise that interventions can have unintended impacts at a range of different scales***

  - To be accomplished through analysis which should be taken up after all the required information is in position – SCSTE/Environment Department
  - Make assessment of the interventions taken place in the past on biophysical and socioeconomic– SCSTE, HP Universities.

- ***Take account of the physical characteristics of the watershed during the participatory planning of interventions and, in particular, ensure that interventions have the potential to benefit target groups***
    - Create perspective action plan – This is a collective effort – Lead by SCSTE with participation from implementing line departments.

- ***Use latest tools such as distributed hydrological simulation modeling to estimate flow quantities at all the scales after standardizing the hydro-model in complaisance with the international OGC (Open GIS Consortium) standards. Such framework shall provide water balance of any unit of choice. It can also be used to generate scenarios for possible interventions and to evaluate their impacts before implementation. Moreover, the availability of the framework with updation strategy shall provide the most up to date status of the hydrological system for any future intervention***
    - IIT Delhi team has agreed to play the lead role with cooperation from all concerned line departments.

- ***Establish systems of water governance that make effective decisions that take account of societal, economic and environmental conditions that are characterised by uncertainty, variability and change (including climate change).***
    - Policy update with the feed back from the previous exercise –SCSTE, IPH, Agriculture, Forest and many other departments.

- ***Technical Capacity Building***
    - All levels to generate action plans at respective levels.

Appendix – I

Towards Implementing Environmentally Sustainable Water Policy for Himachal Pradesh

28th August – Shimla

List of participants of the Inaugural session and technical presentations

Sl_no	Title	Name	Post	Department
1	Mr.	Virbhadra Singh	Hon'ble Chief Minister HP	Chief Minister
2	Mr.	Thakur Kaul Singh	Hon'ble IPH Minister, HP	Irrigation and Public Health
3	Mr.	Kunwar Shamsher Singh	Chief Secretary	Govt. of Himachal Pradesh
5	Ms.	Harinder Hira	Principal Secretary	Irrigation and Public Health & Urban Dev.
6	Mr.	Sanjeev Gupta	Secretary	IT, BT & ST
7	Prof.	A. K. Gosain	Professor	Department of Civil Engineering, IIT Delhi
8	Mr.	Jaime Amezaga	Senior Research Associate	CLUWRR,University of Newcastle
9	Mr	B.R. Jamwal	Addl. Director	Rural Development
10	Er.	Y.P. Thakur	Divisional Engineer	Agriculture
11	Dr.	B.C. Vist	Director	Animal Husbandry
12	Dr.	B.D. Malhotra	Joint Director	Animal Husbandry
13	Mr.	S.C. Negi	ADC	Solan
14	Mr.	Bharat Bhusan		Ayurveda AR, P&S, HP
15	Mr.	Arvind Bhatt		Biotech
16	Mr.	S.C. Srivastava	Chief Executive Officer	HIMURJA
17	Mr.	S.C Gupta	Chief Engineer	CWC
18	Mr.	R.N Sharma	Chief Engineer	Irrigation and Public Health
19	Mr.	P. Dorje	Dy.Director CWC	CWC, HP

Sl_no	Title	Name	Post	Department
20	Mr.	Rajesh Kumar	Director	CWC, HP
21	Dr.	R.K. Gupta	Director Hydrology	CWC, New Delhi
22	Mr.	R.C. Thakur	Director	Agriculture University, Palampur
23	Mr.	S.M. Sani		DRDA, Shimla
24	Dr.	Debapriya Dutta	Additional Director (NRDMS)	Department of Science and Technology,Delhi
25	Ms.	Nisha Mehndiratta	Project Scientific Officer	Department of Science and Technology,Delhi
26	Mr.	R.P. Dogre	Asstt. Director	Fisheries Department
27	Mr.	J.S. Walia	C.C.F. Planning & Development	Forest Department
28	Mr.	R.A. Singh	Principal Chief Conservators of Forest	Forest Department
29	Mr.	R.K.Gupta	Project Director Kandi Solan	Forest Department
30	Mr.	S.P. Basudeva	C.F.Dharamshala	Forest Department
31	Mr.	K.S. Tanwar		H.P. Gyan Vigyan Samiti
32	Mr.	Ankit Kaundinya	I.T.Assistant	H.P. SCST&E
33	Mr.	Bharat Khera	Member Secretary (EC)	H.P. SCST&E
34	Mr.	Hemant Tanwar	I.T.Assistant	H.P. SCST&E
35	Mr.	K. Kaisth	Sr.Scientific Officer	H.P. SCST&E
36	Mr.	Manoj Kaul	Project Associate	H.P. SCST&E
37	Dr.	R.K. Sood	Joint Member Secretary	H.P. SCST&E
38	Mr.	R.S. Thapa	Sr.Scientific Officer	H.P. SCST&E
39	Mr.	Randhir Chauhan	Scientific Officer	H.P. SCST&E
40	Dr.	S.C. Gupta	Sr.Scientific Officer	H.P. SCST&E
41	Dr.	S.S. Chandel	Pr.Scientific Officer	H.P. SCST&E
42	Mr.	S.S. Randhawa	Scientific Officer	H.P. SCST&E
43	Mr.	Sanjay Verma	Project Officer	H.P. SCST&E
44	Mr.	Sanjeev Sharma	P.A.	H.P. SCST&E
45	Mr.	Umesh Pathania	J.E.	H.P. SCST&E

Sl_no	Title	Name	Post	Department
46	Mr.	D.P. Sinha	Consevator Of Forest	H.P.S.E.B
47	Mr.	Shamsher Singh	Chairman	H.P.S.E.B
48	Dr.	K.S. Katoch	Subject Matter Specialist	Horticulture Department
49	Mr.	P.S Thakur		Horticulture Department
50	Ms.	Aparna Negi	Reader, Economics deptt	Himachal University
51	Mr.	V.K. Malhotra		HPVHA
52	Mr.	J.N. Sharma	Chief Engineering	Irrigation and Public Health
53	Er.	R.K. Jarhyan	Executive Engineer	Irrigation and Public Health
54	Ms.	Anju Sharma	Executive Engineer (D)	Irrigation and Public Health
55	Mr.	Bhajan Lal	Asstt. Engineer (D) P&I	Irrigation and Public Health
56	Mr.	C.L. Sood	S.E. P&I (UNIT II)	Irrigation and Public Health
57	Mr.	Deepak Aggarwal	Asstt. Engineer (D)	Irrigation and Public Health
58	Mr.	M.S. Kanwar	S.E.	Irrigation and Public Health
59	Mr.	R.K. Dogra	S.E.	Irrigation and Public Health
60	Mr.	R.K. Sharma	Asstt. Engineer (D) P&I	Irrigation and Public Health
61	Mr.	Virender Sipayia	Executive Engineer (D)	Irrigation and Public Health
62	Mr.	R.S. Nagi		Irrigation and Public Health
63	Mr.	Achraj Bhandari	Project Engineer	IIT Delhi
64	Mr.	Debajit Basuray	Engineer	INRM Consultants, New Delhi
65	Dr.	Sandhya Rao	Director	INRM Consultants, New Delhi
66	Mr.	Munish Sharma	Project Engineer	NIT, Hamirpur
67	Dr.	Sushil Kapta	Deputy Advisor Forestry	PAPU

Sl_no	Title	Name	Post	Department
68	Dr.	S.S. Negi	Member Secretary	PCB, HP
69	Mr.	R.N. Sarangi	Deputy Advisor WR	Planning Commission, New Delhi
70	Mr.	B.D. Sharma	Director	Information & Public Relations
71	Mr.	Raghuvanshiram	Scientist	RRL Bhopal
72	Mr.	Pawan Rana	Director	Sandesh, Hamirpur
73	Mr.	Tegu Sharma	Press secretary(CM)	CM office
74	Mr.	R.S. Chauhan		SJVNL
75	Mr.	Pratap	CEO	Techhouse,New Delhi
76	Mr.	R.C. Thakur		Urban Development, Shimla
77	Mr.	Ajay Garg		Urban Development, Shimla
78	Mr.	Prem Kumar	Principal Secretary	Welfare & Coop. Deptt.
79	Mr.	Sunandan	Program Officer (NRM)	Winrock International India, Delhi
80	Mr.	Vinay Tondon	Program Manager	Winrock International India, Delhi
81	Mr.	J.S. Bajwa	Chief Engineer (Retd.)	
82	Ms.	Renu Dhar	Addl. Chief Secy (Industries)	Govt. of Himachal Pradesh
83	Mr.	Yogesh Khanna	Principal Secretary	Forest Department
84	Ms.	Purnima Chauhan	Addl. Secretary	Irrigation and Public Health
85	Mr.	J.R. Katwal	Addl. Secretary	Science And Technology
86	Dr.	H.R. Sharma	Dy. Director	Agriculture
87	Er.	Daljeet Awasthi	Junior Engineer	O/o Dy. Director of Agriculture, Palampur
88	Dr.	Vinod Sharma	Agriculture Development Officer	O/o D.D.A Hamirpur
89	Dr.	Prithvi Chand Sharma	Subject Matter Specialist (Project Cell Shimla)	
90	Er.	Parmod Sood	Sub Divisional Soil Cons. Officer	Agriculture

Sl_no	Title	Name	Post	Department
91	Dr.	Pankaj Khullar	MD	HP Forest Corporation
92	Mr.	Ravi Chopra		PSI Dehradun
93	Mr.	Vaidya		CDRI Shimla
94	Dr.	O.P. Bhuraita		H.P. Gyan Vigyan Samiti
95	Er.	K.L. Thakur	Sr. P.O.	HIMURJA
96	Mr.	Shamsher Singh	Deputy Director	Rural Development
97	Mr.	Virendra Sharma	Environmental Advisor	DFID, India
98	Mr.	Tarun Ghawana		INRM Consultants, New Delhi
99	Mr.	Balaji Angamuthu		IIT Delhi
100	Er.	A.S. Acharya	Chief Engineer (Retd.)	Irrigation and Public Health
101	Er.	Abhigya Chauhan	Chief Engineer (Retd.)	Irrigation and Public Health
102	Dr.	Alka Sharma	Scientific Officer	H.P. SCST&E
103	Mr.	Ashok Thakur	Principal Secretary	Home ,Vlg. & Tourism, HP
104	Mr	B.R. Sharma	Executive Engineer	Irrigation and Public Health
105	Mr.	B.S. Chauhan	Principal Secretary	Personnel F&S Deptt., HP
106	Mr.	D.K. Negi	Executive Engineer P&I (Unit II)	Irrigation and Public Health
107	Dr.	J.C. Rana	Director	Agriculture
108	Mr.	J.D. Bhardwaj	Chief Engineer (Retd.)	
109	Dr.	K.K. Jindal	Director R&E	Dr Y.S.Parmar Univ., HP
110	Mr.	P.C. Kapoor	Secretary	Health & FW Deptt., HP
111	Ms.	Pooja Sharma	Programme officer	H.P. Voluntary Health Organisation
112	Mr.	Pushpander Rana	DFO	Ponta Sahib, HP
113	Mr.	R.K. Verma	CEO	Sai Engineering, HP
114	Dr.	R.L. Chauhan	Member Civil	H.P.S.E.B
115	Mr.	Rajan Mahajan	Executive Director	H.P Voluntary Health Org

Sl_no	Title	Name	Post	Department
116	Mr.	Rajesh Solankey	Scientific Officer	H.P. SCST&E
117	Mr.	S.C. Negi	Principal Secretary	PWD & TD & Housing Deptt., HP
118	Mr.	S.P. Lohia	Executive Engineer	Irrigation and Public Health
119	Er.	T.L. Sharma	Engineer-in-Chief (Retd.)	Irrigation and Public Health
120	Mr.	Tarun Gupta	Environment Engineer	H.P. SCST&E

Appendix – II

Towards Implementing Environmentally Sustainable Water Policy for Himachal Pradesh

28th August – Shimla

List of participants for Panel Discussion & Recommendations Session

Sl. no	Name	Designation	Department
1.	Mr. Yesh Pal Thakur	Divisional Engineer, soil conservation and agriculture, Shimla	Agriculture
2.	Mr. Prithvi Chand Sharma	Subject matter specialist (Agriculture)	Agriculture
3.	Dr. Vinod K. Sharma	Agriculture Development officer	Agriculture
4.	Dr. B.P. Malhotra	Joint Director, Animal Husbandry, Shimla	
5.	Mr. H.R. Sharma	Dy. Director ,Agriculture, Distt. Shimla	Agriculture
6.	Mr. Vinay Tondon	Program Manager, NRM	Winrock International India
7.	Mr. Champeshwar Lall Sood	Superintending Engineer , PLG and INV unit II	GOI
8.	Mr. P. Dorje	Deputy Director, CWC ,GOI, Shimla	GOI
9.	Mr. Rajesh Kumar	Director, CWC	GOI
10.	Prof. R.C. Thakur	Director Research, CSKHDKV University, Palanpur	University
11.	Mr. R.N Sharma	Chief Engineer (South), IPH, Shimla	IPH
12.	Dr. R.K. Sood	Joint Member Secretary, SCSTE	SCSTE
13.	Mr. S.C Gupta	Chief Engineer (IB&N), CWC, Chandigarh	CWC

Sl. no	Name	Designation	Department
14.	Prof. A.K. Gosain	Professor, Department of Civil Engineering, IIT Delhi	IIT Delhi
15.	Mr. Jaime M. Amezaga	Senior Researcher, CLUWRR, University of Newcastle	University of Newcastle upon Tyne, UK
16.	Dr. D.Dutta	Additional Director, Department of Science and Technology	DST
17.	Mr. R.K. Jarhyan	Executive Engineer, IPH	IPH
18.	Mr. R.K. Dogra	SE (D) , IPH	IPH
19.	Mr. M.S. Kanwar	SE , IPH	IPH
20.	Mr. Virander S. Speya	EE (D), IPH	IPH
21.	Mr. R.K. Gupta	Director, CWC, New Delhi	CWC
22.	Mr. S.S Chandel	SCSTE, Shimla	SCSTE
23.	Mr. S.P. Vasudeva	Conservator of forest, Dhramshala	Forest
24.	Mr. R.N Sarangi	Dy. Advisor (WR), Planning Commission, New Delhi.	Planning commission
25.	Dr. Sandhya Rao	INRM Consultants Pvt. Ltd	New Delhi
26.	Mr. Raghuvanshi Ram	RRL (CSIR), Bhopal	CSIR
27.	Mr. S.S Randhawa	SCSTE, Shimla	SCSTE
28.	Mr. R.S. Thapa	SCSTE, Shimla	SCSTE
29.	Mr. R.S. Nagi	IPH, Shimla	IPH
30.	Mr. Bhajan Lal	AE, Lal Bhavan, Kasumpti	IPH
31.	Mr. R.K. Sharma	IPH (P&I) II, Jal Bhawan, Kasumpti	IPH
32.	Dr. K.S. Katrch	Department of Horticulture, Shimla	Horticulture

Sl. no	Name	Designation	Department
33.	Mr. Anju Sharma	IPH Department	IPH Department
34.	Mr. Deepak Aggarwal	IPH Department	IPH Department
35.	Mr. Pramod Sud	Department of Agriculture	Agriculture
36.	Mr. D.K Awasthi	Department of Agriculture	Agriculture
37.	Mr. Debajit Basu Ray	INRM Consultants Pvt. Ltd	New Delhi
38.	Mr. S.K. Shandil	H.P. State EP & PCB	HPSEP&PCB
39.	Mr. Virendra Sharma	DFID India	DFID India
40.	Ms. Aparna Negi	Reader, Department of Economics, Himachal University	Economics Department, HU.

News Clippings

The Indian Express, 29th August 2004.

Water harvesting compulsory

EXPRESS NEWS SERVICE
SHIMLA, AUGUST 28

WITH a view to make the best use of the available water in the state and to overcome the growing problem of water scarcity, the state government has decided to make water harvesting compulsory in urban and industrial areas. Many of the Himalayan glaciers were receding due to global warming, said Chief Minister Virbhadra Singh who stressed upon the need for evolving and implementing an environmentally sustainable water policy for the state.

The CM said this today while inaugurating a workshop aimed at attaining an environmentally sustainable water policy for Himachal Pradesh. The event was organised by the HP State council for Science Technology and Environment jointly with the Indian Institute of New Castle, UK.

He said hill regions had certain peculiar problems related to socio-economic development and no programmmes or policies had been devised keeping that in mind.

He said one of the components required to be considered in the water policy in the context of mountains was strengthening the concept of local water harnessing and management. He said water harvesting practices adopted by people amenable to local geophysical conditions required to be studied and analysed, as these were time tested and had sustained the supply of water both for drinking and irrigation purposes since time immemorial.

Singh said the state government had been making all possible efforts to conserve the mountain forests to ensure supply of fresh water to downstream areas.

The Tribune, 30th August 2004.

HP to establish centre for monitoring glaciers

Tribune 30.8.2004

TRIBUNE NEWS SERVICE

SHIMLA, AUGUST 29

A Regional Centre for Monitoring Climatic Changes and Himalayan Glaciers will be set up in the state in collaboration with the Department of Science and Technology.

Stating this here yesterday, the Chief Minister, Mr Virbhadra Singh, said a majority of the glaciers in the Himalayas were receding, perhaps due to global warming. "These subliminal changes may hinder the planned harnessing of water resources in the mountainous regions, unless a forecast model, based on field information and satellite data is developed," he said.

The Chief Minister while inaugurating a workshop on "Towards implementing environmentally sustainable water policy for Himachal Pradesh" said despite 202 of the total 332 glaciers located in Himachal Pradesh, many parts of the state at times face acute water shortage.

The setting up of the regional centre will not only help in developing a database but recent developments like the formation of 100 lakes and water bodies on the basins of the Chenab and the Beas during the past four decades would also be studied.

The preliminary report had already been sent to the government and a task force had visited the state in April. Receding of the glaciers, formation of moraine lakes and availability and use of run off the water would be dealt under the project.

"Scientifically sound database and understanding the hydrology as well as the climatic situation of the state is essential if the vast hydro power potential in the state has to be tapped," he added. He said the government was considering constituting environment cells in every department.

Speaking on the occasion, the Irrigation and Public Health Minister, Mr Kaul Singh Thakur, said the state would formulate its water policy by ensuring public participation and its own needs. "A project on "Water Availability Through Self Help" had recently been sanctioned, which aims at empowering and involving the Panchayati Raj institutions in the management of safe drinking water schemes," he added.

Amar Ujala,29th August, 2004.

अमर उजाला चंडीगढ़, रविवार, 29 अगस्त, 2004 9

पहाड़ों में कारगर नहीं मैदानी नीतियां : वीरभद्र सिंह

पर्वतीय हालातों के अनुरूप जल नीति बनाने की वकालत

कार्यालय संवाददाता

शिमला। मुख्यमंत्री वीरभद्र सिंह ने कहा कि मैदानी इलाकों के लिए बनाए गए कार्यक्रमों एवं नीतियों को पहाड़ी राज्यों में लागू नहीं किया जाना चाहिए। उन्होंने पर्वतीय परिस्थितियों के अनुरूप सतत जल नीति बनाने की जोरदार वकालत की। उन्होंने कहा कि सरकार राज्य में मौसम के बदलाव पर निगरानी रखने के लिए क्षेत्रीय केंद्र स्थापित करना चाहती है। सरकार का विचार पर्यावरण प्रकोष्ठ की स्थापना करने का भी है।

मुख्यमंत्री शनिवार को राज्य विज्ञान एवं पर्यावरण परिषद द्वारा भारतीय प्रौद्योगिकी संस्थान नई दिल्ली, यूनिवर्सिटी ऑफ न्यू कॉसल, इंगलैंड, डिपार्टमेंट फॉर इंटरनेशनल डवलपमेंट, इंगलैंड के सहयोग से 'हिमाचल प्रदेश के लिए पर्यावरण अनुकूल जल नीति' विषय पर आयोजित कार्यशाला में बोल रहे थे। उन्होंने कहा कि मैदानी इलाकों के लिए बनाए गए कार्यक्रमों एवं नीतियों से पर्वतीय राज्यों की विशिष्ट दिक्कतों को हल नहीं किया जा सकता। मुख्यमंत्री ने पर्वतीय क्षेत्रों की परिस्थितियों को ध्यान में रखकर पृथक नीतियां एवं कार्यक्रम बनाने की जोरदार वकालत की। उन्होंने कहा कि पहाड़ी क्षेत्रों के लोगों की जल संबंधी समस्याओं को मानवीय दृष्टिकोण एवं अन्य कठिनाइयों की रोशनी में देखकर समझना चाहिए। इसके लिए भौगोलिक परिस्थितियों का अध्ययन जरूरी है। उन्होंने पारंपरिक पहाड़ी सिंचाई प्रणाली का हवाला देते हुए जन भागीदारी के माध्यम से जल नीति का हिस्सा बनाए जाने का सुझाव दिया। उन्होंने जल स्रोतों के प्रभावी प्रबंधन के लिए एकीकृत वाटर शैड विकास परियोजना को प्रभावशाली बताते हुए सलाह दी कि इससे बंजर भूमि का विकास और पारंपरिक स्रोतों का संरक्षण हो सकता है। उन्होंने कहा कि हिमाचली क्षेत्र में स्थित ग्लेशियरों में आ रहे बदलाव पर निगरानी रखने के लिए भारत सरकार के सहयोग से एक क्षेत्रीय मौसम बदलाव निगरानी केंद्र स्थापित करने की योजना है। साथ ही सरकार पर्यावरण प्रकोष्ठ की स्थापना भी कर रही है।

सिंचाई एवं जनस्वास्थ्य मंत्री कौल सिंह ठाकुर ने कहा कि राज्य जल नीति अंतिम दौर में है। स्व सहायता के माध्यम से जल उपलब्धता परियोजना को मंजूरी दिए जाने की जानकारी देते हुए उन्होंने कहा कि इसके लिए फेडरल रिपब्लिक ऑफ जर्मनी द्वारा धन उपलब्ध कराया जा रहा है। बादल फटने की घटनाओं की भविष्यवाणी के लिए सरकार रडार स्थापित करने की प्रक्रिया में है।

कार्यशाला

- मौसम बदलाव निगरानी केंद्र बनाना चाहते हैं
- पर्यावरण प्रकोष्ठ की स्थापना पर भी विचार

Policies for the plains not viable for mountainous areas

(Shimla) Chief minister Virbhadra Singh said that policies made for plains should not be implemented in the hills. He strongly emphasized on the need for policy formation for hills based on local conditions. He said that his government is going to establish a centre to monitor regional climate change.

The chief Minister on Saturday was speaking in a workshop titles "Towards Implementing Environmentally Sustainable Water Policy for Himachal Pradesh" organized by State Council for Science Technology and Environment and supported by Indian Institute of Technology, Delhi, University of Newcastle, UK , Department for International Development, UK.

Divya Himachal, 29th August, 2004.

दिव्य हिमाचल

शिमला-चंडीगढ़-पंचकूला, रविवार, 29 अगस्त, 2004

प्रदेश में मौसम निगरानी केंद्र बनेगा

वीरभद्र सिंह बोले

- पर्यावरण प्रकोष्ठ भी बनेगा
- जल नीति बनाने की आवश्यकता पर बल

Centre for monitoring climate change to be established in the State

Chief Minister stated that Himachal Pradesh government is thinking of opening an environmental cell in every department to keep a balance between Environment and development. Along with this with the help of central government a regional climatic change study centre is going to be established to study the changes in Glaciers in Himachal Pradesh.

Hon'ble Virbhadra Singh was speaking in a workshop titled "Towards Implementing Environmentally Sustainable Water Policy for Himachal Pradesh" organized by State Council for Science Technology and Environment and supported by Indian Institute of Technology, Delhi, University of Newcastle, England, Department for International Development, UK.

Punjab Kesari,29th August, 2004.

राष्ट्रीय/अन्य

प्रदेश में मौसम बदलाव निगरानी केंद्र स्थापित करने की योजना

शिमला : हिमाचल प्रदेश के लिए पर्यावरण जल नीति विषय पर आयोजित कार्यशाला की अध्यक्षता करते मुख्यमंत्री तथा उपस्थित अधिकारी। (छाया : विवेक)

Plans to establish centre for studying climate change

Himachal Pradesh government is inclined to set up a regional centre to study climate change. It also wants to establish a cell for environment in every department to keep a balance between development and environment. Shri Virbhadra Singh, Hon'ble chief minister was speaking in a workshop on "Towards implementing an environmentally sustainable water policy for Himachal Pradesh"……

On this occasion Irrigation and public health minister Shri Thakur Kaul Singh informed the gathering that State Government is in final stages of preparing a water policy for Himachal Pradesh. In which public participation, judicious distribution and quality aspects are given top priority. He stated that numerous traditional water harvesting techniques are still being followed in the state. He also said that there are many laws on water conservation but none talks about people's participation which needs to be changed….

Himachal Bhaskar, 29th August, 2004.

चंडीगढ़ रविवार 29 अगस्त, 2004 | हिमाचल भास्कर

मौसम पर नजर रखने को सेंटर

शिमला। मुख्यमंत्री वीरभद्र सिंह ने कहा है कि सरकार हिमालय क्षेत्र में स्थित ग्लेशियरों में आ रहे बदलाव पर नजर रखने के लिए केंद्र सरकार की मदद से एक क्षेत्रीय बदलाव निगरानी सेंटर लगाने की इच्छुक है।

उन्होंने कहा, सरकार विकास व पर्यावरण मुद्दों की देखरेख और पर्यावरण संतुलन बनाए रखने के लिए प्रत्येक विभाग में पर्यावरण प्रकोष्ठ स्थापित करने की योजना बना रही है। परियोजनाओं के कारण पर्यावरण मुद्दे उभरकर सामने आ रहे हैं। इनकी देखरेख के लिए राज्यस्तरीय पर्यावरण प्रभाव मूल्यांकन तथा अनुश्रवण समिति का गठन किया गया है। उन्होंने कहा, प्रदेश की विविध कृषि जल वायुगत स्थिति है। यहां कोई योजना या नीति बनाते समय इसे एक इकाई के रूप में नहीं लिया जा सकता। प्रत्येक कृषि जलवायुगत क्षेत्र की अपनी समस्याएं हैं।

»» शेष पेज 12 पर

जल संरक्षण कार्यशाला...

मौसम पर नजर...

उन्होंने कहा कि जल प्रणाली का संरक्षण एक अन्य ऐसा क्षेत्र है जिस पर ध्यान दिया जाना चाहिए। उन्होंने कहा, जल प्रबंधन के लिए अधिक संरचना का सृजन करना ही इस समस्या का समाधान नहीं है। राज्य के लोगों की कृषि जोत भूमि छोटी-छोटी है। जल संरक्षण तथा जल नीति के कार्यान्वयन में लोगों की भागीदारी को सुनिश्चित बनाया जाना चाहिए तथा कार्यशाला के दौरान जल का उपयोग करने तथा जल संरक्षण पर आने वाली लागत पर भी गहन विचार होना चाहिए। उन्होंने कहा कि अगर लोगों के लाभार्थ उठाऊ योजनाएं बनाई जाती हैं तो इन योजनाओं में बिजली की लागत अधिक आती है। उन्होंने सस्ती तथा प्रभावी सिंचाई योजनाएं जैसे हाईड्रम इत्यादि को कार्यान्वित करने पर बल दिया। सिंचाई एवं जन स्वास्थ्य मंत्री कौल सिंह ठाकुर ने कहा, प्रदेश राज्य जल नीति को अंतिम रूप देने की प्रक्रिया में है जिसमें सभी प्रमुख मुद्दों जैसे सामुदायिक भागीदारी, जल के सही वितरण तथा जल की गुणवत्ता को बनाए रखने को अधिमान दिया जाएगा। उन्होंने कहा कि बादल फटने की घटनाओं की भविष्यवाणी के लिए राज्य सरकार राडार स्थापित करने की प्रक्रिया में है।

Shimla. The Chief Minister stated that a centre to monitor regional climatic changes is going to be established with the help of Central Government. It will also monitor changes in glaciers in Himachal Pradesh……

Due to development activities, issues related to environment are being highlighted now. He also pointed out that no uniform policy can be implemented in Himachal Pradesh taking it as a single unit. There are different problems for each climatic region.

He informed the gathering that Himachal State water policy is being given final touches and it (water policy) gives adequate emphasis on Public Participation, Proper Distribution and quality aspect of Water.

Official Press Release – Govt. of Himachal Pradesh.

FORMULATE ENVIRONMENTALLY SUSTAINABLE WATER POLICY ---SHRI VIRBHADRA SINGH

No. 780/2004-PUB **PRESS NOTE** **28th August, 2004**

Shri Virbhadra Singh, Chief Minister has stressed the need for evolving and implementing environmentally sustainable Water Policy for the State keeping in view the specifications of mountain regions and their unique problems. He was inaugurating a workshop on "Towards implementing Environmentally Sustainable Water Policy for Himachal Pradesh" organized by the Himachal Pradesh State Council for Science Technology and Environment in collaboration with Indian Institute of Technology, Delhi, Centre for Land Use and Water Resource Research, University of New Castle, U.K., Department for International Development (DFID) U.K. here today. Shri Virbhadra Singh reiterated that hill regions have certain peculiar problems related to socio-economic development. No programme or policy devised keeping in view the plain areas should be foisted upon hill States. The strategy evolved should also keep in mind that the communities living in the upper regions of watersheds are provided share of benefits from harnessing upstream mountain resources. He said that the linkage of hydro climate, human intervention and biophysical process operating in the higher reaches of watersheds needed to be understood. One of the important components required to be considered in the water policy in the context of mountains was strengthening the concept of local water harnessing and management, he added. He said that water harvesting practices adopted by people amenable to local geophysical conditions are required to be studied and analysed, as these are time tested and have sustained supply of water both for drinking and irrigation purposes since time immemorial. Shri Virbhadra Singh said that irrigation systems which have existed in Himalayan tract have evolved over a very long period of time. The old practices incorporated water rights of the user groups and the system developed around ease of operation, economy of efforts etc. Considering the ever-growing demand for mountain water resources, its management in close partnership with local communities should be an integral part of any water policy; Chief Minister Shri Virbhadra Singh said that mountainous regions are also passing through a very critical phase of socio-economic development. As a result of development interventions, stability and integrity of watersheds have been affected considerably. The ecological degradation in the mountains is a serious problem. He said that State Government have been making all possible efforts to conserve the mountain forests to ensure supply of fresh water to down stream areas and in fact we have voluntarily imposed ban on green felling to achieve this objective. Chief Minister said that most of the Himalayan glaciers were receding perhaps due to global warming. These subliminal changes may hinder planned harnessing of water resources in the mountain regions, unless a forecast model based on field information and satellite data is developed. Shri Virbhadra Singh said that in order

to replenish the traditional water sources and to manage water supplies, rain water harvesting can play a vital role. The interest in domestic utilization of rain water run off has grown. In order to harness the rain water run-off, the State Government has taken a policy decision to make rain water harvesting compulsory in urban and industrial areas in all buildings of more than 1000 sq m plinth area. New and efficient methods of water use and harnessing are required to be identified and evolved for implementation with active public participation. Chief Minister said that integrated watershed development was a sine qua non for effective management of water resources. Integrated Watershed programme with local participation was also needed for conserving waste land, plants and natural resources. Adoption of scientific agricultural and horticultural practices will help in preserving ecological balance of mountain and hilly areas. He stressed for strengthening the existing legislative measures to enhance people's participation in management of local resources. He said that women play an important role in preservation of water resources by sharing major responsibilities for agriculture, forests and other natural resource management activities. Women now take active part in various cooperative groups and water committees formed at village level. He said that the need was to evolve a strategy for further empowering women in management of all kinds of resources including water

REGIONAL CENTRE FOR MONITORING CLIMATE CHANGES

Shri Virbhadra Singh said that Government intends to set up a Regional Centre for Monitoring climate changes and Himalayan glaciers in collaboration with Department of Science and Technology, Government of India. Chief Minister said that State Government was planning to constitute Environment Cells in each department so that the development and environmental issues are taken care off in an objective manner. A State level Environment Impact Assessment and Monitoring Committee has also been set up to look into the issues of development vis-à-vis the environmental concerns arising out of major projects. Chief Minister said that Himachal Pradesh has diverse agro-climatic conditions and therefore cannot be construed as single unit while planning or policy formation. Each agro climate zone has its own potential, problems and peculiarities. While forming water policy all these factors should be taken into consideration. The operation and maintenance or water system is another area of concern. Mere creation of more and more infrastructure for water management without looking into the maintenance and ownership aspects will not yield desired results. The inhabitants of this State have small holdings. He said that people's participation in operation and maintenance is must. This workshop must aim at identifying the extent to which cost is to be borne by the users under different kinds of schemes. For instance, it may be difficult for the people of the State to bear the cost of electricity in case of lift schemes. He said there was also need to adopt a simpler and cost effective method of irrigation like hydrams. Shri Kaul Singh Thakur, Irrigation and Public Health Minister said that Himachal was in the process of finalizing its State Water Policy which would address all relevant and important issues pertaining to community participation, proper distribution and maintenance of water quality. He said that water was a finite resource and need of the

hour was to conserve every drop of water. Himachal has a rich tradition of conservation which needs to be emphasized and revived. Shri Kaul Singh Thakur said that State has number of laws but these do not address the issue of participatory approach to management of water. He said that process of making relevant amendment in our laws and also considering enactment of new laws which would not only encourage participation but would also regulate use of scarce water has started. He said that a project named "Water Availability Through Self Help (WASH) has been recently sanctioned and is being funded by the Federal Republic of Germany. This project aims at empowering and involving the Panchayati Raj Institutions in management and implementation of safe drinking water schemes. He said that State was also in the process of having RADAR installed for facilitating in forecasting cloudbursts which have become a common phenomenon in recent years. He expressed that the workshop, with the active participation of NGOs will address the various issues flagged particularly on participatory approach. Prof. A.K. Gosain, Department of Civil Engineering, IIT Delhi, while delivering his keynote address stressed on the need of using the integrated approach for proper planning and management of this very precious resource. He emphasized that the real bottleneck in this approach is the lack of framework to collate the available data residing in various line departments. Mr. R.K. Gupta, Director (Hydrology), Central Water Commission, New Delhi provided an overview of the salient features of National Water Policy. Mr. Bharat Khera, Member Secretary, SCST&E, proposed the vote of thanks. Mr. Jaime M Amezaga from Centre for Landuse and Water Resources Research, UK shared with the audience some of the recent initiatives being taken by the CLUWRR, University of Newcastle Upon Tyne, UK, with the help of the Department for International Development (DFID), UK. These initiatives are geared towards generation of improved outcomes on land and water policies in a network of countries. Shri Sanjeev Gupta, Secretary, Science and Technology in his address welcomed the dignitaries, sponsors and the participants for their positive response and contribution. He elaborated on the purpose and need of such interaction for positioning the society to face the challenges of present and future scarcity in water resources and the need for evolving environmentally sustainable solutions. Kanwar Shamsher Singh, Chief Secretary, Smt. Harinder Hira, Principal Secretary (IPH) and other senior officers of the State Government were present on the occasion among others. The senior officers, Scientists and planners from Govt. of India DFID and State Government are participating in the workshop.

Message from Mr. John Palmer

"Towards implementing environmentally sustainable water policy for Himachal Pradesh"

Workshop hosted by the State Council for Science, Technology and Environment, Himachal Pradesh

Shimla, 28 August 2004

Your Excellency the Chief Minister of Himachal Pradesh, other Distinguished Delegates

The Forestry Research Programme of the United Kingdom Department for International Development offers its best wishes for the success of your workshop today. The support from FRP for the project which has organised the workshop today is covered by DFID central funding for forestry research. This complements DFID's Country Plan for India entitled "Partnership or Development", February 2004. This Country Plan in turn supports the Government of India tenth 5-year plan 2002-2007. Both India and the UK are firmly in support of attainment of the Millennium Development Goals.

The UK, through DFID, contributes less than 0.06% of the GDP of India. In order to make best use of our relatively tiny resources, we have to focus our attention on the priority problems where we believe that UK-based expertise, together with specialist knowledge which we can organise from other countries, can most effectively contribute to the analysis, development and shaping of Central and State Government policy, all the while respecting the sovereignty of India.

The DFID Country Plan responds in particular to the request from the Government of India for financial assistance to poverty alleviation, including technical support for policy shaping. The background which is mentioned in the DFID Country Plan is the shift in the tenth 5-year plan from food security to agricultural productivity. In some places, the enhancement of agricultural productivity, especially for vegetable cropping in the dry season in advance of a water audit, is leading to increasing demands on groundwater. Where this demand is greater than the natural capacity for recharge, the water table may drop so quickly and so deeply that hand-dug wells in villages can no longer provide domestic or smallholder supplies. The village people may then be forced to depend upon expensive water brought in by tankers. This water may cost much more than domestic supplies provided through reticulated systems in urban areas. So, unintentionally, the pressure for rapid increase in agricultural productivity may actually lead to increased poverty.

In addition, increased pumping of ground water may lead to decreased run-off into rivers. You are much better informed than me about the consequences of the decline in river flows, such as in the Cauvery catchment. The closure or near-closure of catchments mean that downstream users and consumers will have their supplies reduced especially in the dry season, leading to shortages and increased poverty in both rural and urban areas, and the degradation of the ecosystems which depend upon perennial flows of river water.

Recognition of the need to manage both water demand and water supply provides the opening for the technical support which can be provided although on a regrettably small scale from the DFID central funds for strategic, multi-country research. The team which has organised this workshop draws on research findings from Costa Rica in Central America, Grenada in the Caribbean, South Africa and Tanzania in Africa as well as the wealth of knowledge which is available and increasing daily in the States of India.

I mention these countries because the problems faced by India are also faced by other developed and developing countries. DFID believes that the sharing of experiences and the organisation of joint research between affected countries is both technically efficient and cost-effective. Of course, the general experiences which can be synthesised across countries still need to be examined carefully and adapted locally to the particular situations of each State. The DFID Forestry Research Programme hopes that this workshop provides an opportunity for the presentation of the interim findings from the research in HP, and hopes that the studies will be incorporated beneficially into the policies and practices for the management of water supply and demand in this State.

Thank you so much for providing the opportunity for this multi-country experience to be presented to you today.

Message from:
Mr. John Palmer
Manager of DFID's centrally-funded
Forestry Research Programme (FRP)
Natural Resources International Limited
Park House, Bradbourne Lane, Ditton,
Aylesford, Kent ME20 6SN, U.K.

Workshop Brochure

Workshop
On
Towards Implementing Environmentally Sustainable Water Policy For Himachal Pradesh

August 28, 2004 Shimla

Organised by:

H. P. State Council for Science, Technology and Environment, Shimla,

Indian Institute of Technology Delhi

UNIVERSITY OF NEWCASTLE UPON TYNE

University of Newcastle upon Tyne, UK

Sponsored by:

FRP
FORESTRY RESEARCH PROGRAMME

Forestry Research Programme (FRP)
Department for International Development (DFID), U. K.

Introduction

The National Water Resources Council (NWRC), the apex policy making body for water resources development in India, formulated the 1987 and 2002 national policies which were respectively placed before parliament and circulated to the central ministries and states for implementation. Progress in the implementation is considered, reviewed and reported to the NWRC by the National Water Board constituted solely for this role. Water is a state subject and the administrative control and responsibility for water development rests with the various State Departments and Corporations.

The National Water Policy 2002 recognises that water resource development should be planned for in hydrological units, or watersheds. By taking into account multi-sectoral factors such as ground water, surface water and other environmental considerations the sustainability in the quality and quantity of water resources will be achieved.

Implementation Difficulties

In actual practice, a large number of projects, varying from water resource to watershed development projects with large overlap of objectives and tackled by various line departments at the state level and various ministries at the central level, are being taken up. Although they act upon the common water resource, they lack the proper coordination which is essential for ensuring collective sustainability of such acts and interventions.

At the local level, integrated watershed management planning should be a comprehensive multi-resource management planning process involving all stakeholders within the watershed, who together as a group, cooperatively work toward identifying the watershed's resource issues and concerns, as well as developing and implementing watershed plans with solutions that are environmentally, socially and economically sustainable at various levels of connectivity of the watersheds.

The integrated watershed development efforts in India go back to 1970. There have been many changes in the implementation strategies during the course of these years. Until 1995 watershed development projects were officially co-ordinated by multi-sectoral programmes (with differing objectives) launched by the Government of India (GoI). After review in 1999 by the Ministry of Rural Development (MoRD) and the Ministry of Agriculture (MoA), a common set of operation guidelines, objectives, strategies and expenditure norms were established in 2001 for watershed development programmes. The common guidelines encouraged the active involvement of non-governmental organisations, semi-governmental institutions and private enterprises, universities and training institutions. New Guidelines for "Haryali" were issued in 2003 giving a central role to the Panachayat bodies.

In spite of the success of many watershed development projects, concerns are being raised that watershed development programmes are still firmly based on the belief that water is essentially an infinite resource and can be managed through the continual development of ground water abstraction together with the implementation of water harvesting techniques.

The present implementation of the watershed management programmes has many shortcomings. Some of the major ones include: (1) ignoring the hydrological boundaries of the watersheds, (2) ignoring the connectivity of the watersheds and treating each watershed as a stand alone unit, where activities within the watershed are considered independent of their impacts downstream (3) ignoring the hydrological characteristics of the watershed while deciding on the possible interventions, (4) non-availability of evaluation procedures, and (5) ignoring the environmental sustainability aspects.

Similarly, there are many other programmes and projects such as water resources development, drinking water programme, forestry programme, hydropower development, etc., which are dealing with the same water resource and need a common framework for its proper planning and development. It may also be appropriate to take account of climate change impacts to place the society in a better position to cope up with the enhanced spatial and temporal variability of this precious resource.

What Needs to be Done

The above shortcomings are not always on account of ignorance but are due more to the non-availability of the required tools and a unified framework within which the issues can be addressed. It is important to understand that integrated watershed management should not merely imply the maintenance of an inventory of different activities to be undertaken within a hydrological unit. It also requires the collation of relevant information needed to evaluate the cause and effect of all the proposed actions within the watershed. The watershed is the smallest unit where the evaluation of man induced impacts upon water resources becomes possible. Therefore although the 'panchayat' (cluster of villages) remains the preferred implementation unit, the watershed should be the evaluation unit used in assessing impacts.

Since a watershed is considered as the smallest unit of a drainage basin, a hydrological framework that can keep track of the inter-connection of these units is essential. The impacts resulting from actions taken at the watershed level will be experienced at a higher level within the drainage basin, and the assessment of these impacts will require the availability of the framework.

The establishment of this common hydrological framework is a necessary step for the implementation of integrated water resource management in HP. Such a framework will require regular

maintenance and updation to reflect fully the most accurate ground truthed data and the infrastructure requirements for planning and management of the relevant planning departments. Such a framework, once available, could be used by all the line departments and updated by the relevant departments which have designated areas of jurisdiction over the data entry.

Therefore, there is a definite need for generation, collation and dissemination of information between the various stakeholders of the water sector. This can be achieved by putting a framework at the state level built as a standardised network connecting various line departments for sharing and updating scientifically validated information. Such information shall also supplement the information requirements of effective e-governance.

Objective of the Workshop

The collaborative project LOWFLOWS (R8171), funded by Forest Research Programme of DFID, is aimed at contributing to local understanding of natural resources management and scientific knowledge. In addition to the University of Newcastle Upon Tyne, UK and IIT Delhi, the other institutions involved in the project are Winrock International India National Institute of Technology in Hamirpur (HP), Regional Research Laboratory in Bhopal (MP), State Council for Science, Technology and Environment, Shimla and Department of Science and Technology, New Delhi. One of the two pilot watersheds selected is Chabutra watershed in Himachal Pradesh. By calibrating a hydrological model for different land uses, the project will be able to assess and demonstrate what impacts changes in land use, particularly forestry and irrigated agriculture, will have on water availability, both within the watershed in which the land use change is taking place and within the wider macro-watershed that is impacted downstream, providing the basis of a decision support system.

The proposed workshop shall initiate discussion on the issues of integration and dissemination of information for planning and management of water resources with the key stakeholders with the aim to instigate sustainable policy implementation and management strategies.

Programme

Sh. Virbhadra Singh Hon'ble Chief Minister of Himachal Pradesh has very kindly agreed to inaugurate the workshop. Many experts from different organisation including IIT, DFID shall deliver keynote addresses covering various aspects of water resources/watershed management and bringing about a much-desired cooperation between implementing organisations.

The workshop shall consist of two sessions. The forenoon session will have keynote addresses from experts in which approximately 140 participants will take part, this will be followed in the afternoon by discussion on the subject by a core

group consisting of 30-40 participants. This group shall draw recommendations for implementation of a sustainable water resources policy in the state.

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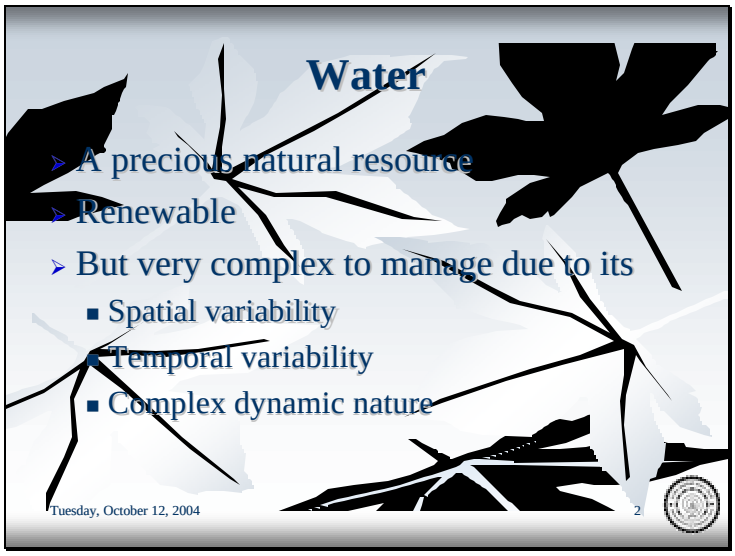
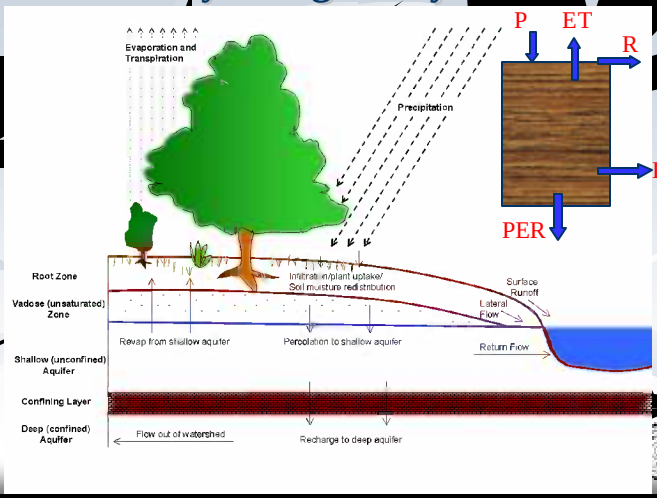
PowerPoint Presentations:



Eco-System

- Every area develops an Ecological System over a long period
- The inputs to such system might fluctuate from year to year (Drought or Flood Year) but shall be governed by long term average values
  - Unless disturbed by man made actions
  - Or climate changes

Hydrological Cycle



Implications of local fluctuations – Say Drought

- For rainfed agriculture
  - If the monsoon does not reach in time the crop can not be sown
  - If the next rain is delayed for more time than the crop can sustain, the crop shall fail
- For domestic water supply
  - Wells may go dry
  - Surface water bodies may not fill up
  - Flows may reduce in the drainage systems

Possible options and consequences

- Supplement requirements by bringing in additional water
  - As surface water - from adjoining or far-off areas
  - As ground water - from deeper depths
- This is where the problems start
  - When the exploitation is indiscriminate

Some of the Implications of uncontrolled interference

- Reduction in Stream Flow
- Lowering of water table
- Damage to soil health
- Water quality problems
- Health hazards
- Damage to local ecology
- And the list can be unending

Integrated Watershed Philosophy

- To alleviate some of the above problems the concept of integrated watershed management was introduced
- Watershed is a natural divide which can be used to check the sum total of the inputs and outputs and thus the sustainability of the manmade interference
- 'Integrated' implies incorporation of all possible usage and interest of all stake holders

Watershed Connectivity

- Every area belongs to a watershed
- Nomenclature changes with size
  - Micro-watershed, watershed, sub-catchment, catchment, sub-basin, basin are the levels of hierarchy
- Watersheds belong to a bigger drainage system and have interconnectivity

Water related projects

- Irrigation (Major, medium, minor, lift) -IPH
- Hydropower (Mega to small) – HPSEB, Himurja
- Watershed – Forest, agriculture, rural departments
- Forestry
- Agriculture & horticulture
- Water supply
- Sanitation

Integration required

- All the above users work on different scales
  - but draw on the same water resource
- For example: A large number of watershed management interventions are being made without knowing their possible impacts on the resource at the local and the higher level
- Integration is possible only through a common framework
  - Unifying information at various scales

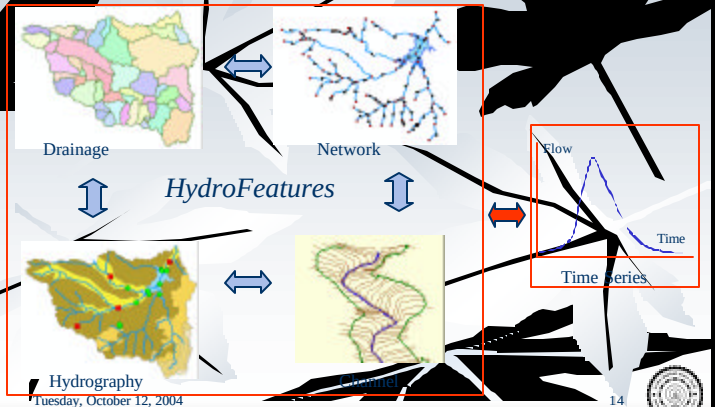
Unified Framework: is the answer

- A unified framework
  - Shall map the areas starting from watersheds to river basin level (using GIS)
  - Shall provide information on water quantity and quality in space and time (observation, simulation)
  - Act as a tool for legislation for actions taken by stake holders at various levels
  - Shall provide sustainability assessment

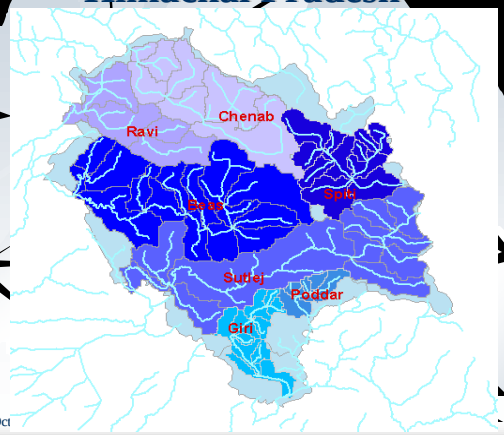
Components of Framework

- NSDI – National Spatial Database Infrastructure
- GIS based infrastructure
  - Terrain (watershed boundaries), landuse, soil
  - Administrative boundaries
  - Road, rail network
  - Facilities networks and many other layers
- Model Base
  - Physical, environmental and socio-economic models

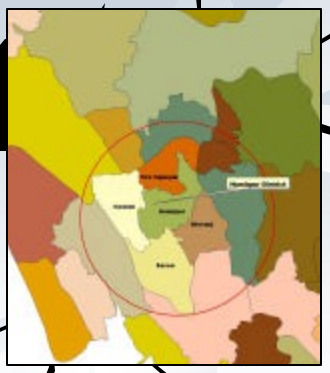
ArcGIS Hydro Data Model

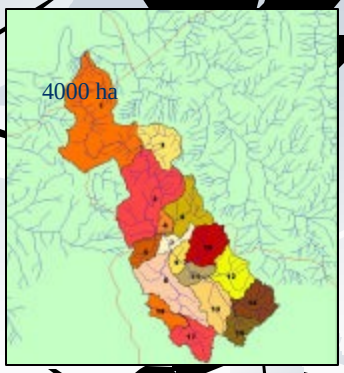


River Basin Framework for Himachal Pradesh



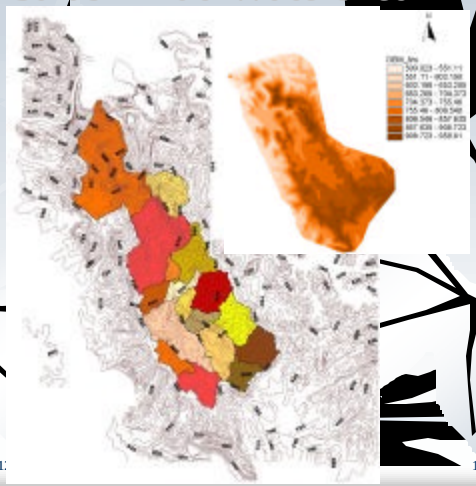
Salasi Khad Watershed





Watershed of Interest – in Relation
showing sub watershed with Drainage

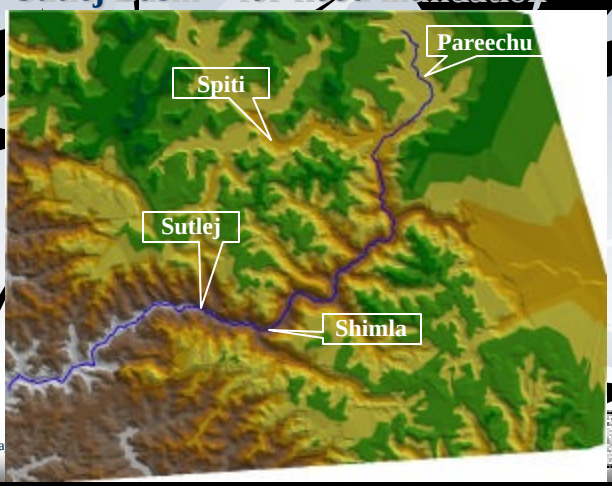
Salasi Khad Watershed



Tuesday, October 1

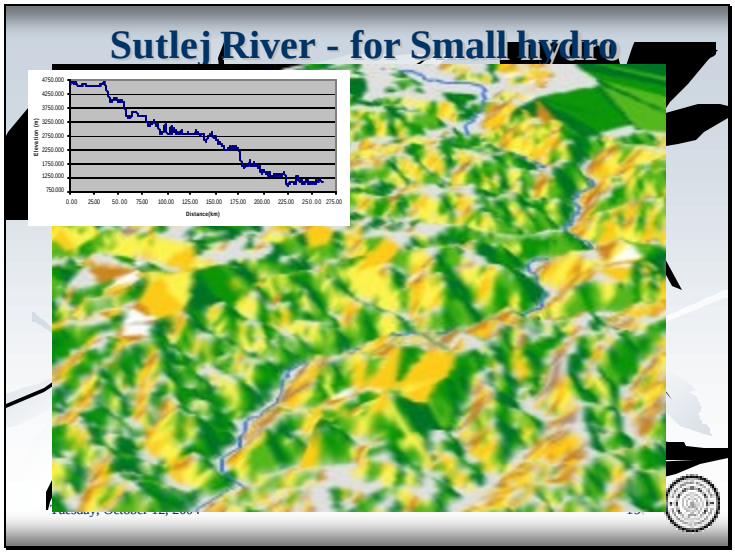
17

Sutlej Basin – for flood inundation

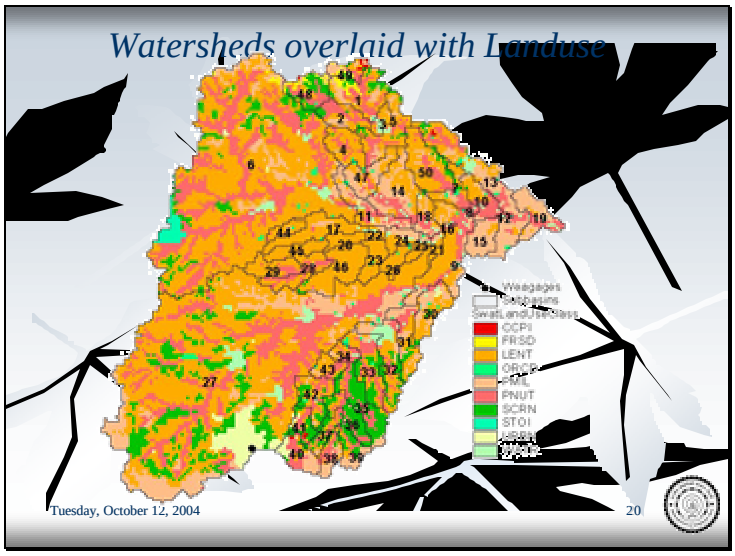


Tuesda

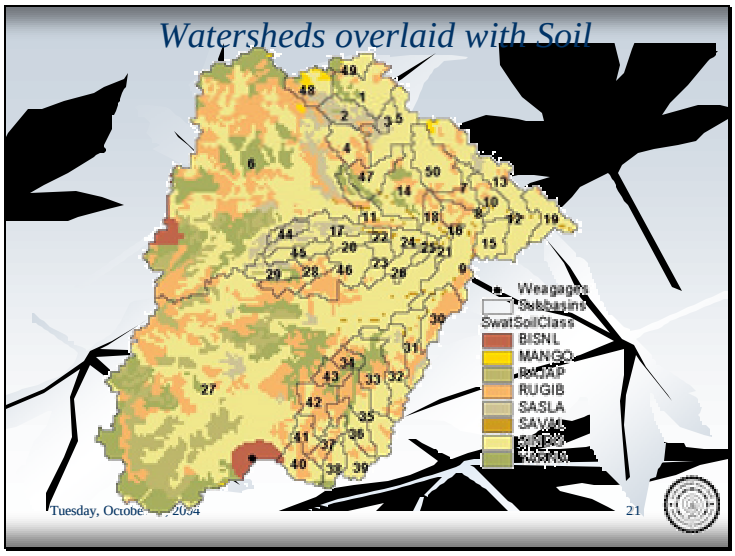
Sutlej River - for Small hydro

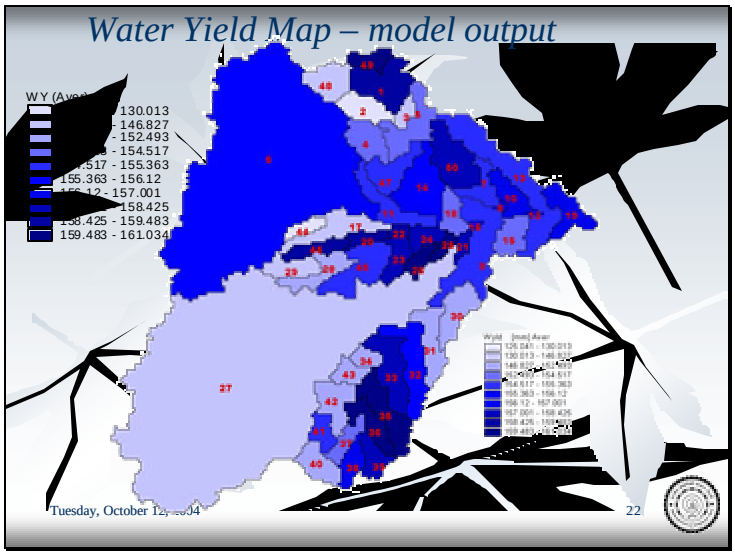


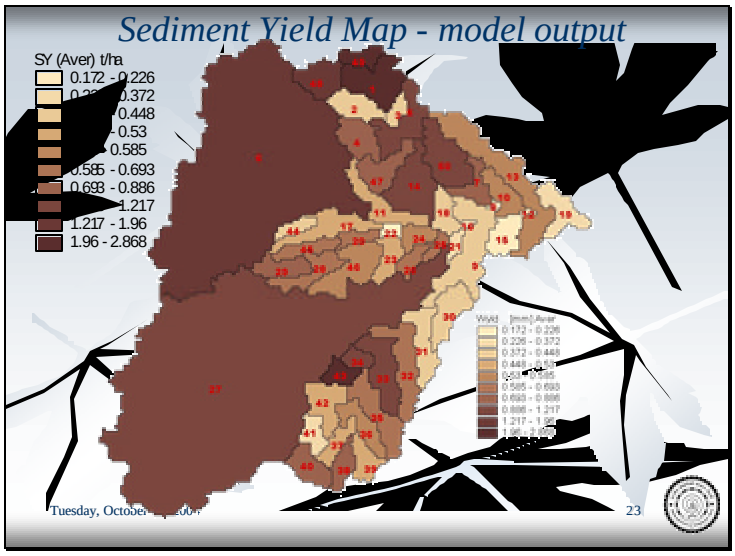
Watersheds overlaid with Landuse

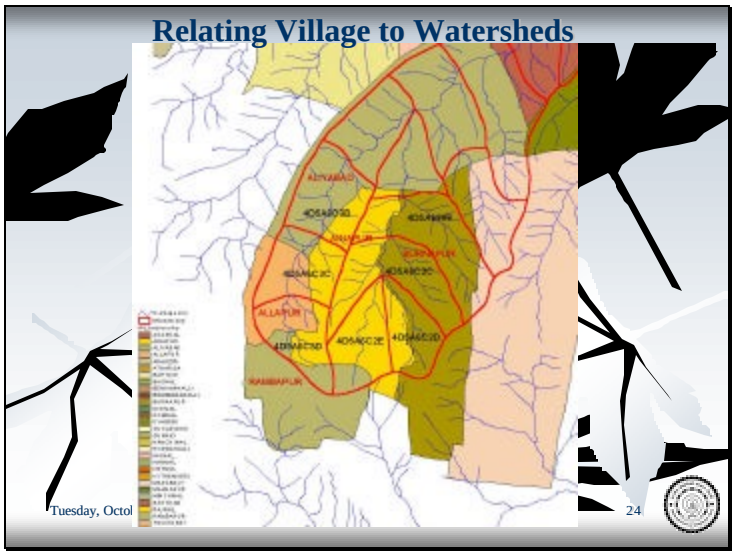


Tuesday, October 12, 2004 20

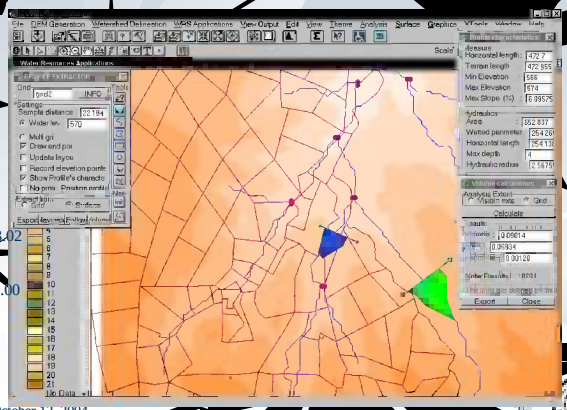

Watersheds overlaid with Soil
Weagages
Subbasins
SwatSoilClass
BISNL
MANGO
RUGIB
SASLA
Tuesday, Octobe
21


Water Yield Map – model output
WY (Aver
130.013
146.827
152.493
154.517
155.363
156.12
157.001
158.425
159.483
161.034
Tuesday, October 12,
22


Sediment Yield Map - model output
SY (Aver) t/ha
0.172 - 0.226
0.372
0.448
0.53
0.585
0.585 - 0.693
0.693 - 0.886
1.217
1.217 - 1.96
1.96 - 2.868
Tuesday, October
23


Relating Village to Watersheds
Tuesday, Octol
24

Locating Water Harvesting Structure



Area (ha) 3.02
Volume (ha-m) 0.80
Height (m) 2.00

Area 6.93
Volume 9.00
Height 4.00

Tuesday, October 12, 2004 25

What needs to be done?

- Generation of base information by respective line departments
- Common framework with updation facility for integrated approach
- Consensus on ownership and sharing of data and information

Tuesday, October 12, 2004 26

What will be the benefits?

- Duplication of effort avoided
- Scenario Generation through Scientific Approach
- Increased public awareness and participation
- Improved planning and management of this precious resource

Other Initiatives

- CLUWRR & IIT Delhi Initiative on Forest, Land and water policy instruments – improving outcomes (FAWPIO)
- Besides India, projects in RSA, China and Bangladesh
  - Guidelines for "allocation equity" based policies;
  - Bridging Research and Policy (BRAP) Networks;
  - An improved land and water management framework and methodologies


THANK YOU
Tuesday, October 12, 2004
29

NATIONAL WATER POLICY

R.K.GUPTA

- FIRST NWP ADOPTED IN SEPTEMBER,1987
- NEW CHALLENGES NECESSIATED THE REVIEW
- REVISED POLICY ADOPTED IN APRIL 2002

NEED FOR THE POLICY

- WATER IS SCARCE
- NATIONAL RESOURCE TO BE PLANNED,DEVELOPED, CONSERVED AND MANAGED AS A PRECIOUS RESOURCE
- ADOPT AN INTEGRATED & ENVIRONMENTALLY SOUND BASIS

-
- MANAGE THE RESOURCE IN A SUSTAINABLE MANNER GUIDED BY NATIONAL PERSPECTIVE

PROJECT PLANNING

- PLANNING & IMPLEMENTATION OF WR PROJECTS INVOLVES
  - SOCIO-ECONOMIC ASPECTS
  - R&R OF PAP
  - PUBLIC HEALTH
  - DAM SAFETY
  - EQUITY & SOCIAL JUSTICE IN REGARDS TO WATER DISTRIBUTION
  - GROUND WATER EXPLOITATION

WATER NEEDS

- DOMESTIC
- IRRIGATION
- HYDROPOWER
- ECOLOGY
- AGRO-INDUSTRIES & NON AGRICULTURAL INDUSTRIES
- NAVIGATION & OTHER USES

INFORMATION SYSTEM

- WELL DEVELOPED INFORMATION SYSTEM, FOR WATER RELATED DATA IN ITS ENTIRETY, AT NATIONAL & STATE LEVEL
- STANDARDISED NATIONAL INFORMATION SYSTEM WITH NETWORK OF DATA BANKS AND DATA BASES, INTEGRATING CENTRAL & STATE AGENCIES NEEDS TO BE ESTABLISHED
- STANDARDS FOR CODING, CLASSIFICATION & PROCESSING OF DATA NEEDS TO BE ADOPTED

VISION for 21st Century

- Optimal sustainable development, maintenance of quality, and efficient use of country's water resources to match the growing demands

With the active involvement of stakeholders

In order to achieve accelerated, equitable economic development of the country

WATER VISION

- To help meet food & fibre requirement
- To make available safe drinking water
- To safeguard existing resources against pollution & over exploitation
- To maximise Hydropower development
- Enhance ecology
- To mitigate miseries caused by water related natural disasters

WATER VISION STRATEGY

- Integrated Development & Management of Water Resources
- Development of New Resources
- Optimal Utilisation
- Preserving Resources
- Dissemination and Application of Technology & Research
- Stakeholders participation

- For Achieving its Water Vision the country has adopted

NATIONAL WATER POLICY (2002)

NATIONAL WATER POLICY
HIGHLIGHTS

- Sustainable Planning, Development and management of Water Resources governed by National Perspective
- Establishment of Standardised National Water Resources Information System
- Reorientation / Reorganisation of Institutions for multi-sectoral, multi-disciplinary and participatory approach

HIGHLIGHTS

- Drinking Water
- Quality of Water
- Management of Floods & Droughts
- Financial & Physical sustainability of Water Resources facilities
- Water sharing guided by National Perspective
- Promoting beneficiaries participation

HOW DO WE GO ABOUT IT?

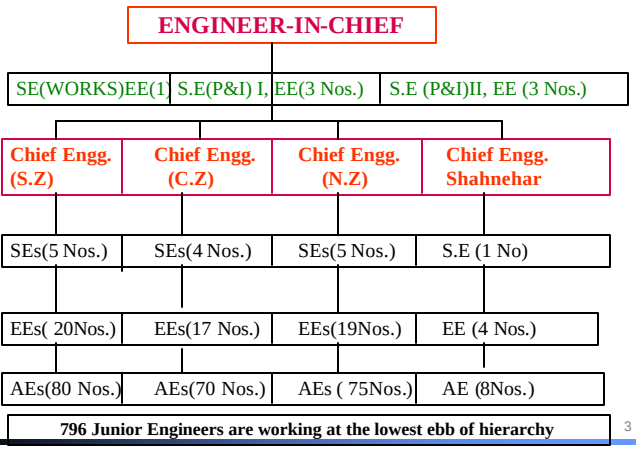
- Discuss ways and means for sustainable implementation of National Policy / State Policy
- Each State to have a close integration of water use and land use policies
- State Water Resources Department to cater for the schemes fro development of water at one place with due consideration of all aspects and implemented by concerned departments under integrated plan.

- Linkages between line departments dealing with the rural water supply, minor irrigation, major and medium irrigation, the watershed development agencies needed to be established
- Water Information Resource Centre should be established where all water related data shall be made available also in local language

THANK YOU

HIMACHAL PRADESH AT A GLANCE AS PER CENSUS 2001	
Number of districts	12
Area in sq.km.	55673.00
Total population	60,77,248
Males	30,85,256
Females	29,91,992
Decadal population growth(1991-2001)	+17.53%
Population density per sq.km.	109
Percentage of urban population	9.79
Literacy	40,29,097(77.53%)
Number of Towns	57
Number of villages	20,118
Census villages (as per 1981 census)	16807
No of habitations	45367
Water Potential of the State (usable)	296 BCM

ORGANISATION CHART OF IPH DEPTT



3

Status of annual expenditure incurred and revenue receipts in various sector :

S.N	Sector	O&M Expdt.	Receipt of water charges.
1.	RWS	113.90 Cr.	2.83 Cr.
2.	UWS	15.44 Cr.	2.45 Cr.
3.	Irrigation	33.01 Cr.	0.26 Cr.

Thus, the cost of production of water in urban areas (Shimla town) works out to as high as Rs. 27/kl whereas the return is at Rs. 4/kl implying an implicit subsidy of Rs. 23/kl.

- Out of the total useable potential of 296 BCM of water available in the state, 0.15 BCM is consumed for drinking water and 1.20 BCM for irrigation purposes.

With the handing over of system to ULB/PRIs/Communities, reduction in the O&M cost and thereby, reduction in cost of production of water could be realized.

4

Status of habitations in the state (as on 31/7/04)
State has taken a conscious decision to supply water @ 70 lpcd.

Not Covered (NC)	Partially Covered (PC)	Fully Covered (FC)	TOTAL
NIL	7244	38123	45367

- It is proposed to cover remaining 7244 partially covered (PC) in next 3 years as per policy document of the Government.
- During the CFY 2004-05 there is target of coverage of 1500 (PC) habitations.
- To cover these remaining habitations an amount of about Rs.650.00 crore shall be required.

5

STATUS OF IRRIGATION (as on 31.03.04)

Total Potential Created : 2.01988 Lakh hects.

	IPH	RDD	Total
1. Minor Irrigation	96856 ha.	92796 ha	189652 ha.
2. Major Irrigation & Medium Irrigation	12336 ha.		12336 ha.
Total:-	109192 ha.	92796 ha.	201988 ha Say 2.02 lac ha.

6

USAGE/ WASTAGE OF TREATED WATER

Immediate stringent measures are necessary for conserving precious water, the production cost of which is as high as Rs. 27/ kilo ltr. but is supplied @ Rs.4/-Kl. as in Shimla Water Supply Scheme.

- Water is a resource that must be shared rather than exploited at the expense of others
- Losses in distribution ranges from 25% to 35%.
- Less than 20% of treated water is used for drinking & cooking purposes.
- More than 80% of treated water is used for other purposes

7

SAVING OF WATER

What we do	What should be done	Conservation possibilities
Bathing with Shower 100 ltr.	Bathing with Bucket 18 ltr.	82 litrs.
Bathing with running water 40 ltr.	Bathing with Bucket 18 ltr.	22 litrs.
Using old style flush in Latrines 20 ltr.	Using new style flush 6 ltr.	14 litrs.
Shaving with running water 10 ltr.	Shaving by taking water in mug 1 ltr.	9 litrs.
Brushing teeth with running water 10 ltr.	Brushing teeth by taking water in mug 1 ltr.	9 litrs.
Washing Clothes with running water 116 ltr.	Washing clothes with bucket 36 ltr.	80 litrs
Washing Car with running water 100 ltr.	Washing Car with wet cloth 18 ltr.	82 liter
Washing floor with running water 15'X10'	Washing floor with wet cloth 10 ltr.	40 liter
Washing hands with running tap 10 ltr.	Washing hands with mug 0.5 ltr.	9.5 litrs

8

OUR OBJECTIVE

TO PROVIDE SAFE DRINKING WATER TO ALL AND ASSURED IRRIGATION TO MAXIMUM FEASIBLE CULTIVATED AREA WITH PEOPLES PARTICIPATION

9

WATER IS A CRITICAL NATURAL

RESOURCE

UNLIKE OTHER MAN MADE

RESOURCES e.g POWER.

WATER HAS NO SUBSTITUTE

10

CONSERVATION & SUSTAINABILITY

OF WATER IS A GLOBAL CONCERN

SO THAT SCARCITY OF WATER

DOES NOT LEAD TO WARS FOR

SURVIVAL.

11

STRATEGIC FOCUS

'THINK GLOBALLY & ACT LOCALLY'

ON:

- SOURCING,
- SUPPLYING,
- DISTRIBUTING,
- CONSERVING **WATER**

12

MIXED EXPERIENCE WITH A TOP-DOWN SUPPLY DRIVEN APPROACH TO DETERMINE WATER REQUIREMENTS AND DISTRIBUTION HAS PROMPTED RETHINKING……. "***WE CAN MANAGE WATER BETTER".***

MOVE TOWARDS A PARTICIPATORY, NEED-BASED, BOTTOM UP APPROACH WITH ACTIVE INVOLVEMENT OF THE COMMUNITY IN:-

- WATER PROJECTS FORMULATION
- IMPLEMENTATION
- DISTRIBUTION
- O&M, VILLAGERS MAY HAVE THEIR OWN TARIFF STRUCTURE & COLLECTING SYSTEM.

DWSCs, DWSMs,SWSC & SWSM notified as the new institutional framework.

13

GOVT. IS A TOTAL PROVIDER, SHIFT HAS TO BE AS A TOTAL FACILITATOR. TRANSITION CAN BE A SLOW & PAINFUL LEARNING PROCESS FRAUGHT WITH UNCERTAINTY.

DIALOGUE WITH RDD IN SELECTED PANCHAYATS TO FACILITATE FEEDBACK AND FEED FORWARD ON TENTATIVE STRATEGIES BEFORE A FULL FLEDGED LAUNCH OF SWAJALDHARA IS UNDERTAKEN.

14

Initiatives to implement participatory approach.

- Water Availability Self Help **(WASH)** project, agreed between the Govts. of India and Federal Republic of Germany is being undertaken with the objective of "water users *P*RIs and stakeholders are enabled and empowered to plan, implement and manage safe drinking water and minor irrigation systems in a sustainable manner".
- To encourage peoples participation in installation of handpumps in drought prone areas, extending potable water facility to schools and revival of traditional water sources, GoI has launched the Prime Minister's Programme to fund said activities with people's contribution ranging from 5% for SC habitations and 10% for others with the rider to maintain the assets thereafter.
- Preparation of Vision document is being undertaken with the assistance of water & Sanitation Programme- South Asia (WSP-SA) World Bank for implementing reforms in the drinking water supply and sanitation sector in the State.

15

WE AIM AT A PROACTIVE WATER POLICY WHICH SEEKS TO MAINTAIN A CONSTANT DIALOGUE BETWEEN STAKEHOLDERS AND GOVT. THE POLICY AIMS AT:-

- A sustainable bottom up demand driven, decentralized approach to water supplied on 'user pays' principle.
- Public private partnership involving vertical coordination between Govt., NGOs and WUAs/ panchayats, ULBs

16

- Since watersheds impact directly on quantity and quality of water, a horizontal dialogue to coordinate with linked departments like Forest, Agriculture, Soil Conservation, IPH, PRIs and UD needs to be established.
- To reform mindset through IEC.
- A progressive, legislative & regulatory framework to lend dynamism to this Policy has to be reframed.

17

CHANGING MINDSET AND ENHANCING HUMAN CAPABILITIES- THE BIGGEST CHALLENGE OF 21ST CENTURY.

THROUGH IEC:-

-for departmental officers.

-for the WUAs

-for grassroots polity PRI,

ENCOURAGE COMMUNITY/WUA(DRINKING & IRRIGATION)

-To deploy/revive traditional best practices in both drinking water e.g Bouli & irrigation i.e distribution of water through warabandi.

-Operation & Maintenance

-Collection of abiana & water tariff.

18

METHODS OF REGULATION

- 'User pays' principle.
- Progressive costing of water for different classes/segments of users.
- Levy and realization of water charges through the user community.
- Metering in Urban & Rural areas.

19

METHODS OF CONSERVATION

- Water Harvesting.
- Plugging leakages – beyond unaccounted for water (UfW) losses due to transmission, distribution & in-house.
- Maximizing retention
- Revival of traditional practices.

20

RAIN WATER HARVESTING & RECHARGE STRUCTURES

- Roof top harvesting made mandatory in urban areas
- Initiatives taken for water harvesting for the coverage of rural habitation.
- The state of H.P is one of the hill states selected for artificial recharge and rain water harvesting project launched by GoI at an estimated cost of Rs. 175 Crore (Rs. 3.5 Crore allocation for H.P during CFY) for ponds, check dams, RRWH & RW.
- Recharge structures to be incorporated in RWSS for sustainability.

21

WATER QUALITY SURVEILLANCE (WQS) & CHLORINATION

The state has no significant water quality problems. However in few areas where excess iron problems have been encountered IRPs are being provided.

? Likely threat to water quality from increased use of pesticides and pollutants in the agriculture and river system.

- Periodical disinfections of Bowlies, particularly during droughts, since these serve as the most dependable alternate source.
- 15 Water Testing Labs. Established at:
  Mandi, Kullu, Keylong, Nahan, Hamirpur, Chamba, R/Peo, Bilaspur, Nurpur, Rohru, Una, D/sala, Kandaghat & Shimla
  One mobile lab at Shimla.
- Active participation of the PRIs and Deputy Commissioners in the chlorination campaign annually carried out during critical period from March to September.

? Providing a system of WQS at village/block level.

22

HYDROLOGY PROJECT-II

Introductory

- At present data is collected by, Revenue, Forest, CWC, IMD, BBMB, HPSEB, IPH, PWD, Arg. Uni., Hor. Uni. & Env. & Pollution Control Board with limited infrastructure/instruments and equipments, thereby lacking an integrated approach.
- World Bank aided HP-II project amounting to Rs. 49.5 Crore is being undertaken with the main objective to integrate the data of water availability and to develop an integrated and comprehensive hydrological data collection and information system.
- And to promote the sustained, effective use of the hydrologic information system (HIS) by all potential users concerned with water resources planning and management, both public & private.

23

HYDROLOGY DATA BASE

- Authentic data is a necessary precursor for project realistic planning.
- Link with Standardized national information system create a network of databanks and data bases.
- Modern information system necessitate designing data protocol to facilitate exchange of data among various user agencies.
- Efforts to develop and continuously upgrade technological capability to collect, process and disseminate data.

24

PROGRESSIVE LEGISLATIVE FRAMEWORK TO SUPPORT REFORMS

- Policies: State water Policy is in active consideration.
- Existing Acts: Water Supply Act and minor canal Act
- Proposed Acts: Ground Water Bill. Participatory Irrigation Management Bill.

25

PROPOSED INSTITUTIONAL SETUP

- Existing Institutions under the water resources sector will have to be reoriented/ recognized & even created to give effect to multi-sectoral, multidisciplinary and participatory approach as well as integrating quality, quantity and the environmental aspects.

- That is why Swajaldhara has been launched.

26

INCENTIVE MOTIVATION TO WUAs:-

CAN BE INBUILT IN POLICY TO ENCOURAGE PANCHAYATS TO UNDERTAKE WATER AND SANITATION SCHEMES BY TAGGING OTHER INCENTIVES WHICH COULD BE AVAILABLE TO VWSC/ VILLAGES ON A PERFORMANCE-LINKED CRITERIA. THESE INCENTIVES COULD BE THE FULFILLMENT OF LONG STANDING DEMANDS LIKE LINK ROADS, SCHOOLS ETC.

27

THANK YOU

28

Towards an Improved State Water Policy for Himachal Pradesh

Research Funded under the Forest and Research Programme,
Department for International Development, U.K. (DFID)

Presentation outline…

- Introduction
- Questioning the assumed
- The policy environment
- Himachal Pradesh Draft State Water Policy
- Stakeholder dynamics
- Conclusions
- Recommendations

Introduction…

- Within the scientific community there is a felt need for a clearer understanding of the impacts of land use (including forests) on water resources
- Scientific studies now showing that the often assumed forest-water linkages is not a universal truth: could have adverse impacts downstream
- In this context the 'Low Base Flows & Livelihoods in India' project has been designed

Low Base Flows & Livelihoods in India

Project Objectives:

- Improving scientific understanding of forests-water flows interactions
- Developing decision-making tools such as GIS based hydrological models
- Linking this improved understanding to policy with the aid of these tools and through direct interactions with institutions and policy makers

Questioning the assumed…

- Land use decision is also a water decision (Falkenmark 2003) BUT, understanding impacts is a complex issue
- Forests attract rainfall or exist where rainfall is plentiful? Unresolved (Calder 1999, 2000; Wilk 2000)
- Site-specific parameters (landform, soil type, infiltration properties) significantly impact water flows (Calder 2000)
- Scale important while interpreting hydrological effects e.g. floods in plains (Calder 1999, Wilk 2000)

THEREFORE:

Questioning the assumed…

Standardized responses are not adequate (such as Afforestation,WSD) & could have downstream negative impacts in the long term.

Have to take into account site-specific parameters - e.g. land use patterns / geology / socio-economic etc.

The policy environment…

- Policies based on generalized understanding of land use and water flow interactions
  - National Forest Policy (1988)
  - National Water Policy (1987 / 2002)
  - Guidelines for WSD (1994 / 2001 & Hariyali 2003)
- Blanket policies cannot address a diversity of biophysical criteria and socio-cultural settings as found in India

HOWEVER

- Now have access to technology (GIS / Remote Sensing) to get an improved understanding of site-specific characteristics to develop improved policies

HP Draft State Water Policy

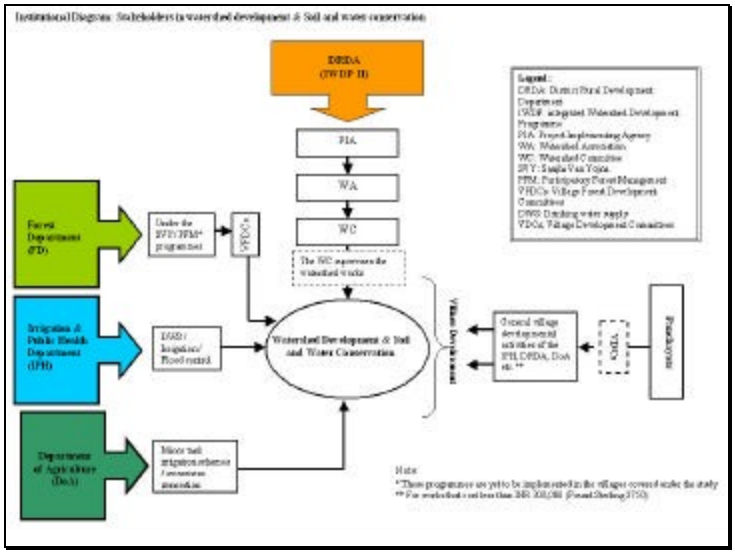
- HPDSWP similar to the NWP – not apt. given HP's mountainous terrain/fractured geology – specialized interventions needed for WR development
- NWP oriented towards canal irrigation development. In HP irrigation limited by biophysical criteria - mostly rainfed. Therefore, need to reorient DSWP towards state specific issues – site specific catchment treatment
- For this a scientific understanding of water flows and factors that influence it is necessary.

There exist provisions within the HPDSWP that can enable this

HP Draft State Water Policy

Some examples of existing provisions:

- Does recognize need for 'close integration of land use and water use policies' (Para 9.2) & use of 'science and tech to improve efficiency of water resources management' (Para 1.5)
- Recognizes the need for a 'multi-disciplinary and participatory approach' to WR development (Para 4.1)
- Para 6.2 & 7.1 call for impact evaluations in terms of socio-eco factors & groundwater potential – evaluation framework necessary



Stakeholder Dynamics…

- Little or no coordination between govt. line departments (exists mostly on an informal basis)
- Each Dept has it's own defined functions/thrust and priority areas that often overlap but are still pursued individually
- Coordination between line depts. limited to single programmes – e.g. WSD – not at the overall level of day to day functioning
- Parallel institutions exist at the village level with every new projects – members overlap – but little formal coordination

In conclusion…

- Land use –water flow linkages need to be assessed at the State level using scientific insights and available technology (e.g. GIS based hydrological models)
- Two-pronged endeavor necessary:
  1. Improved (scientific) understanding of land use-water flows interactions
  2. Based on this improved understanding, develop a uniformity in thinking (perceptions) among stakeholders at all levels
- Land & water policies need to reflect this improved understanding through integrated frameworks for decision-making

Recommendations…

Improving Inter-departmental Coordination:

1. **Official procedures that engender inter-departmental coordination need to be established** through appropriate policies at the State (possibly implemented through a Nodal Dept), and equally importantly at the Central level.
2. Awareness generation and training will have to be imparted at every level of the bureaucratic system – it should not be limited to localized, project areas.
3. Mechanisms for information and data sharing within and among line departments and other practitioners need to be developed.
4. A **'Convergence Government Order' be passed by the Chief Secretary at the state level that makes it mandatory for relevant line departments to coordinate amongst themselves in order to achieve common objectives / goals** – as proposed by the ongoing DFID funded Forest Sector Reform Project in Himachal Pradesh.

Recommendations…

Influencing Political Will:

1. **Political will plays a crucial role in policy change and implementation**. Awareness generation exercises / training programmes that inform political actors about the current thinking / advances in the sector need to be regularly organised. These can be organised in a concerted manner by the relevant line departments.
2. For effective implementation, policies need to be **backed by resourced action plans**. This requires political (and bureaucratic) will and commitment that can be nurtured through awareness generation programmes.

Recommendations…

Policy Issues

1. **A scientific 'Land Use Policy' that takes into cognisance the impacts that various forms of land use (including forests) have on water resources needs to be developed** for Himachal Pradesh.

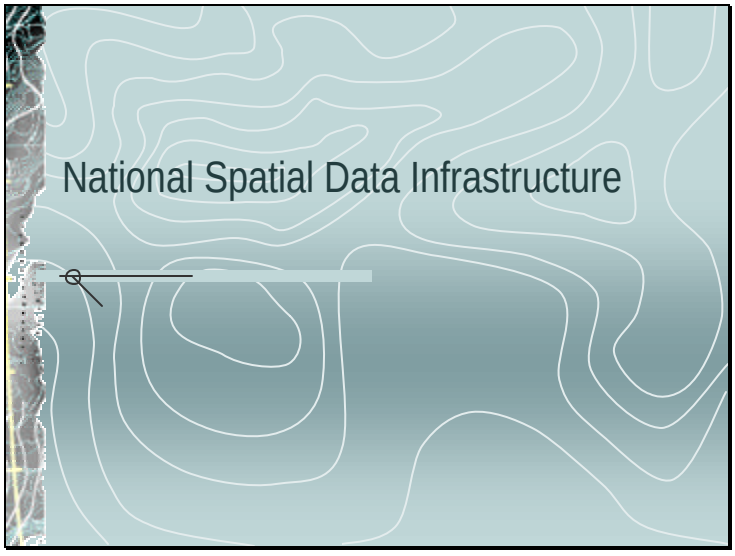
2. **The development of a state specific water policy, formulated on the basis of a scientific understanding of water flows,** including the factors that influence it, would be the first step towards conserving & managing water resources within Himachal Pradesh in an efficient and sustainable manner.

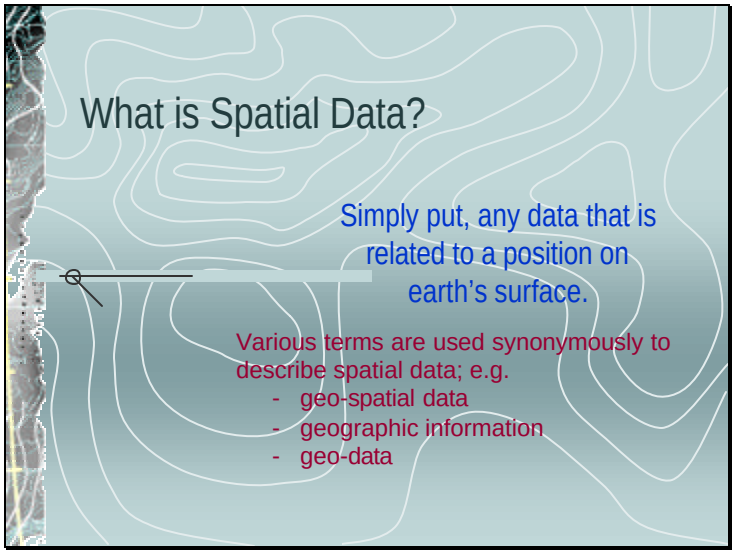
3. **The Irrigation & Public Health department (IPH) should be involved in the design and implementation of watershed development projects in Himachal Pradesh as they have knowledge of the hydrology of the region.**

Recommendations…

Policy Issues (Contd)

4. **Frameworks for the evaluation of socio-economic and hydrological impacts of water resource development programmes (e.g. WSD) and effective feedback loops informing policy change need to be developed.**


National Spatial Data Infrastructure


What is Spatial Data?
Simply put, any data that is related to a position on earth's surface.
Various terms are used synonymously to describe spatial data; e.g.
- geo-spatial data
- geographic information
- geo-data

Conventionally “spatial data” is available in the form of –

- Maps – Topographical, Geological, Soil, Cadastral, Forest, Hydrographic …
- Satellite Images
- Aerial Photographs
- Textual and Statistical Data

Data in conventional forms (print / analogue) is difficult to use because ….

Information content is fixed

Digital Technologies now enable

- easy integration
- easy storage of large volumes
- easy, quick and selective retrieval
- complex analysis

Advances in I.T., Communication and Networking technologies enable large volumes of diverse data-sets to be used in conjunction giving rise to the metaphor of

DATA INFRASTRUCTURES

The Metaphor captures the concept of information flow

Vertically i.e. from local, to national, to regional and global and

Horizontally i.e. between organisations, individuals and communities

India has possibly the longest known tradition of systematically collected Scientific spatial data.

- Survey of India - 234 years
- Geological Survey - 150 years
- Marine Survey - 137 years
- Census of India - 129 years
- India Meteorological Department - 125 years

Pioneering work in post independence on application of space technologies has transformed the spatial data scenario .....

- acquisition
- updation
- analysis

Abundance and richness of data assets with

- SURVEY OF INDIA
- GEOLOGICAL SURVEY OF INDIA
- NATIONAL REMOTE SENSING AGENCY
- FOREST SURVEY OF INDIA
- CENTRAL GROUND WATER BOARD
- CENTRAL WATER COMMISSON
- NIC
- CENSUS
- NATIONAL ATLAS AND THEMATIC MAPPING ORGANISATION

Abundance and richness of data assets with

- NATIONAL BUREAU OF SOIL SURVEY AND LAND USE PLANNING
- MINISTRY OF ENVIRONMENT & FORESTS
- INDIAN METEOROLOGICAL DEPARTMENT
- NATIONAL HYDROGRAPHY DEPARTMENT
- DEPARTMENT OF OCEAN DEVELOPMENT
- MINISTRY OF SURFACE TRANSPORT
- LAND RECORDS

Why are we not able to use and add value to these assets ?

1.We do not know who has what ! !

- Catalogues not accessible

2. Even if we know who has what, we do not know how we can access it …

- “Meta-data” is not available

What is meta-data?

Meta-data is data about " Data ".

Meta-data helps to -

- Discover
- Explore
- Exploit

3. Even if we can access the data we cannot use it in conjunction with one another …

- data follows multiplicity of standards in terms of ..
  - Scale
  - Projection
  - Currency
  - Content
  - Formats
  - Quality

4. Even if the data gets standardized, there may be …

- restrictive policy regimes
- reluctance to share
- stored in different locations

Solution ?

A Spatial Data Infrastructure

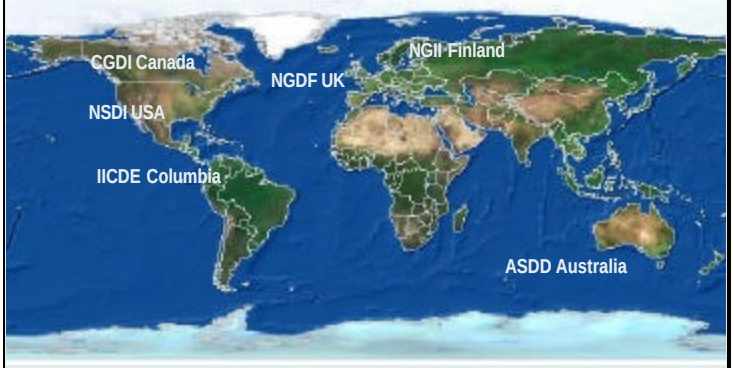
What is Spatial Data Infrastructure?

It is a collection of technologies, policies

and institutional arrangements to facilitate

availability and access to spatial data

SDI initiatives



REGIONAL - EUROGI Europe
PC IDEAS

GLOBAL - GSDI
DIGITAL EARTH

Indian Initiative …..

NSDI

- National Spatial Data Infrastructure

The NSDI Vision

- National infrastructure for the availability of and access to organised spatial data
- Use of the infrastructure at Community, Local, State, Regional and National levels for sustained economic growth

NSDI Objectives

- Develop and maintain standard digital collection of data
- Develop common solutions for Discovery, Access and Use of spatial data in response to the needs of diverse user groups
- Increase the awareness & understanding of the vision, concepts and benefits of the NSDI

The NSDI is an overarching framework for the existing agencies with the authority to mandate constituent agencies to commit their data sets and generate new data on the basis of user needs

Early initiatives – NNRMS, NRDMS, Geomatics …*articulation by Academicia and Industry*

- Aug 2000 - Initiative by Dept. of Space
  DST joins hands with DOS
- Nov 2000 - Task Force constituted
- Feb 2001 - International Workshop
  Formulation of Strategy & Action Plan
  Consultation

Why NSDI ?

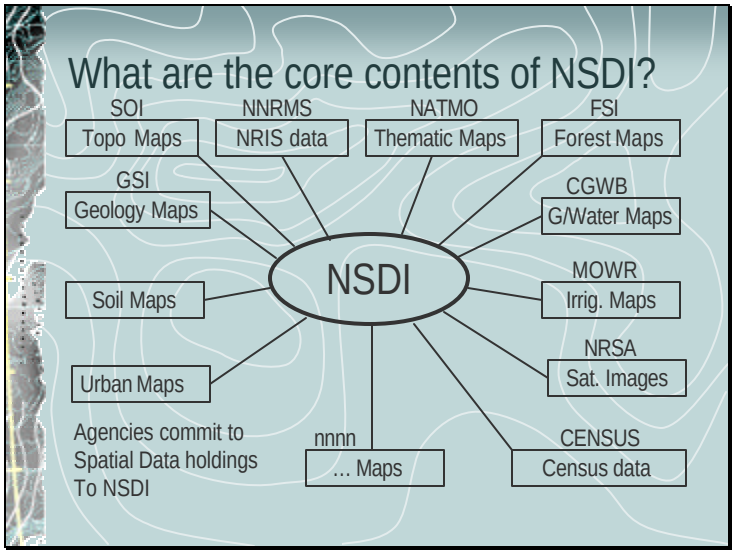
- To provide a " single window " for spatial data access through digital technologies
- Ensure standardisation of data-sets
- Avoid duplication of data-sets
- Provide for inter-agency co-operation

What is NSDI ?

- An organised spatial data resource that is accessible to all
- All the data is available on digital media
- All the data forming part of the NSDI follows common technical standards

NSDI will create a reliable and supporting environment to ….

access geographically-related information using a minimum set of standard practices, protocols and specifications.


What are the core contents of NSDI?
SOI
Topo Maps
NNRMS
NRIS data
NATMO
Thematic Maps
FSI
Forest Maps
GSI
Geology Maps
CGWB
G/Water Maps
NSDI
Soil Maps
MOWR
Irrig. Maps
NRSA
Sat. Images
Urban Maps
Agencies commit to
Spatial Data holdings
To NSDI
nnnn
... Maps
CENSUS
Census data


Design Elements
The NSDI – STANDARDS.
Content and Schemas, Design and Processes, Network protocols, Exchange and Transfer standards, Accreditation and Certification.
Defined and agreed to by data providing agencies

Design Elements

The NSDI – META DATA.

NSDI content and information availability

Design Elements

The NSDI – NODES.

Each data providing agency will have a Front-end server functioning as NSDI node which will process all requests for spatial data.

Agencies may have Back-end server for storage of spatial data

Design Elements

NSDI – SEARCH AND ACCESS PROTOCOLS.

NSDI will have an Interactive Query based search engine to facilitate search, location and access of spatial data.

e.g. " ASK GIRAFFE " of UK

Design Elements

NSDI – ELECTRONIC CLEARING HOUSE.

The NSDI Clearing House would be the mechanism to provide access to the Meta-data and finally to data-sets.

NSDI MASS COMMUNICATION STRATEGY

To increase the Public and Professional use of NSDI services

Who are the NSDI Stake holders and Participants ?

- Government
- Corporate Sector
- NGO's
- Community Organisations
- Academia and Research community
- Citizens

NSDI structure will aspire to

- Be inclusive of all stakeholders
- Add value
- Build on, facilitate and support existing initiatives
- Command respect and authority
- Support sustainable development
- Be flexible and adaptable to change
- Facilitate new initiatives for use and data sharing
- Be simple, transparent, open and democratic
- Enhance decision making process
- Engender partnerships

Who will the NSDI benefit And how ?

Example:
Identify Flood Prone Areas

Information available:

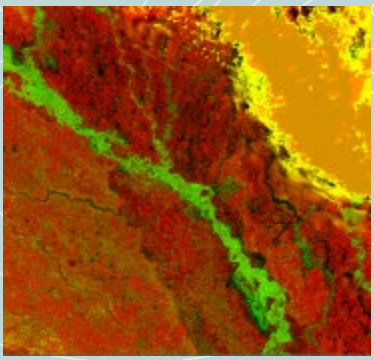
- Bareilly & Rampur district, UP
- Catchment of river Ramganga & tributaries

Information derived:

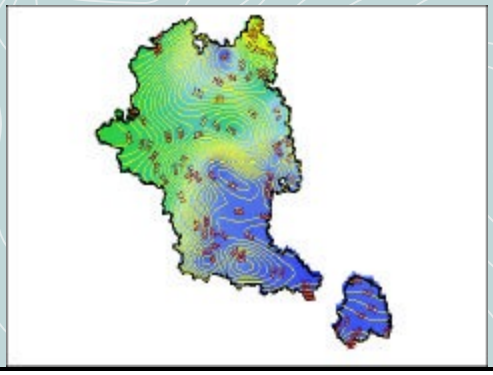
- 1830 sq km of area
- 868 villages

Source: ML Infomap

Satellite image of area

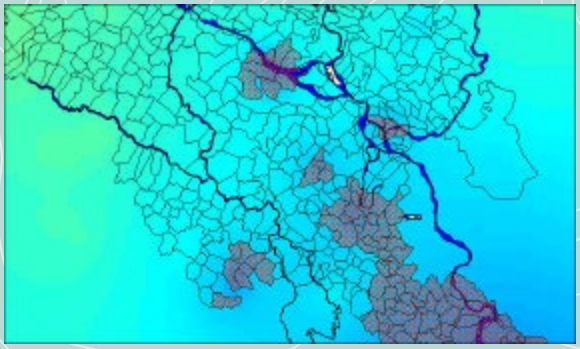


Elevation



Rivers and villages

Low lying areas/villages identified



Of 868 villages studied

192 villages are flood prone and can be identified by name and located correctly

Affected number of people

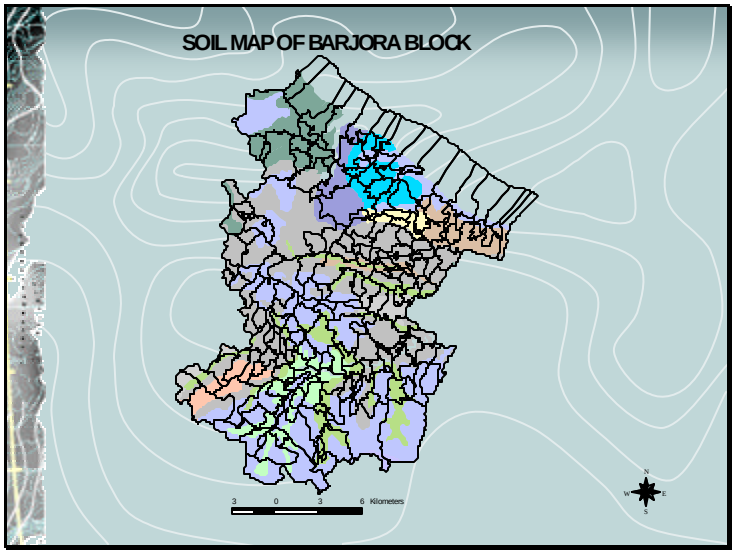
and households can be estimated

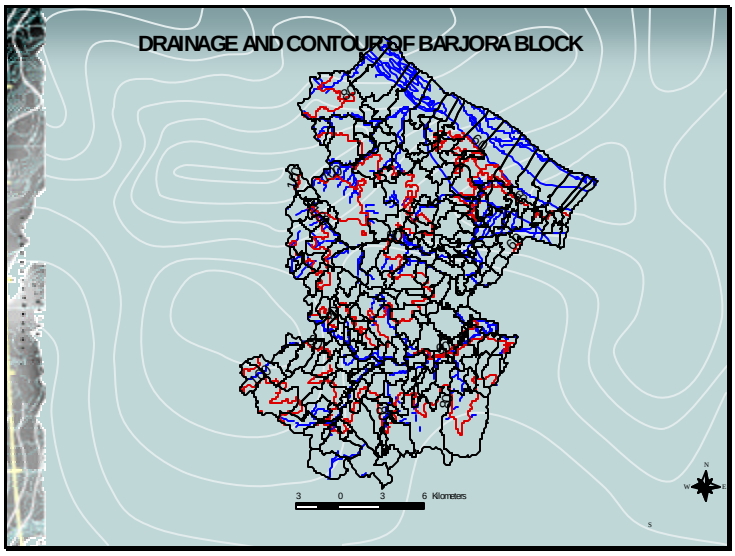
accurately

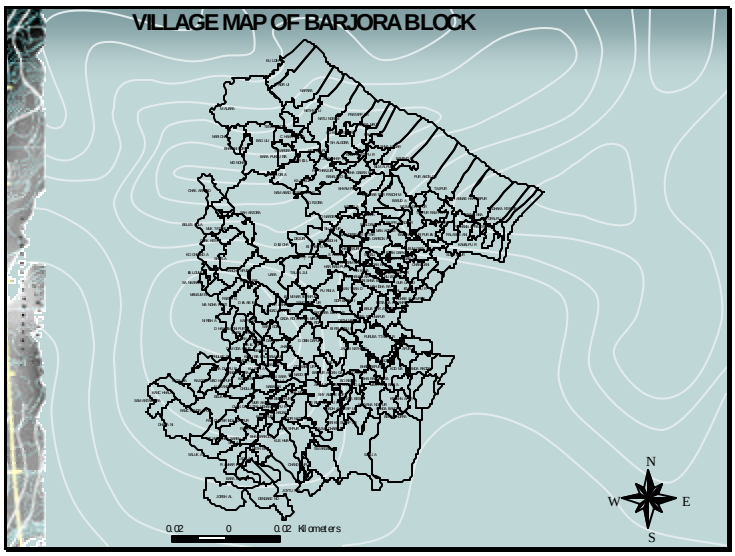
Spatial data integration

Barjora Block, West Bengal: An example from NRDMS

Source: NRDMS




DRAINAGE AND CONTOUR OF BARJORA BLOCK
3 0 3 6 Kilometers
N
W
E
S


VILLAGE MAP OF BARJORA BLOCK
0.02 0 0.02 Kilometers
N
W
E
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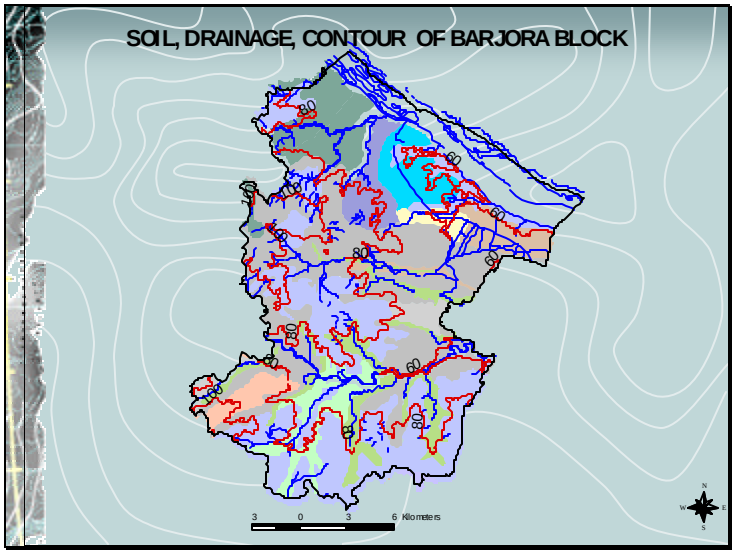
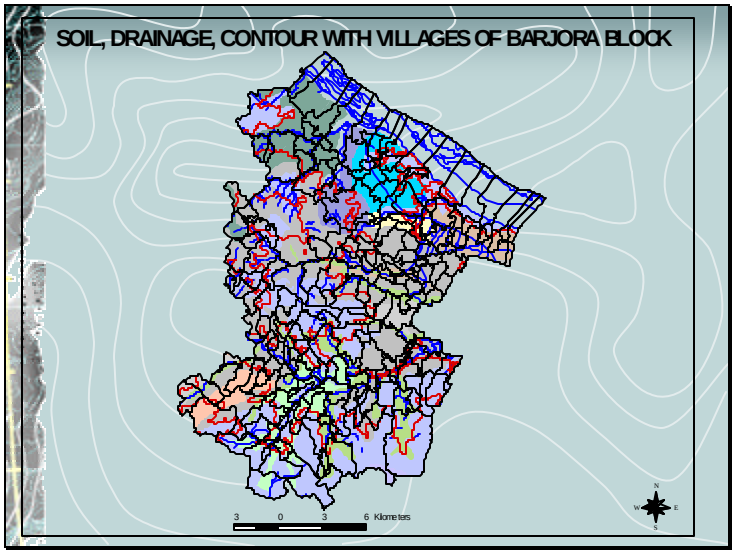
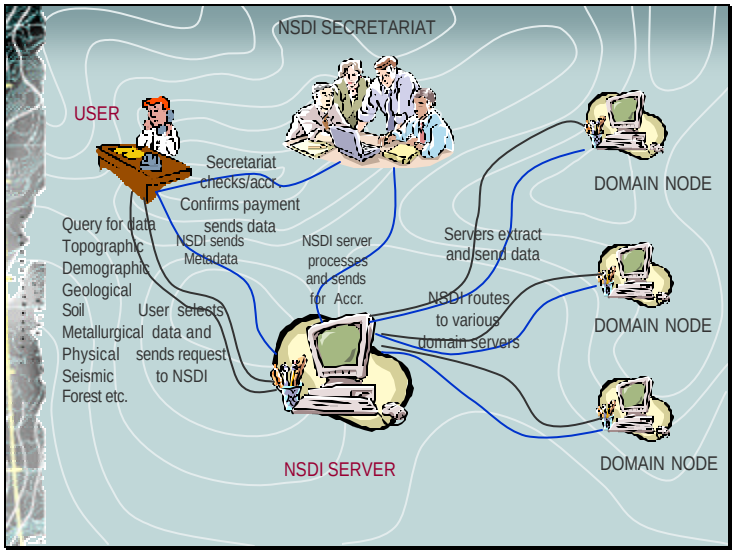

SOIL, DRAINAGE, CONTOUR OF BARJORA BLOCK
3 0 3 6 Kilometers


SOIL, DRAINAGE, CONTOUR WITH VILLAGES OF BARJORA BLOCK
3 0 3 6 Kilometers



NSDI benefits the nation by

- Encouraging organisations to use each others data
- Enables greater ease and speed of access
- Saving time in searching for data
- Savings in cost and time in making data inter-operable

NSDI leverages data assets of Departments

- There is no major capital expenditure
- Departments exploit their own data
- Savings from sharing of data
- Revenues generated from sale of data products and services

NSDI ushers in new map usage culture

- From difficulty to ease of access
- From paper to digital media
- From fixed to flexible formats
- From restrictive to open and sharing regimes
- From slow to speedy access
- From storage to usage of map data

Revenue generation for Businesses by meeting user requirements

- By value adding to data, eg., map and format conversion services
- By developing products, eg., thematic atlases
- By acquiring of large scale and detailed data
- By developing context specific software tools and utilities

Thank You

for your presence,

your attention

and your time !


Himachal Pradesh Resources Map
Indian Institute of Technology, Delhi

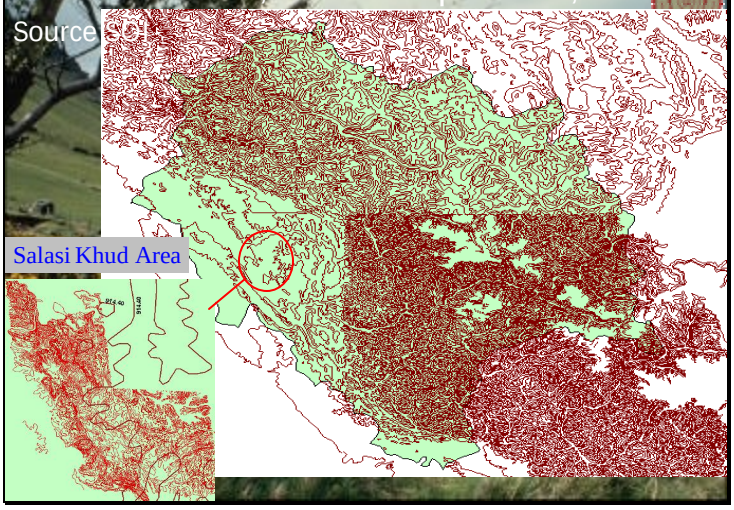

Himachal Pradesh Resources Map
Contours : 1:250,000
Drainage Network: 1:250,000
Roads, Railways: 1:250,000
Landuse :
Soil : 1:500,000
Administrative units
– Districts
– Tehsils
– Block/Kanango circle
– NP/ Patwari circles
– Cities, Towns

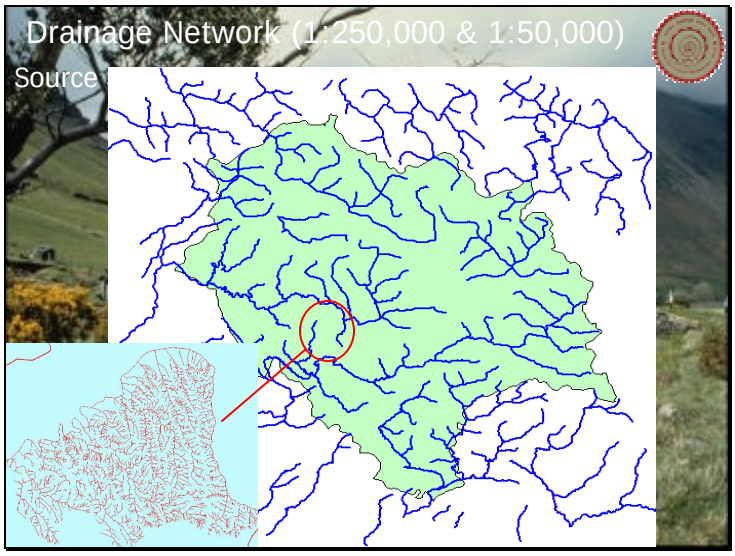
Derived Maps

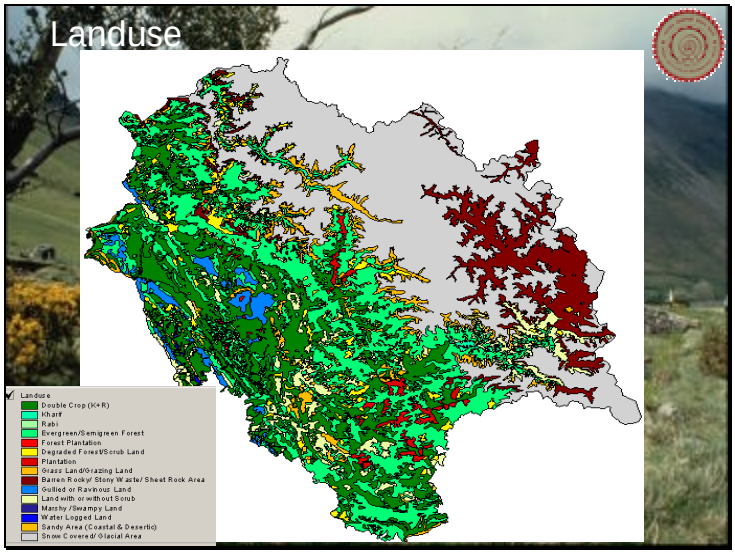
- Digital Elevation Map
- River Basin Map
- Watershed Map
- Locations of raingauge stations
- Forest Division/circles
- Agriculture Department – Zones
- IPH Department Circle – Divisions
- Horticulture Department – Zones

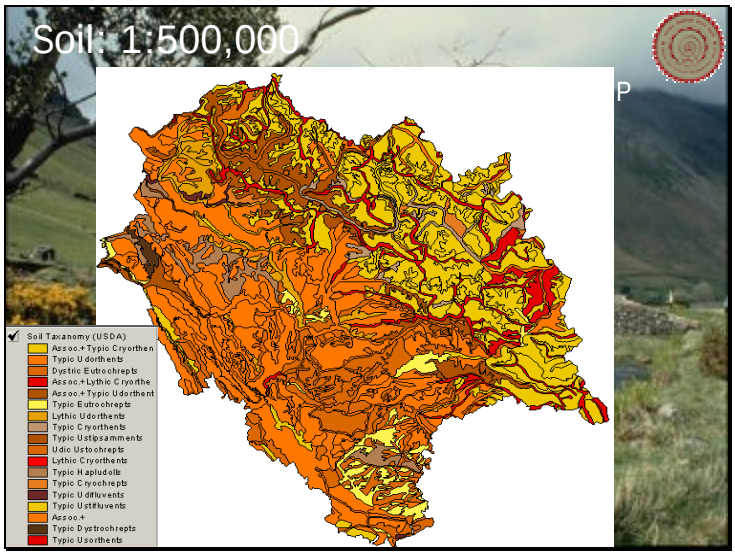
Contours 1:250,000 – Sample 1:50,000

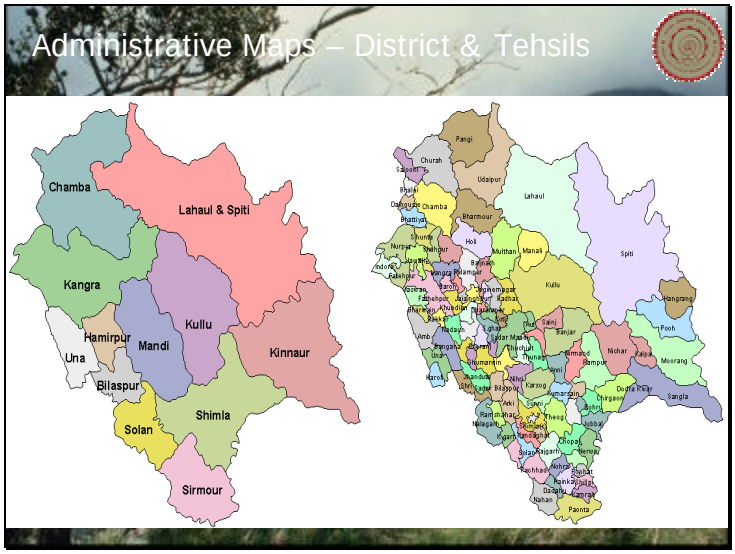
Source

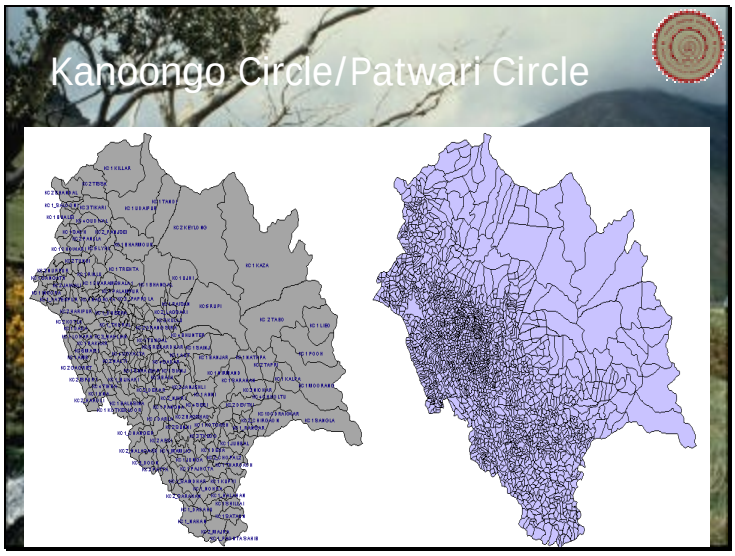


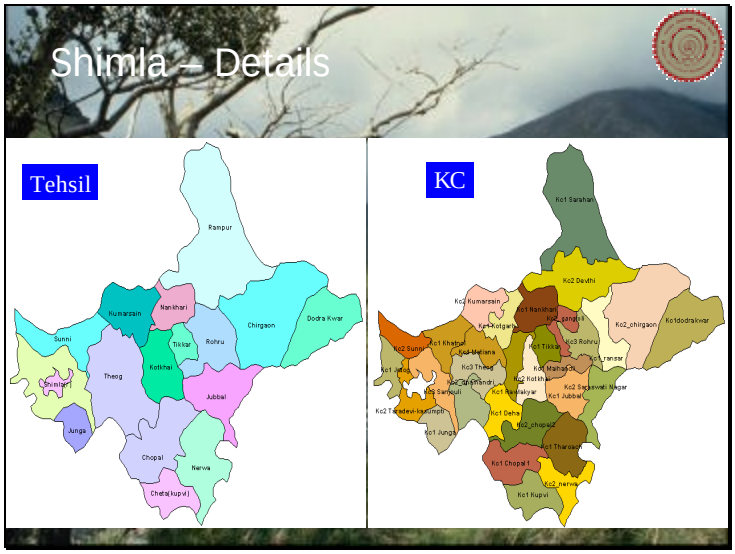

Drainage Network (1:250,000 & 1:50,000)
Source

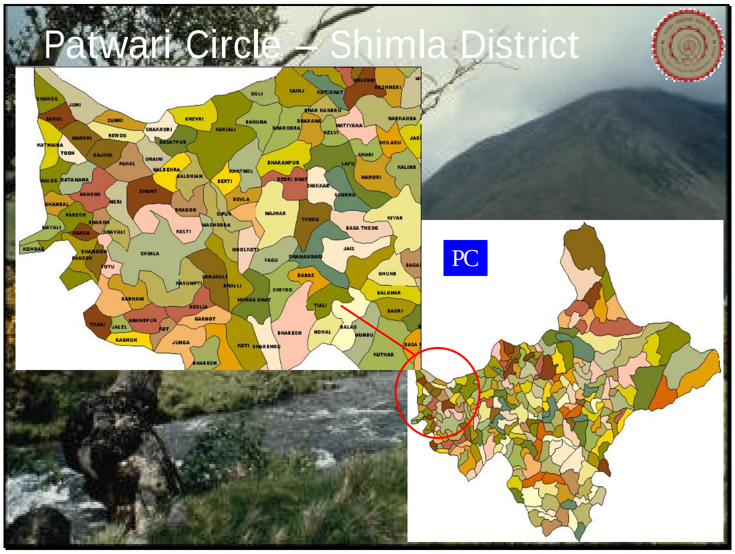

Landuse
Landuse
Double Crop (K+R)
Kharif
Rabi
Evergreen/Semigreen Forest
Forest Plantation
Degraded Forest/Scrub Land
Plantation
Grass Land/Grazing Land
Barren Rocky/ Stony Waste/ Sheet Rock Area
Gullied or Ravinous Land
Land with or without Scrub
Marshy /Swampy Land
Water Logged Land
Sandy Area (Coastal & Deserttic)
Snow Covered/ Glacial Area


Soil: 1:500,000
Soil Taxanomy (USDA)
Assoc.+Typic Cryorthen
Typic Udorthents
Dystric Eutrochrepts
Assoc.+Lythic Cryorthe
Assoc.+Typic Udorthent
Typic Eutrochrepts
Lythic Udorthents
Typic Cryorthents
Typic Ustipsamments
Udic Ustochrepts
Lythic Cryorthents
Typic Hapludolls
Typic Cryochrepts
Typic Udifluvents
Typic Ustifluvents
Assoc.+
Typic Dystrochrepts
Typic Usorthents

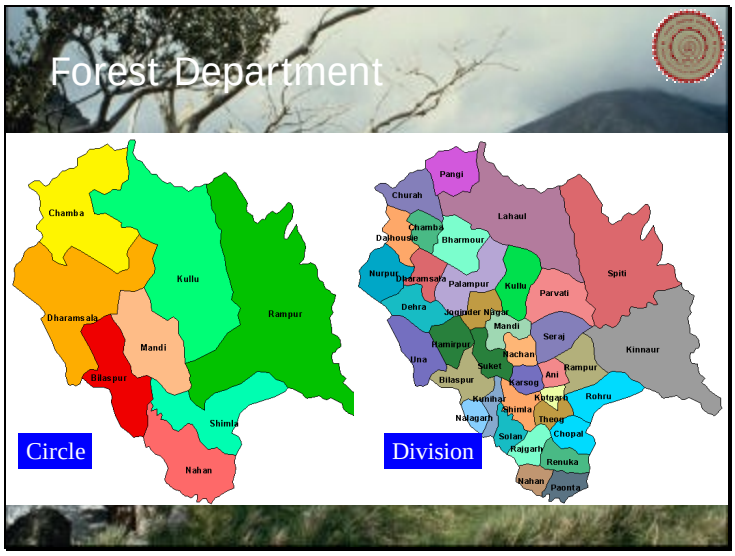

Administrative Maps – District & Tehsils
Chamba
Lahaul & Spiti
Kangra
Kullu
Hamirpur
Mandi
Kinnaur
Una
Bilaspur
Shimla
Solan
Sirmour

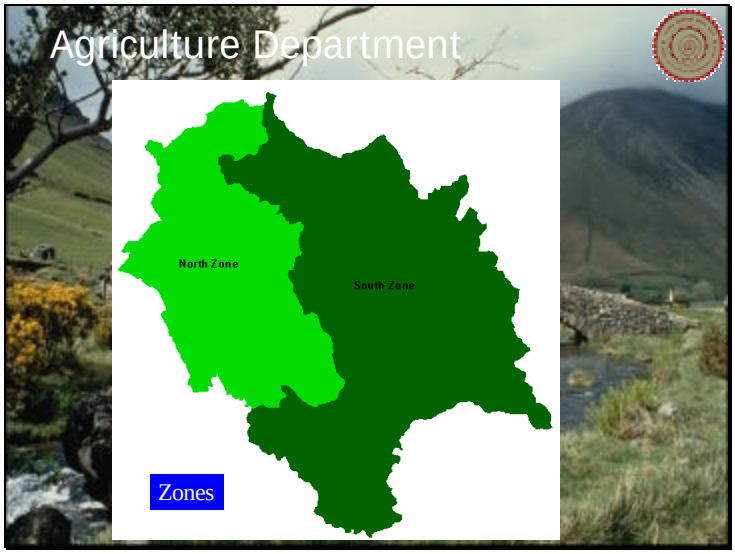

Kanoongo Circle/Patwari Circle

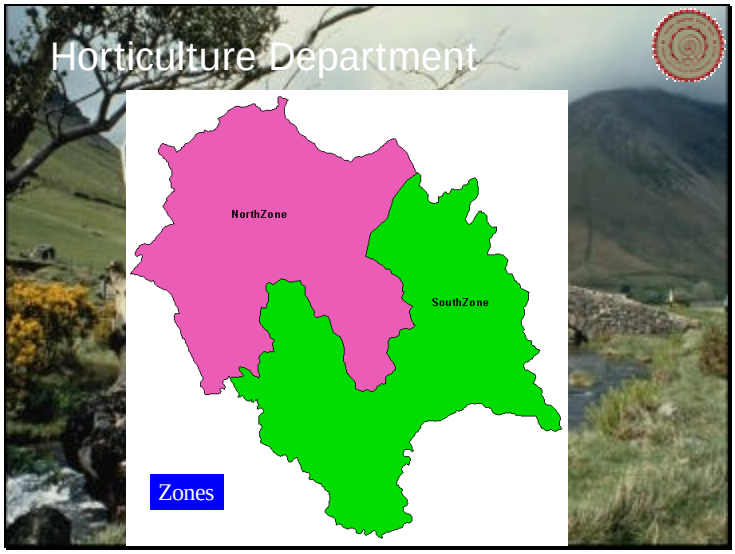

Shimla – Details
Tehsil
KC
Rampur
Rumarsain
Nankhari
Chirgaon
Dodra Kwar
Sunni
Tikkar
Rohru
Kotkhai
Theog
Jubbal
Junga
Chopal
Nerwa
Chela(kupvi)

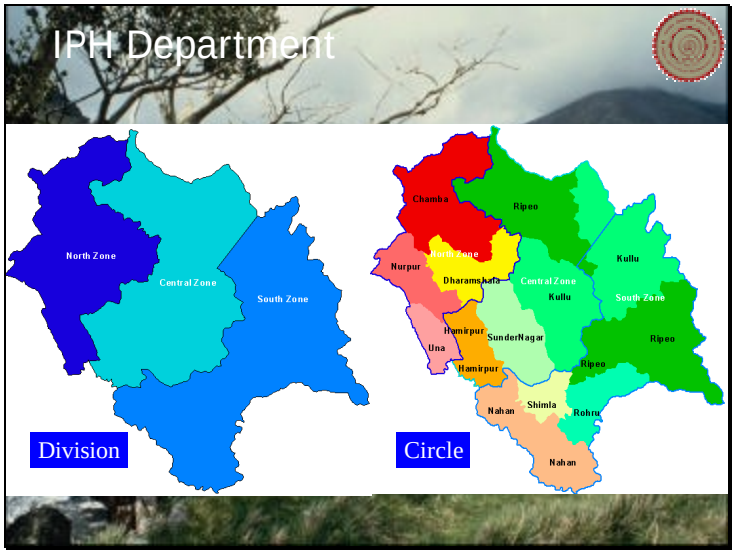

Patwari Circle – Shimla District
PC

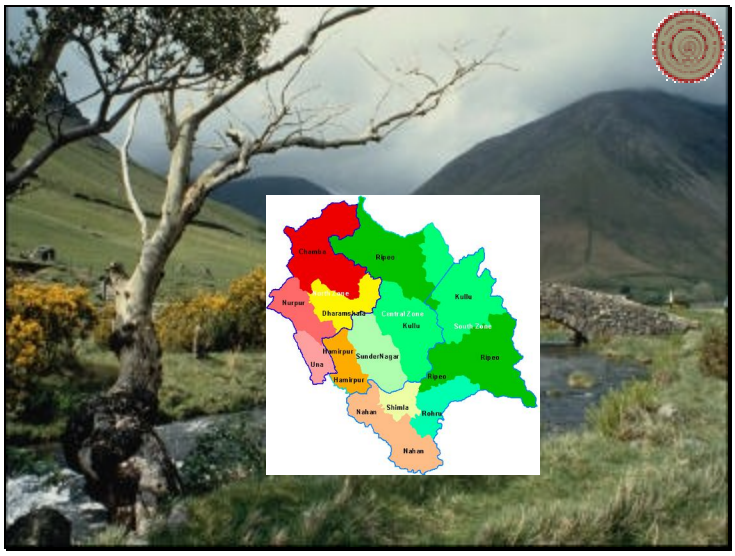

Raingauge Stations
Chamba
Lahaul & Spiti
Kangra
Mandi
Kullu
Hamirpur
Kinnaur
Una
Bilaspur
Solan
Shimla
Sirmour

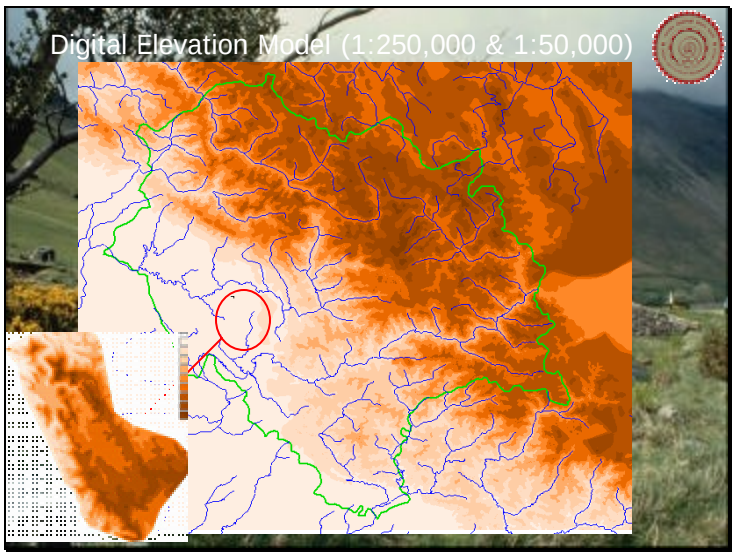

Forest Department
Chamba
Kullu
Rampur
Dharamsala
Mandi
Bilaspur
Shimla
Nahan
Circle
Pangi
Churah
Lahaul
Chamba
Dalhousie
Bharmour
Nurpur
Dharamsala
Palampur
Kullu
Spiti
Dehra
Jogindar Nagar
Parvati
Mandi
Seraj
Ramipur
Kinnaur
Una
Nachan
Suket
Rampur
Bilaspur
Karsog
Ani
Kunihar
Kotgarh
Rohru
Nalagarh
Shimla
Theog
Solan
Chopal
Rajgarh
Renuka
Nahan
Paonta
Division

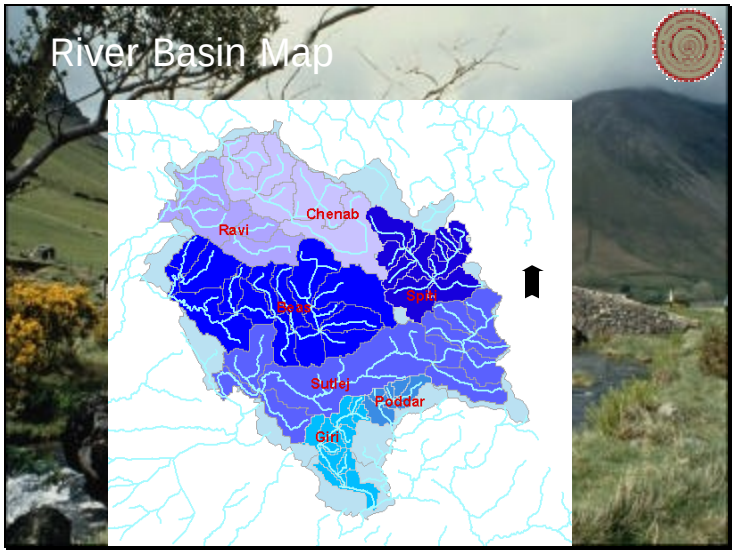

Agriculture Department
North Zone
South Zone
Zones

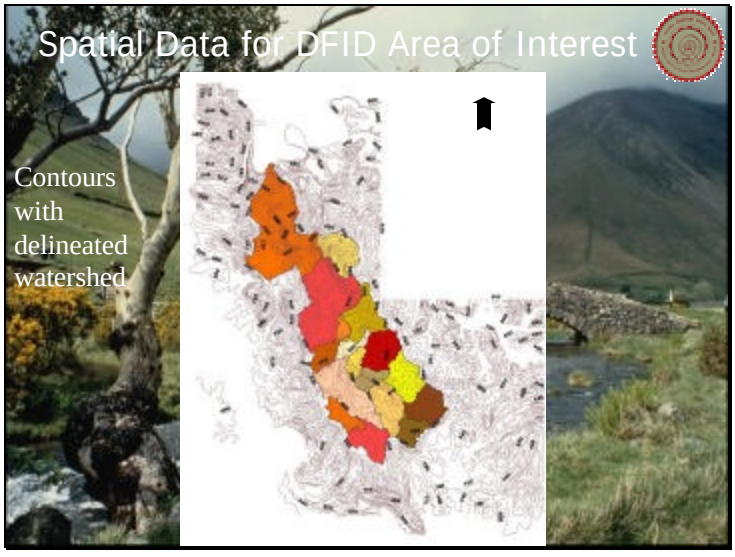

Horticulture Department
NorthZone
SouthZone
Zones

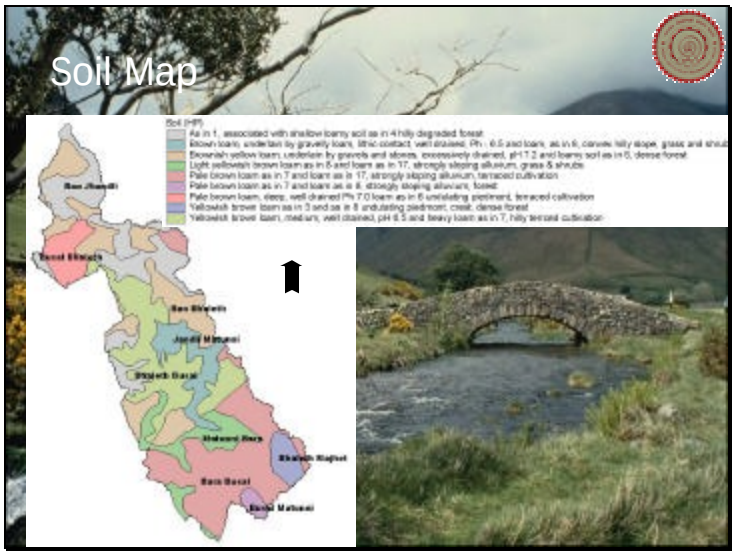

IPH Department
North Zone
Central Zone
South Zone
Division
Chamba
Ripon
North Zone
Nurpur
Dharamshala
Central Zone
Kullu
Kullu
South Zone
Hamirpur
SunderNagar
Una
Ripon
Hamirpur
Ripon
Nahan
Shimla
Rohru
Nahan
Circle

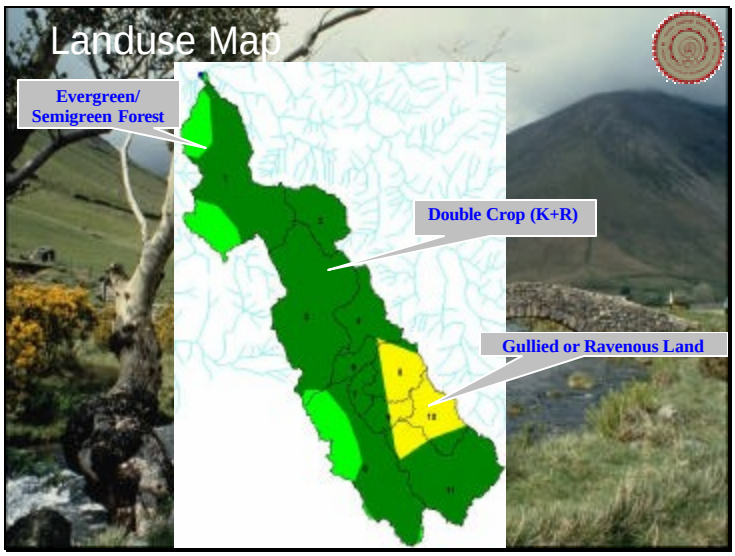

Chamba
Kullu
Nurpur
Dharamshala
Central Zone
Kullu
South Zone
Una
SunderNagar
Rampur
Nahan
Shimla
Nahan

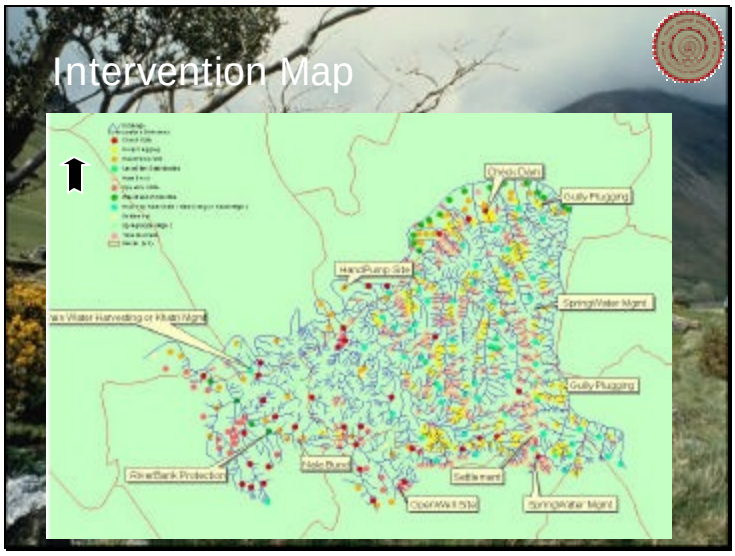

Digital Elevation Model (1:250,000 & 1:50,000)


River Basin Map
Chenab
Ravi
Spiti
Sutlej
Poddar
Giri


Spatial Data for DFID Area of Interest
Contours with delineated watershed


Soil Map


Landuse Map
Evergreen/
Semigreen Forest
Double Crop (K+R)
Gullied or Ravenous Land


Intervention Map
Check Dam
Gully Plugging
Hand Pump Site
Spring Water Mgmt
Gully Plugging
River Bank Protection
Hole Plugs
Settlement
Open Well Site
Spring Water Mgmt

FAWPIO

Forest, Land and Water Policy: Improving Outcomes

JAIME AMEZAGA

Centre for Land Use and Water Resources Research
University of Newcastle upon Tyne, UK

UNIVERSITY OF NEWCASTLE

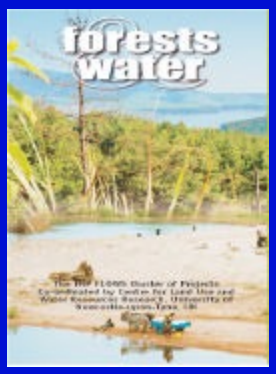
FAWPIO

FAWPIO has grown from a number of DFID projects addressing land and water resources management

FAWPIO aims to:

- **Bridge Research and Policy (BRAP) sharing the experience of a Network of selected projects**
- **Develop an Improved Framework for Land and Water Policies**
  - **Common principles and tools**
  - **Adapted to the reality of each country**

DFID Funded Research on Forests and Water



- Recognises differences in the public and science perceptions on interactions between land use and water
- FRP research (~M£2) worldwide aims to better understand land (forest) and water impacts:
  - Biophysical
  - Socio-economic
  - Connecting science with policy
  - Improve livelihoods

FRP FLOWS Research

- Low Base Flows and Livelihoods (LOWFLOWS) – India (HP and MP)
  Water management in watershed development
- Catchment Management and Poverty (CAMP) – South Africa, Grenada and Tanzania
  Land and water policies impact on livelihoods
- Cloud Forests – Costa Rica
  Bio-physical and socio-economic impact of cloud forests

FAWPIO DFID Projects

- India
  - WHIRL
  - KAWAD
  - APRLP
  - WORLP
- China
- Bangladesh
- Vietnam

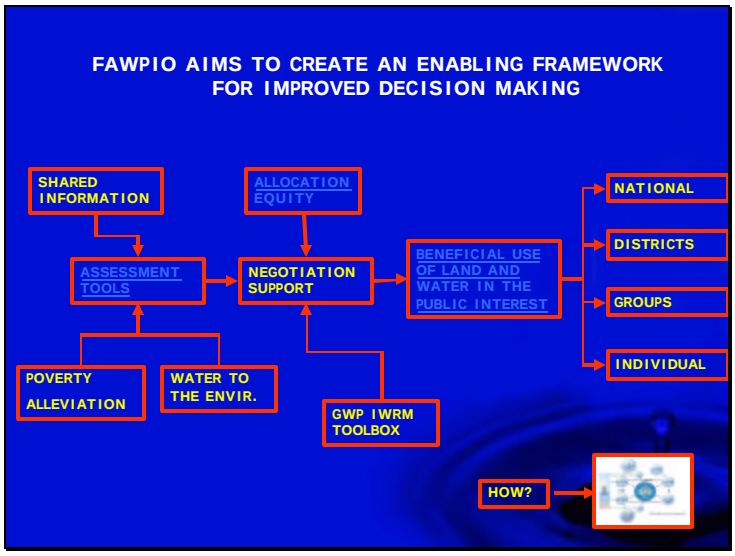
THE BRAP NETWORKS AIM TO LINK DECISION MAKERS AT ALL LEVELS WITH THEIR COUNTERPARTS IN OTHER COUNTRIES

FAWPIO BRAP Networks

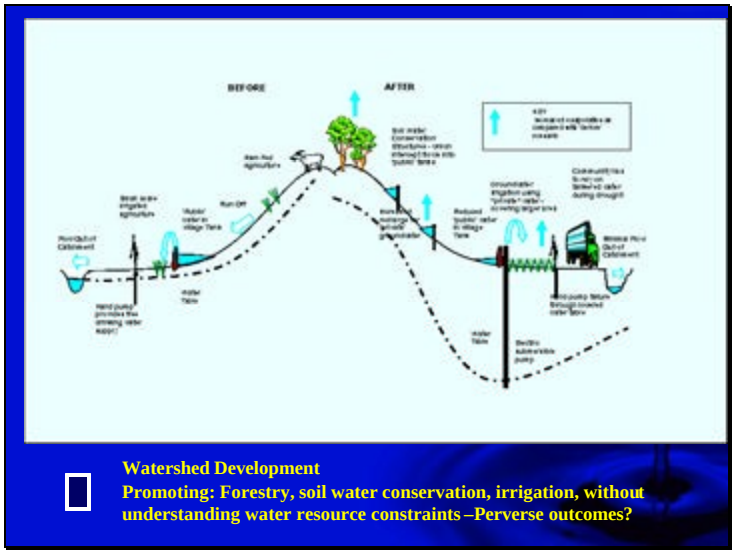
- Coordination Unit at UNEW (UK) in collaboration with DFID Water Policy Unit (London)
- Nodes at participant countries (INDIA-IIT Delhi) with DFID Country Programmes
- Interactions with International Organizations:
  - Global Water Partnership (GWP)
  - Challenge Programme (IWMI)
  - Funders (DFID, World Bank, EU)

FAWPIO BRAP Networks

- Nodes are based on hands-on experience of IMPLEMENTATION of improved land and water policy frameworks
- They build on peer-to-peer relationships to influence and promote implementation of new ideas
- They will be promoted as international best practice
  - GWP Toolbox
  - Guidelines for Governments
  - Guidelines for external assistance programmes


FAWPIO AIMS TO CREATE AN ENABLING FRAMEWORK
FOR IMPROVED DECISION MAKING
SHARED INFORMATION
ALLOCATION EQUITY
ASSESSMENT TOOLS
NEGOTIATION SUPPORT
BENEFICIAL USE OF LAND AND WATER IN THE PUBLIC INTEREST
NATIONAL
DISTRICTS
GROUPS
INDIVIDUAL
POVERTY ALLEVIATION
WATER TO THE ENVIR.
GWP IWRM TOOLBOX
HOW?


A SANCTIONED DISCOURSE PERPETUATES POOR PLANNING
"BENIGN TECHNOLOGIES" ARE OVEREXPLOITED WITHOUT TAKING INTO ACCOUNT THE WATER RESOURCES LIMITS
THERE IS A SELF-REINFORCING TENDENCY WHERE CURRENT INVESTMENTS IN "PERCEIVED" WISDOM PREVENT STAKEHOLDERS ACCEPTING NEW EVIDENCE



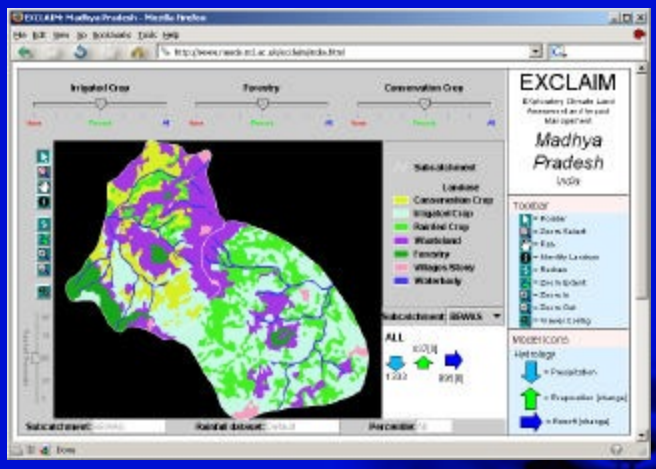
- **Watershed Development**
  Promoting: Forestry, soil water conservation, irrigation, without understanding water resource constraints –Perverse outcomes?

WATER AND LAND ALLOCATION POLICIES OFTEN DO NOT SUSTAINABLY ADDRESS POVERTY

- **POLICIES ARE APPLIED ON A "ONE SIZE FITS ALL" BASIS**
- **NO ANALYSIS OF THE ROOT CAUSES OF POVERTY AND DO NOT RECOGNISE ALL THE FACTORS UNDERLYING PRODUCTIVE WATER USE**
- **POVERTY MONITORING IS BASED ON THE STATE OF POVERTY RATHER THAN THE CAUSES**

WATER ALLOCATIONS DO NOT ALWAYS BALANCE THE PUBLIC BENEFITS AND IMPACTS

- ALLOCATIONS WITHIN THE IWRM FRAMEWORK SHOULD PROMOTE HIGH PUBLIC INTEREST – LOW IMPACT USES
- ALLOCATIONS SHOULD ENSURE THE WATER NEEDED TO REALIZE THE MDGs GETS PRIORITY
- THE LEVEL OF MANAGEMENT INTERVENTION SHOULD RECOGNISE A BALANCE BETWEEN IMPACTS AND PUBLIC BENEFIT



THANKS

Forest, Land and Water Policy:
Improving Outcomes