# PREAMBLE BY THE CHAIRMAN

The Director, CSWCRTI, Dehradun and Chairman of Institute Research Committee (IRC) welcomed the Heads of Centres/Divisions and other participants to IRC meeting, 2007. He informed the house that due to some unavoidable circumstances, the Research Advisory Committee (RAC) meeting of 2007 could not be held before IRC-2007, as per norms. However, permission to hold the IRC meeting was taken from the Chairman, RAC and its proceedings/recommendations would be conveyed to him.

Winning laurels in the field of natural resource management being a customary for the Institute, the Chairman brought to the notice of the house the significant achievements of the Institute during the past one year. Dr. K.S. Dadhwal, Principal Scientist and Head, Division of SS&A was conferred upon with Prof. E.P. Odum Gold Medal Award by the International Society of Ecological Communication, Jharkhand (Organ of Poland), for the year 2007 in recognition of his contributions in the area of contemporary Biology, Environmental Issues and Sustainable Development. Dr. P.K. Mishra, Head, Research Centre, Bellary and Dr. A.K. Tiwari, Head, Research Centre, Chandigarh were awarded the fellowship of the Indian Association of Soil and Water Conservationists (IASWC) for significant contributions in Soil and Water Conservation Research. Dr. N.K. Sharma, Sr. Scientist (Agro.) was awarded the Gold Medal of the Indian Association of Soil and Water Conservation for his contribution towards the activities of IASWC, while Er. Shakir Ali, Scientist (Sr. Scale) of the Research Centre, Kota won the Young Scientist Award. Dr. V.N. Sharda was bestowed upon with the Recognition Award of National Academy of Agricultural Sciences, New Delhi for the biennium 2005-06 for his significant contributions in the field of Agricultural Engineering and Technology, the most prestigious Rafi Ahmed Kidwai Award for the Biennium 2005-06 of ICAR, New Delhi for significant achievements and contributions in the field of Engineering and Technology, and Rajbhasha Gaurav Samman – 2007, awarded by Bhartiya Rajbhasha Parishad (New Delhi) for contribution in the area of propagation and expansion of Hindi language. The Chairman congratulated all the scientists who won the awards and called upon other scientists of the Institute to follow suit. The Chairman also informed the house of the successful organization of National Conference on "Environmental and Livelihood Security through Resource Management in Northern India" by IASWC through Research Centre, Chandigarh of the Institute. He informed the house that the next conference for central region, would be held in October-November, 2008 at Research Centre, Agra of the Institute.

On the research and extension fronts, the Chairman informed the house about the externally aided projects bagged by the Institute in the past year, including one under NAIP-ICAR at Dehradun, two under TDET of MoRD at Dehradun and Bellary, one under FPARP of MoWR at Dehradun and all the 8 Centres, one under National Bamboo Mission of MoA at Vasad, and one for study on development of integrated water resources management approach to cope with droughts from INCOH through National Institute of Hydrology (Roorkee) at Kota. The total outlay for these projects would be about Rs 577.75 lakhs. Also, Research Centre Udhagamandalam has been working on projects funded by the HADP of the State Government of Tamil Nadu. During the second phase of NAIP, the Research Centres are likely to get associated with proposals from other ICAR Institutes and organizations. The Chairman urged the Centres to strive hard for getting associated with externally aided projects and develop technically sound project proposals for external funding from National and International agencies. The Chairman opined that though caliber is there in the scientists, only the initiative is lacking. He stressed upon every Institute scientist to be the leader in at least 1-2 projects and associate in at least 2-4 projects, which is essentially required for developing skills and contribute significantly for efficient conservation and utilization of natural resources.

The Chairman highlighted the Government's concern for environmental issues which are very much enshrined in the Institute's mandate. The role of the Institute for conserving available natural resources and developing technologies to judiciously manage them is becoming increasingly important over the years. National land degradation estimates given by various agencies vary from 53 to 187 m ha. As per latest estimates worked out in consultation with different agencies, 73 m ha area is degraded solely by water erosion in arable land and 9 m ha in non arable land with less than 40% forest canopy. About 12 m ha area is affected by water erosion and soil salinity and 14 m ha by water erosion and soil acidity. Thus a total of 96 million hectare area is affected by water erosion alone or in

conjunction with soil salinity, acidity etc. In addition to 120 m ha area degraded due to water and wind erosion and other problems, 12 m ha is rocky and snow covered area, thus taking the total to 133 m ha area. Though the degraded area has been estimated, however the loss in production and productivity of major crops due to erosion has not yet been worked out. The Chairman urged all the Centres of the Institute along with the SS&A Division at the Headquarters to estimate the loss in productivity/production of all the major crops of rainfed land in the states assigned to each Centre under the Soil Loss Tolerance Limit project. Such data from various experiments conducted by the Institute Headquarters and Centres on runoff plots needs to be compiled and collated with the available potential soil erosion maps of the states. Since the issue is of National priority, therefore, this exercise should be completed within two months and report submitted by 28th February 2008 for onward submission to the Council.

The Chairman brought to the notice of the house the infrastructure developed by the Institute during the past year. The office building and residential complex at Research Centre, Agra and Scientists' Guest House at Research Centre, Vasad were inaugurated by Director General, ICAR. He stressed upon Research Centre, Koraput to complete construction of the new office building and residential complex within the financial year 2007-08. The boundary fencing of Research Farm at Selaqui (Dehradun) was also completed. The Chairman also informed the house that a Training Manual on Soil Conservation & Watershed Management has been published in three volumes by the Institute, which can be sold through the Centres also to the user agencies. The Chairman informed the house about the appointment of new Heads of the Research Centres at Agra, Koraput and Udhagamandalam, and four scientists to the Institute as well as promotions of four scientists as Senior Scientist or Scientist (Senior Scale).

The Chairman finally urged all to contribute heartily in the deliberations for strengthening the research activities of the Institute.

# SALIENT RECOMMENDATIONS OF IRC MEETING – 2007

1. Dr. K.P. Gore, Head, Research Centre, Koraput must ensure that the map of NEH region is completed by January 31, 2008, positively. Dr. G.P. Juyal, Head, H&E Division should complete the work of watershed Atlas by Feb. 29, 2008.

**(Action: Dr. K.P. Gore and Dr. G.P. Juyal)**

2. Inspite of repeated reminders, Head, H&E Division could not submit the document 'Fifty Years Research of Soil & Water Conservation'. The document must be submitted by the Head, H&E Division by January 31, 2008 with no further extension. Heads of Research Centres, Agra and Datia should immediately submit the Executive Summary of their Centre's document. The document of Research Centre, Chandigarh will serve as a model for the other Centres. Chandigarh Centre should submit the revised document by January 10, 2008 to the Headquarters, which will scrutinize the document by January 25, 2008 and send the CD to all Research Centres so that they can change / modify their respective documents accordingly by March 31, 2008. The Headquarters would check the document by April 30, 2008 and send it back to all Research Centres for final printing.

**(Action: All Heads of Research Centres / Divisions and RCM Unit)**

3. Documents of potential technologies submitted by the Research Centres to the Headquarters may be scrutinized by March 31, 2008 and sent back to respective Research Centres for final revision. Research Centres should publish their documents by May 31, 2008.

**(Action: All Heads of Research Centres / Divisions and RCM Unit)**

4. In order to make research data of concluded projects available to the Institute scientists, it is necessary that the data should be computerized. The status of data on rainfall, runoff, soil loss, vegetation change, plant parameters, crop yield etc. should be submitted by all the Research Centres and Divisions at Headquarters by February 29, 2008, followed by its computerization by June 30, 2008. In order to complete the computerization of data within the stipulated time, if required, services of outside sources may be taken on hire basis.

**(Action: All Heads of Research Centres / Divisions)**

5. All the Research Centres of the Institute along with SS&A Division at the Headquarters must work out the loss in productivity and production of all the predominant rainfed crops due to water erosion in the states assigned to each Centre under the Soil Loss Tolerance Limit project. Since the issue is of National priority, therefore this exercise should be completed within two months and report submitted by Feb. 29, 2008 for onward submission to the Council.

**(Action: All Heads of Research Centres / SS&A Division)**

6. It should be ensured by each Principal Scientist and Senior Scientist that he/she should be leader in at least two projects and each Scientist (Sr. Scale) and Scientist in atleast one project.

**(Action: All Scientists and Heads of Centres/ Divisions)**

7. All Centres should have requisite knowledge for running various runoff and erosion models such as SWAT, WEPP, AGNPS, CANWAT, HSPF etc. Scientists from every Centre including the Headquarter should get acquainted with at least one of these models and operationalize to share their expertise with other scientists. Models to be operationalized at different Centres are as follows:

- Artificial Intelligence Tools : Dehradun (Dr. P.R. Ojasvi & team)
- SWAT : Chandigarh (Dr. V.K. Bhatt & Dr A.K. Tewari)
- CANWAT : Koraput (Dr. R.K. Panda)
- Kineorose II : Vasad (Dr. D.R. Sena & Dr. R.S. Kurothe)
- HSPF : Kota (Er. Shakir Ali)

Data required for running the model should be collected by the scientist(s) of respective Centres and Headquarters. Workshop should be convened after 6 months to get acquainted with the models and upgrade the skills in operationalizing them.

**(Action: All Concerned)**

8. Dr. D.R. Sena should visit Research Centres at Bellary, Udhagamandalam and Koraput before March 31, 2008 for checking the procedure of data collection and suggest appropriate methods for computing ground water recharge.

**(Action: Dr. D.R. Sena, Scientist (SS), Vasad)**

9. Reports and findings of Core Projects should be submitted by the concerned leaders at Research Centres one month in advance to the Core Project Leader otherwise the name of the Centre will be deleted from the Core Project. Members of the core project team should meet one day earlier before the actual IRC Meeting to discuss the complete presentation.

**(Action: All Core Project Teams at different Research Centres and Heads)**

10. All scientists should ensure submission of atleast two research papers every year to the competent authority for approval to publish in refereed International / National journals.

**(Action: All Scientists and Heads)**

11. Monthly Progress Reports (MPRs) and Quarterly Progress Reports (QPRs), which are being submitted by Research Centres / Divisions for onward transmission to ICAR, are not up to the mark. The reporting should be well planned and presented in a quantifiable manner.

**(Action: All Heads of Research Centres / Divisions)**

12. The Bulletin on SLTL under different agro-ecological regions of India should be published by 29$^{th}$ February, 2008. Digital copies of SLTL maps of all the states should be provided to all the Research Centres.

**(Action : Dr. D. Mandal, Scientist (SS), HRD&SS Division )**

13. Collection of socio-economic data from Sukhomajri watershed may be restarted. Data collected earlier upto 2002 by Dr Y Agnihotri may be treated as benchmark and data for the period 2002 to 2007 may be interpolated.

**(Action: Head, Research Centre Chandigarh / Dr S.L. Arya)**

## ACTION TAKEN ON
## "SALIENT RECOMMENDATIONS OF IRC MEETING – 2006"

| S. No. | Action Assigned | Action Taken Report |
|---|---|---|
| 1. | The review of the progress of preparation of "National Atlas of Watershed Management Programme in the country" revealed that a lot of good work has been done by some of the Research Centres. However, the required information for compilation of the document still needs to be submitted and updated by some Research Centres. Research Centre, Koraput needs to make special efforts to compile the information for inclusion in the document from four eastern states of India. For this, requisite information and maps showing status of watershed development schemes in states of Jharkhand, Orissa and West Bengal may be provided by 31st January, 2007 and of Nagaland by 28th Feb., 2007. State maps of Gujarat, Maharashtra and Madhya Pradesh along with missing information should be provided by Vasad Centre positively by 28th Feb., 2007. Missing information and map for J&K state may be submitted by Head, Chandigarh centre by 31st Jan., 2007. All Centres must supply missing information in the already submitted material and additional information, if any, for Watershed Atlas by 15th January, 2007. Head, H&E Division may compile and complete the entire work by 31st March, 2007 after obtaining pending information of states assigned to different Research Centres.<br>(Action: All Heads of Research Centres & Head, H&E Division) | The desired information from Koraput, Vasad and Chandigarh Centres has been submitted timely to the Head, H&E Division. Missing information has been incorporated in the text pertaining to watershed development status of different states by the Head, H&E Division. The text including maps in respect of 11 states have been finalized and the assignment pertaining to preparation of maps of the remaining states of NEH region has been given to the Head, Research Centre, Koraput. This assignment has to be completed by Jan. 31, 2008 by Head of Koraput Centre and thereafter, Head, H&E Division shall complete the work of watershed Atlas by Feb. 29, 2008. |
| 2. | The review of the progress of preparation of "Fifty Years Research Achievement in Soil and Water Conservation" revealed that the documents have not been received from H&E and HRD&SS Divisions. The IRC viewed it seriously and it was decided that the two divisions must submit their respective documents by 15th February, 2007 positively with no further extension. Research Centre, Datia may submit the executive summary of their document by 31st December, 2006 and Research Centres, Agra & Koraput by 31st January, 2007. The documents submitted by Centres/Divisions have been scrutinized and refined accordingly. The document of Research Centre, Chandigarh once finalized will serve as a model for other Centres and Divisions to be adopted with suitable modifications as deemed necessary in view of prevailing regional situations for further improvement of the document. Hence, the model document once submitted to the Centres/Divisions on a CD must be thoroughly scrutinized for finalization of their own document by 31st March, 2007.<br>(Action: All Heads of Research Centres/Divisions) | Head, HRD&SS Division has submitted the document and Head, H&E Division has been asked to submit it positively by Jan. 31, 2008. Executive summary of Research Centre, Agra & Datia has to be submitted by Jan. 31, 2008 where as, it has been received from Research Centre, Koraput. The revised document from Research Centre, Chandigarh has been received which has to be modified further. |

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| 3. | All Heads and scientists must ensure that they are engaged in at least two research projects (in one as leader and in another as associate or in two as associate). Therefore, scientists of a research project which is to be concluded must take advance action for submitting new projects to RAC to ensure that he/she is not rendered without a minimum of two projects in any year.<br>(Action: All Heads and Scientists) | It is being followed by all Heads and scientists. A number of new proposals were submitted for approval of IRC – 2007. |
| 4. | The Heads of Centres/Divisions must ensure that all the scientists submit the RPFs pertaining to all new as well as on-going and concluded projects by 31st March, 2007 positively. A team of auditors from the office of the Principal Directorate of Audits (Scientific Departments), C&AG, Govt. of India, New Delhi audited the submission of RPFs of new, ongoing and concluded projects in Dec., 2006. It is mandatory that the complete RPFs are obtained by the concerned Heads of Centres/ Divisions prior to relieving a scientist due to transfer, promotion or retirement. Any lapse on this account or missing data of the concluded projects after the relieving of a scientist shall be the responsibility of the concerned Head of Centre/Division.<br>(Action: All Heads and RCM Unit) | Desired RPFs have been submitted by all Heads. Complete RPFs and data records prior to relieving a scientist due to transfer, promotion or retirement are being obtained by all Heads. |
| 5. | In the SRC Meeting 2005, all Centres and Divisions were assigned the task of submitting a complete package of certain number of potential technologies in the form of a folder / brochure comprising of 10 to 15 pages. Some of the Centres/Divisions have not submitted the write ups so far. Divisions of H&E and Plant Sciences may submit the documents of two technologies each by 15th January, 2007 positively. Research Centres, Kota and Chandigarh may submit the document of three and four technologies, respectively in proper format by 15th January, 2007 positively. Research Centre, Agra must submit the document of three technologies by 28th February, 2007.<br>(Action: Heads of Division, H&E and Plant Science and Heads of Research Centres, Agra, Chandigarh and Kota) | Desired packages of potential technologies have been submitted by the concerned Heads. |
| 6. | The need for bringing quality publications out of the ongoing or concluded projects was duly emphasized. It was decided that each scientist must endeavour to publish at least two research papers in reputed Journals having high score as per NAAS index every year with preferably one as international paper. All the Scientist and Heads of Centres / Divisions should promote this culture and ensure quality publications in future, which is an important indicator for the performance of individual scientist or the Institute as a whole.<br>(Action: All Heads of Centres / Divisions) | Though, publications of good quality have been brought out by the scientists, however, the IRC decided that atleast two good papers should be published by a scientist in reputed International / National Journals every year. |

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| 7. | As a follow up action of the workshop held at Chandigarh on 25th – 26th May 2005, all the Centres and Headquarters may identify two watersheds (one where watershed programme has been executed and completed and the second where it is ongoing) to test and validate the indicators developed and finalized to assess the impact of watershed interventions on biophysical, socio-economic and participatory attributes. To develop integrated farming systems and disseminate the technologies developed by the Institute in different agro-ecological regions, all Centres may identify a watershed and proposals submitted for funding under TDET of MoRD or any other agency as early as possible.<br>(Action: All Heads of Centres / Divisions) | One new watershed / project has been taken up by Bellary, Udhagamandalam and Vasad Centres and HRD&SS Division, Dehradun. The IRC advised other Centres and Headquarters to select new watersheds and develop integrated farming systems and disseminate the technologies developed by the Institute by arranging funding from MoRD or other agencies. |
| 8. | Concluded projects must clearly spell out the output of the research project in terms of process / product / technology developed (as per Item No.8223 of RPF - III) along with its domains of applicability indicating the region or area where it is applicable. The likely impact in terms of conservation of natural resources and or augmentation of agricultural production may be specified quantitatively with reasoning.<br>(Action: All Heads of Centres / Divisions) | It is being followed by all the Centres / Divisions. |

# RESEARCH PROGRAMMES AND SUB-PROGRAMMES

## P-1 WATER EROSION APPRAISAL IN DIFFERENT AGRO-ECOLOGICAL REGIONS (P.I. – Dr. K.S. Dadhwal)

1.1 Inventory and database of erosion status using modern tools and procedures
1.2 On-site and off-site effects of erosion
1.3 Soil erosion processes and models

## P-2 CONSERVATION MEASURES FOR SUSTAINABLE PRODUCTION SYSTEMS (P.I. – Dr. N.K. Sharma)

2.1 Resource conservation measures for arable lands
2.2 Resource conservation measures for non-arable lands

## P-3 HYDROLOGICAL BEHAVIOUR OF WATERSHEDS FOR CONSERVATION PLANNING (P.I. – Er. C. Prakash)

3.1 Rainfall, runoff, vegetation, soil characteristics and management practices
3.2 Effect of conservation measures and landuse on ground water recharge
3.3 Water harvesting

## P-4 REHABILITATION OF AREAS AFFECTED BY MASS EROSION (P.I. – Er. K.P. Tripathi)

4.1 Refinement of technologies for torrent training, landslide control and minespoils rehabilitation

## P-5 PARTICIPATORY INTEGRATED WATERSHED MANAGEMENT (P.I. – Dr. A. Raizada)

5.1 Methodologies for development of watersheds and decision support systems for interventions
5.2 Landuse planning
5.3 Impact on production, environment and bio-diversity
5.4 Farming system approach.
5.5 Watershed technologies (Strategic research)

## P-6 SOCIO-ECONOMIC ANALYSIS AND POLICY DEVELOPMENT FOR WATERSHED MANAGEMENT (P.I. – Dr. Pradeep Dogra)

6.1 Resource economics
6.2 Institute village linkage programme for Technology assessment and refinement
6.3 Common property resource management

## P-7 HUMAN RESOURCE DEVELOPMENT AND TECHNOLOGY TRANSER (P.I. – Dr. B.L. Dhyani)

7.1 Training methodology, need assessment, gender neutrality and evaluation
7.2 Organizational infrastructure & motivational parameters
7.3 Participatory approaches, dissemination of technology and adoption

# STATUS OF PROGRAMME WISE ON-GOING PROJECTS

## P-1 : WATER EROSION APPRAISAL IN DIFFERENT AGRO ECOLOGICAL REGIONS

### 1.1 : INVENTORY AND DATABASE OF EROSION STATUS USING MODERN TOOLS AND PROCEDURES

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 1. | Surface hydrologic response estimation using GIS. | S.S. Shrimali | Hydrology & Engineering, Dehradun | 2002 | 2008 | To be concluded |
| Comments: Project is extended for one year till 2008. | | | | | | |

### 1.3: SOIL EROSION PROCESSES AND MODELS

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|---|---|---|---|---|---|---|
| 2. | Development and validation of runoff and erosion prediction models in different agro-ecological regions. | V.N. Sharda<br>P.R. Ojasvi | Hydrology & Engineering, Dehradun | 2003 | 2008 | To be concluded<br>**(Core Project)** |
| | | A.K. Tiwari | Chandigarh | | | |
| | | V.S. Katiyar | Datia | | | |
| | | Shakir Ali | Kota | | | |
| | | R.S. Kurothe | Vasad | | | |
| Comments: Project is extended for one year till 2008. Standard procedure for computation of soil erodibility factor K of USLE equation may be adopted by Datia Centre. Reasons for increase in runoff after stabilizing to a certain minimum level may be scientifically analyzed and prioritized to arrive at a logical conclusion by Chandigarh Centre. Rainfall values higher than threshold rainfall should be used for computation of runoff and the initial abstraction value (Ia) may be optimized using this runoff value by Vasad Centre. (Action: Leaders at Chandigarh, Datia and Vasad Centres) | | | | | | |
| 3. | Erosion-productivity relationships for evaluating vulnerability and resiliency of soils under different agro-climatic regions of India. | D. Mandal<br>S. Patra<br>N.K. Sharma<br>P. Dogra | HRD&SS, Dehradun | 2008 | 2014 | To be continued<br>(**New Project**) |
| Comments: Required data may be collected additionally from on-going projects to cover various cropping systems. To cover the various agro-ecological regions of the country, this project may be formulated as a core-project. Two days workshop may be held in March, 2008 for formulation of core project. (Action: Dr. D. Mandal) | | | | | | |

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 4. | Effect of stone check dams on resource conservation in black soils under concentrated flow condition: Simulated study in tilting hydraulic flume. | A.K. Singh<br>P.K. Mishra<br>S.K.N. Math | Bellary | 2007 | 2009 | To be continued |

## P-2: CONSERVATION MEASURES FOR SUSTAINABLE PRODUCTION SYSTEMS

### 2.1: RESOURCE CONSERVATION MEASURES FOR ARABLE LANDS

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|---|---|---|---|---|---|---|
| 5. | Yield maximization and resource conservation through organic input management. | B.N. Ghosh<br>N.K. Sharma<br>Pradeep Dogra | Soil Science & Agronomy, Dehradun | 2007 | 2014 | To be continued |
| Comments: Dr. N.K. Sharma will replace Dr. O.P.S. Khola as first associate. | | | | | | |
| 6. | Evaluation of organic farming vis-à-vis inorganic farming for resource conservation and sustained productivity under prominent cropping system. | K.S. Dadhwal<br>N.K. Sharma<br>S. Patra | Soil Science & Agronomy, Dehradun | 2008 | 2015 | To be continued (**New Project**) |
| Comments: Treatments may be modified and their number reduced to seven as suggested. Experimental plot size should be minimum of 50m x 20m. (Action: Dr. K.S. Dadhwal) | | | | | | |
| 7. | Impact of *okra*-maize intercropping on resource conservation and productivity. | N.K. Sharma<br>D. Mandal<br>Ambrish Kumar | Soil Science & Agronomy, Dehradun | 2008 | 2013 | To be continued (**New Project**) |
| Comments: Treatments may be modified as suggested. (Action: Dr. N.K. Sharma) | | | | | | |
| 8. | Evaluating productivity potential of *bhimal* (*Grewia optiva*) along with field crops. | Harsh Mehta<br>K.S. Dadhwal | Plant Science, Dehradun | 2005 | 2015 | To be continued |
| Comments: Yield data may be correlated to soil data. (Action: Dr. Harsh Mehta) | | | | | | |
| 9. | Productivity enhancement in fruit and flower based two tier horticulture system through integrated nutrient management and mulching. | A.C. Rathore<br>B.N. Ghosh | Plant Science, Dehradun | 2008 | 2015 | To be continued (**New Project**) |
| Comments: Total number of treatments may be reduced to seven. Jasmine may be planted under two tier horticultural system and leader of project should ensure the success of Jasmine plantation. (Action: Dr. A.C. Rathore) | | | | | | |

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 10. | Integrated nutrient supply system for rainfed semi-arid tropics. | S.L. Patil | Bellary | 2000 | 2008 | To be concluded |
| Comments: Yield under deficient rainfall and normal rainfall conditions should be separated and analyzed to assess the effect of low, normal and good rainfall on yield. (Action: Dr. S.L. Patil) | | | | | | |
| 11. | Resource conservation and sustainable crop production using bio-fertilizers and organics in degraded Shiwaliks. | Pawan Sharma<br>Pratap Singh<br>Ram Prasad<br>S.L. Arya | Chandigarh | 2007 | 2011 | To be continued |
| Comments: Name of Dr. P. Bhattacharya is deleted. Economics of treatments should be reported. (Action: Dr. Pawan Sharma) | | | | | | |
| 12. | Effect of integrated nutrient management on soil properties under aonla based agri-horti system. | H. Biswas<br>Dev Narain | Datia | 2005 | 2009 | To be continued |
| 13. | Intercropping and tillage practices for sustainable production under rainfed condition in Bundelkhand. | Dev Narain<br>V.S. Katiyar<br>H. Biswas | Datia | 2006 | 2010 | To be continued |
| 14. | *In situ* moisture conservation practices under aonla based agro-forestry system for sustainable production in red soils of Bundelkhand. | Dev Narayan<br>H. Biswas | Datia | 2008 | 2016 | To be continued<br>**(New Project)** |
| Comments: Gauging devices must be installed by March 31, 2008. (Action: Dr. Dev Narayan) | | | | | | |
| 15. | Conserving resources and augmenting livelihood of small holders through multi-tier cropping systems in tribal dominant Eastern Ghats of Orissa. | P. Jakhar<br>B.S. Naik | Koraput | 2005 | 2008 | To be concluded |
| Comments: Mr. P. Jakhar and Er. B.S. Naik will be the leader and associate, respectively of the project and names of Mr. A. Dass and Dr. R.K. Panda are deleted. | | | | | | |
| 16. | Effect of soil amendments on surface cracks in black soils of south eastern Rajasthan. | J. Somasundaram<br>S.N. Prasad<br>Ashok Kumar | Kota | 2006 | 2009 | To be continued |
| 17. | Green manuring for resource conservation, soil health and productivity in fallow mustard cropping sequence. | S.N. Prasad<br>R.K. Singh<br>Shakir Ali<br>Ashok Kumar | Kota | 2008 | 2010 | To be continued<br>**(New Project)** |
| Comments: Taking into account the addition of nitrogen through green manuring, doses of nitrogen under different treatments may be reduced to 0, 15, 30 & 45 kg/ha. (Action: Dr. S.N. Prasad) | | | | | | |

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 18. | Soil health, productivity and conservation under different nutrient management systems for export oriented vegetable crops in the Nilgiris. | D.V. Singh<br>M. Madhu<br>V. Selvi | Udhagamandalam | 2006 | 2008 | To be concluded<br>**(Adhoc project of ICAR)** |
| Comments: To complete the crop cycle and implement the treatment as per plan, additional funds may be obtained from the ICAR, otherwise it will be provided by the Institute (Action: Dr. D.V. Singh) | | | | | | |
| 19. | Techniques for establishment of tea on terrace riser in the Nilgiris. | O.P.S. Khola<br>Gopal Kumar<br>V. Selvi | Udhagamandalam | 2008 | 2012 | To be continued<br>**(New Project)** |
| Comments: The riser slope may be taken as 1:1. Different treatments for testing the establishment of tea on risers such as different depths of hole for tea planting, soil and organic matter mixtures for filling of holes, standard spacing, micro-irrigation and minimum soil disturbance may be tried. (Action: Dr. O.P.S. Khola) | | | | | | |
| 20. | Improvisation of terraces of farmers' fields in the Nilgiris. | M. Madhu<br>Gopal Kumar | Udhagamandalam | 2008 | 2010 | To be continued<br>**(New Project)** |
| Comments: Treatments may be modified as suggested. (Action: Dr. M. Madhu) | | | | | | |
| 21. | Optimum tillage and organic manuring practices for crop production and resource conservation in the Nilgiris. | P. Murlidharan<br>O.P.S. Khola | Udhagamandalam | 2008 | 2011 | To be continued<br>**(New Project)** |
| 22. | Crop diversification through agro-forestry for productivity and sustainability on reclaimed land of Mahi ravines. | H.B. Singh<br>S.P. Tiwari<br>V.C. Pande | Vasad | 2003 | 2008 | To be concluded |
| Comments: Drumstick seeds may be supplied to all Research Centres (half kg to each) for testing. (Action: Dr. H.B. Singh) | | | | | | |

## 2.2: RESOURCE CONSERVATION MEASURES FOR NON-ARABLE LANDS

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|---|---|---|---|---|---|---|
| 23. | Evaluation of comparative performance of aonla based agri-horti systems at 2% slope in Doon Valley. | R.K. Dubey<br>K.S. Dadhwal<br>A.C. Rathore | Soil Science & Agronomy, Dehradun | 2002 | 2012 | To be continued |
| 24. | Evaluation of the agro-forestry systems for marginal lands in Doon valley. | Charan Singh<br>N.K. Sharma<br>Ratan Singh<br>Pradeep Dogra | HRD&SS, Dehradun | 2001 | 2010 | To be continued |
| 25. | Silvipastoral systems under various management practices for degraded lands. | Charan Singh<br>A. Raizada | HRD&SS, Dehradun | 1996 | 2012 | To be continued |

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 26. | Fuelwood and fodder production from densified plantations on old riverbed land. | A. Raizada<br>Charan Singh<br>B.N. Ghosh | Plant Science, Dehradun | 1997 | 2016 | To be continued |
| 27. | Evaluating the performance and developing techniques for enhancing growth and seed yield of Jatropha curcas in degraded lands of sub-humid Himalayas. | J. Jayaprakash<br>D. Mandal | Plant Science Dehradun | 2006 | 2015 | To be continued |
| Comments: Head, H&E Division may inspect the site alongwith Head, Plant Science Division and suggest measures to control water logging in the selected experimental site. Otherwise, new site alongwith suitable intercrops may be selected.<br>(Action: Dr. J. Jayaprakash / Head, H&E Division/Head, Plant Science Division) | | | | | | |
| 28. | Enhancement of guava productivity through canopy management and mulching in rainfed bouldery riverbed lands. | A.C. Rathore<br>B.N. Ghosh | Plant Science, Dehradun | 2008 | 2015 | To be continued<br>(**New Project**) |
| Comments: Guava may be planted at spacings of 6m x 6m and 3m x 6m. Fallow-*toria* and sunhemp -*toria* should be cultivated as treatments in the inter-tree space.<br>(Action: Dr. A.C. Rathore) | | | | | | |
| 29. | Economic fortification of existing forest and horti land use system through medicinal and aromatic species. | K.P. Mohapatra<br>Pramod Jha | Agra | 2005 | 2009 | To be continued |
| 30. | Evaluation of fruit species vis-à-vis conservation techniques for salt affected black soils of semi-arid tropic regions. | D. Ramajayam<br>R.N. Adhikari<br>S.K.N. Math<br>B. Mondal | Bellary | 2005 | 2015 | To be continued |
| 31. | Study on effect of *in situ* moisture conservation measures on runoff, soil loss and yield of maize crop. | Pratap Singh<br>V.K. Bhatt<br>Pawan Sharma | Chandigarh | 2007 | 2009 | To be continued |
| Comments: Dr. (Ms.) Pawan Sharma will replace Dr. P. Bhattacharya as second associate of the project. | | | | | | |
| 32. | Peach based agri-horticulture land use system for degraded Shiwaliks. | Ram Prasad<br>Pratap Singh<br>R.P. Yadav<br>S.L. Arya | Chandigarh | 2008 | 2015 | To be continued<br>**(New Project)** |

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 33. | Bio-engineering measures for resource conservation and management in red sloppy lateritic soils of Orissa. | B.S. Naik<br>R.K. Panda<br>P. Jakhar<br>H. Gowda | Koraput | 2008 | 2011 | To be continued<br>**(New Project)** |
| Comments: Study should be undertaken in minimum plot size of 40m x 20m. Vegetative barriers should be planted at row to row distance of 50 cm and plant to plant distance of 20 cm in staggered rows. H-flume should be installed for runoff and soil loss monitoring. Contour cultivation should be taken as control.<br>(Action: Er. B.S. Naik) | | | | | | |
| 34. | Evaluation of different under utilized fruit species with varying inter-space managements in Chambal ravines. | H.R. Meena<br>A.K. Parandiyal<br>J. Somasundaram<br>Ashok Kumar | Kota | 2006 | 2015 | To be continued |
| 35. | Evaluation of promising oilseed tree species under silvi-pastoral system for rehabilitation of Chambal ravines. | A.K. Parandiyal<br>J. Somasundaram<br>Ashok Kumar | Kota | 2008 | 2015 | To be continued<br>**(New Project)** |
| 36. | Studies on afforested Shola species and swamps in the Nilgiris. | R. Ragupathy<br>M. Madhu<br>P. Murlidharan | Udhagamandalam | 2005 | 2008 | To be concluded<br>**(HADP Funded)** |
| Comments: Data of same species across different edaphological, climatological and altitudinal conditions may be compared and analyzed. Characteristics of catchments (land use, area etc.) contributing runoff to swampy area should be incorporated in the study and water quality at the entrance and exit points of the shola forest watershed may be analyzed for its suitability for multiple uses. (Action: Mr. R. Ragupathy) | | | | | | |
| 37. | Effectiveness of different bio-engineering measures in new tea plantation in the Nilgiris. | D.C. Sahoo<br>P. Murlidharan<br>M. Madhu | Udhagamandalam | 2007 | 2010 | To be continued |
| 38. | Integrated management of soil health for sustainable production in the Nilgiris. | Gopal Kumar<br>D.C. Sahoo | Udhagamandalam | 2008 | 2010 | To be continued<br>**(New Project)** |
| Comments: Water and sediment yield data may be collected and CAN fertilizer should be added as treatment. Optimum lime requirement may be worked out based on soil testing and it must be economical. (Action: Dr. Gopal Kumar) | | | | | | |
| 39. | Enhancing productivity of non-arable ravine lands by plantation of cashew (*Anacardium occidentale* L.) with different intercropping systems. | H.B. Singh<br>M.L. Gaur<br>S.P. Tiwari<br>V.C. Pande | Vasad | 2008 | 2022 | To be continued<br>**(New Project)** |
| Comments: Only recommended cashew spacing to be adopted. Treatments may be modified as suggested. Water and sediment yield data may be collected.<br>(Action: Dr. H.B. Singh) | | | | | | |

## P-3: HYDROLOGICAL BEHAVIOUR OF WATERSHEDS FOR CONSERVATION PLANNING

### 3.1: RAINFALL, RUNOFF, VEGETATION, SOIL CHARACTERISTICS AND MANAGEMENT PRACTICES

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 40. | Hydrological behaviour of small watersheds and sustainability of production systems. | V.N. Sharda<br>C. Prakash<br>A. Raizada<br>N.K. Sharma | Hydrology & Engineering, Dehradun | 1999 | 2010 | To be continued |
| Comments: Intensive survey of trenches to assess their siltation status and vegetation establishment to be conducted. Performance of fruits and forest species may be assessed. Impact of agronomic and other interventions on income generation also should be assessed. The project is extended by three years till 2010. (Action: Dr. A. Raizada / Dr. N.K. Sharma) | | | | | | |
| 41. | Testing of hydrological instruments. | K.P. Tripathi<br>S. Patra | Hydrology & Engineering, Dehradun | 2005 | 2009 | To be continued |
| Comments: Project is extended for two years till 2009 and Er. S. Patra is associated with this project. Hydrological instruments may be tested in small stream and recommendations may be given to Bureau of Indian Standards. A channel of 10-20 m length may be constructed near tube well in the Research Farm for testing current meter. Digital sediment sampler and differential GPS (after operationalization) may be provided by Dr. G.P. Juyal to Er. K.P. Tripathi for testing. (Action: Er. K.P. Tirpathi/Dr. G.P. Juyal) | | | | | | |
| 42. | Environmental impact assessment of community based water resources management projects in Uttarakhand. | V.N. Sharda<br>P.R. Ojasvi<br>Pradeep Dogra | Hydrology & Engineering, Dehradun | 2006 | 2008 | To be concluded |
| Comments: Project is extended for one year till 2008. Data should be collected for one more year for analysis. (Action: Dr. V.N. Sharda) | | | | | | |
| 43. | Assessment of impact of climate change on hydrology and crop production in the selected watersheds. | K.P. Tripathi<br>D.R. Sena<br>S. Patra<br>S.P. Tiwari<br>H.B. Singh | Hydrology & Engineering, Dehradun | 2008 | 2011 | To be continued<br>**(NPCC Funded)**<br>**(New Project)** |
| 44. | Hydrological evaluation of recommended forest trees in Himalayan foothills. | A. Raizada<br>Ambrish Kumar<br>Charan Singh<br>B.N. Ghosh | Plant Science, Dehradun | 2004 | 2018 | To be continued |
| Comments: Calibration equations should be developed for runoff (control) vs runoff data to assess net effect of treatments. (Action: Dr. A. Raizada) | | | | | | |

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 45. | Combating land degradation through cycling of organic matter under different land use systems. | Pramod Jha<br>K.P. Mohapatra | Agra | 2007 | 2009 | To be continued |
| Comments : Name of Dr. Om Prakash is deleted. | | | | | | |
| 46. | Hydrological response to micro-catchments under different land uses with vegetation manipulation. | V.K. Bhatt<br>A.K. Tiwari<br>Pawan Sharma | Chandigarh | 2005 | 2012 | To be continued |
| Comments: Name of Dr. P. Bhattacharya is deleted. Micro watershed $WS_4$ (control) may be restored to original condition and maintained till the end of project. (Action: Dr. V.K. Bhatt) | | | | | | |
| 47. | Hydrological implication of sequential alternation of land use covers in a ravinous catchment. | R.S. Kurothe<br>D.R. Sena<br>V.C. Pande<br>S.P. Tiwari<br>H.B. Singh | Vasad | 2004 | 2012 | To be continued |
| 48. | Design development and testing of simple and low cost continuous mechanical sediment yield sampler. | D.R. Sena<br>R.S. Kurothe<br>S.P. Tiwari | Vasad | 2005 | 2008 | To be concluded |
| Comments: Project is extended for one year till 2008. Dr. D.R. Sena and Dr. M.L. Gaur will insure that the project work is completed in 2008. (Action: Dr. D.R. Sena/ Dr. M.L. Gaur) | | | | | | |
| 49. | Hydrologic and economic evaluation of Bamboo plantations in gullied lands under major ravines of India. | M.L. Gaur<br>S.P. Tiwari<br>V.C. Pande | Vasad | 2008 | 2011 | To be continued (**National Bamboo Mission**) **(New Project)** |
| | | K.P. Mohapatra<br>S.K. Dubey | Agra | | | |
| | | A.K. Parandiyal<br>Shakir Ali | Kota | | | |
| Comments: Similar project proposal with equal independent funding for Research Centres, Agra & Kota may be prepared by Feb., 2008. Dr. M.L. Gaur may pursue "National Bamboo Mission" for funding of these proposals. Meanwhile, the already available fund from the Mission may be allocated to Research Centres Agra & Kota to initiate the project. (Action : Dr. M.L. Gaur / Dr. K.P. Mohapatra / Dr. A.K. Parandiyal) | | | | | | |

### 3.2 : EFFECT OF CONSERVATION MEASURES AND LANDUSE ON GROUND WATER RECHARGE

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 50. | Effect of conservation structures on ground water recharge. | D.R. Sena<br>R.S. Kurothe<br>S.P. Tiwari<br>V.C. Pande | Vasad | 2001 | 2008 | To be concluded<br>**(Core Project)** |
| | | V.K. Bhatt<br>A.K. Tiwari<br>R.P. Yadav | Chandigarh | | | |
| | | V.S. Katiyar<br>H. Biswas | Datia | | | |
| | | Shakir Ali<br>R.K. Singh<br>B.K. Sethy | Kota | | | |
| | | R.K. Panda | Koraput | 2004 | | |
| | | R.N. Adhikari<br>A.K. Singh<br>S.K.N. Math | Bellary | 2004 | | |
| | | V. Selvi<br>D.V. Singh | Udhagamandalam | 2004 | | |
| Comments: Ground water recharge for individual structure depending upon location and size of structure may be isolated / segregated. Master recession curve equation should be used for estimating recharge by the Koraput centre. Core group meeting should be held to evolve uniform procedure for collection of relevant data and its analysis. Resistivity meter may be utilized from private organizations for generation of ground water data. (Action: Project Leaders at all study sites) | | | | | | |

### 3.3: WATER HARVESTING

| | | | | | | |
|---|---|---|---|---|---|---|
| 51. | Effective utilization of waterways for conservation and production. | S.S. Shrimali<br>B.N. Ghosh<br>Harsh Mehta<br>Charan Singh | Hydrology & Engineering, Dehradun | 2003 | 2008 | To be concluded |
| Comments: Flow entering into the waterways from other experimental sites may be accounted for computation of water budget. (Action: Er. S.S. Shrimali) | | | | | | |

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 52. | Hydrological evaluation of CBT in Himalayan foothills. | Ambrish Kumar<br>N.K. Sharma<br>B.L. Dhyani | HRD&SS, Dehradun | 2007 | 2009 | To be continued |
| Comments : Title of the project is modified. | | | | | | |
| 53. | Study on the effect of water quality on water use efficiency in Agra watershed. | S.K. Srivastava<br>Pramod Jha | Agra | 2007 | 2009 | To be continued |
| 54. | Effect of interventions on small watershed hydrology. | V.S. Katiyar<br>H. Biswas<br>Dev Narain | Datia | 2001 | 2008 | To be concluded |
| Comments: Dr. M.L. Gaur failed to provide requisite data to Dr. V.S. Katiyar for calibration period, and therefore calibration equations could not be developed. Dr. A.K. Tiwari, Head, Research Centre, Chandigarh and Dr. M.L. Gaur shall visit Research Centre Datia on 27th Dec., 2007 and make available the data from 1999 to 2004 to Dr. V.S. Katiyar who should develop calibration equations before his retirement.<br>(Action: V.S. Katiyar / Dr. M.L. Gaur / Dr. A.K. Tiwari) | | | | | | |

## P-4 REHABILITATION OF AREAS AFFECTED BY MASS EROSION

### 4.1 REFINEMENT OF TECHNOLOGIES FOR TORRENT TRAINING, LANDSLIDE CONTROL AND MINESPOILS REHABILITATION

| 55. | To find specifications for cost-effective design of spurs with regard to their shape, geometry and apron by carrying out laboratory studies (in hydraulic flume) | G.P. Juyal<br>S. Patra | Hydrology & Engineering, Dehradun | 2005 | 2008 | To be concluded |
|---|---|---|---|---|---|---|
| Comments: Name of Er. B.S. Naik is deleted and Dr. G.P. Juyal will be the leader of this project. Er. S. Patra is associated with the project. Out of the five comments given earlier, only two have been addressed. The project is extended for one year till 2008 to address the comments (i), (iii) & (v) of IRC-2006 proceedings.<br>(Action: Dr. G.P. Juyal) | | | | | | |
| 56. | Characterization of soil stability and its improvement in mass erosion prone areas of lower Shiwalik. | R.P. Yadav<br>V.K. Bhatt<br>A.K. Tiwari<br>Ram Prasad<br>Pawan Sharma | Chandigarh | 2007 | 2009 | To be continued |
| Comments: Dr. R.P. Yadav will replace Dr. P. Bhattacharya as leader of project. | | | | | | |

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 57. | Cost effective conservation measures for management of medium and deep ravinous lands | B.K. Sethy<br>A.K. Parandiyal<br>Shakir Ali<br>Ashok Kumar<br>J. Somasundaram | Kota | 2004 | 2012 | To be continued |
| Comments: Biotic interference, especially in case of bamboo in the control watershed must be checked for better comparison. (Action: Er. B.K. Sethy ) | | | | | | |
| 58. | Productive utilization of ravines through introduction of horticulture and improved planting materials. | A.K. Parandiyal<br>J. Somasundaram<br>B.K. Sethy<br>H.R. Meena | Kota | 2005 | 2010 | To be continued |
| Comments: Soil quality may be ascertained and Horticulture experts to be consulted before replacing *Sharifa* with aonla. The change made should be reported. (Action: Dr. A.K. Parandiyal) | | | | | | |
| 59. | Landslide characterization and management plan for the Nilgiris. | D.V. Singh<br>V. Selvi<br>D.C. Sahoo | Udhagamandalam | 2005 | 2009 | To be continued<br>**(HADP Funded)** |
| Comments: Project is extended for two years till 2009 and the title is modified. Land use with land slides in different zones may be integrated and treatment plans may be prepared accordingly. Funds must be procured from HADP by February, 2008. (Action: Dr. D.V. Singh) | | | | | | |
| 60. | Field based estimation of stream bank erosion for different ephemeral channels in Mahi ravines. | M.L. Gaur<br>S.P. Tiwari | Vasad | 2007 | 2009 | To be continued |
| Comments : Erosion status may be correlated with size of micro catchment area. (Action : Dr. M.L. Gaur) | | | | | | |

## P-5: PARTICIPATORY INTEGRATED WATERSHED MANAGEMENT

### 5.1 METHODOLOGIES FOR DEVELOPMENT OF WATERSHEDS AND DECISION SUPPORT SYSTEMS FOR INTERVENTIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| 61. | Resource conservation and management in Netrenahalli watershed, Chitradurga district, Karnataka. | R.N. Adhikari<br>S.K.N. Math<br>S.L. Patil<br>P.K. Mishra<br>N. Loganandhan<br>B. Mondal<br>D. Ramajayam | Bellary | 2008 | 2011 | To be continued<br>**TDET (MoRD)**<br>**(New Project)** |

### 5.3: IMPACT ON PRODUCTION, ENVIRONMENT AND BIODIVERSITY

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 62. | Ethno biological studies and impact evaluation on Indigenous Technical knowledge (ITK) associated with fishery resources, fish harvesting, fish poisons and community based fishing festivals in mid Himalayas. | M. Muruganandam<br>J. Jayaprakash | Hydrology & Engineering, Dehradun | 2007 | 2008 | To be concluded |
| Comments: Awareness may be created about the damage done to the fish fauna during Fishing Melas and alternatives for fish production and entertainment may be listed to minimize ecological disturbance. Compare environmental impacts of various such alternatives and link them to the recommendations of the State Fishery Department. (Action: Mr. M. Muruganandam) | | | | | | |

### 5.4 FARMING SYSTEM APPROACH

| | | | | | | |
|---|---|---|---|---|---|---|
| 63. | Visioning, Policy Analysis and Gender (V-PAGe) | Pradeep Dogra | HRD&SS, Dehradun | 2008 | 2012 | To be continued<br>(**NAIP Project**)<br>**(New Project)** |
| 64. | Enhancement of livelihood security through sustainable farming systems and related farm enterprises in North-West Himalaya. | B.L. Dhyani<br>Ambrish Kumar<br>D. Mandal | HRD&SS, Dehradun | 2008 | 2012 | To be continued<br>(**NAIP Project**)<br>**(New Project)** |

### 5.5 : WATERSHED TECHNOLOGIES (STRATEGIC RESEARCH)

| | | | | | | |
|---|---|---|---|---|---|---|
| 65. | Watershed Technology (Mission Mode). | K.P. Tripathi<br>Bankey Bihari<br>S. Patra | Hydrology & Engineering, Dehradun | 1999 | 2009 | To be continued |
| Comments: Project is extended for two years till 2009. Dr. Bankey Bihari will replace Dr. P. Dogra for socio-economic study. Er. S. Patra is associated as second associate. (Action: Er. K.P. Tripathi) | | | | | | |
| 66. | Development of model watershed Iduhatti in the Nilgiris. | M. Madhu<br>D.V. Singh<br>V. Selvi<br>P. Sundarambal<br>R. Ragupathy<br>Siddayya | Udhagamandalam | 2008 | 2011 | To be continued<br>**(HADP Funded)**<br>**(New Project)** |

## P-6: SOCIO-ECONOMIC ANALYSIS AND POLICY DEVELOPMENT FOR WATERSHED MANAGEMENT

### 6.1: RESOURCE ECONOMICS

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 67. | Relative performance of watershed development projects under different institutional structures in semi-arid Karnataka and Andhra Pradesh. | B. Mondal<br>N. Loganandhan<br>P.K. Mishra | Bellary | 2008 | 2010 | To be continued<br>**(New Project)** |
| Comments: Questionnaire may be revised to evolve concrete quantifiable methodology for comparing institutional structures for watershed development.<br>(Action: Dr. B. Mondal) | | | | | | |
| 68. | Economic analysis of soil and water conservation measures in Nilgiris. | Siddayya<br>D.C. Sahoo<br>M. Madhu<br>R. Ragupathy | Udhagamandalam | 2006 | 2008 | To be concluded |
| Comments: Dr. Siddayya will be the leader of the project. Realistic reasons for the negative and positive coefficients of the Cobb Douglas analysis may be assigned.<br>(Action: Dr. Siddayya) | | | | | | |

### 6.2 : INSTITUTE VILLAGE LINKAGE PROGRAMME FOR TECHNOLOGY ASSESSMENT AND REFINEMENT

| | | | | | | |
|---|---|---|---|---|---|---|
| 69. | Participatory dissemination and assessment of land and water management technologies for livelihood security in rainfed areas of north-western Himalayas under TDET scheme, Dept. of Land Resources, Ministry of rural Development. | B.L. Dhyani<br>D.S. Tomar<br>Ambrish Kumar<br>Charan Singh<br>Bankey Bihari<br>M. Muruganandam<br>D. Mandal | HRD&SS,<br>Dehradun | 2007 | 2010 | To be continued<br>**TDET (MoRD)** |
| Comments: Name of Mr. S.C. Mohan is deleted and Dr. D. Mandal is associated with the project. 3 km long GI pipeline must be installed by March, 2008.<br>(Action: Dr. B.L. Dhyani) | | | | | | |

### 6.3 : COMMON PROPERTY RESOURCE MANAGEMENT

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 70. | Evaluation of institutional arrangements and impact of community based water storage structures in different agro-climatic zones of India | Pradeep Dogra<br>Bankey Bihari<br>B.L. Dhyani<br>C. Prakash | HRD & SS, Dehradun | 2008 | 2011 | To be continued<br>**(Core Project)**<br>**(New Project)** |
| | | B. Mondal<br>N. Loganandhan<br>A.K. Singh | Bellary | | | |
| | | S.L. Arya<br>V.K. Bhatt | Chandigarh | | | |
| | | Om Prakash<br>V.S. Katiyar | Datia | | | |
| | | Ashok Kumar<br>S.V. Singh<br>Shakir Ali | Kota | | | |
| | | Siddayya<br>P. Sundarambal<br>D.C. Sahoo | Udhagamandalam | | | |
| | | V.C. Pande<br>G.L. Bagdi<br>D.R. Sena | Vasad | | | |
| Comments: A well structured schedule should be prepared for data collection. The population size for which the water storage/harvesting structure was constructed, the actual population it is serving, conflicts and their resolution should be clearly brought out from the study. Region-wise scope of such structures based on existing potential should be a recommendation of the study. (Action: Leaders at different locations) | | | | | | |

## P-7 HUMAN RESOURCE DEVELOPMENT AND TECHNOLOGY TRANSER

### 7.1 TRAINING METHODOLOGY, NEED ASSESSMENT, GENDER NEUTRALITY AND EVALUATION

| | | | | | | |
|---|---|---|---|---|---|---|
| 71. | Study on capacity building of field functionaries for watershed development and management. | Bankey Bihari | HRD & SS, Dehradun | 2005 | 2009 | To be continued |
| Comments: Project is extended for two years till 2009. The questionnaire / proforma should be systematically prepared to list all components of watershed and natural resource management and under each component, all activities should be listed to assess realistic training needs. The questionnaire / proforma should be sent to participants of various earlier training programmes conducted by the Institute for data collection. A large data set should be collected for analysis and arriving at a valid conclusion. (Action: Dr. Bankey Bihari) | | | | | | |

| S. No. | Title of the Project | Leader and Associates | Centre/Division | Start | Completion | Remarks |
|---|---|---|---|---|---|---|
| 72. | Capacity building programmes for watershed management in India: Assessment and impact analysis. | Bankey Bihari<br>B.L. Dhyani<br>P. Dogra | HRD & SS, Dehradun | 2008 | 2011 | To be continued<br>**(Core Project)**<br>**(New Project)** |
| | | N. Loganandham<br>B. Mondal | Bellary | | | |
| | | S.L. Arya | Chandigarh | | | |
| | | Om Prakash | Datia | | | |
| | | S.V. Singh<br>Ashok Kumar | Kota | | | |
| | | P. Sundarambal<br>Siddayya | Udhagamandalm | | | |
| | | G.L. Bagdi<br>V.C. Pande | Vasad | | | |
| Comments: The questionnaire to be developed should be very specific to soil and water conservation aspects and should be output oriented so that actual impact may be assessed. The developed questionnaire may be presented in a seminar before 30th April, 2008. For the study, participants trained by our Institute and other organizations, and their work done (output) should be identified. Trainings undergone by our trainees from other organizations should be taken into account. In order to improve our training programme, compare the outputs of our trainees with that of other trainees. (Action: Leaders at different locations) | | | | | | |

### 7.3 PARTICIPATORY APPROACHES, DESSEMINATION OF TECHNOLOGY AND ADOPTION

| | | | | | | |
|---|---|---|---|---|---|---|
| 73. | Information and communication technologies for efficient water management: US India collaborative extension / outreach and distance education under AKI. | S.L. Arya<br>A.K. Tiwari<br>Pratap Singh | Chandigarh | 2008 | 2009 | To be continued<br>(**AKI Project**)<br>**(New Project)** |

**NOTE :**

- Although the presentation mode this year was category wise, yet the listing has been done on the basis of identified programmes as done in previous years.
- The year of start and completion in respect of all the projects will be according to the relevant financial years.
- Projects without any soil conservation aspects do not fit into the mandate of the Institute. Hence, observations to justify the study may be recorded.
- Timely funding should be assured well in advance for those projects which are being externally supported.

# PROJECTS CONCLUDED IN 2007

| S. No. | Programme No. | S. No. of IRC Meeting Proc. 2006 | Title of the Project | Centre/Division |
|---|---|---|---|---|
| 1. | 1.1 | 1 | Assessment, monitoring and mapping of erosion hazards and developing a database for conservation planning. | Soil Science & Agronomy, Dehradun |
| 2. | 1.3 | 4 | Soil loss tolerance limits for agro-ecological regions of India. | HRD&SS Dehradun/ Agra/ Bellary/ Chandigarh/ Datia/ Koraput/ Kota/ Udhagamandalam/ Vasad. |
| 3. | 2.1 | 6 | Bi-cropping of *Stylosanthesis hamata* in maize-wheat rotation for their impact on resource conservation, soil health and productivity. | Soil Science & Agronomy, Dehradun (Terminated) |
| Comments: The project leader failed to identify bi-cropping treatment, resulting into failure of *Stylo Santhesis hamata* in Doon Valley conditions and non-utilization of two years project data, which is viewed very seriously by the House. (Action: Dr. O.P.S. Khola) | | | | |
| 4. | 2.1 | 7 | In-vitro micro propagation of elite provenances of Bhimal (*Grewia optiva)* | Plant Science, Dehradun |
| 5. | 2.1 | 12 | Evaluation of mechanical and vegetative measures on field size runoff plots. | Datia |
| Comments: Statistical data at 1% and 5% levels of significance may be analyzed and conservation efficiency of each measure with respect to control may be worked out. (Action: Dr. V.S. Katiyar) | | | | |
| 6. | 2.1 | 16 | Evaluation of conservation measures with prominent cropping systems for medium black soils. | Kota |
| 7. | 3.1 | 32 | Stochastic analysis of rainfall and runoff data for planning conservation measures. | Hydrology & Engineering, Dehradun |
| 8. | 3.1 | 38 | Soil conservation measures in red arable soils. | Datia |
| 9. | 3.1 | 39 | Studies on hydrological behaviour and management of Jhola lands in Eastern Ghat Highland Zone of Orissa. | Koraput |
| 10. | 5.3 | 54 | Integrated land and rainwater management for sustainable production in Shiwalik foothills in Mandhala village, Distt. Solan (H.P.). | Chandigarh |
| Comments: All the indicators (bio-physical, socio-economic etc.) for watershed management should be finalized, computed and compared with the bench mark data to assess the overall impact of the project. The findings may be published and made available to all concerned. *Modus operandi* of handing over the farmers' contributions may be finalized and reported. Monitoring to record changes in cropping pattern, income generation activities etc. and collection of meteorological data under ground water recharge project may also be continued even after the conclusion of the project. (Action: Dr. A.K. Tiwari) | | | | |

| S. No. | Programme No. | S. No. of IRC Meeting Proc. 2006 | Title of the Project | Centre/Division |
|---|---|---|---|---|
| 11. | 5.4 | 55 | Development and evaluation of integrated farming system in middle Himalayas | Hydrology & Engineering, Dehradun |
| Comments: Though the project is concluded but the Integrated Farming System (IFS) model must be maintained as a demonstration model in the ongoing Sainji watershed project. The IFS models which are being developed at three sites with the help of State Government Agencies may be ready within a year. (Action: Mr. M. Muruganandam) | | | | |
| 12. | 6.1 | 57 | Effect of watershed development programme on employment generation in semi-arid regions. | Bellary |
| 13. | 6.3 | 60 | Study on pastoral migratory graziers in relation to watershed projects in Shiwalik foothill villages in Haryana. | Chandigarh |
| 14. | 7.3 | 62 | Constraints analysis and methodology for transfer of technologies in watershed management programmes. | HRD & SS, Dehradun/ Bellary/ Datia/ Kota/ Udhagamandala/ Vasad |
| Comments: Clear cut recommendations based on administrative, management and technological constraints, failures and solutions for each watershed should be given alongwith general recommendations, especially pertaining to natural resource management/development, common to all the watersheds. A comprehensive report should be submitted by Feb. 29, 2008. (Action: Dr. Bankey Bihari) | | | | |

# NEW PROJECTS APPROVED IN IRC MEETING - 2007

| S. No. | Prog. No. | S.No. of this proc-eedings | Title of the Project | Centre/Division |
|---|---|---|---|---|
| 1. | 1.3 | 3 | Erosion productivity relationship for evaluating vulnerability and resiliency of soils under different agro-climatic regions of India. | HRD&SS, Dehradun |
| 2. | 2.1 | 6 | Evaluation of organic farming vis-à-vis inorganic farming for resource conservation and sustained productivity under prominent cropping system. | SS&A, Dehradun |
| 3. | 2.1 | 7 | Impact of *okra*-maize intercropping on resource conservation and productivity. | SS&A, Dehradun |
| 4. | 2.1 | 9 | Productivity enhancement in fruit and flower based two tier horticulture system through integrated nutrient management and mulching. | Plant Science, Dehradun |
| 5. | 2.1 | 14 | *In situ* moisture conservation practices under aonla based agro-forestry system for sustainable production in red soils of Bundelkhand. | Datia |
| 6. | 2.1 | 17 | Green manuring for resource conservation, soil health and productivity in fallow mustard cropping sequence. | Kota |
| 7. | 2.1 | 19 | Techniques for establishment of tea on terrace riser in the Nilgiris. | Udhagamandalam |
| 8. | 2.1 | 20 | Improvisation of terraces of farmers' fields in the Nilgiris. | Udhagamandalam |
| 9. | 2.1 | 21 | Optimum tillage and organic manuring practices for crop production and resource conservation in the Nilgiris. | Udhagamandalam |
| 10. | 2.2 | 28 | Enhancement of guava productivity through canopy management and mulching in rainfed bouldery riverbed lands. | Plant Science, Dehradun |
| 11. | 2.2 | 32 | Peach based agri-horticulture land use system for degraded Shiwaliks. | Chandigarh |
| 12. | 2.2 | 33 | Bio-engineering measures for resource conservation and management in red sloppy lateritic soils of Orissa. | Koraput |
| 13. | 2.2 | 35 | Evaluation of promising oilseed tree species under silvi-pastoral system for rehabilitation of Chambal ravines. | Kota |
| 14. | 2.2 | 38 | Integrated management of soil health for sustainable production in the Nilgiris. | Udhagamandalam |
| 15. | 2.2 | 39 | Enhancing productivity of non-arable ravine lands by plantation of cashew (*Anacardium occidentale* L.) with different intercropping systems. | Vasad |
| 16. | 3.1 | 43 | Assessment of impact of climate change (runoff and soil loss) on crop production in the selected watersheds. | H&E, Dehradun |
| 17. | 3.1 | 49 | Hydrologic and economic evaluation of Bamboo plantations in gullied lands under major ravines of India. | Vasad/Agra/Kota |

| S. No. | Prog. No. | S.No. of this proc-eedings | Title of the Project | Centre/Division |
|---|---|---|---|---|
| 18. | 5.1 | 61 | Resource conservation and management in Netrenahalli watershed, Chitradurga district, Karnataka. | Bellary |
| 19. | 5.4 | 63 | Visioning, Policy Analysis and Gender (V-PAGe) | HRD&SS, Dehradun |
| 20. | 5.4 | 64 | Enhancement of livelihood security through sustainable farming systems and related farm enterprises in North-West Himalaya. | HRD&SS, Dehradun |
| 21. | 5.5 | 66 | Development of model watershed Iduhatti in the Nilgiris. | Udhagamandalam |
| 22. | 6.1 | 67 | Relative performance of watershed development projects under different institutional structures in semi-arid Karnataka and Andhra Pradesh. | Bellary |
| 23. | 6.3 | 70 | Evaluation of institutional arrangements and impact of community based water storage structures in different agro-climatic zones of India | HRD&SS/Bellary/ Chandigarh/ Datia/ Kota/ Udhagamandalam/ Vasad |
| 24. | 7.1 | 72 | Capacity building programmes for watershed management in India: Assessment and impact analysis. | HRD&SS/Bellary/ Chandigarh/ Datia/ Kota/ Udhagamandalam/ Vasad |
| 25. | 7.3 | 73 | Information and communication technologies for efficient water management: US India collaborative extension / outreach and distance education under AKI. | Chandigarh |

## OBSERVATIONAL TRIAL APPROVED FOR 2008

| S.No. | Title of the project | Leader & Associate | Centre/Division |
|---|---|---|---|
| 1. | Application of GIS for automatic delineation of micro-watersheds, their characterization and priority settings for planning and management. | D.R. Sena<br>M.L. Gaur<br>H.B. Singh | Vasad |

# DIVISION/CENTRE-WISE NUMBER OF ON-GOING PROJECTS

## TOTAL NUMBER OF PROJECTS (DIVISION/CENTRE-WISE)

| S. No. | DIVISION/CENTRE | SL. NO. OF ON-GOING PROJECTS | TOTAL |
|---|---|---|---|
| 1. | Dehradun | | |
| | • Soil Science & Agronomy | 5, 6, 7, 23 | **4** |
| | • Hydrology & Engineering | 1, 2, 40, 41, 42, 43, 51, 55, 62, 65 | **10** |
| | • HRD & SS | 3, 24, 25, 52, 63, 64, 69, 70, 71, 72 | **10** |
| | • Plant Science | 8, 9, 26, 27, 28, 44 | **6** |
| 2. | Agra | 29, 45, 49, 53 | **4** |
| 3. | Bellary | 4, 10, 30, 50, 61, 67, 70, 72 | **8** |
| 4. | Chandigarh | 2, 11, 31, 32, 46, 50, 56, 70, 72, 73 | **10** |
| 5. | Datia | 2, 12, 13, 14, 50, 54, 70, 72 | **8** |
| 6. | Koraput | 15, 33, 50 | **3** |
| 7. | Kota | 2, 16, 17, 34, 35, 49, 50, 57, 58, 70, 72 | **11** |
| 8. | Udhagamandalam | 18, 19, 20, 21, 36, 37, 38, 50, 59, 66, 68, 70, 72 | **13** |
| 9. | Vasad | 2, 22, 39, 47, 48, 49, 50, 60, 70, 72 | **10** |
| | **Grand Total** | | **97** |

## PROGRAMME-WISE NUMBER OF PROJECTS

| S. No. | DIVISION/ CENTRE | P-1 | P-2 | P-3 | P-4 | P-5 | P-6 | P-7 | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Dehradun | | | | | | | | |
| | ♦ Soil Science & Agronomy | - | 4 | - | - | - | - | - | **4** |
| | ♦ Hydrology & Engineering | 2 | - | 5 | 1 | 2 | - | - | **10** |
| | ♦ HRD & SS | 1 | 2 | 1 | - | 2 | 2 | 2 | **10** |
| | ♦ Plant Science | - | 5 | 1 | - | - | - | - | **6** |
| 2. | Agra | - | 1 | 3 | - | - | - | - | **4** |
| 3. | Bellary | 1 | 2 | 1 | - | 1 | 2 | 1 | **8** |
| 4. | Chandigarh | 1 | 3 | 2 | 1 | - | 1 | 2 | **10** |
| 5. | Datia | 1 | 3 | 2 | - | - | 1 | 1 | **8** |
| 6. | Koraput | - | 2 | 1 | - | - | - | - | **3** |
| 7. | Kota | 1 | 4 | 2 | 2 | - | 1 | 1 | **11** |
| 8. | Udhagamandalam | - | 7 | 1 | 1 | 1 | 2 | 1 | **13** |
| 9. | Vasad | 1 | 2 | 4 | 1 | - | 1 | 1 | **10** |
| | **Grand Total** | **8** | **35** | **23** | **6** | **6** | **10** | **9** | **97** |

# NUMBER OF PROJECTS WITH INDIVIDUAL SCIENTIST

In the Staff Research Council Meeting of 1995, certain norms regarding **MAXIMUM** number of projects that any scientist of CSWCRTI may hold, were decided as mentioned below:

**A. Leadership in one project with association in other four projects (1+4)**

or

**B. Leadership in two projects with association in other two projects (2+2)**

or

**C. Leadership in three projects without association in any other project (3+0)**

In the Staff Research Council Meeting of 2000, certain norms regarding **MINIMUM** number of projects that any scientist of CSWCRTI may hold, were decided as mentioned below:

**A. Leadership in one project with association in other one project (1+1)**

or

**B. Association in two projects (0+2).**

The number of projects with each individual scientist of the Institute, after the IRC Meeting of 2007 is as follows:

| S. No. | Name | Designation | Leader | Associate | Total | S. No. of projects to be concluded |
|---|---|---|---|---|---|---|
| 1. | Dr. V.N. Sharda | Director | 3 (2,40,42) | -- | 3 | 2,42 |
| **Soil Science and Agronomy Division** | | | | | | |
| 2. | Dr. K.S. Dadhwal | Head of Division | 1 (6) | 2 (8,23) | 3 | -- |
| 3. | Dr. Ratan Singh | Pr. Scientist (Soils) | -- | 1 (24) | 1 | -- |
| 4. | Dr. N.K. Sharma | Sr. Scientist (Agro.) | 1 (7) | 6 (3,5,6,24,40,52) | 7 | -- |
| 5. | Dr. B.N. Ghosh | Sr. Scientist (Soils) | 1 (5) | 5 (9,26,28,44,51) | 6 | 51 |
| 6. | Mr. R.K. Dubey | Scientist (SS) (Agro.) | 1 (23) | -- | 1 | -- |
| **Hydrology and Engineering Division** | | | | | | |
| 7. | Dr. G.P. Juyal | Head of Division | 1 (55) | -- | 1 | 55 |
| 8. | Er. K.P. Tripathi | Pr. Scientist (Engg.) | 3 (41,43,65) | -- | 3 | -- |
| 9. | Dr. P.R. Ojasvi | Sr. Scientist (Engg.) | -- | 2 (2,42) | 2 | 2,42 |
| 10. | Er. S.S. Shrimali | Sr. Scientist (Com.App.) | 2 (1,51) | -- | 2 | 1,51 |
| 11. | Mr. M. Muruganandam | Scientist (SS) (Fisheries) | 1 (62) | 1 (69) | 2 | 62 |
| 12. | Er. S. Patra | Scientist (Engg.) | -- | 6 (3,6,41,43, 55,65) | 6 | 55 |
| **Human Resource Development and Social Science Division** | | | | | | |
| 13. | Dr. B.L. Dhyani | Head of Division | 2 (64,69) | 3 (52,70,72) | 5 | -- |
| 14. | Mr. D.S. Tomar | Sr. Scientist (Agro.) | -- | 1 (69) | 1 | -- |
| 15. | Dr. Bankey Bihari | Sr. Scientist (Ag. Extn.) | 2 (71,72) | 3 (65,69,70) | 5 | -- |
| 16. | Dr. Charan Singh | Sr. Scientist (Forestry) | 2 (24,25) | 4 (26,44,51,69) | 6 | 51 |
| 17. | Dr. Ambrish Kumar | Sr. Scientist (Engg.) | 1 (52) | 4 (7,44,64,69) | 5 | -- |
| 18. | Dr. D. Mandal | Scientist (SS) (Soils) | 1 (3) | 4 (7,27,64,69) | 5 | -- |

**(Figures in parenthesis are serial number of on-going projects listed in these proceedings).**

| S. No. | Name | Designation | Leader | Associate | Total | S. No. of projects to be concluded |
|---|---|---|---|---|---|---|
| **Plant Science Division** | | | | | | |
| 19. | Dr. A. Raizada | I/c Head of Division | 2 (26,44) | 2 (25,40) | 4 | -- |
| 20. | Dr. Harsh Mehta | Sr. Scientist (Pl. Breed.) | 1 (8) | 1 (51) | 2 | 51 |
| 21. | Dr. A.C. Rathore | Scientist (Hort.) | 2 (9,28) | 1 (23) | 3 | -- |
| 22. | Dr. J. Jayaprakash | Scientist (Forestry) | 1 (27) | 1 (62) | 2 | 62 |
| 23. | Dr. J.M.S. Tomar | Scientist (Forestry) | -- | -- | Nil | -- |
| **Research Coordination & Management Unit** | | | | | | |
| 24. | Er. C. Prakash | Pr. Scientist (Engg.) | -- | 2 (40,70) | 2 | -- |
| 25. | Mr. A.K. Khullar | Scientist (SG) (Ag. Stat.) | -- | -- | Nil | -- |
| 26. | Dr. Pradeep Dogra | Sr. Scientist (Ag. Eco.) | 2 (63,70) | 5 (3,5,24,42,72) | 7 | 42 |
| **Research Centre, Agra** | | | | | | |
| 27. | Dr. S.K. Dubey | Head of Centre | -- | 1 (49) | 1 | -- |
| 28. | Dr. H.C. Nitant | Pr. Scientist (Soils) | -- | -- | Nil | -- |
| 29. | Er S.K. Srivastava | Scientist (Engg.) | 1 (53) | -- | 1 | -- |
| 30. | Dr. K.P. Mohapatra | Scientist (Forestry) | 2 (29,49) | 1 (45) | 3 | -- |
| 31. | Dr. Pramod Jha | Scientist (Soils) | 1 (45) | 2 (29,53) | 3 | -- |
| **Research Centre, Bellary** | | | | | | |
| 32. | Dr. P.K. Mishra | Head of Centre | -- | 3 (4,61,67) | 3 | -- |
| 33. | Er. R.N. Adhikari | Pr. Scientist (Engg.) | 2 (50,61) | 1 (30) | 3 | 50 |
| 34. | Dr. S.K.N. Math | Pr. Scientist (Soils) | -- | 4 (4,30,50,61) | 4 | 50 |
| 35. | Dr. S.L. Patil | Sr. Scientist (Agro.) | 1 (10) | 1 (61) | 2 | 10 |
| 36. | Er. A.K. Singh | Scientist (SS) (Engg.) | 1 (4) | 2 (50,70) | 3 | 50 |
| 37. | Dr. N. Loganandhan | Scientist (SS)(Ag. Extn.) | 1 (72) | 3 (61,67,70) | 4 | -- |
| 38. | Dr. B. Mondal | Scientist (Ag. Eco.) | 2 (67,70) | 3 (30,61,72) | 5 | -- |
| 39. | Mr. D. Ramajayam | Scientist (Hort.) | 1 (30) | 1 (61) | 2 | -- |
| **Research Centre, Chandigarh** | | | | | | |
| 40. | Dr. A.K. Tiwari | Head of Centre | 1 (2) | 4 (46,50,56,73) | 5 | 2,50 |
| 41. | Dr.(Ms.) Pawan Sharma | Pr. Scientist (Soil Micro-bio) | 1 (11) | 3 (31,46,56) | 4 | -- |
| 42. | Dr. Pratap Singh | Pr. Scientist (Agro.) | 1 (31) | 3 (11,32,73) | 4 | -- |
| 43. | Dr. R.P. Yadav | Sr. Scientist (Soils) | 1 (56) | 2 (32,50) | 3 | 50 |
| 44. | Dr. (Ms.) S.L. Arya | Sr. Scientist (Ag. Eco.) | 3 (70,72,73) | 2 (11,32) | 5 | -- |
| 45. | Dr. V.K. Bhatt | Sr. Scientist (Engg.) | 2 (46,50) | 3 (31,56,70) | 5 | 50 |
| 46. | Dr. Ram Prasad | Sr. Scientist (Hort.) | 1 (32) | 2 (11,56) | 3 | -- |
| **Research Centre Datia** | | | | | | |
| 47. | Dr. V.S. Katiyar | Head of Centre | 3 (2,50,54) | 2 (13,70) | 5 | 2,50,54 |
| 48. | Dr. Dev Narayan | Sr. Scientist (Agro.) | 2 (13,14) | 2 (12,54) | 4 | 54 |
| 49. | Dr. Om Prakash | Sr. Scientist (Ag. Extn.) | 2 (70,72) | -- | 2 | -- |
| 50. | Dr. H. Biswas | Scientist (Soils) | 1 (12) | 4 (13,14,50,54) | 5 | 50,54 |

**(Figures in parenthesis are serial number of on-going projects listed in these proceedings).**

| S. No. | Name | Designation | Leader | Associate | Total | S. No. of projects to be concluded |
|---|---|---|---|---|---|---|
| **Research Centre, Koraput** | | | | | | |
| 51. | Dr. K.P. Gore | Head of Centre | -- | -- | Nil | -- |
| 52. | Dr. R.K. Panda | Sr. Scientist (Engg.) | 1 (50) | 1 (33) | 2 | 50 |
| 53. | Er. B.S. Naik | Scientist (Engg.) | 1 (33) | 1 (15) | 2 | 15 |
| 54. | Mr. H. Gowda | Scientist (Forestry) | -- | 1 (33) | 1 | -- |
| 55. | Mr. P. Jakhar | Scientist (Agro.) | 1 (15) | 1 (33) | 2 | 15 |
| **Research Centre, Kota** | | | | | | |
| 56. | Dr. S.N. Prasad | Head of Centre | 1 (17) | 1 (16) | 2 | -- |
| 57. | Dr. R.K. Singh | Sr. Scientist (Soil Fer.) | -- | 2 (17,50) | 2 | 50 |
| 58. | Dr. S.V. Singh | Sr. Scientist (Ag. Extn.) | 1 (72) | 1 (70) | 2 | -- |
| 59. | Dr. A.K. Parandiyal | Sr. Scientist (Forestry) | 3 (35,49,58) | 2 (34,57) | 5 | -- |
| 60. | Dr. Ashok Kumar | Sr. Scientist (Ag. Eco.) | 1 (70) | 6 (16,17,34, 35,57,72) | 7 | -- |
| 61. | Er. Shakir Ali | Scientist (SS) (Engg.) | 2 (2,50) | 4 (17,49,57,70) | 6 | 2,50 |
| 62. | Dr. J. Somasundaram | Scientist (SS) (Soils) | 1 (16) | 4 (34,35,57,58) | 5 | -- |
| 63. | Er. B.K. Sethy | Scientist (Engg.) | 1 (57) | 2 (50,58) | 3 | 50 |
| 64. | Mr. H.R. Meena | Scientist (Hort.) | 1 (34) | 1 (58) | 2 | -- |
| **Research Centre, Udhagamandalam** | | | | | | |
| 65. | Dr. O.P.S. Khola | Head of Centre | 1 (19) | 1 (21) | 2 | -- |
| 66. | Dr. M. Madhu | Sr. Scientist (Agro.) | 2 (20,66) | 4 (18,36,37,68) | 6 | 18,36,68 |
| 67. | Dr. D.V. Singh | Sr. Scientist (Soil Fer.) | 2 (18,59) | 2 (50,66) | 4 | 18,50 |
| 68. | Dr.(Ms.) P.Sundarambal | Sr. Scientist (Ag. Extn.) | 1 (72) | 2 (66,70) | 3 | -- |
| 69. | Mr. R. Ragupathy | Scientist (SS) (Forestry) | 1 (36) | 2 (66,68) | 3 | 36,68 |
| 70. | Er. (Ms.) V. Selvi | Scientist (SS) (Engg.) | 1 (50) | 4 (18,19,59,66) | 5 | 18,50 |
| 71. | Dr. P. Murlidharan | Scientist (SS) (Soils) | 1 (21) | 2 (36,37) | 3 | 36 |
| 72. | Er. D.C. Sahoo | Scientist (Engg.) | 1 (37) | 4 (38,59,68,70) | 5 | 68 |
| 73. | Dr. Gopal Kumar | Scientist (Soils) | 1 (38) | 2 (19,20) | 3 | -- |
| 74. | Dr. Siddayya | Scientist (Ag. Eco.) | 2 (68,70) | 2 (66,72) | 4 | 68 |
| **Research Centre, Vasad** | | | | | | |
| 75. | Dr. R.S. Kurothe | Head of Centre | 2 (2,47) | 2 (48,50) | 4 | 2,48,50 |
| 76. | Dr. H.B. Singh | Pr. Scientist (Agro.) | 2 (22,39) | 2 (43,47) | 4 | 22 |
| 77. | Dr. S.P. Tiwari | Pr. Scientist (Soil Fer.) | -- | 8 (22,39,43,47, 48,49,50,60) | 8 | 22,48,50 |
| 78. | Dr. M.L. Gaur | Sr. Scientist (Engg.) | 2 (49,60) | 1 (39) | 3 | -- |
| 79. | Dr. G.L. Bagdi | Sr. Scientist (Ag. Extn.) | 1 (72) | 1 (70) | 2 | -- |
| 80. | Mr. V.C. Pande | Scientist (SG) (Ag.Eco.) | 1 (70) | 6 (22,39,47,49, 50,72) | 7 | 22,50 |
| 81. | Dr. D.R. Sena | Scientist (SS) (Engg.) | 2 (48,50) | 3 (43,47,70) | 5 | 48,50 |

**(Figures in parenthesis are serial number of on-going projects listed in these proceedings).**

# LIST OF PARTICIPANTS

| | | | |
|---|---|---|---|
| 1. | Dr. V.N. Sharda | Director | Chairman |
| **CSWCRTI, DEHRADUN** | | | |
| 2. | Dr. K.S. Dadhwal | Head (SS&A Division) | Member |
| 3. | Dr. G.P. Juyal | Head (H&E Division) | Member |
| 4. | Dr. B.L. Dhyani | Head (HRD&SS Division) | Member |
| 5. | Dr. A. Raizada | I/c Head (Plant Science Division) | Member |
| 6. | Er. K.P. Tripathi | Principal Scientist (Engg.) | |
| 7. | Dr. Ratan Singh | Principal Scientist (Soils) | |
| 8. | Er. C. Prakash | Principal Scientist (Engg.) & OIC (RCM Unit) | Member Secretary |
| 9. | Mr. D.S. Tomar | Senior Scientist (Agro.) | |
| 10. | Dr. N.K. Sharma | Senior Scientist (Agro.) | |
| 11. | Dr. P.R. Ojasvi | Senior Scientist (Engg.) | |
| 12. | Er. S.S. Shrimali | Senior Scientist (CAA) | |
| 13. | Dr. Charan Singh | Senior Scientist (Forestry) | |
| 14. | Dr. B.N. Ghosh | Senior Scientist (Soils) | |
| 15. | Dr. Pradeep Dogra | Senior Scientist (Ag. Eco.) | Rapporteur |
| 16. | Dr. Ambrish Kumar | Senior Scientist (Engg.) | |
| 17. | Dr. Bankey Bihari | Senior Scientist (Ag. Extn.) | |
| 18. | Mr. M. Muruganandam | Scientist (SS) (Fisheries) | |
| 19. | Mr. R.K. Dubey | Scientist (SS) (Agro.) | |
| 20. | Dr. D. Mandal | Scientist (SS) (Soils) | |
| 21. | Dr. A.C. Rathore | Scientist (Hort.) | |
| 22. | Dr. J. Jayaprakash | Scientist (Forestry) | |
| 23. | Dr. J.M.S. Tomar | Scientist (Forestry) | |
| 24. | Dr.(Ms.)Sangeeta N.Sharma | Technical Officer (T-7-8) | Rapporteur |
| 25. | Mr. S.K. Sinha | Technical Officer (T-5) | Rapporteur |
| **RESEARCH CENTRE, AGRA** | | | |
| 26. | Dr. S.K. Dubey | Head of the Centre | Member |
| 27. | Dr. Om Prakash | Principal Scientist (Agro.) | |
| 28. | Dr. K.P. Mohapatra | Scientist (Forestry) | |
| 29. | Dr. Pramod Jha | Scientist (Soils) | |
| **RESEARCH CENTRE, BELLARY** | | | |
| 30. | Dr. P.K. Mishra | Head of the Centre | Member |
| 31. | Er. R.N. Adhikari | Principal Scientist (Engg.) | |
| 32. | Dr. S.L. Patil | Senior Scientist (Agro.) | |
| 33. | Dr. N. Loganandan | Scientist (SS) (Ag. Extn.) | |
| 34. | Mr. D. Ramajayam | Scientist (Hort.) | |
| 35. | Dr. B. Mondal | Scientist (Ag. Eco.) | |
| **RESEARCH CENTRE, CHANDIGARH** | | | |
| 36. | Dr. A.K. Tiwari | Head of the Centre | Member |
| 37. | Dr. Pratap Singh | Principal Scientist (Agro.) | |
| 38. | Dr. R.P. Yadav | Senior Scientist (Soils) | |
| 39. | Dr.(Ms.) S.L. Arya | Senior Scientist (Ag. Eco.) | |
| 40. | Dr. Ram Prasad | Senior Scientist (Hort.) | |

| | | | |
|---|---|---|---|
| **RESEARCH CENTRE, DATIA** | | | |
| 41. | Dr. V.S. Katiyar | Head of the Centre | Member |
| 42. | Dr. K.C. Dubey | Senior Scientist (Hort.) | |
| 43. | Dr. Dev Narayan | Senior Scientist (Agro.) | |
| 44. | Dr. H. Biswas | Scientist (Soils) | |
| **RESEARCH CENTRE, KORAPUT** | | | |
| 45. | Dr. K.P. Gore | Head of the Centre | Member |
| 46. | Dr. R.K. Panda | Senior Scientist (Engg.) | |
| 47. | Er. B.S. Naik | Scientist (Engg.) | |
| **RESEARCH CENTRE, KOTA** | | | |
| 48. | Dr. S.N. Prasad | Head of the Centre | Member |
| 49. | Dr. R.K. Singh | Senior Scientist (Soil Fert.) | |
| 50. | Dr. A.K. Parandiyal | Senior Scientist (Forestry) | |
| 51. | Dr. Ashok Kumar | Senior Scientist (Ag. Eco.) | |
| 52. | Dr. J. Somasundaram | Scientist (SS) (Soils) | |
| 53. | Er. B.K. Sethy | Scientist (Engg.) | |
| **RESEARCH CENTRE, UDHAGAMANDALAM** | | | |
| 54. | Dr. O.P.S. Khola | Head of the Centre | Member |
| 55. | Dr. M. Madhu | Senior Scientist (Agro.) | |
| 56. | Dr. D.V. Singh | Senior Scientist (Soils) | |
| 57. | Dr.(Ms.) P. Sundarambal | Senior Scientist (Ag. Extn.) | |
| 58. | Mr. R. Ragupathy | Scientist (SS) (Forestry) | |
| 59. | Dr. Gopal Kumar | Scientist | |
| 60. | Dr. Siddayya | Scientist | |
| **RESEARCH CENTRE, VASAD** | | | |
| 61. | Dr. H.B Singh | I/c Head of Centre | Member |
| 62. | Dr. M.L. Gaur | Senior Scientist (Engg.) | |
| 63. | Dr. G.L. Bagdi | Senior Scientist (Ag. Extn.) | |
| 64. | Mr. V.C. Pande | Scientist (SG) (Ag. Eco.) | |
| 65. | Dr. D.R. Sena | Scientist (SS) (Engg.) | |