उत्तराखण्ड शासन

# PERFORMANCE AUDIT OF
# ACCELERATED IRRIGATION BENEFITS PROGRAMME (AIBP)

## REPORT OF THE
## COMPTROLLER AND AUDITOR GENERAL OF INDIA

## FOR THE YEAR ENDED MARCH 2008

**GOVERNMENT OF UTTARAKHAND**

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## PREFACE

1. This Report of the Comptroller and Auditor General of India contains the results of Performance Audit of the 'Accelerated Irrigation Benefits Programme' (AIBP) in Uttarakhand. The Report has been prepared for submission to the Governor under Article 151 (2) of the Constitution of India.

2. The Performance audit was conducted through a test-check of the records of the Irrigation Department and Minor Irrigation Department, physical verification of the schemes and collection of data from the Directorates of Agriculture and Statistics covering the period 2003-08. The sample selected comprised 12 irrigation divisions in six districts of the State. Implementation of the programme relating to the period subsequent to March 2008 has also been commented upon wherever necessary.

3. The audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

# EXECUTIVE SUMMARY

# Executive Summary

Accelerated Irrigation Benefits Programme (AIBP) was launched by the Government of India (GOI) to accelerate the completion of the ongoing major irrigation projects in the States. In Uttarakhand, schemes were sanctioned under this programme with effect from 2002-03. Two departments – Irrigation Department (ID) and Minor Irrigation Department (MID) implement AIBP in the State; MID being the focal point, accounted for 94 *per cent* of the AIBP schemes. 1931 minor irrigation schemes were sanctioned during 2002-08 to create 161507.02 hectares of additional irrigation potential (IP)) at an estimated cost of Rs 1167.79 crore. GOI provided 82 *per cent* of the funds and the remaining was funded by the State Government. 50 *per cent* of the sanctioned schemes were completed by March 2008 and the remaining were in progress (47 *per cent*) or were yet to start (3 *per cent*). 38 *per cent* of the targeted irrigation potential (IP) was created. A performance review of the scheme was conducted to assess whether it led to augmentation of irrigation potential and its utilisation in the State, and whether it had an impact on agricultural growth.

The performance review revealed that, only one of the two departments; ID followed a well-laid down system in execution of works. The guls constructed by ID were found to be in good condition and well-maintained. The Department maintained asset registers in the divisions and also kept a record of the irrigation potential created and utilized. However, there were major areas of concern requiring corrective measures, as brought out below:

## I Planning

Implementation of the schemes under AIBP was marred by poor planning and injudicious selection of schemes. Surveys were conducted in a perfunctory manner resulting in taking up unviable schemes - some completed but performing sub-optimally and some others abandoned at the time of execution. There were no uniform norms for calculation of Benefit-Cost ratio (BCR) of a project, to provide an assessment on its economic viability. User charges covered less than 5 *per cent* of maintenance costs incurred by the ID. The Detailed Project Reports (DPRs) are scrutinized by the Technical Advisory Committee (TAC) that is already stretched with a wide brief, and is unable to play the role of an effective nodal agency.

***Comprehensive surveys should be carried out before preparing the DPRs and schemes should be prioritized based on the spatial distribution of irrigation assets. Norms need to be laid down for calculation of BCR and applied uniformly for all the schemes undertaken. A nodal agency may be set up to co-ordinate between the two project implementing departments and to ensure allocation of resources to priority areas. This nodal agency could also provide technical scrutiny of the schemes, so that viability of a scheme is assured before execution. Power to levy and collect user charges may be vested with the same department, that executes the programmes.***

## II Implementation of the schemes

There were enormous delays in the execution of the schemes, primarily due to delays in release of funds, procurement of pipes, land disputes etc. New schemes were taken up

without completing the existing schemes. Physical verification showed that 66 *per cent* of the schemes claimed by the departments as completed and functional, were, in fact, either damaged/ defective / incomplete. Moreover, the fact that the schemes having no command area to serve and which were non-functional since inception were not only built but also were taken over by Water Users' Associations (WUA)indicates that the WUAs perceive the programme primarily as a source of wage generation.

Maintenance of assets is an issue that remains unaddressed in MID. MID, by "handing over" the constructed guls, has ridden itself of the responsibility of their maintenance, but the users see maintenance as the Government's responsibility.

***A comprehensive database of the irrigation assets created by various departments and under various schemes, should precede any further accretion to the asset base. The State Government should allocate adequate resources for repairs of the damaged projects. There is a need to lay down norms for categorizing repairs as major or minor and fix departmental responsibility for the former. User charges need to be collected on all irrigation schemes and credited to a reserve fund, to be used for maintenance of the assets. A portion of the user charges could then be made available to the WUAs in order to help them to be self-sufficient.***

### III Community participation in the programme

Participatory Irrigation Management (PIM) is currently in a nascent state in Uttarakhand. Formation of WUAs is a mere formality that is met prior to submission of proposals for construction of guls. They cease to have existence thereafter except in the form of a bank account with seed money which is lying un-utilised. The WUAs do not have a legal existence; they have neither the funds nor the capacity to undertake responsibilities of maintenance of assets imposed on them. Instances of schemes proposed by the WUAs initially, only to be caught up later in disputes, point to the ineffectiveness of PIM in the State.

***WUAs need to be given legal sanctity through an enabling legislation and empowered to discharge the responsibilities entrusted to them. The farmers need to be motivated and convinced that the benefits that would accrue from PIM would exceed the costs of participation. The departmental engineers need to be trained/ re-oriented towards this objective. Large-scale publicity through print media, public campaigns and television, need to be resorted to. Co-option of NGOs to inform the farmers of their rights and benefits of PIM, along with responsibilities, could be considered.***

### IV Financial management

Internal controls relating to utilization of funds and material are weak and carry the risk of fraud and misappropriation. Important control registers were not maintained in the divisions and the practices followed with regard to unspent balances, stock accounts, muster roll payments etc. are in contravention of the financial rules. UCs were not based on the actual funds expended and audited Statements of Expenditure, an important requirement in AIBP, were not prepared.

***Important controls which provide a trail on receipt and utilization of stock- maintenance of the materials at site register and timely closing of stock account, must be adhered to. The Works Register and the Asset register provide a control on the assets being created/ created and their utilization. A system of reporting the quantum of unspent AIBP funds in the department should be initiated and cases of incorrect reporting in utilization certificates may be investigated and responsibility fixed. Large payments made on muster rolls with temporary imprest, must be discontinued. The Department could adopt the mode of payment practiced in NREGS, after evaluating its suitability.***

## V Impact of the programme

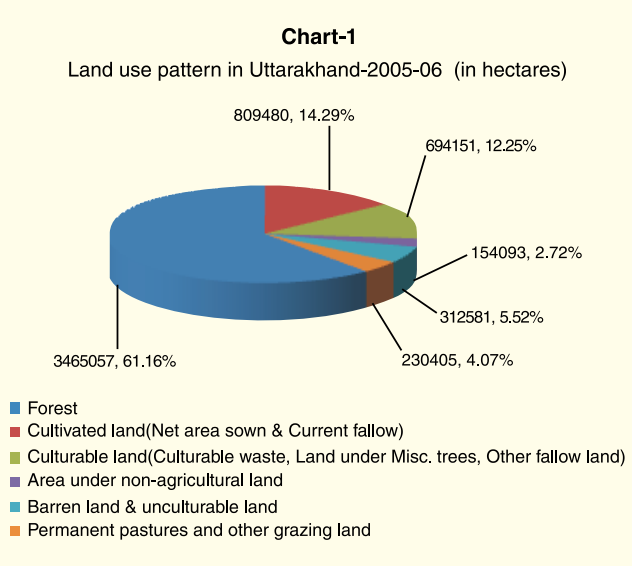
The claims of the Departments on addition of irrigation potential through AIBP schemes were grossly exaggerated and are not reflected in the trends on key parameters- gross irrigated area or cropping intensity. Our analysis does not show a significant impact of AIBP in augmenting the irrigation potential in the State.

# CHAPTER-1

# INTRODUCTION

# CHAPTER 1 INTRODUCTION

## 1.1 Profile of Uttarakhand




Uttarakhand is a predominantly hilly State, where over 75 *per cent* of the population is dependent on agriculture for their livelihood; as against 60 *per cent* at the national level.

The overall land use pattern in the State shows that 61 *per cent* of the land is covered with forests (chart 1)). The cultivable land in the State has shrunk due to industrialization and urbanization, which mirrors the trend at the national level. Only 14 *per cent* of the total area is sown and after deducting the barren land and area under non-agricultural use, 16 *per cent* of the land holds potential for being brought under cultivation.

**Table – 1** **(in thousand hectares)**

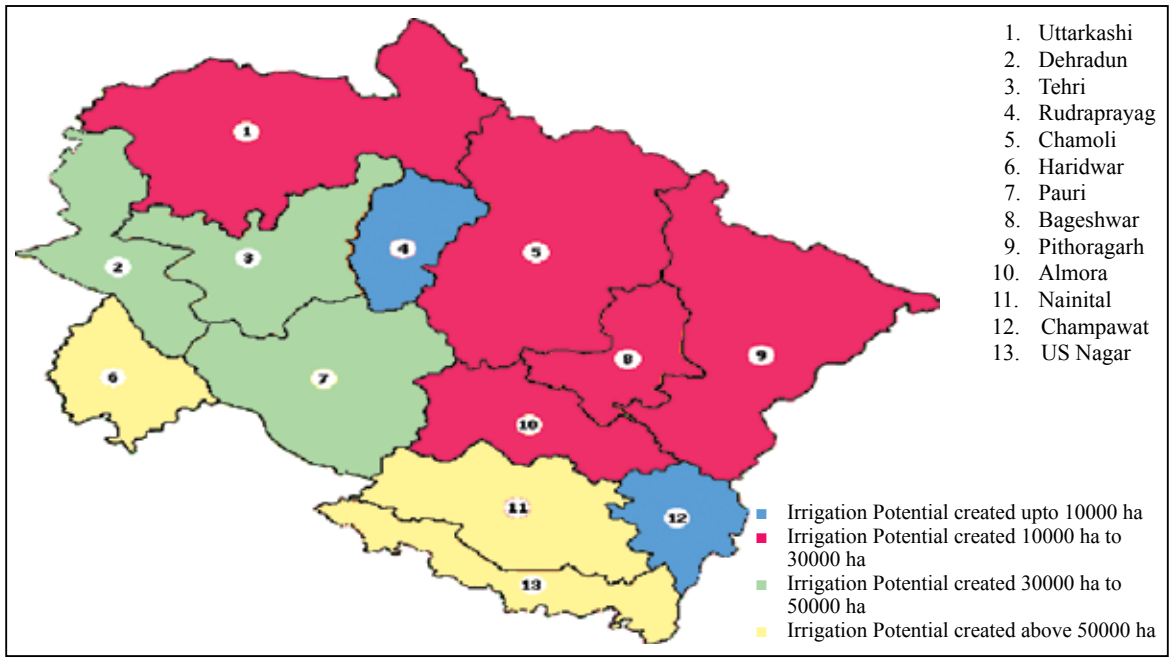
| Area | Uttarakhand | India |
|---|---|---|
| Cultivable land | 1504 | 182560 |
| Actually cultivated | 809 | 155560 |
| Percentage of actually cultivated area | ***54*** | ***85*** |
| Irrigated land | 343 | 60200 |
| Percentage of Irrigated land to cultivable land | ***23*** | ***33*** |
| Percentage of Irrigated land to actually cultivated area | ***42*** | ***39*** |

The statistics (2005-06) on cultivation show that only 54 *per cent* of the available culturable land is actually cultivated in the State, against the national level of 85 *percent*. Several factors contribute to the low utilization. Most of the cultivable land is occupied by marginal and sub-marginal farmers and extension of cultivation to these areas is expensive. Almost 70 *percent* of the land holdings in Uttarakhand are marginal (i.e., less than 1 hectare) and 18 *per cent* are small (between 1-2 hectares). The size of the holdings is also small, with the average size being 0.95 hectares, as against the national average of 1.32 hectares.

23 *per cent* of the cultivable land in the State is irrigated against 33 *per cent* at the national level. These facts highlight the pressing need for expansion of sustainable irrigation facilities in Uttarakhand.

The gap between irrigation facilities in hills and plains, presents a grim picture. Hill regions account for only 28 *per cent* of the irrigation facilities in the State against the availability

of cultivable land of 75 *per cent* and the remaining 72 *per cent* are in the plain areas which account for only 25 *per cent* of the cultivable land as can be seen from the following map.




## 1.2 Sources of irrigation

The hill regions of the State generally depend upon precipitation for agriculture. Rainwater and snow soak into the soil through pores and crevices, and reappear in the form of springs. These springs are either tapped directly for irrigation, or the streams and rivers which they feed, form the source. The supply of water in the perennial springs diminishes during winters and hot summers, while it is plentiful during monsoons.

Spring water can be used for irrigation at almost any altitude. The water of springs or streams is carried through surface channels traditionally called 'guls' into the fields located at lower levels. Ponds are also used occasionally as sources for irrigation. Irrigation systems constructed by the Government also use mainly guls to divert water from streams or rivers and carry water by gravity flow to fields situated downstream. Where the availability of water is low, tanks (hauz) are constructed for storage of water, which is then released to the fields through guls.

Surface lift schemes are of two types: one that uses electricity and the other which lifts water by means of suction, without the use of

electricity, through 'hydraulic ram' (hydram). Both these systems lift water mainly from rivers and supply to adjoining villages.

Irrigation in the Terai region[1] that accounts for most of the irrigation facilities in the State, is mainly through surface and ground water systems. These include canal systems and private and State wells – dug wells, shallow and deep tube wells etc.

Most of the agricultural land in the hills is at the river bed level. In addition, cultivable land is available about 20 feet above the present flow of the water, which cannot be irrigated with gravitational flow of surface water. It is in these areas that lift schemes through hydram, would be of use. The hydrams are inexpensive, but require regular maintenance as well as an operator for daily operations, which would explain their low prevalence in the State.

[1] Covering the plain districts of Udham Singh Nagar, Haridwar and parts of Nainital.

# CHAPTER-2

# ACCELERATED IRRIGATION BENEFITS PROGRAMME

# CHAPTER 2 ACCELERATED IRRIGATION BENEFITS PROGRAMME

Accelerated Irrigation Benefits Programme (AIBP) was launched in 1996-97 by the Government of India (GOI) to accelerate the creation of irrigation potential by providing financial assistance to the State Governments to ensure early completion of ongoing multipurpose and irrigation projects. From 2002-03, minor surface irrigation schemes (both new and ongoing) were also made eligible for the grant of assistance under the programme.

Uttarakhand started this programme in the year 2002-03. A total of 1931 schemes (*Minor Surface Irrigation Schemes*) were sanctioned during the period 2002-08 under AIBP with the aim of creating 161507.02 hectares of irrigation potential (IP) at an estimated cost of Rs. 1167.79 crore.

## 2.1 Salient Features

The programme was to be funded on a matching basis by the Central and the State Government. The Central share of assistance was to be released by way of Central Loan Assistance (CLA), 50 *per cent* of which was repayable in 20 annual installments along with interest (13 *per cent* per annum). The remaining 50 *per cent* enjoyed an initial grace period of five years and was payable thereafter in 15 annual installments.

The terms of funding were further relaxed over the years and presently, the GOI funds 90 *per cent* of the project cost in Special Category States like Uttarakhand, by way of grants called Central Assistance (CA). The remaining 10 *per cent* is borne by the State Government. SCS that undertook reforms were to get an additional incentive of 100 *per cent* GOI funding. ERM (Extension, Renovation and Modernisation) schemes were also brought under the ambit of AIBP in December 2006.

The periodic modifications made in the AIBP guidelines are tabulated below:

**Table - 2**

| | October 1996 | February 2002 | April 2005 | December 2006 |
|---|---|---|---|---|
| **Selection Criteria** | ♦ Multi-purpose projects costing over Rs. 1,000 crore (relaxed to Rs. 500 crore in March 1997) where substantial progress has been made and which are beyond the resource capability of the State.<br>♦ Major and medium projects which were in advanced stage of completion and when completed, would provide assured water supply to 1,00,000 ha. | ♦ Fast Track Projects (FTPs) that can be completed in two agricultural seasons to be funded 100 *per cent* by GOI.<br>♦ MOU to be signed with GOI for FTP and carrying out reforms for rationalizing water rates.<br>♦ Inter-State projects and projects with larger irrigated area per unit of additional investment are to be given priority.<br>♦ Projects cleared by Planning Commission will be considered for funding. | ♦ MI schemes of Non-Special Category States with potential of more than 100 hectares with preference to tribal and drought prone areas. | ♦ Major, medium and ERM projects cleared by Planning Commission and are in advanced stage of construction and can be completed in the next four financial years and not receiving any other form of financial assistance.<br>♦ For MI schemes in Non-SCS, State to give undertaking to complete projects in two financial years and formation of Water Users Association for post construction maintenance. |

| | | | | |
|---|---|---|---|---|
| **Funding Pattern** | ♦ CLA to States on matching basis (modified in 1997 to fund SCS in the ratio of 2:1 and further modified in 1999 for SCS to 3:1 (Centre:State)) to be recovered in 20 equal monthly instalments @ 13 *per cent* interest p.a.<br>♦ Central assistance to be reimbursed on quarterly basis for expenditure actually incurred. | ♦ Funding pattern relaxed to 4:1 for States in case they rationalise their water rates to recover full O&M cost of irrigation projects.<br>♦ SCS and KBK districts of Orissa were fully funded by Centre if they undertook reforms.<br>♦ Failure to carry out reforms after giving undertaking, entailed withdrawal of assistance under AIBP and recovery of loan with interest. | ♦ GOI will release only grant component of the Central Assistance and the loan component is to be raised by the States from market borrowings However, the Centre would raise loan financing for the loan component for fiscally weak States. | ♦ Central grant of 90 *per cent* of project cost for SCS, tribal/ drought prone and flood prone areas and 25 *per cent* for non-SCS. States to fund the rest.<br>♦ 90 *per cent* of total grant to be released immediately and 10 *per cent* after expending 70 *per cent*. Funding for later years will be after receipt of utilisation certificates for the previous fundings.<br>♦ Grant component and State share to be released within 15 days of its release by GOI. |

## 2.2 Organisational structure

In Uttarakhand, AIBP schemes are implemented by two different departments i.e. Irrigation Department (ID) and Minor Irrigation Department (MID) through 18 ID Divisions and 13 MI Divisions, each headed by an Executive Engineer (EE). EEs in ID work under the supervision of four Superintending Engineers (SE) who in turn, report to two Chief Engineers (CE) one each for Garhwal and Kumaon regions respectively. In MID, there are two SEs headed by one CE. The overall administrative control of the Department vests with the concerned Secretaries of ID and MID.

# CHAPTER-3

# FRAMEWORK OF AUDIT

# CHAPTER 3 FRAMEWORK OF AUDIT

## 3.1 Scope of Audit

Performance audit of AIBP was carried out during May 2008 to November 2008 and covered the period 2003-04 to 2007-08. Out of 13 districts in the State, we selected 6 districts for test- check. Sampling was done under three strata:

*Stratum-I* Capital District (Dehradun)

*Stratum-II* Three districts (Almora, Pithoragarh & US Nagar) from Kumaon Region and three districts (Chamoli, Dehradun & Pauri) from Garhwal Region, comprising one district from plain and two districts from hill areas within each region. The districts were selected using statistical sampling method of PPSWR (Probability Proportional to Size With Replacement)

*Stratum-III* 30 minor irrigation schemes (24 of MID and 6 of ID) were selected by SRSWOR (Simple Random Sampling Without Replacement).

Information and data was also collected from the MID & ID Departments, Directorates of Agriculture and Statistics of the State.

## 3.2 Audit Objectives

The objectives of the performance audit were to ascertain whether:

- Schemes were undertaken after a detailed survey and the sanctioned schemes met the programme criteria. The need for the projects and their technical viability was examined by an appropriate nodal authority;
- The schemes were implemented within the time schedule and within the approved costs, and provided assurance on quality. The programme created the planned infrastructure and the schemes were functional;
- Implementation of participatory irrigation management achieved its objectives of community participation in planning and execution of schemes. PIM created a sense of ownership of assets among the users;
- AIBP led to augmentation of irrigation potential and utilisation in the State and had a substantial impact on growth of agriculture.

## 3.3 Audit Criteria

The audit criteria used for performance audit of the scheme are as follows:

- Guidelines of GOI on AIBP
- Detailed Project Reports (DPRs) of the scheme;
- Other circulars/instructions issued by GOI/State Government.

## 3.4 Audit Methodology

Before commencing the audit, the audit objectives, criteria and scope were discussed (May 2008) with the Secretary to the Government of Uttarakhand and Chief Engineers (ID and MI department) in an entry conference.

Audit conclusions were drawn after scrutiny of relevant records of the divisions for the period 2003-04 to 2007-08, analysis of the available data, replies to the audit queries along with physical verification of the schemes (which also included interaction with the beneficiaries). The audit findings were discussed (May, 2009) with the Secretary of the Department in an exit conference and the replies of the Department have been incorporated in the Report at appropriate places.

## 3.5 Acknowledgement

The office of the Accountant General (Audit), Uttarakhand acknowledges the cooperation and assistance extended by the Irrigation Department and Minor Irrigation Department, Government of Uttarakhand, during the conduct of the performance audit.

# CHAPTER-4

# PLANNING

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## 4.1 Preparation and approval of schemes

AIBP guidelines envisage that irrigation schemes should be prepared after a survey on water requirements with an assessment on hydrological, meteorological, environmental and ecological aspects of the project. A Detailed Project Report (DPR) is to be prepared for every scheme, identifying the source of water, seasonal discharge of water and after factoring in the conjunctive use of surface water, need for environment and forest clearance. The detailed cost estimates, Benefit Cost Ratio (BCR) and other economic parameters such as Culturable Command Area (CCA), annual irrigation, intensity of irrigation also need to be reflected in the DPR.

Scrutiny revealed that the irrigation divisions did not carry out a detailed survey on the required lines. To some extent, shortage of field technical staff in MID, especially at the level of Junior Engineers (JE) affected the quality of survey work. The following instances detected in the sampled divisions, illustrate the lacunae in the surveys:

- In Udham Singh Nagar Division of ID, one JE reported survey of four sub-schemes covering 218 hectares of CCA in one single day. We found eight similar instances tabulated below (details at ***Appendix-1 (A)***), which raise doubts on the veracity of the claims of the Department:

**Table - 3**

| Division | Scheme | Date of survey | No. of sub-schemes surveyed in a day | CCA covered (in ha.) | Length (km.) |
|---|---|---|---|---|---|
| Almora/ MI | Jaicholi | 15.06.03 | 06 | 32.80 | 4.160 |
| | | 17.06.03 | 12 | 42.20 | 5.265 |
| | Dhaura | 26.11.04 | 05 | 55.00 | 5.800 |
| | Degot | 5.5.05 | 06 | 37.50 | 4.050 |
| Pithoragarh (MI) | Barave | 27.05.03 | 05 | 24.50 | 2.865 |
| | | 20.05.03 | 04 | 26.80 | 3.350 |
| US Nagar /ID | Katna/ Basgar | 23.1.04 | 04 | 218.00 | 2.000 |
| Dehradun (MI) | Kawakhera | 24.08.04 | 07 | 78.00 | 9.400 |

*Source: Information obtained from divisions.*

- DPRs of 39 sub-schemes covering 410.10 ha cultivable land, prepared by MID did not mention the date of survey (Table-4):

**Table - 4**

| Division | Scheme | No. of sub-schemes | CCA (in ha.) | Length (km.) |
|---|---|---|---|---|
| Pauri | Sobra | 06 | 66.60 | 7.30 |
| | Jakhola | 08 | 89.50 | 10.00 |
| | Gawani | 20 | 162.00 | 20.60 |
| Dehradun | Vinhar | 05 | 92.00 | 9.00 |
| **Total** | | **39** | **410.10** | **46.90** |

*Source: Information obtained from divisions. Details in* ***Appendix-1 (B)***

- Physical verification of schemes (para 5.3) also provided evidence on the inadequacy of surveys. We found that a gul was planned by the MID (Naini sub-scheme: Pauri) although there was another gul in the command area; the estimated length of two guls failed to reach the fields (Sundergaon sub-scheme; Pauri and Dhaulaghar sub-scheme in Pithoragarh); and a stretch of the Kush gul in Chamoli was planned in a jungle where no command area existed.
- Seven schemes[2] ***(Appendix 5 (D)*** were constructed despite insufficient water at source. Ninety seven sub-schemes sanctioned for the two biennia 2004-06 and 2005-07, were not taken up on several grounds like lack of water in the source, barren land, lack of command area and disputes among the beneficiaries etc. 86 new schemes were approved by the State Government in their place 2-3 years later i.e., in the last phase of their scheduled time for completion (Table 5). Clearly, the changes had to be made because of gaps in the initial surveys.

**Table - 5**

| District | Original sanction | | | Changed sanction | | |
|---|---|---|---|---|---|---|
| | Month | No. of sub-schemes | Estimated cost (Rs. in lakh) | No. of sub-schemes | Month of sanction | Estimated cost (Rs. in lakh) |
| Almora | 10/2004 | 3 | 28.06 | 4 | 03/2006 | 35.10 |
| | 11/2005 | 5 | 38.93 | 5 | 09/2007 | 37.18 |
| | | 8 | 34.40 | 10 | 03/2008 | 33.21 |
| Pauri | 10/2004 | 4 | 30.12 | 4 | 03/2006 | 13.33 |
| | 11/2005 | 27 | 213.02 | 20 | 09/2007 | 188.40 |
| Champawat | 10/2004 | 2 | 26.83 | 6 | 03/2006 | 29.55 |
| Pithoragarh | | 2 | 10.58 | 4 | | 12.85 |
| Bageshwar | | 3 | 19.04 | 3 | | 20.26 |
| Uttarkashi | | 18 | 16.35 | 6 | 04/2006 | 16.35 |
| Uttarkashi | 11/2005 | 18 | 31.90 | 11 | 03/2008 | 21.29 |
| Tehri | 10/2004 | 6 | 24.19 | 12 | 04/2006 | 24.19 |
| Haridwar | 11/2005 | 1 | 102.89 | 1 | 05/2006 | 102.49 |
| **Total** | | **97** | **576.31** | **86** | | **534.20** |

*Source : Information obtained from Minor Irrigation Department.*

The Government accepted (May, 2009) the audit findings and assured that appropriate measures (including hiring of contractual services) would be taken for carrying out proper survey while planning the schemes.

## 4.2 Benefit-Cost ratio

Irrigation works have traditionally been treated as commercial schemes. Post-independence, provision of irrigation was deemed to be a responsibility of the State and as a conduit to improving social welfare. Consequently, the rate of return on the irrigation schemes was progressively reduced[3].

[2] Koliagair: Chamoli; Kaprauli, Patal, Sundergaon & Kainur: Pauri; Brambachkuri: Pithoragarh; Gada Rahiya: Dehradun.

[3] Institutional reforms in Indian Irrigation: Ashok Gulati, Ruth Meinzen-Dick, KVRaju for International Food Policy Research, 2005

Benefit-Cost ratio is the ratio of annual benefits over annual cost of the project. The annual benefit is the expected increase in agricultural income, net of input costs (seeds, fertilizer etc), owing to the irrigation project. The annual cost includes cost of operation and maintenance, depreciation costs and interest on the total project cost. Implicit assumption in its calculation is that the farmers will be able to meet the running costs of the project through increased earnings from higher production.

Currently, if an irrigation project provides benefit-cost ratio (BCR) of one, it is considered economically justifiable. AIBP guidelines also adopted the benchmark of BC ratio of one as a pre-requisite for funding a project.

### *4.2.1 Assessment of benefits*

The DPRs of MID contained varying assumptions in the calculation of BCR in Garwal and Kumaon regions. The norms used by MID also differed from that of the ID.

In Garhwal region, MID projected that irrigation would increase the yield almost ten times the pre-irrigation yield, an assumption that not only had no basis, but was substantially higher than the corresponding norms adopted by the Agriculture Department of the State (Table 6). In addition, the MI divisions in Garhwal did not deduct from the projected yield, the costs incurred by the farmer on inputs like seeds, manure etc., while calculating the BCR.

**Table - 6**

| **Category** | **Norms for yield per hectare of land (in Rs)** | |
|---|---|---|
| | **In DPR in Garhwal** | **Of Agriculture department[4]** |
| **Rabi (wheat)** | | |
| a) Un-irrigated | 1100 | 9080 |
| b) Irrigated | 10787 | 21500 |
| Ratio of a:b | **1:9.8** | **1:2.4** |
| **Kharif (Rice)** | | |
| a) Un-irrigated | 1530 | 9470 |
| b) Irrigated | 16950 | 23000 |
| Ratio of a:b | **1:11.1** | **1:2.4** |
| **Other crops** | | |
| a) Un-irrigated | 1530 | 44500 |
| b) Irrigated | 17250 | 130000 |
| Ratio of a:b | **1:11.3** | **1:2.9** |

*Source : Information obtained from divisions and Agriculture Department.*

Provision for loss of water at the normative value of 265 litres per minute (LPM) per km, was not taken into consideration by MID in Garhwal region while calculating the net available water discharge. In the 22 sub-schemes checked in Audit in three districts, the loss of water was estimated at 9932.20 LPM, thus reducing the projected CCA of 368.70 ha by 107.15 ha[5], a reduction of 29 *per cent* in the CCA. Details are at ***Appendix 2.***

[4] Norms of Agriculture Department were set in the year 2000-01 but are in current use

[5] The loss of water being 265 LPM/km, the total loss of water along the length of 37.48 km would be 9932.20 LPM. 100 LPM is taken as the required discharge for irrigating one hectare of land. Thus CCA of 368.70 hectares would require 36870 LPM. The total designed discharge in the sub-schemes was only 36088 LPMof which if 9932.20LPM of water is lost, the water availability would be 26155.8 LPM (36088.0-9932.2), would reduce the CCA to 261.56 hectares. The excess projection of CCA would be 107.15 hectares (368.7-261.56)

AIBP guidelines permit funding of Extension, Renovation, Modernisation (ERM) schemes subject to the condition that they will not merely be restoration of lost potential, but new potential would be created from the water saved. 111 sub-schemes were undertaken as ERM schemes without calculating BCR in district Chamoli and Pauri, on which Rs 3.38 crore was spent as of March 2008. The schemes were approved and sanctioned despite the DPRs showing nil increase in CCA, indicating that the schemes were merely restoration works.

In Kumaon region, MID calculated the BCR on the basis of a two-fold increase in yield of both wheat and rice as well as introduction of a new crop i.e., potato, after the provision of irrigation. In fact, the BCR projection of most schemes in Kumaon reached the figure of one, mainly on account of a projected start in potato production. However, all the districts in Kumaon, barring Udham Singh Nagar, registered a substantial fall in the production of potato as can be seen from the table below, raising questions about the projected BCR in the schemes in Kumaon.

**Table - 7**

| District | Production of potato (in MT) | | |
|---|---|---|---|
| | 2002-03 | 2007-08 | % drop in production |
| Almora | 24875 | 5059 | 79.7 |
| Bageshwar | 13332 | 1798 | 86.5 |
| Champawat | 11971 | 1935 | 83.8 |
| Nainital | 54160 | 33040 | 39.0 |
| Pithoragarh | 21538 | 3243 | 84.9 |
| U.S.Nagar | 17580 | 29280 | (-)66.6 |

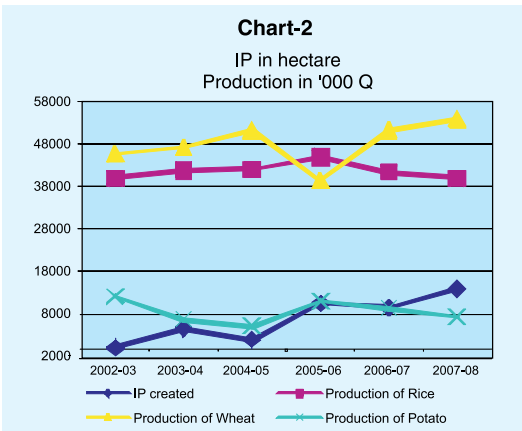
*Source : Information obtained from Agriculture Department.*

During our interaction with the beneficiaries of 62 sub-schemes of MID in both Kumaon and Garhwal regions, we were informed that in 40 of the sub-schemes, representing 65 *per cent* of the total, a *kuchcha* gul already existed i.e., the project merely involved conversion of a *kuchcha* gul to a *pucca* gul. However, the DPRs did not reveal this fact. The BCR was calculated on the assumption that the area was not being irrigated hitherto.

The MID divisions could not provide to us maps delineating the CCA under each project. The only document attached to the DPR was the *khasra* of the village. We could not physically verify the CCA in the absence of the detailed maps.

Of the 19 sub-schemes of Irrigation Department that we checked, eight involved conversion of a *kuchcha* gul to *pucca* gul; two sub-schemes involved lining works; 4 sub-schemes involved construction of field guls connecting existing guls; three sub-schemes involved both lining works and construction of field guls and only two sub- schemes were new schemes. Thus 17 out of 19 schemes (representing 89 *per cent* of the total) were essentially ERM schemes although the DPRs did not indicate this position. The BCR

**Chart-2**



was calculated on the basis of increase in CCA in all the schemes, which assumed that there was no agricultural production in the areas that were to be brought under irrigation through the AIBP schemes. This assumption was unrealistic and inflated the BCR, especially in view of the fact that a majority were ERM schemes. Moreover, the beneficiaries told us that the areas were previously under cultivation although the schemes did have an impact on the yield.

The projection of BCR while justifying a scheme, pre-supposes that the irrigation project is an integrated one, by which other prime factors that affect agricultural productivity would also be addressed in its planning and implementation. These factors would include provision of quality seeds, fertilizers, storage facilities etc; improvement in credit availability and access to markets. However, the DPRs did not contain any data on these parameters and did not reflect such an integrated approach.

There was no direct correlation between irrigation and agriculture production, that BCR seeks to establish, as the overall trends in agricultural production in the selected districts not only show wide inter-year fluctuations, but also a downward trend in all crops except wheat, even as there was a continuous accretion in irrigation potential (IP) each year.

### *4.2.2 Assessment of costs*

The costs included in the calculation of BCR comprise depreciation costs and costs for repair and maintenance. MID assessed the two costs at 4-5 *per cent* (Kumaon Region) and 5 *per cent* (Garhwal Region) of the total project cost. However, this was a notional cost shown only for calculation of BCR and MID did not spend any money on maintenance of guls constructed under AIBP. The adequacy of the O&M costs could not be assessed in the absence of any norms or benchmarks[6].

**ID** has laid down norms for maintenance by which a scheme is covered for annual repairs after two years of completion. ID spent Rs 0.59 lakh to Rs 0.83 lakh per km. annually on regular maintenance. However, in the DPRs of the test-checked schemes, the cost was pegged at Rs 3000 to Rs 7000, thus overstating the BCR.

### *4.2.3 Levy of user charges and recovery of costs*

Use of BCR to determine the economic viability of a project implies that the government seeks to recover the running costs of the project from the users who with increased benefits accruing from the project will be encouraged to pay the user charges. It also assumes that the assets created will indeed be maintained with the user charges collected.

MID does not levy user charges from the beneficiaries of the project but ID levies charges at the rate of Rs 40 per hectare per crop i.e., a minimum of Rs 80 per hectare per annum. The rate has remained unchanged since October 1994. The Revenue Department could not provide the data on user charges actually collected. In any case, even if the entire amount levied were to be collected, it would meet less than 5 *per cent* of the cost incurred by ID on operation & maintenance (Table 8). Establishment costs included in the O&M costs were not segregated by the departments.

[6] The size of the guls constructed by MID differ from that of ID; hence maintenance expenditure of ID cannot be taken as a benchmark for MID schemes

**Table - 8**

| Particulars | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 |
|---|---|---|---|---|---|
| Cumulative Irrigation potential utilized (hectares) | 216434 | 220872 | 228228 | 235600 | 252626 |
| User charges levied (Rs in lakhs) | 180.54 | 189.44 | 225.61 | 223.67 | 240.83 |
| Cost of O&M incurred (Rs in lakhs) | 3824.25 | 4554.75 | 5292.62 | 4697.35 | 5066.75 |
| Percentage of user charges to Cost of O&M | **4.7** | **4.2** | **4.3** | **4.8** | **4.8** |

The Central Ministry introduced (February 2002) the concept of *'Reforming State'* for linking infrastructure creation with better management and maintenance through a rational cost recovery mechanism. The reforming State was to sign an undertaking to rationalize water rates to cover the full O&M cost of irrigation schemes in a period of five years. In return, the central assistance for *'Reforming State'* was to be provided in full without any State share.

User charges levied by the ID, are collected by the Revenue Department. There is no incentive to the ID to ensure recovery and the multiplicity of departments obfuscates the accountability for failure to collect charges. In some States, like Rajasthan, the Irrigation Department levies and collects the charges.

The Government assured (May, 2009) that efforts would be made to ensure uniformity in calculation of BCR across the two regions and mandatory condition for reaching the cut-off at one (for BCR) will be reviewed.

## 4.3 Institutional structures for planning

Specific proposals received by MID/ ID from Gram Panchayats (GPs) form the basis for developing schemes under AIBP. After the preliminary survey, the MID Division sends the proposals to the Zila Panchayat (ZP) for its consent on the need and priority that should be assigned to the proposals. The ZP members are ordinarily aware of the village conditions but the ZP does not have any village-level data on the existing schemes or on the irrigation coverage of villages, on the basis of which it can decide on priority. By and large, it is the pressure exerted by the elected representatives- panchayat members or the MLAs/ MPs that determines the priority that each proposal receives. In the case of ID schemes, the Department itself determines the priority without referring the proposals to the ZP.

The MID Divisions did not maintain any record of the proposals that they received. The Divisions stated (January 2009) that those proposals which are considered unviable, are destroyed. The proposals from the GPs were undated and we could not ascertain the timeliness in disposal of the proposals at the Divisional level.

The DPRs prepared by the MID/ID are sent to the Technical Advisory Committee (TAC) of the Finance Department. The TAC comprising three engineers: one EE, one AE and one JE, drawn from various State departments, has a wide brief as construction works taken up by all the departments of the State Government have to be cleared by the TAC. The thin spread of its resources is an issue that the State Government has taken note of but the proposal for strengthening the TAC (August 2006) is yet to be implemented. Currently, the TAC is unable to function as a nodal technical agency to streamline the planning of AIBP

schemes. The need for an effective nodal agency is evident from the following deficiencies in planning:

- There are no uniform norms for calculation of BCR, with each department (MID/ID) and in fact, each region within the same department using different assumptions in calculation of BCR. Even DPRs that did not meet the BCR norms were approved by the TAC (discussed in detail under the para on BCR)
- Even after the MID standardized (September 2006) the size of guls, 18 sub-schemes, out of 45 sub-schemes selected, representing 40 *per cent* of the sub-schemes sanctioned by TAC during the year 2007-08, were approved where the size of the gul was higher than the norm ***(Appendix 3)***. The Divisions stated that the deviations were necessitated due to land conditions and water availability. However, the DPRs did not contain any justification for deviation from the norms.
- AIBP envisaged that minor irrigation schemes would be funded, provided that the proposed schemes meet the pre-conditions viz., the project cost of these schemes per hectare should not exceed Rs. 1 lakh; and individual schemes should benefit at least 20 hectares and group of schemes (within a radius of 5 km.) should benefit at least 50 hectares. Scrutiny revealed that the project cost of 568 sub-schemes taken up in AIBP was in excess of Rs. 1 lakh per ha; 15 schemes of single cluster covered area, less than 20 hectare; and 50 group schemes covered area, less than 50 ha. The divisions replied that due to geographical conditions and immediate necessity of these schemes, guidelines could not be adhered to. The schemes were, however, approved despite deviation from the norms.
- US Nagar Division of MID included in the DPRs for 60 schemes, 5 *per cent* for contractor's profit[7] for bricks, which was inadmissible under AIBP since the schemes were to be executed through Water User Associations (WUAs).

GOI approves the AIBP schemes on a biennial basis, on the basis of an abstract of the schemes. Since the DPRs are not sent to the GOI, the TAC is the sole external agency that conducts the technical appraisal of AIBP projects. There is a need for a nodal agency, especially in view of the fact that two separate departments execute the AIBP schemes and there are no uniform, standardized parameters for selection of schemes. The divisions felt that some of the pre-conditions in AIBP (such as limits on project cost and the CCA) require relaxation in hilly areas. These are issues which require examination by a nodal agency to ensure efficacy in planning of schemes.

Absence of a nodal agency which is armed with comprehensive data on irrigation facilities in the villages: available and planned, led to gaps in planning. For instance, two sub-schemes (Sawna Chalog and Khadra: Chakrata block) were sanctioned by ID in 2004-06. However, during execution, it was found that MID had already constructed the guls in the area, whereupon, ID abandoned the schemes.

The Government accepted (May 2009) that inter-departmental co-ordination is imperative for holistic approach towards agricultural development and to ensure this, coordination committees would be formulated for effective inter-departmental exchange of information. It was also directed to fix responsibility in the cases where faulty planning has been noticed.

[7] A total of Rs. 9.57 lakh was paid for 1,06,29,833 bricks.

## Conclusions

*Detailed surveys were not undertaken diligently to provide vital inputs in the preparation of DPRs resulting in unviable schemes being taken up.*

*In the absence of uniform norms for assessment of Benefit-Cost-Ratio (BCR), different departments and indeed, different regions within the same departments, adopted differing parameters in calculation of BCR. The projections on benefits were exaggerated and costs were under-assessed.*

*The DPRs are scrutinized by the Technical Advisory Committee (TAC) that is already stretched with a wide brief, and is unable to play the role of an effective nodal agency.*

## Recommendations

- Comprehensive surveys should be carried out before preparing the DPRs and schemes should be prioritized based on the spatial distribution of irrigation assets.
- There is an urgent need to strengthen inter-departmental coordination to ensure that the projected benefits of increased agricultural production are realised. A nodal agency may be set up to co-ordinate between the two departments and to ensure allocation to priority areas. This nodal agency could also provide technical scrutiny of the schemes, so that viability of a scheme is assured before execution.
- Norms need to be laid downfor calculation of BCR and applied uniformly for all the schemes undertaken.
- Field level posts, especially of Junior Engineers and Assistant Engineers, may be filled on priority. Span of control of the field level engineers may be reviewed and where it is too high, co-option of contractual staff for field surveys and for inspections may be considered.
- Power to levy and collect user charges may be vested with the same department that executes the programmes.

# CHAPTER-5

# EXECUTION OF SCHEMES

# CHAPTER 5 EXECUTION OF SCHEMES

A total of 1931 schemes (Minor Surface Irrigation Schemes) were sanctioned during the period 2002-08 under AIBP targeted to create 161507.02 hectares of irrigation potential (IP) at an estimated cost of Rs. 1167.79 crore. (Details are in ***Appendix 4*****).** Of these, 1811 schemes were executed by MID and the remaining 120 schemes by the ID.

The two departments follow different patterns of execution. MID executes the works through the targeted beneficiaries and the department provides the materials. MI works in ID are executed through contractors, selected through tendering.

ID follows a well-laid down system in execution of works. The guls constructed by ID were found to be in good condition and well-maintained. The Department maintains asset registers in the divisions and also keeps a record of the irrigation potential created and utilized.

## 5.1 Progress on works

The progress on implementation of irrigation schemes during 2002-03 to 2007-08 in the State is detailed below:

**Table - 9**

| Year | No. of total schemes sanctioned | | | No. of schemes completed | | | No. of ongoing schemes | | | No. of schemes not started | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ID | MI | Total | ID | MI | Total | ID | MI | Total | ID | MI | Total |
| 2002-03 | 8 | 185 | 193 | - | - | - | 8 | 185 | 193 | - | - | - |
| 2003-04 | - | - | - | 7 | 185 | 192 | 1 | - | 1 | - | - | - |
| 2004-05 | 3 | 226 | 229 | 1 | - | 1 | 3 | 226 | 229 | - | - | - |
| 2005-06 | 15 | 502 | 517 | 1 | 226 | 227 | 17 | 438 | 455 | - | 64 | 64 |
| 2006-07 | 16 | - | 16 | 17 | 185 | 202 | 16 | 253 | 269 | - | - | - |
| 2007-08 | 78 | 898 | 976 | 4 | 335 | 339 | 89 | 816 | 905 | 1 | - | 1 |
| **Total :** | **120** | **1811** | **1931** | **30** | **931** | **961** | **89** | **816** | **905** | **1** | **64** | **65** |

*Source : Information obtained from the Department.*

Out of 1931 schemes sanctioned, 961 representing 50 *per cent* of the schemes sanctioned under AIBP, were completed as of March 2008; 65 were yet to start and on 905 schemes, the work was underway. The schemes are sanctioned for completion within the biennium. By and large, funds required to be released to MID/ID by April of the first year of the biennium, were released by October of the year- January of next year, thus causing a spill-over of schemes. For eg: a scheme sanctioned for 2005-07 biennium, received funds only by January 2006, be taken up for execution by April 2006 and would be due for completion by March 2008, one year after the biennium. Of 955 schemes sanctioned for which *the funds were released during 2002-06*, 875 were completed by March 2008, thus achieving 92 *per cent* completion.

Scrutiny of the divisional records[8] in MID showed that work on 10 *per cent* of the works (425) reported to be under construction, had actually been suspended, due to disputes or want of material. Around 8 *per cent* of the works completed, were reported to be non-functional.

**Table - 10**

| Particulars | No of sub-schemes | Cost incurred as of March 2008 (Rs in crore) | Irrigation potential (hectares) |
|---|---|---|---|
| Total no of sub-schemes sanctioned in 6 test-checked districts during 2002-08 | 8305 | N.A. | 74293.40 |
| • Sub-schemes completed | 3891 | 342.43 | 36269.70 |
| ▪ Sub-schemes lying non-functional/ damaged | 326 | 16.28 | 2010.27 |
| • Sub-schemes on which work was underway | 4323 | | |
| ▪ Sub-schemes lying incomplete due to disputes | 114 | 7.88 | 1209.91 |
| ▪ Sub-schemes lying incomplete due to want of pipes | 311 | 7.80 | 2497.37 |
| • Sub-schemes yet to take-off due to disputes | 91 | Nil | 477.36 |

When queried on 311 sub-schemes lying incomplete due to want of pipes, the divisions attributed the delays to a shift in the procurement policy in September 2007 by which it was decided that pipes will be henceforth be purchased centrally. The procurement was initiated in June 2008 and was still under process as of January 2009. The two-year gap due to delays in finalizing the centralized procurement, resulted in spill-over of schemes.

The Government stated (May 2009) that efforts were under way to complete the works and assured that necessary action would be taken to avert delays.

## 5.2 Priority on works

GOI guidelines prescribe that eligible schemes covered under the programme during the previous years would get preference over new schemes proposed for inclusion during the current year. However, despite 292 schemes sanctioned in the biennium 2005-07 remaining incomplete, MID took up 4623 new sub- schemes in the biennium 2007-09. The old schemes remained incomplete as of December 2008 while the divisions completed 509 of the new sub-schemes sanctioned at a total cost of Rs 1.04 crore. Clearly, the divisions preferred to take up new schemes without completing the old.

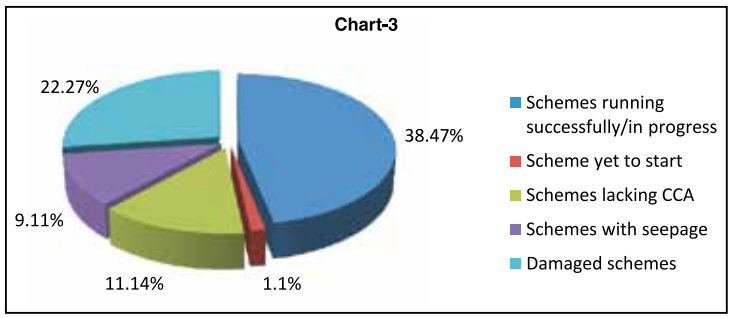
Government assured (May 2009) that a comprehensive database on the assets created and assessment of actual need would be initiated at the earliest.

## 5.3 Physical Verification of Schemes

In an attempt to ascertain the operational status of the completed and commissioned schemes, we conducted a joint physical verification with the departments (MID and ID) of

[8] In the absence of consolidated database, we compiled this information from individual files on each scheme/ sub-scheme

81 sub-schemes (36 *per cent*) out of the 223 sampled sub-schemes across six districts. This included 56 sub-schemes that were complete and 25 sub-schemes which were in progress. We found that only 34 *per cent of the completed sub-schemes* (19) were running successfully; the rest were either damaged/defective or incomplete. Important findings in this regard are illustrated below; details are in ***Appendix 5***:




## *A Guls that were not connected to the fields in the command area*

| |
|---|
| Name of the Project : Kukroli (MID, Pithoragarh) |
| Name of the Scheme : Dholaghar |
| Estimated Cost : Rs. 4.51 lakh |
| Projected Length : 0.75 km |
| Projected CCA : 7 ha. |
| Expenditure : Rs. 4.51 lakh |
| No. of beneficiaries : NA |
| Year of construction : 2004-05 |


*Dholaghar - Two parallel guls without command area*

***Specific findings***

Total length of 0.75 km was constructed but instead of one gul, two guls were constructed parallel to each other, both of which fell short of the command area by around 200 mtrs. Apparently, a dispute in the Gram Panchayat led to the construction of two competing guls.

| | |
|---|---|
| Name of the Project : Sobra (MID, Pauri)<br>Name of the Scheme : Naini<br>Estimated Cost : Rs. 5.78 lakh<br>Projected Length : 1 km<br>Projected CCA : 8.60 ha.<br>Expenditure : Rs. 5.78 lakh<br>No. of beneficiaries : 18<br>Year of construction : 2004-05<br>  <br>*Naini-Two canals catering to the same command area* | ***Specific findings***<br>Naini gul was constructed and handed over to WUA in March 2005. Another gul was constructed for the same command area in 2007-08. The beneficiaries told us that the new gul was unnecessary as the previously constructed gul had sufficient water. |
| Name of the Project : Jakhola (MID, Pauri)<br>Name of the Scheme : Sundergaon<br>Estimated Cost : Rs. 6.48 lakh<br>Projected Length : 1 km<br>Projected CCA : 9 ha.<br>Expenditure : Rs. 6.47 lakh<br>No. of beneficiaries : 21<br>Year of construction : 2005-06<br>  <br>*Sundergaon - Gul left mid-way* | ***Specific findings***<br>Sundergaon Gul was constructed in February 2006 and handed over to the WUA to cater to nine hectares of CCA; however, the estimated length of one kilometer failed to reach the fields and the gul was left mid-way at road side. AE of the division told us that another 1.0 km. has been sanctioned under a different scheme in the year 2007-08 to reach the fields, which was under construction. |

| | |
|---|---|
| Name of the Project : Kawakhera (MID, Dehradun)<br>Name of the Scheme : Gada Rahiya<br>Estimated Cost : Rs. 7.08 lakh<br>Projected Length : 1 km<br>Projected CCA : 8 ha.<br>Expenditure : Rs. 1.50 lakh<br>No. of beneficiaries : 19<br>Year of construction : 2007-08<br>  <br>*Gada Rahiya - Gul left unconnected to water source and fields* | ***Specific findings***<br><br>Gada Rahiya Gul was intended to cover eight hectares of CCA with a length of one kilometer. However, only 300 metres of gul was constructed, which was neither connected to the permanent water source nor to the command area. The gul was handed over to the WUA in March 2008. |
| Name of the Project : Bhadgaon (MID, Pithoragarh)<br>Name of the Scheme : Jhamkot<br>Estimated Cost : Rs. 5.47 lakh<br>Projected Length : 1km<br>Projected CCA : 10 ha.<br>Expenditure : Rs. 5.47 lakh<br>No. of beneficiaries : 40<br>Year of construction : 2006-07<br>  <br>*Bhadgaon Jhamkot – Incomplete gul* | ***Specific findings***<br><br>Only 500 metres was constructed in May 2006 against the estimated length of one kilometer, whereafter it was suspended without any command area in reach. Beneficiaries told us that the gul was lying in the same state since the last two years. |

| | |
|---|---|
| Name of the Project : Kanalichhina (ID, Pithoragarh)<br>Name of the Scheme : Bagrihaat<br>Estimated Cost : Rs. 17 lakh<br>Projected Length : 2.17 km<br>Projected CCA : 19 ha.<br>Expenditure : Rs. 11.17 lakh<br>No. of beneficiaries : NA<br>Year of construction : 2007-08<br>  <br>*Bagrihaat – Gul left mid way without reaching the fields* | ***Specific findings:***<br>Bagrihaat Gul was constructed in May 2008 to cover 19 hectares of CCA with an estimated length of 2.17 km. However, only 120 metres of gul was constructed, which failed to reach the command area. |
| Name of the Project : Gawani (MID, Pauri)<br>Name of the Scheme : Bagadi<br>Estimated Cost : Rs. 7.07 lakh<br>Projected Length : 1km<br>Projected CCA : 7.50 ha.<br>Expenditure : Rs. 7.07 lakh<br>No. of beneficiaries : 10<br>Year of construction : 2007-08<br>  <br>*Bagadi – No water flow due to wrong alignment* | ***Specific findings:***<br>Bagadi Gul was constructed in June 2007 and was handed over to the user group in July 2007. The gul was non-functional due to wrong alignment and the villagers told us that water has never flown in the gul since its commissioning. |

| | |
|---|---|
| Name of the Project : Kush (MID, Chamoli)<br>Name of the Scheme : Kush<br>Estimated Cost : Rs. 15.04 lakh<br>Projected Length : 2.50 km<br>Projected CCA : 20.20 ha.<br>Expenditure : Rs. 15.67 lakh<br>No. of beneficiaries : 31<br>Year of construction : 2007-08<br>  <br>*Kush – No connectivity with the command area* | ***Specific findings***<br>Kush Gul was constructed and handed over to WUA in December 2007. Around 250 meters of the tail portion of the gul was constructed in the jungle where no command area existed. In fact, a majority of the fields were not connected to the guls. |
| Name of the Project : Kawakhera (MID, Dehradun)<br>Name of the Scheme : Karnee<br>Estimated Cost : Rs. 11.22 lakh<br>Projected Length : 1.40 km<br>Projected CCA : 13 ha.<br>Expenditure : Rs. 4.45 lakh<br>No. of beneficiaries : 24<br>  <br>*Karnee- Damage gul* | ***Specific findings***<br>Karnee Gul was constructed in January 2008 and was handed over to the WUA in March 2008. However, only 600 metres was constructed against the estimated length of 1400 metres due to disputes. We found that the constructed portion of the gul was completely damaged. |

## B Insufficient water at source

| | |
|---|---|
| Name of the Project : Jakhola (MID, Pauri)<br>Name of the Scheme : Patal<br>Estimated Cost : Rs. 6.39 lakh<br>Projected Length : 1 km<br>Projected CCA : 9 ha.<br>Expenditure : Rs. 6.39 lakh<br>No. of beneficiaries : 20<br>Year of construction : 2005-06 | ***Specific findings***<br><br>Patal Gul was constructed in February 2006 and was handed over to the WUA in March 2006. There was very little water at the source and the beneficiaries told us that they were not getting sufficient water for their fields. |
|  <br>*Patal gul – Insufficient water at source* | |
| Name of the Project : Koliagair (MID, Chamoli)<br>Name of the Scheme : Koliagair<br>Estimated Cost : Rs. 17.75 lakh<br>Projected Length : 3 km<br>Projected CCA : 21 ha.<br>Expenditure : Rs. 18.04 lakh<br>No. of beneficiaries : 48<br>Year of construction : 2006-07 | ***Specific findings***<br><br>Koliagair Gul was constructed in December 2006 and was handed over to the WUA in March 2007. The quantity of water at the source of the gul was inadequate to cover 21 hectares of command area, a fact testified by the middle and tail end users of the gul. |
|  <br>*Koliagair gul – Insufficient water* | |

| | |
|---|---|
| Name of the Project : Bhadgaon (MID, Pithoragarh)<br>Name of the Scheme : Brambachkuri<br>Estimated Cost : Rs. 2.99 lakh<br>Projected Length : 0.50 km<br>Projected CCA : 7 ha.<br>Expenditure : Rs. 2.99 lakh<br>No. of beneficiaries : 20<br>Year of construction : 2005-06 | ***Specific findings***<br>Brambachkuri Gul was constructed in January 2007 and was handed over to the WUA in September 2007. There was no source of water feeding in one of the stretches of the gul and it was therefore, non-functional. |

*Brambachkuri gul-No water source*

## *C Work pending for want of clearance on forest land*

| | |
|---|---|
| Name of the Project : Baank (ID, Chamoli)<br>Name of the Scheme : Baank<br>Estimated Cost : Rs. 29.53 lakh<br>Projected Length : 2.50 km<br>Projected CCA : 35 ha.<br>Expenditure : Nil<br>No. of beneficiaries : NA<br>Year of construction : NA | ***Specific findings***<br>Baank scheme was sanctioned in November 2007. Out of the total canal length of 2.5 km, the alignment of 2.0 km. passed through forest land, which was not transferred by the Forest Department as of March 2008.<br>The department used the sanctioned amount of Rs. 15 lakh on another work. The beneficiaries stressed on the need for the canal as there was no alternative source of irrigation available to them. The divisional AE told us that the matter was being pursued with the Forest Department. |

*Baank scheme – Yet to start*

## D Damaged schemes

| | |
|---|---|
| Name of the Project : Gawani (MID, Pauri)<br>Name of the Scheme : Bheeda<br>Estimated Cost : Rs. 7.07 lakh<br>Projected Length : 1 km<br>Projected CCA : 7.50 ha.<br>Expenditure : Rs. 7.07 lakh<br>No. of beneficiaries : 10<br>Year of construction : 2007-08<br>  <br>*Bheeda – Non functional gul* | ***Specific findings***<br>Bheeda Gul was constructed in December 2007 and was handed over to the WUA in March 2008. The head of the gul was damaged due to excessive flow of water in the source river. The beneficiaries told us that the gul was damaged since its commissioning. |
| Name of the Project : Barave (MID, Pithoragarh)<br>Name of the Scheme : Dhari<br>Estimated Cost : Rs. 3.59 lakh<br>Projected Length : 0.60 km<br>Projected CCA : 6 ha.<br>Expenditure : Rs. 3.59 lakh<br>No. of beneficiaries : 38<br>Year of construction : 2004-05<br>  <br>*Dhari – Damaged feeder gul* | ***Specific findings***<br>Dhari Gul was constructed in December 2005 and was handed over to the WUA in January 2006. The gul was completely damaged and yet, a connecting gul (Dhari Vistar) was planned (2005-07 biennium ; Rs 3.73 lakh)and constructed. The beneficiaries also found the construction of connecting gul unjustified, when the feeder gul itself was damaged. |

| | |
|---|---|
| Name of the Project : Jakhola (MID, Pauri)<br>Name of the Scheme : Kainur<br>Estimated Cost : Rs. 13.14 lakh<br>Projected Length : 2 km<br>Projected CCA : 17 ha.<br>Expenditure : Rs. 13.17 lakh<br>No. of beneficiaries : 24<br>Year of construction : 2006-07<br>  <br>*Kainur gul – Damaged head* | ***Specific findings***<br><br>Kainur Gul was commissioned in May 2006 and was handed over to the WUA in June 2006. We found the head of the gul completely damaged and there was insufficient water at source. |
| Name of the Project: Vinhar (MID, Dehradun)<br>Name of the Scheme : Latikhet<br>Estimated Cost : Rs. 14.15 lakh<br>Projected Length : 2 km<br>Projected CCA : 18 ha.<br>Expenditure : Rs. 6.74 lakh<br>No. of beneficiaries : 15<br>Year of construction : 2005-06<br>  <br>*Latikhet – Damaged gul* | ***Specific findings***<br><br>Latikhet Gul was constructed in January 2006 and was handed over to the WUA in February 2006. The gul was found damaged and covered by debris, grass & weeds at some places. The villagers told us that the gul was lying damaged since 2007; thereafter they made temporary arrangements, which was inadequate. |

| | |
|---|---|
| Name of the Project : Kawakhera (MID, Dehradun)<br>Name of the Scheme : Bandiyara<br>Estimated Cost : Rs. 13.45 lakh<br>Projected Length : 2 km<br>Projected CCA : 16 ha.<br>Expenditure : Rs. 9.48 lakh<br>No. of beneficiaries : 25<br>Year of construction : 2007-08<br>  <br>*Bhandiyara – Damaged gul* | ***Specific findings***<br><br>Bhandiyara Gul was constructed in February 2008 and was handed over to the WUA in March 2008. It was found damaged near the head and covered by debris, grass and weed. |
| Name of the Project : Nayal (MID, Pithoragarh)<br>Name of the Scheme : Ganaikuna<br>Estimated Cost : Rs. 5.41 lakh<br>Projected Length : 0.92 km<br>Projected CCA : 9 ha.<br>Expenditure : Rs. 5.41 lakh<br>No. of beneficiaries : 43<br>Year of construction : 2005-06<br>  <br>*Ganaikuna – Damaged gul* | ***Specific findings***<br><br>Ganaikuna gul was commissioned in February 2006, but was lying damaged. The beneficiaries reported that due to the damage, around 4 hectares of command area remained unirrigated. |

| | |
|---|---|
| Name of the Project : Jakhola (MID, Pauri)<br>Name of the Scheme : Byasi<br>Estimated Cost : Rs. 9.77 lakh<br>Projected Length : 1.50 km<br>Projected CCA : 13 ha.<br>Expenditure : Rs. 9.77 lakh<br>No. of beneficiaries : 20<br>Year of construction : 2005-06 | ***Specific findings***<br><br>Byasi gul was constructed in June 2006 and was handed over to the WUA in June 2006. We found that a 20 meter stretch of the gul was damaged and at many places, it was filled with silt and weeds which hinder the flow of water. |

*Byasi – Damaged gul*

## *E Seepage*

| | |
|---|---|
| Name of the Project : Nayal (MID, Pithoragarh)<br>Name of the Scheme : Deoradi Bora<br>Estimated Cost : Rs. 5.90 lakh<br>Projected Length : 1.40 km<br>Projected CCA : 11 ha.<br>Expenditure : Rs. 5.90 lakh<br>No. of beneficiaries : 32<br>Year of construction : 2006-07 | ***Specific findings***<br><br>Deoradi Bora gul was constructed in May 2006 to cover an area of 11 hectares. We found that seepage, debris and weed growth hindered the flow of water through the gul. The beneficiaries told us that the command area was un-irrigated and that they were not getting any benefit from the gul. |

*Deoradi Bora gul*

| | |
|---|---|
| Name of the Project : Jaicholi (MID, Almora)<br>Name of the Scheme : Laduda<br>Estimated Cost : Rs. 6.26 lakh<br>Projected Length : 1 km<br>Projected CCA : 8.50 ha.<br>Expenditure : Rs. 7.89 lakh<br>No. of beneficiaries : 25<br>Year of construction : 2005-06<br>  <br>*Laduda gul – Cracks and seepage* | ***Specific findings***<br>The bed of Laduda Gul was found damaged resulting in heavy seepage. Water logging was noticed in the adjoining fields. |
| Name of the Project : 29.70 km. hill channel (ID, Kalsi, Dehradun)<br>Name of the Scheme : Chunoti<br>Estimated Cost : Rs. 13.24 lakh<br>Projected Length : 1km<br>Projected CCA : 25 ha.<br>Expenditure : Rs. 13.51 lakh<br>No. of beneficiaries : NA<br>Year of construction : 2005-06<br>  <br>*Chunoti gul – cracks and seepage* | ***Specific findings***<br>Chunoti Gul was constructed in March 2006 to cover 25 hectares of CCA. The branches of the canal were found in a poor condition; covered with grass & weeds, seepage was taking place through cracks. |

| | |
|---|---|
| Name of the Project : Vinhar (MID, Dehradun)<br>Name of the Scheme : Vinhar<br>Estimated Cost : Rs. 14.30 lakh<br>Projected Length : 2 km<br>Projected CCA : 18 ha.<br>Expenditure : Rs. 14.06 lakh<br>No. of beneficiaries : 15<br>Year of construction : 2006-07<br>  <br>*Vinhar gul – Heavy seepage* | ***Specific findings***<br><br>Vinhar Gul was constructed in June 2006 and was handed over to the WUA in June 2006. Heavy seepage was found at some places in the gul. The beneficiaries reported that seepage resulted in poor crop. |

## *F Polluted water supply*

| | |
|---|---|
| Name of Project : Devariya (MID, US Nagar)<br>Name of Scheme : Devariya<br>Estimated Cost : Rs. 5.31 lakh<br>Projected Length : 0.81 km<br>Projected CCA : 8 ha.<br>Expenditure : Rs. 4.71 lakh<br>No. of beneficiaries : 16<br>Year of construction : 2007-08<br>  <br>*Devariya – Polluted water supply* | ***Specific findings***<br><br>Water flowing in the main canal was polluted due to effluents of Century Paper Mill at Lal Quan. The beneficiaries told us that polluted water from the canal had badly affected the livestock and agricultural production. We were also told that despite continuous pursuance with the higher authorities, no corrective measures were taken. |

The State Government stated (May 2009) that the departmental engineers have been directed to furnish the up-to-date status of the irrigation channels and corrective measures would be initiated after that.

Where the schemes were functional, the WUAs felt that they had benefited from the scheme, as the schemes had reduced water-logging at the head-end and reduced the conflicts over water. The results of physical verification however, have thrown up several disturbing aspects on the execution of the schemes, as discussed below:

- The fact that 66 *per cent* of the schemes claimed as completed and functional, were actually non-functional, reveals a large gap in reporting and monitoring systems in MID. Schemes constructed without linking the gul with the command area and defective construction, point to defects in planning (discussed in Chapter 4).
- The need for conservation works to ensure sustainability of water sources are also highlighted by the fact that at least seven sub-schemes of MID (14 *per cent* of 56 completed sub-schemes physically verified) were partially functional due to inadequate water at source. This was particularly important because the schemes are tapping surface water from springs. On the other hand, 12 sub-schemes of MID (24 *per cent* of completed schemes) were found damaged in landslides, which are frequent in some of the districts in the State. The damage was extensive and yet, no action had been taken to repair it.
- WUAs took over all schemes regardless of the fact that they did not reach the command area or were defective in design. The lack of ownership to the schemes was evident; the beneficiaries merely look upon the schemes as wage generating projects, which even if they did not enhance irrigation, were still providing employment.
- Maintenance of MID - executed schemes is a neglected area. MID deducts 3 *per cent* of the labour component of the project from the muster rolls and the sum, treated as seed money for maintenance, is deposited in a joint bank account of the Gram Pradhan and JE of the concerned division. Scrutiny revealed that this sum was lying unutilized in the bank accounts. MID did not undertake maintenance work on any of the AIBP schemes on the ground that there was no budget provision for repair works under AIBP and that since the guls had been handed over to the WUAs, maintenance was their responsibility. On the other hand, the WUAs told us that they too were not maintaining the guls. 94 *per cent* of the AIBP schemes were executed by MID; such a high number of assets are being constructed only to be left in neglect. Thus irrigation schemes continue to be caught in the vicious cycle of "build-neglect-rebuild"[9].
- Inspections form an important part of the execution. As per the Manual of Orders (Irrigation), the EEs should inspect every irrigation channel once in every crop season and a minimum of 10 *per cent* of canals/guls constructed every year. The required involvement of the JEs/AEs, expected to be at site, was bound to be much higher. We were told that inspections were carried out but the findings of the physical verification show that either the divisional staff/ officers were not aware of the problems or that although aware of them, they chose to do little about them.

[9] John Briscoe's Indian Water Economy : Bracing for a turbulent future, June 2005

- Though no norms for staffing were available with the MID or ID, a comparison of the work being handled by JEs and AEs in the two departments revealed understaffing in MID which limited its capacity for maintenance as can be seen from the table below:

**Table : 11**

| Work load | MID | ID |
|---|---|---|
| Km length of guls/JE | 166 | 63 |
| Covered area(ha)/JE | 346 | 1871 |
| Km length of guls/AE | 1870 | 100 |
| Covered area(ha)/AE | 39099 | 2972 |

It may be mentioned here that a JE in MID, in addition to the divisional works also looks after all public works in the block undertaken under block plans i.e. NREGS, MLA /MP fund, Block Panchayat fund, Finance Commission fund etc.

- AIBP guidelines envisage a detailed mechanism to be instituted at the central, state and project level for monitoring which is to be carried through a system independent of construction agencies. The schemes are to be monitored at prescribed intervals. No such mechanism was in place till 2006-07 when the district administration was asked to constitute independent bodies for comprehensive physical verification of AIBP schemes sanctioned in 2006-07. The evaluation work was underway (as of April 2009).
- No sign boards displaying name of construction agency, construction cost, year of construction, were found at any of the sites related to AIBP works, in contravention of the Government orders issued at the time of administrative and financial sanction.

The Government replied (May, 2009) that strict measures would be adopted for inspection and monitoring.

## Conclusion

*There were enormous delays in the execution of the schemes, primarily due to delays in release of funds, procurement of pipes, land disputes etc. New schemes were taken up without completing the existing schemes. Physical verification showed that 66 per cent of the schemes claimed by the departments as completed and functional were in fact, either damaged/ defective / incomplete. This is a poor reflection on the performance of the programme in the State and amplifies the deep rooted flaws at various stages of planning, execution and monitoring. Moreover, the fact that the schemes without command area to serve and which were non-functional since inception were taken over by the WUAs indicate that the WUAs perceive the programme primarily as a source of wage generation.*

*While 72 per cent of damages occurred because of landslides and structural erosion, the fact that the damages were not reckoned in the divisional records show that either they went un-noticed or that post-construction, the departments showed little interest in recording the damages or undertaking repairs to them. MID by "handing over" the constructed guls, has ridden itself of the responsibility of their maintenance; the users see maintenance as the Government's responsibility. Consequently, 27 per cent of the guls physically verified by us were lying in disrepair.*

**Recommendations**

- A comprehensive database of the irrigation assets created by various departments and under various schemes, should precede any further accretion to the asset base.
- The State Government should allocate adequate resources for repairs of the damaged schemes. There is a need to lay down norms for categorizing repairs as major or minor and fix departmental responsibility for the former.
- User charges need to be collected on all irrigation schemes including that of MID. The user charges collected could be credited to a reserve fund, which would make available funds for maintenance of the assets. The subvention from the fund should be budgeted and the utilization audited regularly to prevent any misuse. A portion of the user charges could then be made available to the WUAs in order to help them to be self-sufficient.
- There should be greater focus on conservation works to ensure sustainability of the sources. These may be planned and executed in conjunction with Pey Jal Nigam/ Sansthan.
- The compliance with extant orders fixing responsibility of departmental officers for faulty planning and execution, will have a salutary impact on quality of works. Review of the span of control of field officers, may also be conducted to ensure that they are in a position to meet with their duties.
- Rational targets for inspection by higher authorities-Executive Engineers, Superintending Engineers and Chief Engineers, may be fixed and adhered to.

# CHAPTER-6

# PARTICIPATORY IRRIGATION MANAGEMENT

# CHAPTER 6 PARTICIPATORY IRRIGATION MANAGEMENT

The state of irrigation in Uttarakhand mirrors the malady that affects the irrigation sector in the country: low water rates, inadequate maintenance of the irrigation system, poor revenue assessment and collection mechanisms and rapidly rising costs of operation and maintenance (Vaidyanathan Committee on Pricing of Irrigation Water, 1992).

Participatory irrigation management (PIM) in India was a step to address the management issues in irrigation sector. It was recognized that the quality of an irrigation service in terms of adequacy of water discharge, timeliness (that ensures that the water is available when the farmers need it), equity (by which tail-end of the gul receives as much water as the head-end), dependability and convenience in supply greatly affects the yield from irrigation commands. With modern agricultural technology, proper water management holds the key to increased agricultural productivity. There is also a growing realization that bureaucratic controls at tertiary levels are not only unnecessary but also foster inefficiency, corruption and lead to high costs. It is the farmer who has a better understanding of his field conditions, who can manage the system better. In the current set-up, the farmers believe that the canals belong to the Government and that they are beneficiaries of the public irrigation system, with no role or responsibility for the upkeep of the assets. PIM seeks to decentralize water management, create water users' associations (WUA) and turnover the operation and maintenance of downstream parts of the irrigation systems, distribution of water among users and collection of water rates[10] to the users.

AIBP guidelines recommend that WUA should be formed for each scheme and that ownership of the schemes was to be rested with these groups who would in turn be responsible for its day-to-day water management and its maintenance along with minor repairs. The State Government issued (March 2005) orders that AIBP schemes should be executed by MID through WUAs but the order was not made applicable to ID, although it executes AIBP schemes.

As a result, WUAs were not formed by ID divisions in the 278 schemes executed by it under AIBP. Out of 8583 sub-schemes executed by MID in the sampled districts, WUAs were formed in only 4806 sub-schemes (56 *per cent*) as of March 2008. Further, only 2836 sub-schemes were handed over to the concerned WUAs. The MI divisions replied that since the order for formation of WUAs was issued in March 2005, the WUAs could be formed only for schemes sanctioned thereafter. However, the financial sanctions issued prior to March 2005 also contained clear instructions for formation of WUAs and out of six selected divisions, two divisions (Pauri and Pithoragarh) had formed the WUAs since inception of the schemes.

In India, there is a great deal of variety in approach towards PIM, irrigation being a State subject. Fourteen states[11] have pilot or full scale programs with a wide ranging brief for WUAs. Andhra model is a trendsetter in this regard. The Andhra Pradesh Farmers Management of Irrigation Systems Act 1997 clearly sets out the rights and responsibilities

[10] Swain and Das: Participatory Irrigation Management in India: Implementation and Gaps: Journal of Development in sustainable agriculture 3: 28-39 (2008)

[11] A.P, Assam, Bihar, Gujarat, Haryana, H.P, Karnataka, Kerala, M.P, Maharashtra, Orissa, Rajasthan, Tamil Nadu and West Bengal.

of WUAs as summarized below:

***Rights***

- Obtain information on water availability
- Receive water in bulk from irrigation department on agreed terms
- Levy fees for service charges and systems maintenance and management
- Plant trees and grass on canal bunds to augment farmers' income
- Get information on new crop varieties and have freedom to grow any crop
- Suggest improvements in layouts of field channels to supply water to all farmers
- Plan and promote use of groundwater

***Responsibilities***

- Prepare crop plans to match water deliveries
- Supply water to all members according to approved terms
- Carry out timely maintenance and repairs
- Impose penalties for misuse/wastage of water and tampering with canal network controls
- Minimize conveyance and operational losses
- Educate farmers on new methods of field irrigation, new crop varieties, pesticides etc.
- Assist Revenue Department in preparation of demand and collection of water charges
- Resolve disputes
- Maintain accounts and hold elections

Scrutiny revealed that the WUAs were formed only on paper, to meet the criterion set in AIBP and PIM was not implemented in Uttarakhand in its spirit as detailed below:

**Table 12**

| Key elements of PIM[12] | Objectives | Status in Uttarakhand | Good practices in other States |
|---|---|---|---|
| **Create an enabling legislation and frame** rules to enable implementation | Legislative backing is necessary to ensure sufficient commitment on the part of all concerned. | The presence of WUAs was supported only by Government orders. There was no legal sanctity to the WUA and the roles and responsibilities of WUAs were not clearly identified. State Government issued an order (September 2008) to fix only the responsibilities of WUAs and the Department, in case of defective works. This approach of only clarifying duties without providing them any rights or resources to meet the obligations is an important factor to the failure of PIM in Uttarakhand. | 14 States in India have enacted enabling legislation to provide a legal recognition to WUAs. |

[12] Peter &Pingle 1999: Participatory Irrigation Management in Andhra Pradesh: Big Bang-Consolidation-Extension

| | | | |
|---|---|---|---|
| | In order for the WUA to be a socially inclusive institution, the law should provide reservation of seats for women, SCs and STSs. | Despite the prominent role of women in rural economy, the representation of women in WUAs was only 9 *per cent*. The villages are populated more with women than men due to migration in the hill districts of Uttarakhand. | |
| **Conduct elections to WUAs** | To enable democratic selection of WUA office bearers | The WUAs are formed informally at the time of sending a proposal. The WUAs do not have an identity separate to that of the Gram Panchayat | Regular elections to WUAs are envisaged in the laws under which WUAs have been formed. In the Pani Panchayat Act of Orissa, 2002 there is a provision to recall the president of a Pani panchayat if he is not responsive to the farmers' needs and misuses his position. There is a similar provision for recall in the Andhra Act |
| Hold regular meetings of executive committee and General Body meeting should be convened | To ensure that decisions are taken collectively | It is the gram pradhan who is actually consulted for site selection and construction of irrigation canals; the beneficiaries know very little about the WUA concept[13].<br><br>205 schemes in test-checked divisions were admittedly lying incomplete due to disputes between beneficiaries. The actual number held up due to disputes would be much higher. This points to inability of a weak WUA, without a legal basis, to enforce the majority decisions/ commitments of the WUA | |
| **Fund PIM for initial thrust** and give back water charges collected to WUAs **to ensure sustainability and funding for O&M** | To help WUAs cover organizational expenses for the initial years and to improve efficiency of management as individual farmers are the ultimate water users and are motivated to use water efficiently | 3 *per cent* of the labour cost was kept aside for O&M; no separate funds were allocated for covering initial expenses on establishing WUAs. WUAs are also not collecting water charges. The WUAs have been handed the work of maintenance of irrigation system without any sustainable source of funding. | Acts of A.P. and M.P. mention the composition of funds at the disposal of farmers' organizations. These include grants as a share of water tax collected in the area; income from other assets/properties attached to the irrigation system; fees collected by WUAs for services rendered in better management of irrigation; and amounts received from other services |

[13] Disowned institutions in Hilaungad watershed: Study carried by People's Science Institute, Dehradun

| | | | |
|---|---|---|---|
| **Information, Education, Training to WUAs**:<br><br>**Provide incentives** for forming WUAs | Farmers will form WUAs and will take on additional responsibility only if they are convinced that the benefits due to PIM will exceed their costs of participation | No such exercise has been undertaken; lack of direction and cooperation from the government machinery was evident from the lack of ownership by the WUAs to the assets. | In A.P., a White Paper, Draft Bill, the final act and detailed rules were widely disseminated through mass meetings, hand bills, seminars and through the media to inform farmers of the changes and the reasons behind.<br><br>Orissa's Department of Water Resources has declared many incentives for forming Pani Panchayat, which include annual maintenance grants and prizes for the best performing Pani Panchayats. |
| **Build capacities of WUAs and Irrigation Department** | WUAs will be able to operate and maintain irrigation systems, provided their personnel have the expertise, technical knowledge and appropriate managerial ability. Irrigation officials also need to have right mindset and technical expertise required for PIM. | WUAs were found weak and ineffective; after their formation, they are left to their device without any mentoring role played by an already thinly stretched MID. | Maharashtra, Gujarat and Kerala assign prominence to WUAs in maintenance & repairs; users are actively involved in joint survey and certification of repair work. Rajasthan model involves farmers in diagnosis and execution of works which gives greater leverage to WUA and leaves little room for corruption, cost over run and poor quality of structures. |
| **Improve support to agriculture.**<br><br>**Restore faulty irrigation structures** before handing them over to WUAs for their upkeep | To secure farmers' support for reformed irrigation management structure, they should find substantially tangible, quick-yielding and sustainable benefits in the first year of operation | There was no co-ordinated effort involving different departments to provide such support.<br><br>Many schemes which were non-functional since inception were also handed over to WUAs. | In A.P., funds were given to WUAs for critical repairs which led to visible improvements in irrigation performance and helped in building trust between the irrigation department and the farmers |
| **Ensure continuous appraisal**, interaction and feedback | For success of the PIM and its replication in other areas | No independent appraisal has been carried in the State. | AP, Rajasthan and Karnataka models have been extensively researched. |

*Gohri Maphi* scheme of MID at Dehradun was constructed in 2005-07 at a cost of Rs 44.23 lakh. It created an IP of 55 hecatres and benefited 46 families, of which 8 were SC/ ST. The gul was well-constructed and provided sufficient water to the entire command area. We found that the farmers were growing vegetables and cereal crops and were in a position to sell their produce after meeting their own requirements for food grains. The beneficiaries evidently saw benefit in the scheme and were ready to work together and co-operate with each other to maximize their returns.

The State Government, while accepting the audit contention, stated (May, 2009) that bottom-up approach for extensive training at grass-root level, provision of legal sanctity to WUAs and rehabilitation of damaged assets would be initiated. The Government also agreed for sending teams/groups to Andhra Pradesh, Rajasthan and Himachal Pradesh for studying the mechanism regarding PIM being followed in these States.

## Conclusion

*Participatory Irrigation Management (PIM) is currently in a nascent state in Uttarakhand. Formation of Water User Associations (WUA) is a mere formality that is met prior to submission of proposals for construction of guls. They cease to have existence thereafter except in the form of a bank account with seed money which is lying un-utilised. The WUAs are not democratically elected and it is, by and large, the Gram Pradhan, who is actually consulted for selection and planning of schemes. Instances of schemes proposed by the WUAs initially, only to be caught up later in disputes, point to the ineffectiveness of PIM in the State.*

## Recommendations

- WUAs need to be given legal sanctity through an enabling legislation and empowered to discharge the responsibilities entrusted to them. Two approaches used by different States in the country could be considered for adoption: top-down approach i.e., first enacting legislation and then introducing PIM extensively, or the bottom-up approach by motivating users to go for PIM through extensive information, education and training programmes and then enacting the law.
- The farmers need to be motivated and convinced that the benefits that would accrue from PIM would exceed the costs of participation. The departmental engineers need to be trained/ re-oriented towards this objective. Large-scale publicity through print media, public campaigns and television, need to be resorted to. Co-option of NGOs to inform the farmers of their rights and benefits of PIM, along with responsibilities, could be considered.
- The Government needs to invest in training for WUAs by identifying a nodal training institution and by developing training modules.
- For the benefits to be tangible and substantial in the first years of operation itself, provision of support to agriculture in the targeted areas, may be embedded in the strategies towards introduction of PIM.

# CHAPTER-7

# FINANCIAL MANAGEMENT

# CHAPTER 7 FINANCIAL MANAGEMENT

## 7.1 Release of funds

The position of fund released by GOI and the State Government and expenditure incurred by MID and ID on the implementation of irrigation schemes under AIBP is detailed below:

**Table - 13**

**Minor Irrigation Department** (Rupees in crore)

| Year | CLA/CA sanctioned | Central share released | State share | Total admissible | Allotment | Expenditure | (-) Shortfall (+) Excess |
|---|---|---|---|---|---|---|---|
| 2003-04 | 24.07 | 24.07 | 8.03 | 32.10 | 41.15* | 41.15 | (+) 9.05 * |
| 2004-05 | 37.50 | 37.50 | 12.50 | 50.00 | 52.99* | 52.99 | (+) 2.99* |
| 2005-06 | 76.39 | 76.39 | 36.78 | 113.17 | 113.05 | 113.05 | (-) 0.12 |
| 2006-07 | 64.77 | 64.77 | 16.57 | 81.34 | 135.90 | 135.90 | (+) 54.56 |
| 2007-08 | 234.10 | 226.72 | 25.19 | 251.91 | 200.00 | 200.00 | (-) 51.91 |
| | **436.83** | **429.45** | **99.07** | **528.52** | **543.09** | **543.09** | **(+) 2.53** |

*Source : Information obtained from MI Department.*

** Includes the short release of fund amounting to Rs. 12.04 crore for the year 2002-03, which was adjusted during 2003-04 : Rs. 9.05 crore and 2004-05 : Rs. 2.99 crore.*

**Table - 14**

**Irrigation Department** (Rupees in crore)

| Year | CLA/CA sanctioned | Central share | State share | Total admissible | Allotment | Expenditure | (-) Shortfall (+) Excess |
|---|---|---|---|---|---|---|---|
| 2003-04 | 1.48 | 1.48 | 0.49 | 1.97 | 2.87 | 2.87 | (+) 0.90 |
| 2004-05 | 1.49 | 1.49 | 0.50 | 1.99 | 1.45 | 1.45 | (-) 0.54 |
| 2005-06 | 4.05 | 4.05 | 1.95 | 6.00 | 9.89 | 9.80 | (+) 3.89 |
| 2006-07 | 19.96 | 19.96 | 2.22 | 22.18 | 15.49 | 14.92 | (-) 6.69 |
| 2007-08 | 38.93 | 38.93 | 4.32 | 43.25 | 43.60 | 43.54 | (+) 0.35 |
| **Total** | **65.91** | **65.91** | **9.48** | **75.39** | **73.30** | **72.58** | **(-) 2.09** |

*Source : Information obtained from Irrigation Department.*

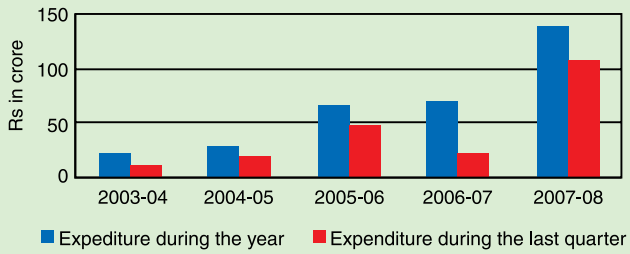
The Irrigation department received Rs. 65.91 crore under AIBP during the period 2003-08. The State government was required to provide its share of Rs. 9.48 crore during the period, thus making available Rs. 75.39 crore to the programme. However, the State Government provided Rs. 2.09 crore less than the required funds; thus a total sum of Rs. 73.30 crore was provided for the programme. Rs. 72.58 crore was spent by the ID, with the utilization being 100 *per cent* in MID and 99 *per cent* in ID.

There were delays in release of funds by the GOI, with the bulk of funds, required to be received by April of the first year of the biennium being received generally in January of the next year, leading to a spill-over of the schemes to the next biennium. In 2005-07, Rs 84.16 crore (44 *per cent)* of the grants sanctioned for schemes for the block year 2005-07 and scheduled to be completed by March 2007, were received by the State Government only in April 2007-Febuary 2008, i.e., after the end of the biennium. As a result, only 37 *per cent* of the schemes sanctioned in 2005-07, could be completed within the scheduled time.

AIBP guidelines envisage that the grant component released by the GOI along with the State share must be released to the project authorities by the State Government within 15 days of its release. However, the State Government released the central grants along with its share, 35 days to 57 days after their receipt from the GOI during 2003-04 to 2007-08 ***(Appendix-6).***

**Chart-4**

Rush of expenditure




The net effect of delays at both GOI and State Government level was that around 50 *per cent* of the funds were released in the last quarter of the year, leading to rush of expenditure, especially in March. In 2005-06 and 2007-08, more than 70 *per cent* of the funds were reported spent by the divisions in the last quarter.

## 7.2 Control over receipt and utilization of funds

MID reported full utilization of the fund received by it during the year, down to the last rupee. ID too utilized almost the entire amount each year. This does not reconcile with the fact that there are cases of spill over of schemes, which would leave the divisions with residual funds. In addition, we computed a saving of Rs. 29.09 lakh on 50 completed sub-schemes covered in the physical verification. The divisions did not have consolidated data on such residual funds. The divisions stated that they used the residual funds for purchase of stock (cement) or on other works and that the entire money was spent. Purchase of cement is done at the level of the division but the latter do not maintain scheme-wise or even programme-wise data on purchase of materials. The entire stock in the division is clubbed in one stock register. In the absence of any control record, we could not track the utilization of the residual funds. Under these circumstances, Audit cannot give an assurance on utilization of residual balances.

The JEs at the sub-divisional level maintain scheme-wise utilization of stock, but these are not segregated programme-wise (AIBP;District Plan etc). The stock is issued in batches, on the basis of a demand slip brought by the gram pradhan and counter-signed by the JE. The divisions are required to maintain a stock account by which receipts of stock are reconciled with purchase orders and utilization reconciled with returns from the sub-divisions. The JEs also did not maintain Materials-at-Site register (MAS) which would indicate the quantum of material brought to site, utilized on the work and the balance to be returned to the Division. MAS is thus the tail end of the trail on issue of stock and constitutes an important control. The MAS is required to be cross-checked with annual physical verification to verify the condition and utilization of stock; the annual physical verification was also not conducted. Clearly, the controls on issue and utilization of stock were inadequate.

The Departments confirmed (May 2009) that due to large number of sub-schemes, the MAS account could not be maintained but stated that, division-wise material issue registers were being maintained.

Financial rules require half yearly closing of the stock accounts. Out of the twelve test checked divisions, only four divisions (33 *per cent*) had closed the stock accounts by

March 2008. Five divisions[14] had closed the stock account last in September 2007, MI, US Nagar and MI, Pithoragarh had closed the stock account upto March 2007 and March 2006 respectively**. Delays in closing of accounts allow space for manipulation and fraud**.

The divisions are required to maintain a works register in which progress on different schemes is recorded on the basis of monthly progress reports compiled in the divisions. However, MID divisions did not maintain/update the works register. MID also does not maintain an asset register. **Thus two vital controls that provide a watch on the progress on works and the assets created by MID, are missing**. The fact that guls which were actually incomplete, were recorded as complete in divisional records highlight the risks due to non-adherence to controls laid down by the system.

The divisions purchased cement bags valued at Rs. 50 crore during the period 2003-08 from open market, which were issued and charged to schemes at Rs. 55.93 crore. The difference between the issue price and purchase price amounting to Rs. 5.93 crore[15] was shown as savings on stock, which the divisions reported as utilized on AIBP works. **Their reported utilization was not supported by any documents.**

**Another area that poses a significant risk is the mode of payment on muster rolls with unlimited temporary imprests drawn by the JE in MID**. Government orders lay down that imprests should be drawn only for petty expenditure and should be settled within a month of drawal. There was no limit on the amount that can be drawn as temporary imprest in MID; on some occasions, the imprest drawn (on each instance) was as high as Rs 90 lakh. Scrutiny revealed that in 28 instances in the sampled divisions, the JEs withdrew sums totaling Rs 3.68 crore, which was retained by them for more than two months. The divisions told us that this facility had been allowed because of the difficult terrain. However, NREGS, which also involves muster roll payment, provides that the funds will be drawn by the BDO and transferred to joint account of the Gram Pradhan and Village development officer. From April 2008, NREGS payments are released directly into the bank accounts of the beneficiaries.

AIBP guidelines prescribe submission of utilization certificates (UCs) by the concerned departments to the State Government in respect of funds provided to them, for onward submission to GOI and further rendition of audited Statements of Expenditure (SoE) within nine months of release of central assistance. Out of Rs 636.13 crore spent by the divisions of MID/ID during 2002-08, UCs for Rs 594.57crore were furnished to the GOI. UCs for funds amounting to Rs 41.56 crore were not furnished. MID stated (December 2008) that it was collecting the requisite information from the divisions.

There were discrepancies in UCs submitted by MID. **UCs for 38 schemes sanctioned in the biennium 2004-06 estimated to cost Rs. 1.55 crore, were furnished by MID in March 2006, although these schemes were abandoned (not taken up at all) and substitute schemes were approved in March 2006**.

[14] March 2008 : MI divisions (Dehradun) & ID divisions (Dehradun, Chamoli, Pauri)
September 2007 MI divisions (Chamoli, Pauri) & ID Divisons (Almora, US Nagar, Pithoragarh)
March 2007 : MI divisions (US Nagar), March 2006 : MI Division (Pithoragarh)

[15] MI Divisions - Chamoli : Rs. 1.93 crore, Dehradun : Rs. 3.19 crore & US Nagar : Rs. 0.45 crore, ID Divisions - US Nagar : Rs. 0.01 crore, Lansdowne : Rs. 0.02 crore & Kalsi : Rs. 0.33 crore.

**There was no system of submission of audited SOEs in the State for the AIBP schemes. This too is a risk area** since there is no assurance on the actual expenditure. However, non-submission of audited SOEs did not deter the GOI from releasing funds under AIBP each year.

The Departments assured (May 2009) that appropriate action would be taken with regard to incorrect reporting of UCs, unspent balances, temporary imprests, stock profit and saving of funds.

## Conclusion

*Internal controls relating to utilization of funds and material are weak and carry the risk of fraud and misappropriation.*

*Important control registers were not maintained in the divisions and the practices followed with regard to unspent balances, stock accounts, muster roll payments etc. are in contravention of the financial rules. UCs were not based on the actual funds expended and audited Statements of Expenditure, an important requirement in AIBP, were not prepared.*

## Recommendations

- Important controls which provide a trail on receipt and utilization of stock- maintenance of the materials at site register and timely closing of stock account, must be adhered to. The Works Register and the Asset register provide a control on the assets being created/ created and their utilization. The concerned officials may be provided training to sensitize them to the need for such controls as also to convey the Departments' resolve that such records would necessarily have to be maintained
- A system of reporting the quantum of unspent AIBP funds in the department should be initiated and cases of incorrect reporting in utilization certificates may be investigated and responsibility should be fixed.
- Large payments made on muster rolls with temporary imprest, must be discontinued with. The department could adopt the mode of payment on muster roll payments in NREGS, after evaluating its suitability.
- The departments should prepare Statements of Expenditure (SOE, and get them audited on priority.

# CHAPTER-8

# IMPACT OF AIBP

## CHAPTER 8 IMPACT OF AIBP

The viability of the irrigation schemes is measured by the economic benefits that would accrue to the beneficiaries through increase in agricultural production on the completion of their schemes. BCR calculations in AIBP were, however, based mainly on increase in production of cereals- rice and wheat. Table-15 summarises the crop-wise position of agricultural production, area under production and productivity in the State over the period 2002-07 (AIBP was introduced in 2002; data for 2008 was not available).

**Table : 15**

| Year | Cereals | Pulses | Oilseeds | Others | Total |
|---|---|---|---|---|---|
| **Area (in hectares)** | | | | | |
| 2002-03 | 993379 | 50948 | 28504 | 132453 | 1205284 |
| 2003-04 | 990666 | 42576 | 37135 | 127618 | 1197995 |
| 2004-05 | 966614 | 44880 | 40735 | 107357 | 1159586 |
| 2005-06 | 959632 | 61190 | 35041 | 100568 | 1156431 |
| 2006-07 | 923842 | 51949 | 28030 | 120939 | 1124760 |
| **Production (in MT)** | | | | | |
| 2002-03 | 1563219 | 33852 | 19838 | 7814727 | . |
| 2003-04 | 1695911 | 27871 | 34673 | 7651299 | |
| 2004-05 | 1702326 | 28354 | 37918 | 6441420 | |
| 2005-06 | 1531718 | 35135 | 29762 | 6134223 | |
| 2006-07 | 1675804 | 33115 | 21030 | 7377229 | |
| **Productivity (in quintals per hectare)** | | | | | |
| 2002-03 | 15.73 | 6.64 | 6.95 | 590.00 | . |
| 2003-04 | 17.12 | 6.55 | 9.34 | 599.00 | |
| 2004-05 | 17.61 | 6.25 | 9.30 | 600.00 | |
| 2005-06 | 15.96 | 5.74 | 8.49 | 610.00 | |
| 2006-07 | 18.13 | 6.37 | 7.50 | 610.00 | |

*Source: Directorate of Economic & Statistics, Uttarakhand*

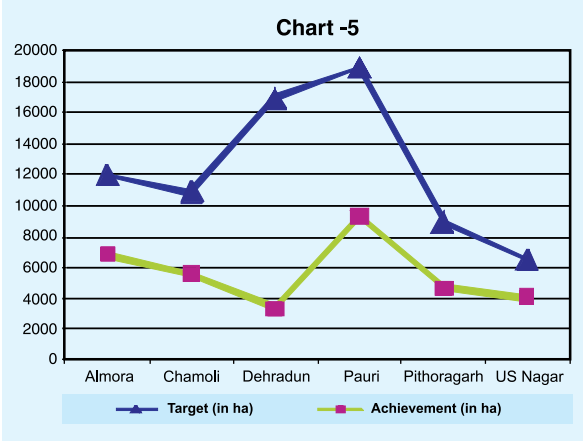
Agricultural production other than that of pulses has gone down over the years, mainly because of the dip in the area under cultivation of these crops. There has been a shift in terms of cropping area with farmers shifting from cereals to pulses. Productivity has increased marginally in both cereals and other crops. There was however, a decrease in pulses and oilseeds. Agriculture Department attributed the fluctuations in production of crops to drought during the years 2002-03 (kharif), 2005-06 (rabi), 2006-07(kharif) and 2007-08 (rabi). This points to the marginal impact that irrigation schemes have had on the famers' dependence on rains. In any case, trends in production and productivity do not indicate any strong correlation between agricultural growth and introduction of AIBP.

Agricultural growth depends on many factors like quality of seeds, use of fertilizers etc., as well as the sowed area and is not hinged entirely on availability of irrigation. Productivity, as measured by yield per hectare, does not depend on the sown area but the other factors mentioned above would impinge on it. However, two indicators that have a direct bearing on irrigation infrastructure and annual availability of water, and were used by us to measure the impact of AIBP are as follows:

- ***Gross irrigated area***: being the area under irrigation* no of crops sown in the area
- ***Cropping intensity***: which is the total cropped area * 100/net area sown

## *8.1 Impact on gross irrigated area*

The AIBP schemes taken up in the sampled divisions during 2002-08 were to add 81642.92 hectares of CCA, thus increasing the CCA in the districts by 26.65 *per cent*. The divisions reported 50 *per cent* achievement, thus adding 41090.62 hectares in CCA. Irrigation potential actually utilized is not being assessed by MID.




Scrutiny revealed that the claims of ID/MID relating to increase in irrigation potential do not tally with the figures for increase in the gross irrigated area in the five districts[16] as estimated by the State Statistics Department. The block year of 2002-05 was taken, for a comparison (the figures for 2005-06 onwards were not available). It is also pertinent to mention here that irrigation is an area where funds are received from many plans and schemes; however to be on the conservative side, departmental achievement under AIBP only was taken for comparison. The comparison (Table-16) shows that the claims of ID/ MID on impact of AIBP on creation of irrigation potential, were more than eight times the increase in the gross irrigated area, indicating either inflation in reporting or low utilization of created potential.

**Table : 16**

| Name of district | CCA reported as created under AIBP during 2002-04 (in hectares) | Gross irrigated area (in hectares) reported by Statistics Department in | | |
|---|---|---|---|---|
| | | 2003 | 2005 | Increase/decrease in 2003-05 |
| Almora | 696.28 | 10148 | 9832 | (-) 316 |
| Chamoli | 630.64 | 2705 | 2928 | 223 |
| Dehradun | 1275.00 | 34218 | 33660 | 558 |
| Pauri | 1147.67 | 14960 | 14271 | 689 |
| Pithoragarh | 413.24 | 7709 | 7056 | (-) 653 |
| **Total** | **4162.83** | | | **501** |

*Source : Information obtained from Statistics Department and selected divisions.*

[16] US Nagar was not taken because of the distortions caused by its inclusion, where the increase in irrigated area was 37 times the AIBP achievements. This, however, provides an indication to the multitude of schemes (other than AIBP) that flow into the sector

## *8.2 Impact on cropping intensity*

The trends in cropping intensity showed an increase till 2004-05 after which it dropped in 2005-06.

At the district level, cropping intensity showed a continuous dip in four of the test-checked districts. In Pauri, the cropping intensity showed inter-year fluctuations while in US Nagar district, it showed a marginal increase of 4 *per cent* (Table-17)

**Chart-6**
Year-wise cropping intensity of Uttarakhand

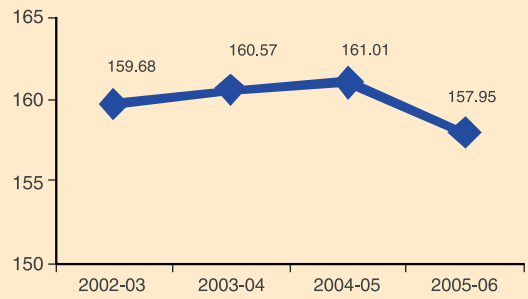



**Table : 17**

| District | 2002-03 | 2003-04 | 2004-05 | 2005-06 |
|---|---|---|---|---|
| Almora | 161.51 | 160.14 | 158.91 | 154.34 |
| Chamoli | 154.03 | 148.11 | 151.32 | 139.55 |
| Dehradun | 154.48 | 155.98 | 156.50 | 151.89 |
| Pauri | 152.84 | 154.09 | 153.09 | 152.99 |
| Pithoragarh | 183.58 | 184.41 | 182.20 | 174.27 |
| US Nagar | 167.07 | 171.25 | 171.45 | 173.85 |

*Source : Agriculture Department.*

The marginal impact of AIBP on the availability of irrigation in the State, despite an investment of Rs. 615.67 crore during 2003-08, may be linked to the following:

- Physical verification conducted by us, showed that 66 *per cent* of the sub-schemes reported to have been created, were either not created or not utilized because the schemes were not functional.
- Secondly, most of the schemes involved merely conversion of kucha guls to pucca guls, a fact not revealed in DPRs; thus addition to IP may be less than projected and claimed to have been achieved.
- There may also be a reduction in irrigated area falling under irrigation sources other than canals, which could have affected the increase in gross irrigated area.

## Conclusion

*The claims of the departments on addition of irrigation potential through AIBP schemes appear grossly exaggerated and are not reflected in the trends on key parameters i.e. gross irrigated area or cropping intensity. The gross irrigated area increased marginally in three sampled districts and in two districts, it registered a decrease. Cropping intensity has fallen down in four out of the six sampled districts; for the State overall, the cropping intensity has gone down in 2005-06. Our analysis does not show a significant impact of AIBP in augmenting the irrigation potential in the State.*

**Recommendation**

- An independent evaluation of the impact of AIBP on irrigation in the State would provide the relevant inputs for taking corrective action and for future planning of the schemes.

The Government accepted and appreciated (May 2009) the findings and recommendations of audit as an aid to management.

**Dehradun** **(DEEPAK ANURAG)**

**The** **Accountant General (Audit), Uttarakhand**

**Countersigned**

**New Delhi** **(VINOD RAI)**

**The** **Comptroller and Auditor General of India**

# APPENDICES

# Appendix – 1

*(Reference: Para 4.1)*

## A: Statement showing the details of inadequate survey

| Name of district | Name of scheme | Name of sub-schemes | Date of survey | Land ha. (CCA) | Length (km.) |
|---|---|---|---|---|---|
| Almora (MI) | Jaicholi | Jaicholi | 15.06.03 | 3.00 | 0.400 |
| | | Malauz | 15.06.03 | 4.00 | 0.560 |
| | | Keurali | 15.06.03 | 8.50 | 1.000 |
| | | Chanoli | 15.06.03 | 4.80 | 0.700 |
| | | Sutali | 15.06.03 | 4.00 | 0.500 |
| | | Laduda | 15.06.03 | 8.50 | 1.000 |
| | | **06** | | **32.80** | **4.160** |
| | | Falyanli | 17.06.03 | 3.60 | 0.500 |
| | | Bagadagadhera | 17.06.03 | 1.50 | 0.200 |
| | | Bajwand | 17.06.03 | 2.50 | 0.340 |
| | | Sherabheeda | 17.06.03 | 2.50 | 0.360 |
| | | Rameladungari | 17.06.03 | 2.50 | 0.360 |
| | | Dholra | 17.06.03 | 6.00 | 0.840 |
| | | Chokuni Bisusiya | 17.06.03 | 6.00 | 0.840 |
| | | Bhanar | 17.06.03 | 3.00 | 0.425 |
| | | Shillinghar | 17.06.03 | 8.00 | 0.800 |
| | | Banoda | 17.06.03 | 1.60 | 0.220 |
| | | Bhanar | 17.06.03 | 2.30 | 0.320 |
| | | Bilori | 17.06.03 | 2.70 | 0.420 |
| | | **12** | | **42.20** | **5.265** |
| | Dhaura | Dhaura | 26.11.04 | 16.00 | 1.500 |
| | | Baini Tamta | 26.11.04 | 6.00 | 0.800 |
| | | Bhainsiyakhal | 26.11.04 | 9.00 | 1.000 |
| | | Jiflta | 26.11.04 | 12.00 | 1.500 |
| | | Nadi | 26.11.04 | 12.00 | 1.000 |
| | | **05** | | **55.00** | **5.800** |
| | Degot | Patalgaon | 5.5.05 | 8.50 | 0.900 |
| | | Pipaldhar | 5.5.05 | 5.50 | 0.600 |
| | | Chitar | 5.5.05 | 5.50 | 0.600 |
| | | Chulerasim | 5.5.05 | 5.50 | 0.600 |
| | | Dholgaon | 5.5.05 | 7.00 | 0.750 |
| | | Kheera | 5.5.05 | 5.50 | 0.600 |
| | | **06** | | **37.50** | **4.050** |

| | | | | | |
|---|---|---|---|---|---|
| Pithoragarh (MI) | Barave | Barave | 27.05.03 | 5.50 | 0.825 |
| | | Shilingia | 27.05.03 | 4.00 | 0.600 |
| | | Dhari | 27.05.03 | 6.00 | 0.600 |
| | | Rauliyagoan | 27.05.03 | 3.50 | 0.240 |
| | | Marh Marsoli | 27.05.03 | 5.50 | 0.600 |
| | | **05** | | **24.50** | **2.865** |
| | | Gairsail | 20.05.03 | 3.30 | 0.300 |
| | | Dador Sale | 20.05.03 | 9.50 | 1.400 |
| | | Khet Patoli | 20.05.03 | 8.00 | 1.000 |
| | | Bipulsale | 20.05.03 | 6.00 | 0.650 |
| | | **04** | | **26.80** | **3.350** |
| US Nagar (ID) | Katna, Basgar etc. | Katna | 23.1.04 | 72.00 | 1.000 |
| | | Basgar | 23.1.04 | 50.00 | 0.350 |
| | | Bhuriya | 23.1.04 | 56.00 | 0.300 |
| | | Daunda | 23.1.04 | 40.00 | 0.350 |
| | | **04** | | **218.00** | **2.000** |
| Dehradun (MI) | Kawakhera | Bandeyara | 24.08.04 | 16.00 | 2.000 |
| | | Demee | 24.08.04 | 13.00 | 1.500 |
| | | Khara Nahar | 24.08.04 | 16.00 | 2.000 |
| | | Goda | 24.08.04 | 8.00 | 1.000 |
| | | Kuthalee | 24.08.04 | 4.00 | 0.500 |
| | | Gada Rahiya Nahar | 24.08.04 | 8.00 | 1.000 |
| | | Karnee | 24.08.04 | 13.00 | 1.400 |
| | | **07** | | **78.00** | **9.400** |

*Source: Information obtained from selected divisions.*

## B: Statement showing the details of inadequate survey

| Name of district | Name of scheme | Name of sub-schemes | Date of survey | Land ha. (CCA) | Length (km) |
|---|---|---|---|---|---|
| Pauri (MI) | Sobra | Kafald-II | Nil | 10.00 | 1.000 |
| | | Kaproli | Nil | 13.50 | 1.500 |
| | | Musethi | Nil | 7.50 | 0.800 |
| | | Naini | Nil | 8.60 | 1.000 |
| | | Jallu | Nil | 9.00 | 1.000 |
| | | Sobra | Nil | 18.00 | 2.000 |
| | | **06** | | **66.60** | **7.300** |
| | Jakhola | Ainthi | Nil | 9.00 | 1.000 |
| | | Patal | Nil | 9.00 | 1.000 |
| | | Sundergaon | Nil | 9.00 | 1.000 |
| | | Rangaon | Nil | 13.50 | 1.500 |
| | | Kuneth | Nil | 10.00 | 1.000 |
| | | Byasi | Nil | 13.00 | 1.500 |
| | | Kainyur | Nil | 17.00 | 2.000 |
| | | Jakhola | Nil | 9.00 | 1.000 |
| | | **08** | | **89.50** | **10.00** |
| | Gawani | Dhar ki Beena | Nil | 5.50 | 0.700 |
| | | Talli Sera | Nil | 7.50 | 1.000 |
| | | Kola | Nil | 15.50 | 2.000 |
| | | Kilwas | Nil | 12.00 | 1.500 |
| | | Odal | Nil | 6.50 | 0.800 |
| | | Musoti | Nil | 20.00 | 2.500 |
| | | Pokhada | Nil | 7.50 | 1.000 |
| | | Bagadi | Nil | 7.50 | 1.000 |
| | | Baundar | Nil | 6.50 | 0.800 |
| | | Chamnau | Nil | 8.00 | 1.000 |
| | | Manjgaon | Nil | 5.50 | 0.700 |
| | | Khandai | Nil | 4.50 | 0.500 |
| | | Saundal | Nil | 6.00 | 0.700 |
| | | Kudidhar Pand | Nil | 6.50 | 0.800 |
| | | Andpur | Nil | 4.50 | 0.600 |
| | | Sileth | Nil | 7.50 | 1.000 |
| | | Lwintha | Nil | 8.00 | 1.000 |
| | | Jhalpadi | Nil | 8.00 | 1.000 |
| | | Bheeda | Nil | 7.50 | 1.000 |
| | | Panaun | Nil | 7.50 | 1.000 |
| | | **20** | | **162.00** | **20.600** |
| Dehradun (MI) | Vinhar | Vinhar | Nil | 18.00 | 2.000 |
| | | Madarsu | Nil | 18.00 | 1.500 |
| | | Narokhad | Nil | 20.00 | 2.000 |
| | | Latikhet | Nil | 18.00 | 2.000 |
| | | Kulethnala | Nil | 18.00 | 1.500 |
| | | **05** | | **92.00** | **9.000** |

*Source: Information obtained from selected divisions.*

# Appendix-2

*(Reference: Para 4.2.1)*

## Detail of excess CCA projected in the DPR by the Divisions.

| Name of Division | Name of Cluster | Name of Sub-scheme | Estimated cost (Rs. In lakh) | Length of gul (In km.) | CCA (ha) | Required discharge for CCA @ 100 lpm/Ha | Designed discharge of gul without loss of water (lpm) | Loss of water @ 265 lpm/ km. | Available net designed discharge (in lpm) | Sufficient for CCA @ 100 lpm/Ha. (Ha) | Excess CCA projected (ha) (6-11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* |
| Pauri | Sobra | Kafald-II | 6.33 | 1.000 | 10.00 | 1000 | 1143 | 265.00 | 878.00 | 8.780 | 1.220 |
| | | Kaproli | 8.70 | 1.500 | 13.50 | 1350 | 1143 | 397.50 | 745.50 | 7.455 | 6.045 |
| | | Jallu | 5.49 | 1.000 | 9.00 | 900 | 1143 | 265.00 | 878.00 | 8.780 | 0.220 |
| | | Sobra | 12.12 | 2.000 | 18.00 | 1800 | 1143 | 530.00 | 613.00 | 6.130 | 11.870 |
| | | **Total** | | **5.500** | **50.50** | **5050** | **4572** | **1457.50** | **3114.50** | **31.145** | **19.355** |
| | Jakhola | Ainthi | 6.31 | 1.000 | 9.00 | 900 | 1143 | 265.00 | 878.00 | 8.780 | 0.220 |
| | | Patal | 6.39 | 1.000 | 9.00 | 900 | 1143 | 265.00 | 878.00 | 8.780 | 0.220 |
| | | Sundergaon | 6.48 | 1.000 | 9.00 | 900 | 1143 | 265.00 | 878.00 | 8.780 | 0.220 |
| | | Rangaon | 9.58 | 1.500 | 13.50 | 1350 | 1143 | 397.50 | 745.50 | 7.455 | 6.050 |
| | | Kuneth | 6.49 | 1.000 | 10.00 | 1000 | 1143 | 265.00 | 878.00 | 8.780 | 1.220 |
| | | Byasi | 9.77 | 1.500 | 13.00 | 1300 | 1143 | 397.50 | 745.50 | 7.455 | 5.545 |
| | | Kainyur | 13.14 | 2.000 | 17.00 | 1700 | 1143 | 530.00 | 613.00 | 6.130 | 10.870 |
| | | Jakhola | 6.64 | 1.000 | 9.00 | 900 | 1143 | 265.00 | 878.00 | 8.780 | 0.220 |
| | | **Total** | | **10.000** | **89.50** | **8950** | **9144** | **2650.00** | **6494.00** | **64.940** | **24.565** |
| | Gawani | Kola | 14.73 | 1.000 | 15.50 | 1550 | 1143 | 265.00 | 878.00 | 8.780 | 6.720 |
| | | Kilwas | 11.10 | 1.500 | 12.00 | 1200 | 1143 | 397.50 | 745.50 | 7.455 | 4.550 |
| | | Musoti | 17.99 | 2.500 | 20.00 | 2000 | 1143 | 662.50 | 480.50 | 4.805 | 15.200 |
| | | **Total** | | **5.000** | **47.50** | **4750** | **3429** | **1325.00** | **2104.00** | **21.040** | **26.460** |
| | | **Total-Pauri** | | **20.500** | **187.50** | **18750** | **17145** | **5432.50** | **11712.50** | **117.125** | **70.380** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chamoli | Kush | Kush | 15.04 | 2.500 | 20.20 | 2020 | 2130 | 662.50 | 1467.50 | 14.675 | 5.530 |
| | Mailagwar | Lalisera Mailagwar | 11.44 | 2.000 | 25.00 | 2500 | 2630 | 530.00 | 2100.00 | 21.000 | 4.000 |
| | Koliyagair | Koliyagair | 17.75 | 3.000 | 21.00 | 2100 | 2130 | 795.00 | 1335.00 | 13.350 | 7.650 |
| | | **Total-Chamoli** | | **7.500** | **66.20** | **6620** | **6890** | **1987.50** | **4902.50** | **49.025** | **17.180** |
| Dehradun | Gohri maphi | Gohri maphi | 44.23 | 3.480 | 55.00 | 5500 | 4862 | 922.20 | 3939.80 | 39.398 | 15.600 |
| | | **Total** | | **3.480** | **55.00** | **5500** | **4862** | **922.20** | **3939.80** | **39.398** | **15.600** |
| | Vinhar | Vinhar | 14.30 | 2.000 | 20.00 | 2000 | 2397 | 530 | 1867 | 18.67 | 1.330 |
| | | Naro Khudd | 14.10 | 2.000 | 20.00 | 2000 | 2397 | 530 | 1867 | 18.67 | 1.330 |
| | | Latti Khet | 14.15 | 2.000 | 20.00 | 2000 | 2397 | 530 | 1867 | 18.67 | 1.330 |
| | | **Total** | | **6.000** | **60.00** | **6000** | **7191** | **1590** | **5601** | **56.01** | **3.990** |
| | | **Total-Dehradun** | | **9.480** | **115.00** | **11500** | **12053** | **2512.20** | **9540.80** | **95.408** | **19.590** |
| | | **G. Total** | | **37.480** | **368.70** | **36870** | **36088** | **9932.20** | **26155.80** | **261.558** | **107.150** |

*Source: Data obtained from the selected MI Divisions*

# Appendix – 3

*(Reference: Para 4.3)*

## Statement showing the details of inflated specification of size

| Name of Division | Name of cluster | Name of Sub scheme | Size of channel (meter) | CCA (ha.) | Length (km) | LPM | Size as per approved norms (Meter) |
|---|---|---|---|---|---|---|---|
| MI Almora | Digot | Jetha-I | 0.30 x 0.25 | 6.5 | 0.600 | 1500 | .25 x .25 |
| | | Simalkhet | 0.30 x 0.20 | 3.5 | 0.300 | 1500 | .20 x .20 |
| | | Pipaldhar | 0.30 x 0.25 | 5.5 | 0.600 | 1500 | .20 x .20 |
| | | Chhitar | 0.30 x 0.25 | 5.5 | 0.600 | 1500 | .20 x .20 |
| | | Beltgaon | 0.30 x 0.20 | 7.0 | 0.600 | 1465 | .25 x .20 |
| | | Banautiya | 0.30 x 0.20 | 6.0 | 0.600 | 1500 | .25 x .20 |
| | | Chulerasim | 0.30 x 0.25 | 5.5 | 0.600 | NA | .25 x .20 |
| | | Jamunia | 0.30 x 0.20 | 6.0 | 0.600 | 1475 | .20 x .20 |
| | | Chhanagaon | 0.30 x 0.20 | 6.0 | 0.450 | 1500 | .20 x .20 |
| | | Dhaungaon | 0.30 x 0.25 | 7.0 | 0.750 | 1475 | .25 x .25 |
| | | Kheera | 0.30 x 0.20 | 5.5 | 0.600 | 1500 | .20 x .20 |
| | | Jetha-II | 0.30 x 0.25 | 6.5 | 0.600 | 1500 | .25 x .25 |
| MI Pithoragarh | Baungothi | Tallagair | 0.25 x 0.20 | 5.0 | 0.600 | 1000 | .20 x .20 |
| | | Dadiyabagar | 0.25 x 0.20 | 4.0 | 0.450 | 1000 | .20 x .20 |
| | | Panipouri | 0.25 x 0.20 | 7.0 | 0.990 | 900 | .25 x .20 |
| MI US Nagar | Devaria | Devaria | 0.50 x 0.30 | 8.0 | 0.810 | 20000 | .25 x .25 |
| MI Dehradun | Hartard-Santard | Gernwa | 0.40 x 0.30 | 25.0 | 1.000 | 100 | .35 x .30 |
| | | Gaiti | 0.35 x 0.30 | 14.0 | 1.500 | 2650 | .25 x .25 |
| **Total schemes :** | | **18** | | | | | |

*Source: Data obtained from the selected divisions*

# Appendix-4

***(Reference: Para 5)***

## Details of Irrigation Potential projected and created during 2002-03 to 2007-08

| Year | Irrigation Potential projected (ha.) | | | Irrigation Potential created (ha.) | | |
|---|---|---|---|---|---|---|
| | ID | MI | Total | ID | MI | Total |
| 2002-03 | 1226.00 | 9334.01 | 10560.01 | - | 1446.95 | 1446.95 |
| 2003-04 | - | - | - | 1226.00 | 5144.29 | 6370.29 |
| 2004-05 | 2531.40 | 15011.00 | 17542.40 | 2531.40 | 4472.05 | 7003.45 |
| 2005-06 | 2717.00 | 34274.00 | 36991.00 | 2699.00 | 17139.50 | 19838.50 |
| 2006-07 | 6645.05 | - | 6645.05 | 1547.00 | 18273.89 | 19820.89 |
| 2007-08 | 21440.34 | 68328.22 | 89768.56 | 3383.00 | 2800.20 | 6183.20 |
| **Total :** | **34559.79** | **126947.23** | **161507.02** | **11386.4** | **49276.88** | **60663.28** |

*Source : Information obtained from the Department.*

# Appendix-5

*(Reference: Para 5.3)*

## A: Statement showing the details of schemes constructed lacking command area

| Name of Division | Name of Scheme | Block year | Name of sub-schemes | Estimated cost (Rs. in lakh) | Length targeted (km.) | CCA (ha.) | Actual expenditure (Rs. in lakh) | Length achieved (km.) | Length constructed without command |
|---|---|---|---|---|---|---|---|---|---|
| Almora | Dungamohan | 2004-06 | Davarasaural | 8.23 | 1.500 | 12.00 | 8.36 | 1.480 | 0.700 |
| Pithoragarh | Bhadgaon | 2005-07 | Bhargaon Jhamkote | 5.47 | 1.000 | 10.00 | 5.47 | 0.450 | 0.400 |
| | Kanalichina | 2007-09 | Bagarihat | 17.00 | 2.170 | 19.00 | 11.17 | 1.730 | 0.120 |
| | Kukroli | 2004-06 | Dholaghar * | 4.51 | 0.750 | 7.00 | 4.51 | 0.650 | 0.650 |
| Pauri | Sobra | 2004-06 | Musethi | 4.92 | 0.800 | 7.50 | 4.92 | 0.800 | 0.800 |
| | | 2004-06 | Naini-II | 5.78 | 1.000 | 8.60 | 5.78 | 1.000 | 0.150 |
| | Jakhola | 2005-07 | Sundergaon | 6.48 | 1.000 | 9.00 | 6.47 | 1.000 | 1.000 |
| | Gawani | 2005-07 | Bagadi | 7.07 | 1.000 | 7.50 | 7.07 | 1.000 | 1.000 |
| Chamoli | Kush | 2005-07 | Kush | 15.04 | 2.500 | 20.20 | 15.67 | 2.500 | 0.250 |
| Dehradun | Kawakhera | 2005-07 | Gada Rahiya | 7.08 | 1.000 | 8.00 | 1.50 | 0.300 | 0.300 |
| | | 2005-07 | Karnee | 11.22 | 1.400 | 13.00 | 4.45 | 0.760 | 0.600 |
| **Total** | **09** | | **11** | **92.80** | **14.120** | **121.80** | **75.37** | **11.670** | **5.970** |

*Source : Information obtained from selected divisions.* ** Not under sample selection*

## B: Statement showing the details of damaged schemes

| Name of Division | Name of scheme | Block year | Name of sub-schemes | Estimated cost (Rs. in lakh) | Length target (km.) | CCA (ha.) | Actual expenditure (Rs. in lakh) | Length achieved (km.) |
|---|---|---|---|---|---|---|---|---|
| Almora | Baisiyachhana | 2006-09 | Tarkhet | 10.71 | 2.000 | 23.00 | 3.90 | 0.000 |
| Pithoragarh | Barave | 2004-06 | Barave | 4.73 | 0.825 | 5.50 | 4.73 | 0.780 |
| | | | Bhattigaon | 3.66 | 0.600 | 6.00 | 3.66 | 0.600 |
| | Nayal | 2004-06 | Ganaikuna | 5.41 | 0.920 | 9.00 | 5.41 | 0.900 |
| | Bhadgaon | 2005-07 | Marh Narang | 5.31 | 1.000 | 7.00 | 5.31 | 0.900 |
| | | | Barambachkuri | 2.99 | 0.500 | 7.00 | 2.99 | 0.500 |
| US Nagar | Surajpur | 2004-06 | Surajpur | 25.50 | 1.860 | 30.00 | 25.50 | 1.860 |
| | Harsan | 2004-06 | Harsan | 30.43 | 3.350 | 49.98 | 30.40 | 2.875 |
| Pauri | Garhmola | 2007-09 | Garhmola | 52.66 | 5.000 | 56.00 | 18.31 | 1.820 |
| | Sobra | 2004-06 | Jallu | 5.49 | 1.000 | 9.00 | 5.49 | 1.000 |
| | Jakhola | 2005-07 | Rangaon | 9.58 | 1.500 | 13.50 | 9.58 | 1.500 |
| | | | Byasi | 9.77 | 1.500 | 13.00 | 9.77 | 1.487 |
| | | | Kainyur | 13.14 | 2.000 | 17.00 | 13.17 | 1.992 |
| Chamoli | Koliyagair | 2005-07 | Koliyagair | 17.75 | 3.000 | 21.00 | 18.04 | 2.940 |
| | Lalisera Mailagwar | 2005-07 | Lalisera Mailagwar | 11.44 | 2.000 | 25.00 | 11.76 | 2.000 |
| Dehradun | Kawa Khera | 2005-07 | Bandiyara | 13.45 | 2.000 | 16.00 | 9.48 | 1.730 |
| | Vinhar | 2005-07 | Latikhet | 14.15 | 2.000 | 18.00 | 6.74 | 1.290 |
| Almora | Jaicholi | 2004-06 | Jaicholi | 2.34 | 0.400 | 3.00 | 2.36 | 0.400 |
| | | | Sutoli | 3.30 | 0.500 | 4.00 | 3.25 | 0.460 |
| Pithoragarh | Barave | 2004-06 | Dhari | 3.59 | 0.600 | 6.00 | 3.59 | 0.600 |
| Pauri | Sobra | 2004-06 | Kaproli | 8.70 | 1.500 | 13.50 | 8.70 | 1.500 |
| | Gawani | 2005-07 | Bheeda | 7.07 | 1.000 | 7.50 | 7.07 | 1.000 |
| **Total :** | **17** | | **22** | **261.17** | **35.055** | **359.98** | **209.21** | **28.134** |

## C: Statement showing the details of seepage schemes

| Name of Division | Name of scheme | Block year | Name of sub-schemes | Estimated cost (Rs. in lakh) | Length target (km.) | CCA (ha.) | Actual expenditure (Rs. in lakh) | Length achieved (km.) |
|---|---|---|---|---|---|---|---|---|
| Almora | Jaicholi | 2004-06 | Laduda | 6.26 | 1.000 | 8.50 | 7.89 | 1.085 |
| Pithoragarh | Nayal | 2004-06 | Deoradi Bora | 5.90 | 1.400 | 11.00 | 5.90 | 1.000 |
| | Kanalichina | 2007-09 | Syaltad | 20.02 | 1.265 | 55.00 | 7.75 | 0.900 |
| Pauri | Jakhola | 2005-07 | Patal | 6.39 | 1.000 | 9.00 | 6.39 | 1.000 |
| | Gawani | 2005-07 | Pokhada | 7.08 | 1.000 | 7.50 | 7.08 | 1.000 |
| Dehradun | Kawakhera | 2005-07 | Dernee | 11.22 | 1.500 | 13.00 | 5.85 | 1.270 |
| | Gouri Maphi | 2005-07 | Gouri Maphi | 44.23 | 3.480 | 55.00 | 44.23 | 3.990 |
| | Vinhar | 2005-07 | Vinhar | 14.30 | 2.000 | 18.00 | 14.06 | 1.950 |
| | 29.70 km hill channel | 2004-06 | Chunoti | 13.24 | 1.000 | 25.00 | 13.51 | 1.000 |
| **Total :** | **09** | | **09** | **128.64** | **13.645** | **202.00** | **112.66** | **13.195** |

*Source : Information obtained from selected divisions.*

## D: Statement showing the details of insufficient water source schemes (*Reference: Para 4.1*)

| Name of Division | Name of scheme | Block year | Name of sub-schemes | Estimated cost (Rs. in lakh) | Length target (km.) | CCA (ha.) | Actual expenditure (Rs. in lakh) | Length achieved (km.) |
|---|---|---|---|---|---|---|---|---|
| Chamoli | Koliyagair | 2005-07 | Koliyagair | 17.75 | 3.000 | 21.00 | 18.04 | 2.940 |
| Pauri | Sobra | 2004-06 | Kaprauli | 8.70 | 1.500 | 13.50 | 8.70 | 1.500 |
| | Jakhola | 2005-07 | Patal | 6.39 | 1.000 | 9.00 | 6.39 | 1.000 |
| | | | Sundergaon | 6.48 | 1.000 | 9.00 | 6.47 | 1.000 |
| | | | Kainur | 13.14 | 2.000 | 17.00 | 13.17 | 1.992 |
| Pithoragarh | Bhadgaon | 2005-07 | Barambachkuri | 2.99 | 0.500 | 7.00 | 2.99 | 0.500 |
| Dehradun | Kawakhera | 2005-07 | Gada Rahiya | 7.08 | 1.000 | 8.00 | 1.50 | 0.300 |
| **Total :** | **05** | | **07** | **62.53** | **10.00** | **84.5** | **57.26** | **9.232** |

*Source : Information obtained from selected divisions.*

# Appendix-6

***(Reference: Para 7.1)***

## Statement showing the delay in release of funds by State Government

| Name of Department | Central share | | | | State Government | | | Delay (days) |
|---|---|---|---|---|---|---|---|---|
| | Fund released (Rs. in crore) | Date of release | State share (Rs. in crore | Total (Rs. in crore) | Fund released within 15 days | Fund released after 15 days | Date | |
| MI | 6.76 | 10.11.03 | 2.25 | 9.01 | 4.01 | 5.00 | 19.12.03 | 40 |
| ID | 0.74 | 10.11.03 | 0.25 | 0.99 | 0.45 | 0.54 | 31.12.03 | 51 |
| | 0.74 | 18.03.04 | 0.24 | 0.98 | 0.83 | 0.15 | 22.04.04 | 35 |
| MI | 10.55 | 18.03.04 | 3.52 | 14.07 | 11.08 | 2.99 | 21.04.04 | 35 |
| ID | 0.45 | 31.03.05 | 0.15 | 0.60 | - | 0.60 | 28.05.05 | 57 |
| | 1.38 | 18.11.05 | 0.66 | 2.04 | - | 2.04 | 30.12.05 | 43 |
| MI | 19.59 | 24.01.06 | 9.44 | 29.03 | 26.91 | 2.12 | 02.03.06 | 37 |
| | 81.00 | 08.02.08 | 9.00 | 90.00 | 84.43 | 5.57 | April'08 | 52 |

*Source : Information obtained from the divisions.*

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