2007-08

Field Training Report

Report submitted to-

Superintending Engineer,
Gosikhurd Lift Irrigation Circle,
Ambadi, Dist: Bhandara
(05/11/2007-07/11/2007)

अधीक्षक अभियंता
गोसीखुर्द उपसा सिंचन मंडळ, आंबाडी (भंडारा)

Superintending Engineer,
Gosikhurd Lift Irrigation Circle, Aambadi,
Bhandara

सरळ सेवा भरतीने नियुक्ती दिलेल्या सहाय्यक कार्यकारी अभियंता/सहाय्यक अभियंता श्रेणी–१
अधिकाऱ्यांसाठी प्रतिष्ठापन प्रशिक्षण कार्यक्रम, (भाग १), जलसंपदा विभाग
Induction Training (Part I) for Direct Recruits (Assistant Executive Engineer and Assistant Engineer (Grade 1)) of Water Resource Department.

कालावधी: ०५–०७ नोव्हेंबर २००७
Duration: 05-07 November 2007

"क्षेत्रीय प्रशिक्षण अहवाल"

"FIELD TRAINING REPORT"

सादरकर्ता–
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Executive Summary

Maharashtra Engineering Training Academy (META), Nashik organized training program for direct recruits - Assistant Executive Engineer of Water Resource Department (WRD), in accordance with Maharashtra Engineering Service Examination-2004. As per schedule of training program, group of Assistant Executive Engineer's was directed to undergo field training under the guidance of Superintending Engineer, Gosikhurd Lift Irrigation Circle, Aambadi, Bhandara to grasp knowledge about lift irrigation schemes.

Gosikhurd project is one of the ambitious project in Vidarbha region. As per plan, it includes construction of main dam at Gosikhurd village, left and right bank canal, 4 Lift Irrigation Scheme (LIS) on reservoir, 2 LIS on left bank canal, renewation of Asolamendha project etc. Gosikhurd village is located in Pauni Tahsil of Bhandara district on Wainganga River. We visited Gosikhurd dam which is created by constructing a composite dam 11.35 km long across River Wainganga. i.e. earthen dam both the right and left ban flanks of central masonry gated Ogee spillway 773 m long in the river gorge and 14 m above foundation level. It have battery of 33 radial gates of 18.3x16.5 m (used first time in Maharashtra) to discharge a design flood of 67,300 m^3/sec.

Fore foreshore LIS were suggested while preparing the project for Administrative Approval. This report includes the basic study of these LIS and other major projects coming under Gosikhurd Lift Irrigation Circle, Aambadi. Nerala LIS, Aambhora LIS, Mokhabardi LIS, Gosikhurd Left Canal, Bawanthadi Project are among the major projects, and other 7 medium and 13 minor irrigation projects are coming under this circle. To cater these vast volumes of work efficiently there are 5 divisions and 23 subdivisions, and during our training session, we planned to visit most of the projects, as per direction of Superintending Engineer- Shri. Pohekar Sir.

While studying about the schemes, I realized the great technical and management skills involved during implementation of the project. It is biggest challenge to every engineer of the circle, to convert all designs and drawings in to reality, without entertaining any mistake or fault. Definitely, their contribution in the success of the entire project is uncountable. I am sure that completion of the project will bring green revolution in Vidarbha region.

कार्य सारांश

महाराष्ट्र लोकसेवा आयोगामार्फ़त घेण्यात आलेल्या 'महाराष्ट्र अभियांत्रिकी सेवा परिक्षा–२००४' च्या निकालाच्या अनुसंघाने 'सहाय्यक कार्यकारी अभियंता' या पदावर नियुक्ती दिलेल्या अधिकाऱ्यांसाठी 'महाराष्ट्र अभियांत्रिकी प्रशिक्षण प्रबोधिनी', नाशिक या संस्थेद्वारे एका वर्षाच्या प्रशिक्षण कार्यक्रमाचे आयोजन करण्यात आले. या प्रशिक्षण कार्यक्रमांर्तगत, पहिल्या तुकडीतील सहाय्यक कार्यकारी अभियंत्यांचा पहिला गट क्षेत्रीय प्रशिक्षणासाठी अधीक्षक अभियंता, गोसीखुर्द उपसा सिंचन मंडळ, आंबाडी, भंडारा यांच्याकडे दि. ०५ नोव्हेंबर २००७ रोजी तीन आठवड्याच्या प्रशिक्षणासाठी रुजु झाला.

प्रशिक्षणाच्या पहिल्या आठवड्यांमध्ये (५–७ नोव्हेंबर २००७) आम्हाला श्री. पोहेकर साहेब, अधीक्षक अभियंता, उपसा सिंचन मंडळ, आंबाडी, यांचे बहुमोल मार्गदर्शन लाभले. नेरला उपसा सिंचन योजना, आंभोरा उपसा सिंचन योजना, मोखबर्डी उपसा सिंचन योजना, गोसीखुर्द डावा कालवा, बावनथडी प्रकल्प हे मोठे प्रकल्प, आणि ७ मध्यम व १३ लहान प्रकल्पाचे काम या मंडळाच्या माध्यमातुन चालु आहेत. या मंडळाचे पाच विभाग आणि तेवीस उपविभाग आहेत. प्रस्तुत अहवालात आम्ही केलेला उपसा सिंचन योजनेचा अभ्यास आणि निरिक्षण नोंदवले आहे.

गोसीखुर्द प्रकल्प हा विदर्भातील एक मोठा महत्वाकांक्षी प्रकल्प आहे. या प्रकल्पांतर्गत गोसीखुर्द गावाजवळ मुख्य धरण, डावा कालवा व उजवा कालवा, जलाशयावरील ४ उपसा सिंचन योजना, डाव्या कालव्यावरील २ उपसा सिंचन योजना, असोलामेंढा प्रकल्पाचे नुतनीकरन इत्यादी प्रमुख घट्कांचा समावेश आहे. मुख्य धरणाचे बांधकाम भंडारा जिल्ह्यातील पवनी तालुक्यातील गोसीखुर्द गावाजवळ सुरु आहे. वैनगंगा नदीवरील मुख्य मातीधरणाची एकुण लांबी ११.३५ कि.मी. असुन यात संधानकातील उत्सारीत भाग ७७३ मी. व अनुत्सारीत भाग १३० मी. यांचा समावेश आहे. उत्सारीत सांडव्यावर १८.३x१६.५ मी. आकाराचे ३३ वक्रद्वारे बसवले आहेत. या आकराच्या वक्रद्वारांची उभारनी महाराष्ट्रात प्रथमच होत आहे. मुख्य धरणाचे सा.क्र. ८२० मी. व सा. क्र. ७८७५ मी. वर अनुक्रमे डावा व उजवा तीर विमोचके बांधण्यात आलेली आहेत व याद्वारे सिंचन व विज निर्मिती (३ मे.वॅ) प्रस्तावीत आहे. तसेच धरणाचे पायथ्याशी २५ मे.वॅ विज निर्मीतीची योजना प्रस्तावीत आहे.

सदर मंडळाचे काम पाहून उपसा सिंचन योजनेसंबंधीच्या आव्हानात्मक कामाची मला जाणीव झाली. या मंडळाचे अधीक्षक अभियंता– श्री. पोहेकर साहेब, यांच्या मार्गदर्शनाद्वारे सर्व अधिकाऱ्यांच्या व कर्मचाऱ्यांच्या संघटनात्मक, कार्यक्षम आणि सदैव मदतीसाठी तत्पर असण्याच्या स्वभावामध्येच या विभागतील यशाचे गमक सामावले आहे. या प्रकल्पाच्या यशामध्ये त्यांचा वाटा निश्चितच मोलाचा आहे व त्यातुनच या भागामध्ये हरितक्रान्ती होवून या भागाचा विकास होईल असे मला वाटते.

Acknowledgement

This report will be incomplete without a proper acknowledgment of the debt to many persons, who made it possible. It is my great pleasure to acknowledge those whose active help and support make this report possible in the present form. First of all I express my sincere gratitude to Shri. S.R. Suryavanshi- Chief Engineer for their guidance during field training.

It is the endless guidance and constant encouragement of Superintending Engineer- **Shri. Pohekar,** and I would like to express my heartfelt gratitude to him for providing us necessary drawings and technical information along with the stay arrangements.

I am deeply indebted to all technical and non-technical staff of circle office for insisting in me the drive to work hard and for inculcating in me the discipline to think clearly. Definitely the knowledge, I received during this training session was a lifetime experience and it will serve as a foundation for my career.

I am thankful to my colleagues who make the stay at Girola Rest House enjoyable. Last, but not least, I wish to express my gratitude towards my parents- Shivaji and Rohini, my grandparents- Rangnath and Sitabai, my uncle Raosaheb and aunty Radhika who sacrificed a lot to give me a good education.

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Content

Chapter 1. Gosikhurd Project

1.1 Introduction

The major part of Vidarbha region lies in Pranhita sub-basin of Godavari region. The tributaries finally contributing to form Pranhita river are Penganga, Wardha and Wainganga.

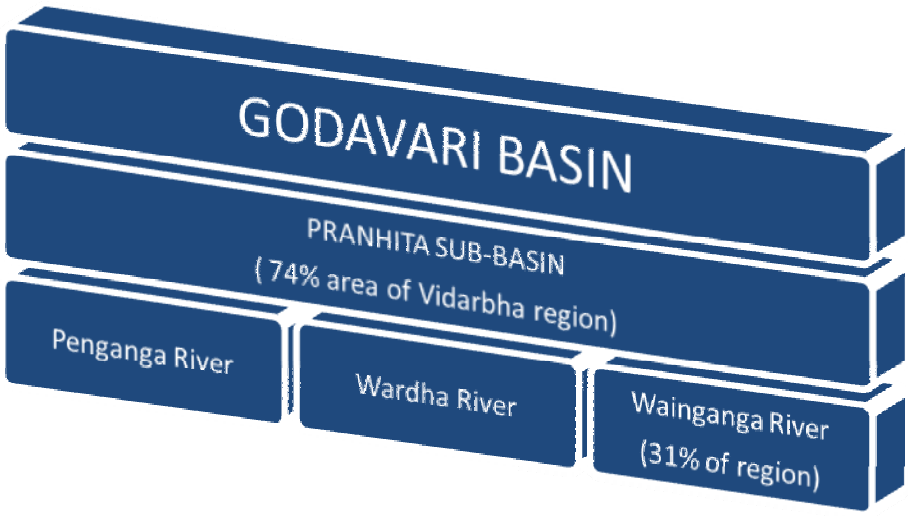


Fig. 1.1.1 Details of contribution of rivers in Vidarbha region

Wainganga originates near the village Pratapgarh at an elevation of 640 m RL in Seoni district of Madhya Pradesh and traverses almost North-South through Bhandara and Chandrapur district of Maharashtra state. Total length of Wainganga from its origin up to confluence with Wardha river is about 717 km. The total catchment area drained up to the proposed dam site of Gosikhurd project is 34,860 km^2, out of which 24,261 km^2 lies in Madhya Pradesh and 10,627 km^2 in Maharashtra state. Wainganga river has following tributaries-

Table 1.1.1 Tributaries of Wainganga river

Left bank tributaries	Right Bank tributaries
1. Thel River (MP) joins at 71 km	1. Hirri River in MP joins at 183 km
2. Bagh River (MS) joins at 257 km	2. Mawanthadi River (MS) joins at 300km
3. Chulband River (MS) joins at 415 km	3. Kanhan River (MS) joins at358 km
4. Khobragadi River (MS) joins at 450 km	4. Mayur River (MS) joins at 386 km
5. Kathani River (MS) joins at 470 km	5. Andheri River (MS) joins at 555 km
6. Dina River (MS) joins at 600 km	

Gosikhurd village is located in Pauni Tahsil of Bhandara district on Wainganga River. As per planning, Gosikhurd reservoir will be created by constructing a composite dam 11.35 km long with earth embankment across River Wainganga. i.e. earthen dam both the right and left ban flanks of central masonry gated Ogee spillway 773 m long in the river gorge and 14 m above foundation level. It will have

battery of 33 radial gates of 18.3x16.5 m size to discharge a design flood of 67,300 m^3/sec. The maximum height of the dam will be 27 m above river bed. The barrage will submerge about 18,960 ha land of which 12,600 ha in Nagpur and Bhandara district (68 villages fully and 75 villages partially)

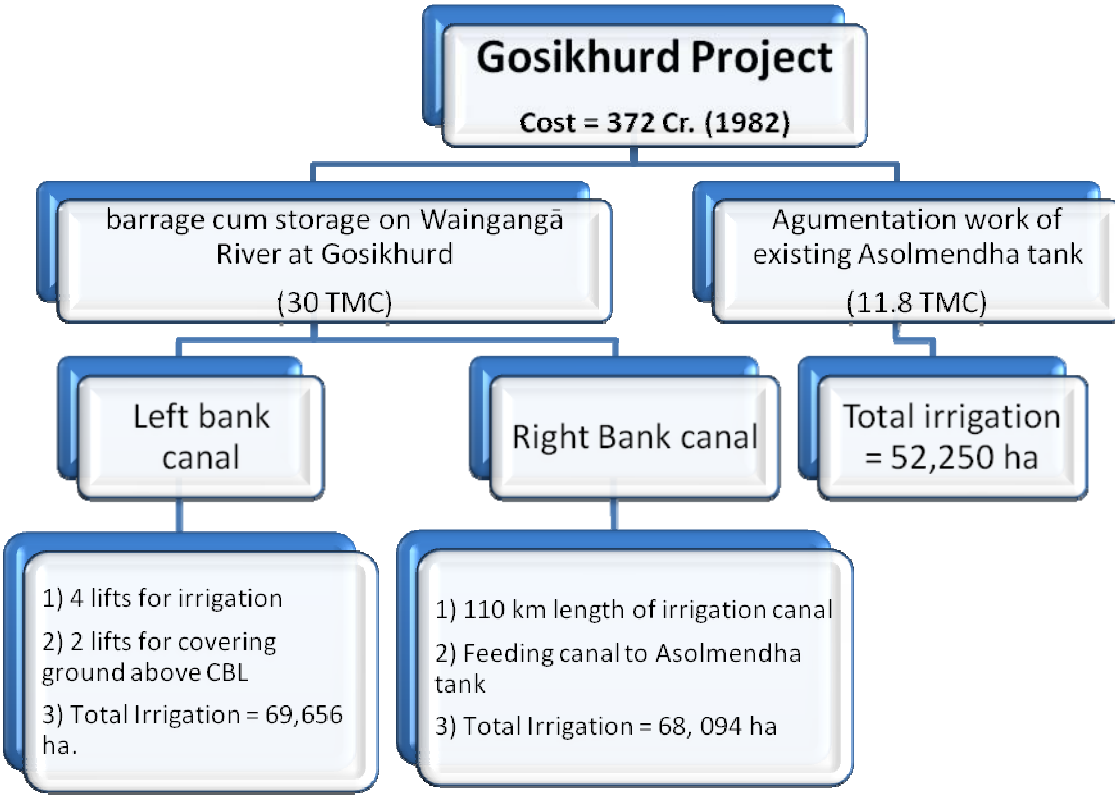


Fig. 1.1.2 Details of Gosikhurd project

The year wise percentage of development of irrigation potential –

Table 1.1.2 Year wise percentage of development of irrigation potential-

5th year of construction	20 %
6th year of construction	29 %
7th year of construction	31 %
8th year of construction	20 %

1.2 Salient features of Gosikhurd Project

a) Cost of Gosikhurd project : 316.57 Cr. (1982)
b) Cost of Asolmendha Tank : 55.62 Cr. (1982)
c) Total cost of project : 372.22 C. (1982)
d) Total irrigation :2,50,800 ha
e) Location of dam :

Table 1.2.1 Details of dam location

State	Maharashtra
District	Bhandara
Tahsil	Pauni
Village	Gosikhurd
Toposheet No.	55 P/9
Latitude	20^{o} 52' 15'' N
Longitude	79^{o} 37' 0'' E

f) Name of river : Wainganga (Tributary of Pranhita)
g) Name of basin : Godavari
h) Catchment area :

	Madhya Pradesh	Maharashtra	Total
Gross	24,261 km^2	10,627 km^2	34,888 km^2
Free			5,902 km^2

i) Availability of water

75 % dependable mansoon yield	501.33 TMC
Past mansoon flow (4.7 %)	23.56 TMC
Total annual yield	524.89MC

1.3 Utilization

a) Irrigation utilization :

With flow canal on LBC	4.418 TMC
On lift canal	3.537 TMC
LB foreshore lift	5.610 TMC
Right bank flow canal	11.85 TMC
RC foreshore lift	6.75 TMC

b) Water supply to ordnance factory, Bhandara : 0.837 TMC
c) Feeding to Asolamendha tank : 13.766 TMC
d) Annual evaporation loss : 7.107 TMC
e) Total utilization : 53.88 TMC
f) Balance spill over : 58.704 TMC

1.4 Dams and spillway details

Table 1.4.1 Details of dam and spillway

Dam	
Type of dam	Rolled filled earthen dam
Length of dam	11.35 km
Maximum height of dam	22 m
Free board	
Over MWL	3m
Over FRL	4.5 m
Spillway	
Type of spillway	Central gated Ogee shaped masonry spillway
Length of spillway	774 m
Maximum height	10.3 m
Crest level	232 m
Design flood	67,300 m^3/sec
No. of gates	33
Size of gates	18.3x16.5m

1.5 Prominent features of irrigation by canal

Table 1.5.1 Prominent features of irrigation by canal

Sr. No	Canal	Capacity (m^3/sec)	Length (km)	CCA (ha)	ICA (ha)	Lift head
1	Right Bank Canal	95	108	53,405	50,735	--
2	Left Bank Canal	40.50	27.5	35,860	34,067	--
3	Left bank fore shore lift- Paghora	21.11	45	21,284	20,223	35 m
4	Left bank fore shore lift- Jakh	4.47	4	4,000	3,800	35 m
5	Right bank fore shore lift- Mokhabardi	24.02	53	21,350	20,280	35 m
6	Right bank fore shore lift- Ambhora	10.24	9.10	9,100	8,645	18 m

Chapter 2. Gosikhurd Lift Irrigation Circle

2.1 Introduction

The Gosikhurd Lift Irrigation Circle, headed by Superintending Engineer- Shri. Pohekar carrying out the construction work of Lift Irrigation Schemes, proposed under Gosikhurd Project. Fore foreshore LIS were suggested while preparing the project for Administrative Approval. This chapter includes the basic study of these LIS and other major projects coming under Gosikhurd Lift Irrigation Circle. Following major projects are ongoing under the supervision of this circle-

1. Ambhora Lift Irrigation Scheme
2. Mokhabardi Lift Irrigation Scheme
3. Nerala Lift Irrigation Scheme
4. Gosikhurd Left Bank Canal
5. Bawanthadi Project

Other 7 medium and 13 minor irrigation projects are also coming under this circle. To cater these vast volumes of work efficiently there are 5 divisions and 23 subdivisions, and during our training session, we planned to visit most of the projects, as per direction of Superintending Engineer- Shri. Pohekar Sir.

2.2 Ambhora Lift Irrigation Scheme

Ambhora Lift Irrigation Division includes Ambhora Lift Irrigation Scheme, stage I and stage II and Mokhabardi Lift Irrigation Scheme as major schemes, and Ambhora Lift Irrigation Scheme, stage I is completed and operated to create irrigation potential. Remaining two schemes are in progress and there are four subdivisions to cater the construction work activities-

1. Ambhora Lift Irrigation Subdivision No. 1, Veltur
2. Ambhora Lift Irrigation Subdivision No. 2, Veltur
3. Ambhora Lift Irrigation Subdivision No. 3, Bhivapur
4. Ambhora Lift Irrigation Subdivision No. 4, Tiroda

Ambhora Lift Irrigation scheme is one of the four LIS proposed under Gosikhurd project. 35 villages from Kuhi Tahsil will be benefited from this scheme.

It is planned to complete this scheme in tow stages to cater the irrigation needs of the farmers, drinking water demand and fishery. The first sage of the project was completed in Dec 2005 and benefited to 2825 ha land under irrigation. The second stage of the project will be completed in June 2008 and planning is done accordingly, to cater irrigation potential of 5656 ha.

2.3 Salient features of Ambhora LIS

Table: Details of the Ambhora LIS			
Sr. no.	**Particulars**	**Stage 1**	**Stage 2**
1	No. of pumps	Total=10 (9+1 stand bye)	Total=4 (3+1 stand bye)
2	Capacity of pumps	850 HP (each)	650 HP (each)
3	Size of pump house	42x22m	21x25m
4	Rising main		
	a. Length	2690m	1750m
	b. Diameter	1600mm	1899mm
	c. Thickness	10mm	14mm
	d. Rows	3No.	2No.
	e. Type of pipes	SWMS	SWMS
4	Static head	28.9m	17.4m
5	Friction head	7.1m	7.1m
6	Total head	36m	24.5m
7	Length of canal	6km	10km
8	Discharge in canal	12.02 m^3/sec	7.34 m^3/sec
9	Water Utilization	56.147 Mm^3	
10	Command area		
	a. GCA	3818 Ha	7600 ha
	b. CCA	2988 ha	5956 ha
	c. ICA	2825 ha	5656 ha
11	Power demand	955 MVA	
12	BC Ratio	1.67	1.67
13	Controlling levels		
	a. River Bed	RL 229.00m	
	b. MDDL (River)	RL 233.00m	
	c. Bed RL at Pump house	RL 227.00 m	RL 252.85m
	d. MDDL in pump house	RL 231.19m	RL 255.05m
	e. Delivery floor of pump house	RL 253.00m	RL 258.60m
	f. Motor floor of pump house	RL 253.80m	RL 258.60m
	g. Bed RL of delivery chamber	RL 260.80m	RL 267.02m
	h. Bed RL of main canal	RL 260.00m	RL 269.00m

2.4 Mokhabardi Lift Irrigation Scheme

Mokhabardi LIS if one of the major LIS on the foreshore of the Gosikhurd dam, which will provide maximum irrigation potential among all the LIS's. This scheme will irrigate 24,343 ha land from 123 villages of Nagpur, Bhandara and Chnadrapur district.

Mokhabardi LIS is planned on river Maru near village Mokhabardi, Tal: Bhiwapur of Nagpur district. It is planned to take water from Gosikhurd dam by extracting approach canal af about 1380m from river Maru. Then lifting water by 17 pumps of 1500 HP each and delivering water by four rising mains of 4515 m long and 2500mm dia.

2.5 Mokhabardi LIS : Original project cost

Gosikhurd project was Administratively approved by Government of Maharashtra vide GR No. GOS-1081/(2381)-WR-1 dtd. 31/03/1983. As per this approval, total cost of project was 372.22 Cr, out of which the cost of Mokabardi LIS was 18.65 Cr. But this was approximately calculated on the basis of proposed HP of system.

Due to escalation of rises and to know the exact cost of project, detailed revised estimates of Gosikhurd Project was prepared in 1995-96 and as per this revised estimate, the total cost of Gosikhurd project was worked out to Rs. 2091.13 Cr. Out of this cost, the cost of Mokhabardi LIS was Rs. 212.84 Cr. Accoring to this revised estimate the Government of Maharashtra has give therevised AA to this project, vide letter no. Gosikhurd/1096/1500/234/96/GP2 dt 3/7/1999.

Again as per rates of year 2000-01, the second revised estimate of Mokhabardi LIS was prepared and accordingy the revised cost of project was 468.18 Cr.

Total expenditure on Mokhabardi LIS up to Oct 2006 is Rs 54.90 Cr, which included Rs. 7.20 Cr. Deposits to MSEB[1]

2.6 Mokhabardi LIS : Various components of project

A. Pump house and Rising main:

1. Location of pump house was selected after studying various alternatives and field data of finally selected site was given to CDO[2].
2. The general layout prepared by CDO was aroved by standing committee in their meeting held on 07/12/2000. As per this general layout it is proposed to provide 17 pumps (16+1 Stand bye) of 1500 HP each, for rising mains of 2.5m dia and 16mm thick.
3. As per letter No. 899/CEGP/P-2 dt.1/4/2003, Chief Engineer, Gosikhurd Project Irrigation, Nagpur has approved that the discharge of 1.703 m3/sec per 1000 ha of shall be considered for further calculations of designing the pumps machinery and rising mains.
4. At present the work of pump house and rising main are in progress.

B. Electricity substation and switchyard

Rs. 7.20 Cr. have already deposited to MSEB for the 132 KV substation and switchyard, required for the Mokhabardi LIS.

C. Canal Distribution Network

Length of main canal	:	43 km
Discharge of main canal	:	35 cumecs
Water utilization	:	134.167 Mm^3
GCA	:	34350 ha
CCA	:	25350 ha
ICA	:	202280 ha

[1] Maharashtra State Electricity Board
[2] Central design Organization, Nashik

2.7 Tekepar Lift Irrigation Scheme

Tekepar LIS is one of the important LIS under Gosikhurd project. As this scheme is proposed on the river, it does not require the storage of Gosikhurd dam. Therefore the first priority was given to this scheme for completion and now scheme is complete and under working condition.

About 6824 ha of area is under irrigation, causing benefits to 7198 ha from 41 villages of Bhandara district. Now as per GR 1/07/2005, the Tekepar LIS has been handed over to the Minor Irrigation division for further maintenance and operation.

Present status of various works under Tekepar LIS:

i. Administrative Approval : Year 1983,
j. Project cost : Rs. 3.51 Cr. (as per 1982-83 DSR)
k. Revised cost of project : Rs. 74.93 Cr. (as per 1995-96 DSR)
l. Revised cost of project : Rs. 96.04 Cr. (as per 2004-05 DSR)
m. Expenditure upto year 2004: Rs. 81.11 Cr.

Physical progress of work:

Most of the work of this LIS has been completed and their progress is as under-

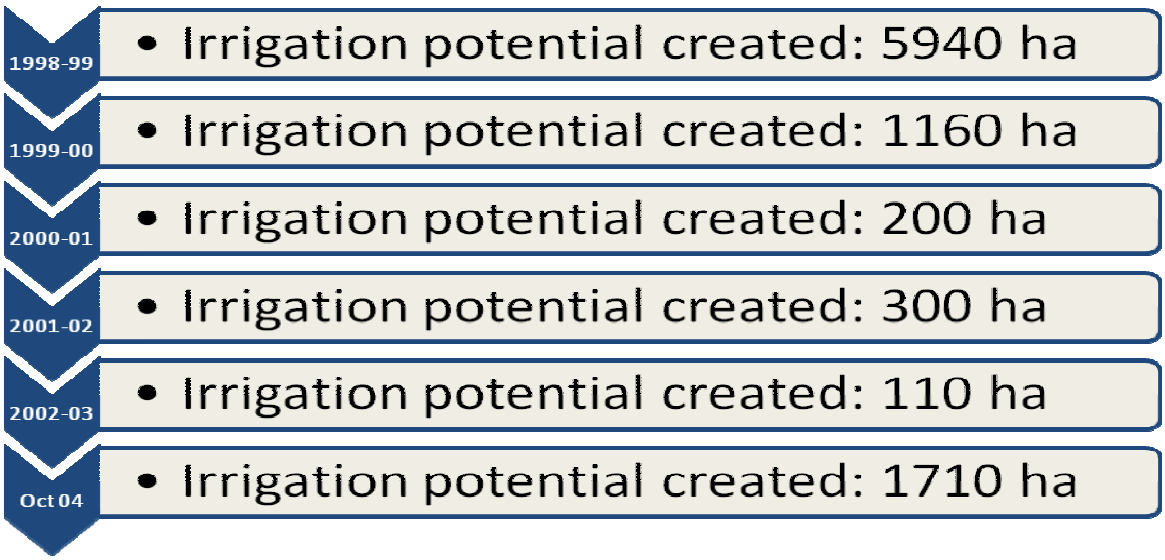
Pump house : 100 % complete
Main canal and distributor : 100 % complete
Distribution network : 100 % complete
Land Development (Part I) : 70 % complete

Command Area details

The command area of Tekepar LIS is as under-

a. GCA: 9340 ha
b. CCA: (as per project report)= 7375 ha
   CCA: (actual)= 6315 ha
c. ICA: (as per project report)= 6824 ha
   ICA: (actual)= 5841 ha

Development of Irrigation Potential:



Land Acquisition proposal's:

1. Forest land: For this scheme, @ 36.36 ha of forest land was acquired from Forest department and @ Rs. 22 Lakhs have been deposited.
2. Private Land: For this scheme, @ 237 Ha of Private Land is qcuried.

2.8 Salient features of Tekepar LIS

a. Location : Near Village Tekepar, Tal and district: Bhandara
b. Controlling Levels:
   1. RBL : 230.73m
   2. MDDL in River:
   3. Foundation Level of pump house :
   4. Motor floor level of pump house :
c. Details of pumps
   1. Type : Vertical Turbine
   2. Number of pumps : 9 No. (including 2 stand bye)
   3. Capacity : 850 HP each
   4. Pump speed : 740 rpm
   5. Size of pump house :
d. Rising main details: 1.6m diameter, 2 rows, 10mm thick, 1400 m long
e. Size of delivery chamber:
f. Main canal details:
   1. Length:16.5m
   2. Discharge:
   3. Bottom width of canal: 4.5m
   4. Slope of canal: 1:7500
   5. Discharge: 8.93 m^3/sec
   6. Side slope: 2:1 (H:V)
   7. Water depth in canal: 1.8m
   8. Free Board: 0.6m
   9. Velocity of water: 0.6416m
   10. Length of distributaries :13.93 km
   11. Type of main canal: Lined
g. Command area details:

Command area	As per project report	Actual
GCA	9340 ha	9340 ha
CCA	7375 ha	6315 ha
ICA	6824 ha	5841 ha

h. Approx. cost of project: 96.04 Cr.
i. BCR: 1.54

2.9 Gosikhurd Lift Irrigation Division, Ambadi (Bhandara)

There are five sub-divisions under Gosikhurd Lift Irrigation Division, Ambadi and following works are in progress-

1. Nerala LIS
2. Karajkheda LIS
3. Dhapewada LIS
4. Sondyatola LIS etc.

The Tekepar LIS is already completed by this division and currently irrigation potential is possible under this scheme.

2.10 Nerala Lift Irrigation Scheme

Nerala LIS is proposed on reservoir of Gosikhurd project. As per revised estimate prepared for second AA the cost of this project is Rs. 318.99 Cr. This scheme will start functioning only after completion of Gosikhurd dam. After completion of this scheme about 21627 ha of area from 116 villages from Lakhani, Bhandara, Pauni, and Lakhandur tahsils will come under irrigation.

CDO, Nashik has proposed four rising mains of 2.5 m dia and 13 pumps of 1000 HP capacity. Water will be lifted from Gosikhurd dam/reservoir and will be delivered in delivery chamber by about 690m long rising main. After delivery chamber water will be supplied to field by gravity canals.

As per availability of funds and land acquisition status this project has been divided in two stages. In first stage, six pups of 1000 HP each and two rising mains of 2.5 m dia. will be constructed. Then water will be supplied to fields by 8.58 km long canals. In first stage about 9204 ha area will come under irrigation. Up to March 2007,Rs. 84.26 Cr. have been spend on this project.

2.11 Salient features of Nerala LIS

1. Cost of project : As per original AA: 1.68 Cr.
   As per revised AA: 158.82 Cr.
2. Pumps : 13 pumps of 1000 HP each.
3. Size of pump house : 54mx10m
4. Rising main : 4 Nos, 2.5m dia, 690m long and 16mm thick
5. Static head : 18.96m
6. Friction head : 1.43m
7. Total head : 20.33m
8. Canals: Length of main canals: 45 km
9. Discharge of main canal : 37 cumecs
10. Water Utilization : 143.88 Mm^3
11. GCA : 24673 ha
12. CCA : 22870 ha
13. ICA : 21727 ha
14. Power demand : 1255 MWA
15. BC Ratio : 1.67

2.12 Salient features of Dhapewada LIS (StageI)

Lift Irrigation Project Division, Tiroda is headed by Executive Engineer- Shri. P.V. Morghade 2007 and includes five sub-divisions as-

1. Lift Irrigation Subdivision No.1, Tiroda
2. Minor Irrigation Investigation subdivision, Bhandara
3. Medium Project Subdivision, Arjuni Morgaon
4. Gosikhurd Left Canal subdivision No. 5 (Tiroda)
5. Dhapewada Lift Irrigation Subdivision No. 2, Tiroda

Salient features of Dhapewada LIS-

a. Location :Near Village Kawalewada, Tal: Tiroda, Dist: Gondia
b. Controlling Levels:
   1. RBL : 251.00m
   2. MDDL in River: 251.50m
   3. Foundation Level of pump house : 241.00m
   4. Motor floor level of pump house : 271.70m

c. Details of pumps
   1. Type : Vertical Turbine
   2. Number of pumps : 6 No. (including 1 stand bye)
   3. Capacity : 800 HP each
   4. Pump speed : 742 rpm
   5. Static head : 35.50 m
   6. Friction head : 7.44 m
   7. Total head : 42.94 m
   8. Size of pump house :

d. Rising main details: Length 4.361km, 2 rows, Dia-1400mm, 10mm thick,

e. Size of delivery chamber:

f. Main canal details:
   1. Length:11.8m
   2. Discharge: 4.42 cumecs
   3. Bottom width of canal: 4.2m
   4. Slope of canal: 1:3000
   5. Discharge: 8.93 m^3/sec
   6. Side slope: 1:1.5 (V:H)
   7. Water depth in canal: 1.02m
   8. Free Board: 0.75m
   9. Type of main canal: Lined

g. Command area details:

Command area	As per project report
GCA	7104 ha
CCA	6253 ha
ICA	5000 ha

h. Approx. cost of project: 24.01 Cr.

Chapter 3. Gosikhurd Left Bank Canal

3.1 Introduction

The Gosikhurd Left Bank Division is headed by Executive Engineer- Shri. Gonnade and work of this division includes excavation and construction of structures on Gosikhurd Left Bank Main Canal (GLMBC) 1 to 22.93 km, Branch canal No. 1 from 1 to 8.23km, branch canal No.2 from 1 to 21.76 km and branch canal No.3 from 1 to 7.55 km.

GLBMC[1] off takes from the head regulator at Ch. 820 m of the main dam of the project. The length of main canal is 22.93 km and its discharge at dam outlet is 45.22 cumecs. In all three branch canals are proposed on the GLBMC.

Table: Details of the branch Canal

Particulars	Chainage	Discharge (m^3/sec)	Length of branch canal
Branch Canal No. 1	@ Ch. 8250 m of LBC	4.98	8.23
Branch Canal No. 2	@ Ch. 11130 m of LBC	18.58	22.76
Branch Canal No. 3	@ Ch. 18260 m of LBC	4.53	7.55

3.2. Lift Irrigation Schemes

There are two lift irrigation schemes Viz, Gosi(Bk) and Akot LIS[2] on the GLBMC at Ch. 900m and Ch.4170m respectively. The details are given in following table-

Table: Details of the LIS

Particulars	Chainage	Discharge (m^3/sec)	Command Area
Gosi (Bk) LIS	@ Ch. 900 m of LBC	8.223	5963 ha
Akot LIS	@ Ch. 4170m of LBC	0.787	575

The total command area of GLBMC and the LIS on LBC is 30519 ha. Out of this 23981 ha is flow irrigation while remaining 6538 ha will be covered by two LIS mentioned above. The command area of GLBMC and LIS is mainly in Pauni and Lakhandur talukas of the Bhandara district. There are about 90 villages which will get irrigation benefits, out of which about 46 villages are from Pauni Taluka and 44 villages from Lakhandur Taluka and @ 14553 ha area from Pauni Taluka and @ 15966 ha area from Lakhandur talukas will get irrigation benefits.

3.3. Cost of the Project

The original AA[3] estimates cost of the project (including GLBC and LIS on GLBS) was about Rs. 24.81 Crore (as per 1989 rates)

In 1999, revised estimates were prepared for the first AA project which was about 148.09 crore.

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[1] Gosikhurd Left Bank Main Canal
[2] Lift Irrigation Schemes
[3] Administrative Approval

Now as per estimates prepared for second AA, the cost of the project is as Rs. 272.66 crore.

The expenditure at the end of July 2007 on the LBC and LIS on LBC is Rs. 76.97 crore.

3.4. Present status of the work

The work of the main dam of the Gosikhurd Project is in full swing and the work of fixing the radial gates in the spillway portion is likely to be completed by Dec-2007.

The earthwork and structures in the LBC is around 30% complete. The concrete lining work is in progress from ch. 0m to 10,000m. The tender procedure for the canal lining work for the remaining length of the main canal is in progress.

The earthwork and the structure of branch canal N0. 1 is also 20%completed. The lining work is 90% completed. The work of distribution system is in progress.

The earthwork and structures on the branch canal No. 3 are in progress and tender process for the structures, earthwork of the branch canal No.3 is completed and the work is likely to be started after this monsoon season.

It is propose to create irrigation potential of 7000 ha from the LBC in year 2007-08 and to create full irrigation potential in the year 2010-2011.

3.5. Salient features of GLBC (Ch. 0 to 11130m)

1. LBC out let : @ Ch.820m of the dam
2. Canal type : Lined canal (Cement Concrete)
3. Canal discharge : at outlet 45.22 cumecs
4. Bottom width : 16m
5. FSD[1] : 2.7m
6. Free Board : 1m
7. Canal slope : 1:10,000
8. Side slope : 2:1 (H:V)
9. Branch canal No.1 @ Ch. 8250m on main LBC
10. Branch canal no.2 @ Ch. 11130m on main LBC

3.6. Salient features of GLBMC (Ch. 11130m to 22930m)

Table: Details of the main Canal

Particulars	Ch. 11130-12870m	Ch. 12870-14400m	Ch. 14400-18160m	Ch. 18160-19280m	Ch. 19280-22930m
Type of canal	Lined	Lined	Lined	Lined	Lined
Length (km)	1.74	1.53	3.76	1.12	3.65
Discharge (m^3/sec)	10.30	8.20	7.24	6.19	4.51
Bottom width (m)	4.3	3.8	3.5	3.05	2.75
FSD (m)	1.85	1.70	1.65	1.45	1.30
Free Board (m)	0.9	0.90	0.90	0.75	0.75
Canal bed slope	1:5000	1:5000	1:5000	1:3500	1:3500
Side slope (H:V)	2:1	2:1	2:1	2:1	2:1

[1] Full Supply Depth

3.7. Salient features of branch canal No. 2 and 3

Salient features of branch canal's

Particulars	Branch canal No. 2	Branch Canal No. 3
Originates at	Ch. 11130m of GLBMC	Ch. 18260m of branch canal No. 2
Length (km)	21.76	7.55
Discharge (m^3/sec)	18.58	4.53
Bottom width (m)	13	5.95
Canal Type	Lined	Lined
FSD (m)	2.2	1.35
Bed slope	From 1:6000 to 1:2500	From 1:3500 to 1:2500
BRL[1] At Ch. 0m	235.533m	228.344
Side slope (H:V)	2:1	2:1
Irrigation (ha)	9349	2964

[1] Bed Reduced Level

Conclusion

During our training session, we studied most of the important reports/documents related to Lift Irrigation Scheme at Gosikhurd Lift Irrigation Circle, Aambadi, Bhandara. It was great experience for me, since I could realize the design of structures and various components which are associated with lift irrigation project.

The Gosikhurd project is one of the ambitious projects and since it is spread over thousands of hectare of land, it created social and environmental impacts. The Lift Irrigation Schemes are implemented when the level of land to be irrigated is above supply level in canal or MDDL in case of dam. Under such circumstances, it is mandatory to lift the water using motors and pipes and then feed to the canal or field. Several LIS are under construction and some LIS like, Tekepar is under working condition. Even though the lift irrigation is costly than gravity irrigation, it causes increase in the irrigation potential and ultimately the improvement of the region.

At the end of one week, I felt that the half week period of training is not sufficient to get in-depth knowledge regarding LIS and its components, and the subject is very vast. Still, I tried my best to gather maximum knowledge through observation and discussion with the officers and staff, and it will be helpful throughout my career.

We are thankful to Superintending Engineer, Shri. Pohekar and all the officers and staff of circle office for their guidance and co-operation during this training session. After going through details of the project, I am sure that the completion of the project will bring green revolution in Vidarbha region.

-Pravin Kolhe
(Assistant Executive Engineer)