

An aerial photograph of a mountain valley. The valley floor is a mix of green forest and greyish-brown soil. A prominent, light-colored, irregularly shaped area on the left side of the valley indicates a landslide. The surrounding hills are covered in dense green forest. The sky is blue with some light clouds.

# Treatment of Landslide & Soil Erosion

**Rangrang, North Sikkim.**  
**FEWMD**

# MICRO PLANNING

**PROJECT: TREATMENT OF LANDSLIDE AND SOIL EROSION  
IN RANGRANG WATERSHED CATCHMENT  
OF TEESTA RIVER, NORTH SIKKIM**

**SCHEME: TECHNOLOGY DEVELOPMENT, EXTENSION & TRAINING  
(TDET).**

**OF: DEPARTMENT OF LAND RESOURCES (DoLR),  
MINISTRY OF RURAL DEVELOPMENT (MoRD),  
GOVERNMENT OF INDIA**



**FOREST ENVIRONMENT & WILDLIFE MANAGEMENT DEPARTMENT,  
GOVERNMENT OF SIKKIM**

Divisional Forest Officer  
Land Use & Environment Cell  
North Division, Mangan.

No. 5-10/2006-TE  
Government of India  
Ministry of Rural Development  
Department of Land Resources  
NBO Building, G Wing, Nirman Bhawan

New Delhi – 110011  
Dated: 6/7.02.2007

To,

The Pay & Accounts Officer,  
Ministry of Rural Development,  
Krishi Bhawan,  
New Delhi – 110011.

Subject: Implementation of project on “Treatment of Landslide And Soil Erosion In Rangrang Watershed Catchment Of Teesta River, North Sikkim” by Divisional Forest Officer (N), Land Use and Environment Cell, Forest Environment and Wasteland Management Department, Government of Sikkim under Technology Development, Extension & Training (TDET) Scheme of the Department of Land Resources (DoLR) – reg.

Sir,

I am directed to convey the approval and sanction of the President of India for the implementation of the project on “Treatment of Landslide And Soil Erosion In Rangrang Watershed Catchment of Teesta River, North Sikkim” at a total outlay of Rs. 4,91,87,000/- (rupees Four Crore Ninety One Lakh and Eighty Seven Thousand only) to Forest Environment and Wasteland Management Department, Government of Sikkim comprising DoLR share of Rs. 4,73,13,000/- lakh and beneficiaries share of Rs. 18,74,000/- lakh over a period of 3 years (2006-07 to 2008-09) as per the details given at Annexure – I & II and subject to terms and conditions given at Annexure – III.

2. The sanction of the President of India is also accorded to the release of an amount of Rs. 1,26,76,000/- (Rupees One Crore Twenty Six Lakh and Seventy Six Thousand only) towards the first installment for implementation of the project during 2006-07.
3. The expenditure will be debitable to:

Demand No.	: 79	
Major Head	: 3601	
Sub Major Head	: 03	
	: 03.661	: National Wastelands Development. Programme
	: 02	: Technology Development, Extension & Training Scheme.
	: 02.00.31	: Grant – in – Aid (2006-07: Plan)
4. Necessary advice may please be issued to the Reserve Bank of India for disbursement of funds in favour of the Secretary, Department of Finance, Government of Sikkim, Gangtok, Sikkim.
5. This sanction issues under the powers delegated to the Department of Land Resources, Ministry of Rural Development with the concurrence of IFD vide ID no. 1552/IFD/2006-07

Yours Faithfully

(Dr. D. Ramakrishnaiah)  
Scientist (TE)



**GOVERNMENT OF SIKKIM**  
**OFFICE OF THE PRINCIPAL CCF-CUM-SECRETARY**  
**FORESTS, ENV & WILDLIFE MANAGEMENT DEPARTMENT**  
Forest Secretariat, Deorali, Gangtok – 737102, Sikkim  
Phone 03592-281261, Fax: 03592-281778

No. 774/FTC/FEWMD.

Dated: 13/12/05

## Notification

The projects on “Treatment of Landslide and Erosion Control in West Sikkim” and “Treatment of Landslide and Erosion in Donak, Seti Khola Watershed, South Sikkim” have been sanctioned by the Department of Land Resources (DoLR) Government of India under Technology Development, Extension & Training (TDET) Scheme. The projects have been sanctioned to contend the acute problem of soil erosion and landslide as pilot projects through bio-engineering treatment. As the projects envisages the identification of benchmark for quantifying the output/results for various parameters, the state government has approved to form the following technical committee for technical advice for the projects in West Sikkim.

1.	Dr. D. Ramakrishniah	Chairman	Director/Scientist (Tech.Extn.) Department Of land Resources, Ministry of Rural Development, NBO Building, Nirman Bhavan, New Delhi – 110011
2.	Dr. R. Anabalgan, Associate Professor	Member	Department of Earth Science, Indian Institute of Technology (IIT) Roorkee, Uttaranchal.
3.	Dr. R.K. Awaste, Soil Scientist	Member	Indian Council of Agriculture Research Gangtok, Sikkim.
4.	Mr. T.T. Bhutia, Addl. Director	Member	Department of Mines & Geology, Sikkim.
5.	Scientist In-charge	Member	G.B. Pant Institute of Himalayan Environment & Development, Pangthang.
6.	Joint Director	Member	Soil Conservation, West, South Sikkim, Food Security & Agriculture Development Department.
7.	Concerned Panchayat of the area.	Member	South / West
8.	Mr. C. Lachungpa, IFS	Member Secretary	Forest, Environment & Wildlife Management Department, Government of Sikkim, Gangtok.

The committee shall meet as and when the department invites for advice and monitoring at least once in a six months. During the course of their expert advice and guidance and monitoring, they will be paid TA / DA as per the provisions of the Sikkim Financial Rule from the overhead provision of the projects.

(T.R. Poudyal) IFS,  
Principal CCF-cum-Secretary  
Forest, Environment and Wildlife Department

## Micro Planning Team.

Sl.No.	Name	Designation
1.	Shri. M.R. Rai	Divisional Forest Officer Land Use & Environment Cell North Division, Mangan.
2.	Shri. R.P. Sharma	Assistant Conservator of Forest Land Use & Environment Cell North Division, Mangan.
3.	Shri. Jigdal Lachungpa	Range Officer Mangan Range Land Use & Environment Cell
4.	Shri. Joshep Lepcha	Range Officer Mangan Range Land Use & Environment Cell
5.	Shri. Kamal Subba	Range Officer Mangan Range Land Use & Environment Cell
6.	Shri. Tempo Bhutia	Accountant.
7.	Tashi Ongyal Bhutia	Computer Operator.
8.	Nimzang Bhutia	Head Surveyer Land Revenue Department.
9.	Bhanu Biswakarma	Surveyer.
10.	Dilli Das Biswakarma	Surveyer.
11.	Suresh Tamang	Driver / Photographer.

## **Panchayat & Public.**

### **Chanday.**

1. M.B. Thapa(Panchayat).
2. Pem Tamang
3. NimPhutia Bhutia
4. Tika Maya Tamang.

### **Namok.**

1. Pacho Bhutia (Panchayat)
2. Pemzang Bhutia
3. Lenkit Bhutia
4. Chinzo bhutia.

3

### **Rangrang.**

1. Sarki Bhutia (Panchayat).
2. Thigen Bhutia.
3. Thenghay Bhutia.
4. Chewang Doma.

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**TREATMENT OF LANDSLIDE AND SOIL EROSION  
IN  
RANGRANG WATERSHED CATCHMENT  
OF  
TEESTA RIVER, NORTH SIKKIM.**

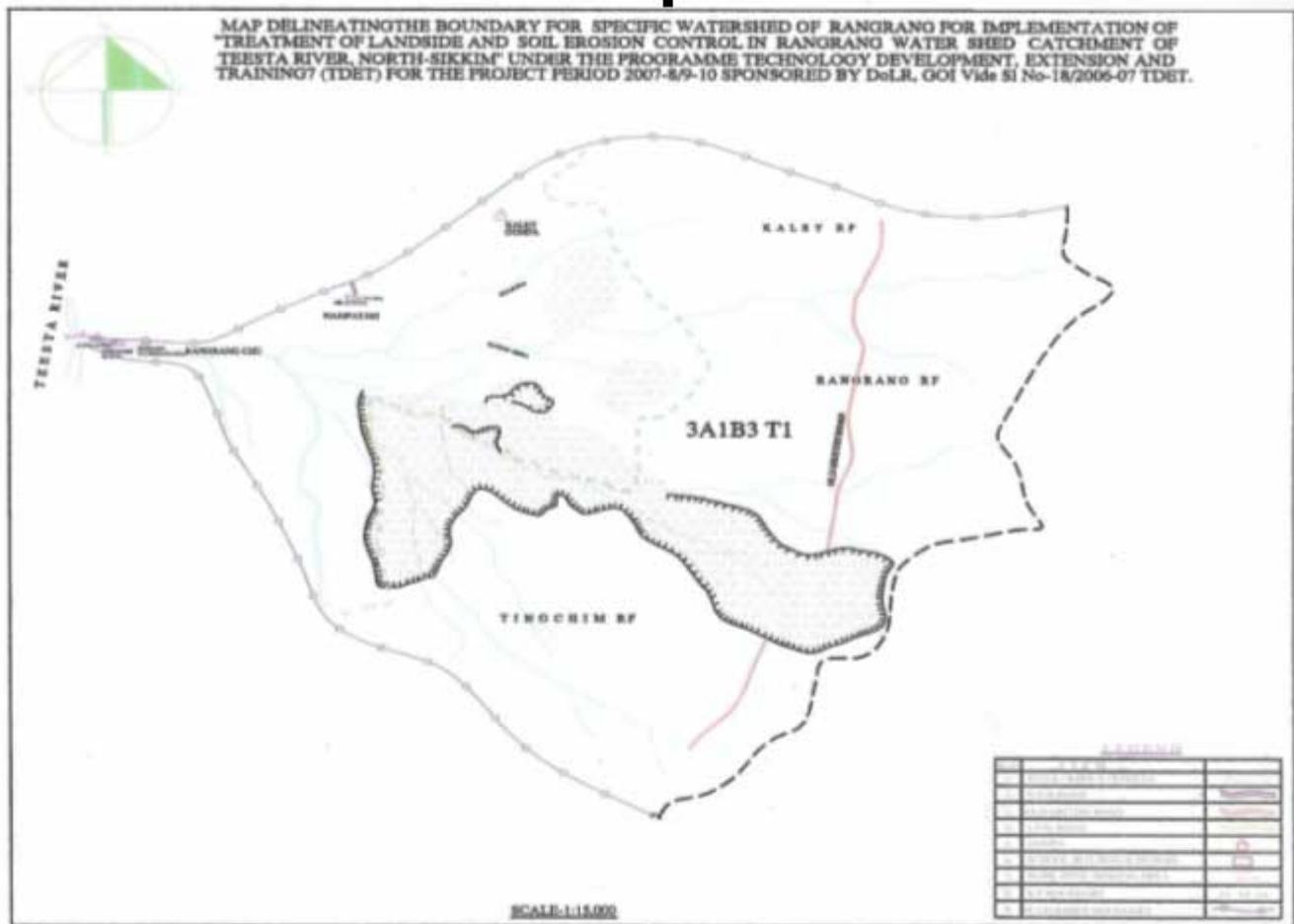
**Introduction**

The project “Treatment of *Landslide & Soil Erosion*” in Rangrang Watershed Catchment of River Teesta, North Sikkim has been sanctioned under the scheme *Technology Development, Extension & Training*(TDET), of Department of Land Resources (DoLR), Government of India vide sanction letter sl.no. 18/2006-07/TDET dated: 6/4.02.2007.

There are three project location viz. Rangrang Watershed, Namok Watershed and Chanday Watershed. Amongst these, the main focus has to be extended to Rangrang Watershed. This watershed has witnessed as many as three major landslides in the year 1967, 1984 and 1991. The entire course of the river Teesta was blocked by huge slush and flooded material and boulders carried by Rangrang Chu across the Teesta. The rapid draw down process had caused spread of water as far as 3 to 4 km. away damaging lives and properties of the area. The entire Mangan bazaar, the only market place of the district, was declared unsafe and the residents were directed to shift from the area within no time. The volume of water remained unsettled for more than two weeks in the form of reservoir at confluence of the Teesta River. The residents of Mangan, Chanday and Rangrang were psychologically apprehensive and were cut off from normal life for a period of more than six month due to the fear of landslide hazards.

On receipt of the sanction of the project under TDET, the local communities were made known about the activities approved in the project. Consequently, micro plan was drawn in accordance with project location / watershed wise planning which are as under:

Rangrang Watershed  
3A1B3-T1  
Micro-Planning  
2007-08



**Rangrang Watershed**

Meeting for the discussion about the project with Panchayat and village elders of Rangrang watershed on 2<sup>nd</sup> May, 2006.



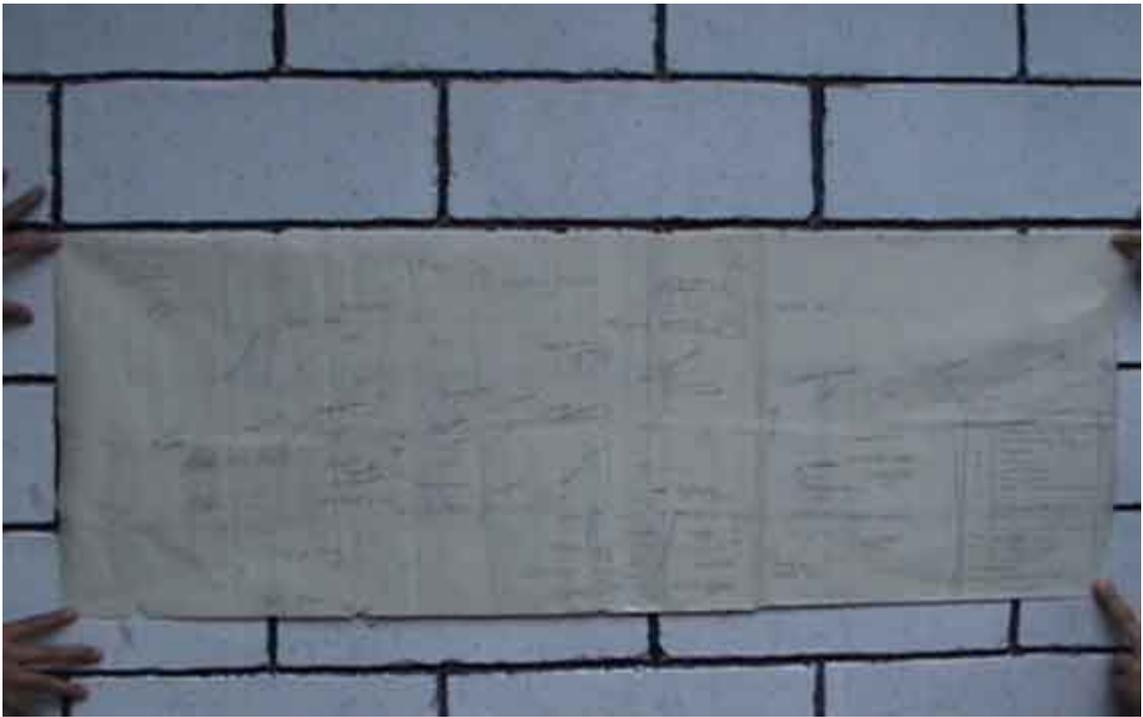
Telling about the project.



Interaction with Public and Panchayat.



**Micro Planning drawn up by the people.**



**Micro Planning drawn up by the people.**



**Micro Planning.**

## **Rangrang Watershed**

Rangrang Watershed is situated in between two Gram Panchayat Units viz Ringhim Nampatam at North, North-west and North-east and Tingchim Mangshilla at South, South-west and South-east. Major portion of landslide occurred in Tingchim Mangshilla side. Nampatam and Kalay Ward of Ringhim Nampatam fall under this watershed. On different dates meetings were conducted and interaction with the people brought about the following facts:

### **Folk Lore (A story that triggered Rangrang Slide)**

*The heard and told past history of Rangrang Landslide.*



There used to be a legendary hunter who used to hunt with bow and poisoned tip arrow made out of Gopay Basn. Over the period, the hunter became so expert that no prey would ever escape from his arrow, meaning, *one arrow one prey*. He used to barter the food grains with his hunts with other villagers. One day, during his hunt he chased a wild bore and aimed at it and released the arrow from his bow. But the story has it that this time a different fate awaited him, he missed his target & the arrow got lost. The hunter was taken aback & was highly astonished. He, then, started to search for his lost arrow. It is said that he searched to that extent that he lost his life searching the arrow. Legend has it that from that very year the Rangrang Landslide occurred and still exists. Now, its been the third generation that has witnessed its existence.

## **Impact of the Slide.**

The Rangrang slides brought about various impacts on the lives and properties of the villagers. The feedbacks during the interaction are recorded as under:

1. There were three lakes known as *Dud Pokhari*, *Kalo Pokhari* and *Sayto Pokhari* on the ridge of the area. Two of which still exists, though the volume of water is very scant and is in the verge of drying out. The third lake (*Sayto Pokhary*) has completely dried out from the spot. One old *Gothala* who has seen all these lakes is still alive and has seen the development of cracks in the *pokharies*.
2. Number of cracks has been developed in sporadic manner which have been deteriorating the cultivable land. The whole aspect once was very productive for Cardamom but due to the alteration of soil condition the area now is practically devoid of the cash crops.
3. One of the village's elder named Shri Thegan Bhutia, states that in Bay village 7(seven) households have been constructed and reconstructed thrice within a decade. Thus ultimately, they abandoned the place because of the gradual sliding down of the whole aspect. Now, they are settled at *Phem Phya* still facing deep trauma of displacement.
4. **Local Mitigation Efforts.**  
Only way known to the local villagers to mitigate this problem is by invoking their local deities which they perform through their rituals every year. The best part observed is that the people of the area have kept the affected area untouched. They do not even allow their cattles to graze and they have also pointed out that the ban on grazing has improved the growth of Bio- mass.

The numbers of slides & slips that exists and visited in the watershed are as follows:

### **Pong gang**

A slide started in this spot in 1995. It was so massive & vulnerable that people chose to abandon cultivation practices. Huge cracks have developed in the area, the whole aspect started to sink and



this was particularly worsened by the flow of river Rangrang at the toe end of the area. Further, right in the middle of the aspect a water hole also exists. During the rainy season, the volume of the water in the water hole increases that gives rise to slope wash.

### **Nagar Kyong**

Nagar is a type of fodder & keyong is a 'Kholsa' or 'Gaon'. This is adjoining to Pong gang where a seasonal water hole exists. This causes similar impact as of Pong gang. Once this area was fully



cultivated with cardamom of *Ramsai* & *Golsai* variety; but this has become a thing of the past & is now completely extinct from the area. The top ridge is called 'Civil Dara' Uttarey R.F.

## **Bay Kyong**

There also exists a water hole. The flow of water is greater than that of the earlier two. This aspect starts from *Khundrukey, Darachok.*



## **Gochungkyong**

This is just at the side of Bay Kyong. The situation of slide here is same as of Bay Kyong.



## **Tersay Khola**

It is a *Khasland* named Bay Khas. The plot no. of *Khasland* is 766/768; area record is 4.1420 & 2.9420 hectare. In this area profuse regeneration of *Alnus nepelensis* is seen that indicates slide prone zone.



## **Rimphim**

It is a mammoth slide which has aggravated the whole Rangrang landslide. This aspect is clearly visible from Nampatam Ridge. As stated above, this had caused a rapid drawdown affect during 1964, 1984 and 1991 in the confluence of Rangrang and Teesta River.



Category of Lands  
&  
Infrastructure Facilities  
In  
Rangrang Watershed.

**DETAILED NAME OF THE VILLAGES, AREA AND INFRASTRUCTURE FACILITIES IDENTIFIED UNDER THE PROJECT "TREATMENT OF LANDSLIDE AND SOIL EROSION" IN RANGRANG WATERSHED CATCHMENT OF TEESTA RIVER, NORTH SIKKIM UNDER TDET.**

Sl. No.	Name of Watershed and Code No.	Name of GPU	Name of the Ward	Name of the villages	Area Details			Infrastructures							Remarks			
					Pvt. Agr. Land	Forest Land	Comm. Land	Monas-teries	Temples/ Mandirs	Churc hes	Schools/ ICDS	Hospitals / Dispen-saries	Panch ayat Ghar	Other Deptt. Offices				
1	Rangrang Watershed 3A1B3-T1	Tingchim/ Mangshilla GPU - 7	Upper Mangshilla Tingjey Ward No. 01	U/tingjey	30 ha.	50 ha.	05 ha.					02 Pry Sch.						
				Dongay lakha	35ha.	70 ha.	02 ha.					02 nos. of ICDS		01 no.				
				Basn Botay Gayonsha	25 ha.													
				Doring gaon	20 ha.													
				Gairy Gaon	20 ha.	20 ha.												
				Lapsey Botey Gaon	15 ha.													
				Beach Gaon	12 ha.													
			Ralak, Ward No. 02	17 Mile	26 ha.	---	---							01 Lower P. Sch.				
				Khunwaley Dara	03 ha.	---	---							01 ICDS				
				Dara Gaon	02 ha.	---	---							--				
				Bhasmay	04 ha.			01 ha.						--				
				Phidangey	02 ha.	---	---							01 ICDS				
				Lall Bazaar	01 ha.	---	---							--				
				Road Line Gaon	05 ha.	---	---							---			Diary Farm	
				Chaprasey Gaon	12 ha.	---	---							---				
			U/Jusing Ward No. 03	U/kami Gaon	05 ha.			01 acre				1						
				L/Kami Gaon	06 ha.						Durga Mandir, Mangim Srijunga		1	01 S.S. Sch. 01 ICDS				
				Lungma Dara	04 ha.			1/2 acre			Pathey -bara Mandir			01 ICDS School				
			L/Jusing Ward No. 4	Road Line Gaon	15 ha.			05 ha.						01 Pry. Sch.				
				Soontaley Gaon	14 ha.			05 ha.						01 ICDS				
				Shigu Gaon	15 ha.													
				5th Mile Gaon	10 ha.			20 ha.									Milk collection Centre.	

**DETAILED NAME OF THE VILLAGES, AREA AND INFRASTRUCTURE FACILITIES IDENTIFIED UNDER THE PROJECT "TREATMENT OF LANDSLIDE AND SOIL EROSION" IN RANGRANG WATERSHED CATCHMENT OF TEESTA RIVER, NORTH SIKKIM UNDER TDET.**

Sl. No.	Name of Watershed and Code No.	Name of GPU	Name of the Ward	Name of the villages	Area Details			Infrastructures							Remarks			
					Pvt. Agr. Land	Forest Land	Comm. Land	Monas-teries	Temples/ Mandirs	Churches	Schools/ ICDS	Hospitals / Dispen-saries	Panch ayat Ghar	Other Deptt. Offices				
	Rangrang Watershed 3A1B3-T1	Tingchim/ Mangshilla GPU - 7	L/ Mangshilla Tibuk, Ward No. 5	Marchawala Gaon	7 ha.	---	---					01 ICDS School						
				Gadel Gaon	10 ha.	---	---					01 Jr. High Sch.						
				Pakham Gaon	---	---	07 ha.											
				4th mile gaon	06 ha.	---	03 ha.											
				Mandir Dar Gaon	02 ha.	---	02 ha.											
				5th Mile Gaon	10 ha.		20 ha.										Milk collection Centre.	
			U/Tingchim Ward No. 6	Chamkoong	90 ha.	85 ha.	25 ha.	---	---	---	---	---	---	---	---	---	---	
				Lumpsey	50 ha.	---	---	01 no.	One ICDS	---	---	---	---	---	---	---	---	
				Mala	10 ha.	---	---	---	---	---	---	---	---	1	---	---	---	
				Tadong	10 ha.	---	---	---	---	---	---	---	---	---	---	---	---	
			L/Tingchim Ward No. 07	Tikjab Gaon	40 ha.		05 ha.							One ICDS				
				Zero Point	30 ha.									01 Jr. High Sch.				
				Bay Gaon	50 ha.		10 ha.											
				Serethang	41 ha.		01 ha.							One ICDS				
				Chongthuk	---													
				Phykten Gaon	60 ha.													
			Phujithang	80 ha.		---												

ANNUAL ACTION PLAN  
OF  
RANGRANG  
WATERSHED  
FOR THE YEAR  
2007-08

**Work Programme for implementation of different activities in Rangrang Watershed under the Scheme TDET during the year 2007-08.**

Sl. No.	Activities	Location	Rupees (in lakhs)		Target	
			Unit	Rate	Phy.	Fin.
1.	Protective Works					
A.	HP Stone wall inside sausage in landslide area.	Rangrang along River Tista	Rmt	4400/-	94	4.14
		Phajithang	Rmt	4400/-	70	3.08
		Dhamchey Khola	Rmt	4400/-	70	3.08
		Ralak Slip	Rmt	4400/-	70	3.08
	<b>Sub Total</b>				<b>304</b>	<b>13.38</b>
B.	Stream training works					
i.	HP Stone wall inside Sausage for river training.	PomcheyTar Slide	Rmt	4400/-	243	10.69
	<b>Sub Total</b>				<b>243</b>	<b>10.69</b>
ii.	G.I. wire sausage wall with 1:2:4 PCC lining	Bay Khas	Rmt	6400/-	25	1.60
		Mangmey Slip	Rmt	6400/-	30	1.92
	<b>Sub-Total</b>				<b>55</b>	<b>3.52</b>
2.(a)	Soil & Moisture Cons.	Lapchay Ohrar Khasmal	Ha.	33000/-	10	3.30
	<b>Sub Total</b>				<b>10</b>	<b>3.30</b>
(b)	Afforestation including maintenance	Rangrang Khasmal	Ha.	20340/-	25	5.09
		Phomchey Tar R.F.	Ha.	20340/-	25	5.08
	<b>Sub Total</b>				<b>50</b>	<b>10.17</b>
3.	Bamboo plantation with seed broadcasting	Pungang Khas	Ha.	25700/-	20	5.14
		Ralak, 17 Mile	Ha.	25700/-	10	2.57
	<b>Sub Total</b>				<b>30</b>	<b>7.71</b>
4.	Bally Benching.	Phomchey Tar Slip	Ha.	24850/-	15	3.73
		Ralak Slip	Ha.	24850/-	05	1.24
		Rangrang Slip	Ha.	24850/-	10	2.49
	<b>Sub Total</b>				<b>30</b>	<b>7.46</b>
5.	Application of geo-synthetics & polymers.	Pungang Slip	Sq. ft.	185/-	300	0.56
	<b>Sub Total</b>				<b>300</b>	<b>0.56</b>
6.	Re-grading of slopes	Pungang	Cum	55/-	2000	1.10
	<b>Sub Total</b>				<b>2000</b>	<b>1.10</b>
7.	Anchoring / shoteeting	Rangrang	Mtr	6500/-	14	0.90
	<b>Sub Total</b>				<b>14</b>	<b>0.90</b>
8.	Total of works (Total area 2525.78 ha out of which 271 ha is private wasteland					<b>58.79</b>
9	Beneficiary contribution in terms of material and labour for 271 ha. Of private land @ 40 % share.				<b>36.53</b>	<b>2.43</b>
10	DoLR share for works component (Sl. No. 8 minus Sl.No. 9)				---	<b>56.36</b>
11	Supervisor				<b>01</b>	<b>0.42</b>
12	Sub-total (Sl.No. 8 + Sl.No.11)				---	<b>59.21</b>
13	Administrative Overhead 12% of sub-total given above in Sl.No. 12				---	<b>7.11</b>
14	<b>Grand Total (Sl.No. 12+Sl.No. 13)</b>				---	<b>66.32</b>
15	Beneficiary contribution in terms of material and labour for 271 ha. Of private land.				<b>36.53</b>	<b>2.43</b>
16	<b>Total DoLR share (Sl.No. 14 Minus Sl.No. 15)</b>					<b>63.89</b>

(Rupees Fifty Eight Lakh Seventy Nine Thousand) only.

Namok Watershed  
3A1B3T1  
Micro-Planning  
2007-08





**Meeting with the panchayat and the public,  
to inform about the project in Namok Watershed.**



**Meeting with the panchayat and the public,  
to inform about the project in Namok Watershed.**

## Namok Watershed.

Namok Watershed is situated within Namok Swayem Gram Panchayat Unit. Because of the configuration of the land slope maximum area of Tingchim Mangshilla GPU comes under this watershed.

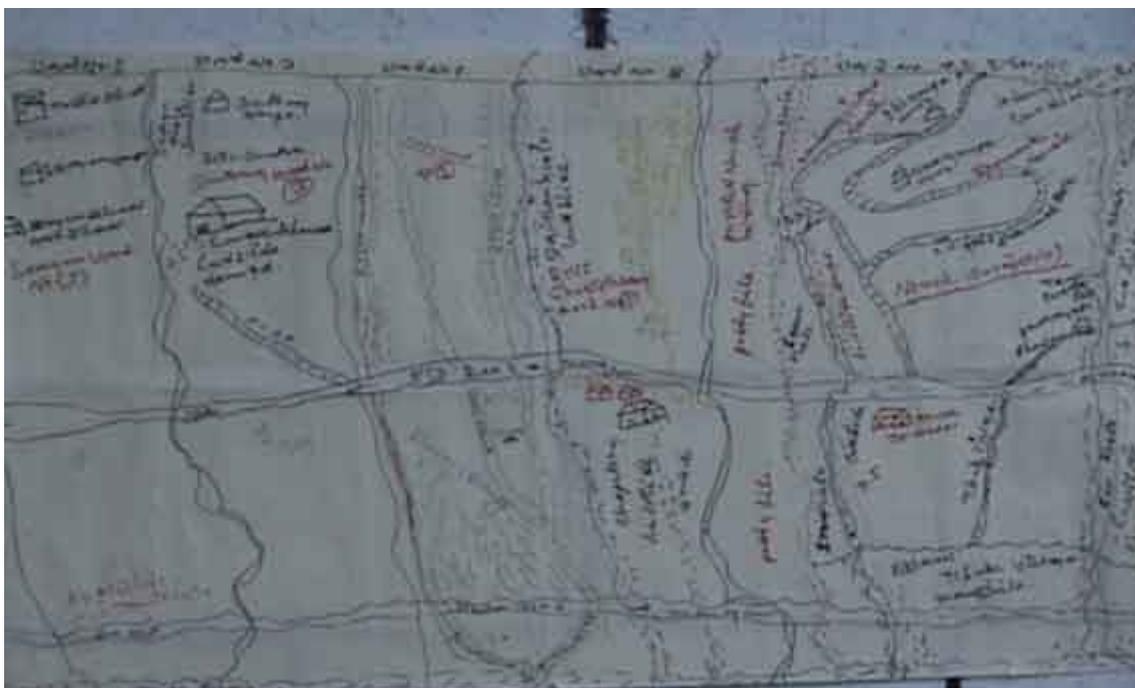
### Boundary.

North: On its north and north –east, there is Upper Tingchim, Lower Tingchim and Tingchim R.F.  
South: Swayem beyond Raley Khola.  
East: Namok R.F.  
West: Teesta River.

### Micro Planning in Namok Watershed.



Namok watershed falls in Namok-Swayem Gram Panchayat Unit. Micro Planning was conducted that involved Forest Officials, Panchayats and people of all wards falling under this Gram Panchayat Unit viz. Swayem, Deythang, Tikpu, Namok and Rabi Chongthong wards.



The causes and effect of landslides & soil erosion is being described in detail ward wise falling under the Namok watershed.

### **Swayem Ward**

The main cause of landslides & soil erosion in this ward are *Ree Khola* & *Jhamee Khola*. The whole aspect of the block is a slip that descends down and touches river Teesta. This block is traversed by two very important road ways i.e. the North Sikkim





Highway and the By-pass road, towards Singtam. The constant slips result in the blockage of road especially that of By-Pass road towards Singtam, popularly called as Namok landslide zone. The B.R.O. have been

facing great hazard due to this slide as it often closes during rainy season. Indeed the land slip has been over burdened because of slope wash just above road line. Similarly, the same problem has been created at another point of the same By-Pass road which is popularly termed as Lasoney *Pahiro* (slide). Mitigation of this problem has to be taken up in a separate scheme because of the extent of damage done.



**Loaded Lorries and Taxi Vehicle awaiting for road clearance at point 5<sup>th</sup> Mile Namok Landslide.**



**BRO's JCV pulling stuck up loaded lorry in the uphill side at above point.**

### **Deythang Ward.**

This area has Deythang *Khola* that might cause future havoc to the Deythang *Gompa* and human habitation. A timely intervention and protective measures is highly required to avert the obvious danger that Deythang *Khola* might pose in the future.



## **Tikpu Ward.**

This ward is traversed by three kholas viz. Rabin *Khola*, Rahee *Khola* & Tikpu *khola*. These *Kholas* have activated slides, cracks & slips. The one village that's been badly affected is Kirung Busty. A further deterioration of the area can be checked only by prompt preventive measures.

## **Namok Ward**

The main *kholas* that flows through this ward are Bar *Khola*, Somen *Khola* & Satong *Khola*. During the micro-planning, it was known that the slide in this particular ward started late in 1960's. Attached



to the beginning of the landslide, one very famous folklore was told by the JFMC President: “that an unknown soldier in the vicinity of old british road killed a python. Popular belief says that this incident angered the Mother Nature, as a result from that very year this area was hit by landslides & slips”. This has been a cause of worry for the locals ever since. Their main cultivation of Cardamom & Paddy heavily suffered due to the frequent slides & slips of land in the area.

The impact of land slides and slips have resulted in the constant sinking of the road. At a point in the north sikkim highway, the road has almost become bow shaped. (*Picture showing the sinking road just above*). This point has been particularly responsible for hindrance in the smooth running of vehicles.

The slide also threatens to wash out Tibuk village completely.

## **Rabi Chongthong Ward.**

This ward has a sinking area in a village named Chepaythang. The existence of water in a sporadic manner in the vicinity is the indicator of sinking slopes. Rahee *Khola* being the main activator of the slip in the area flows downwards to meet river Teesta along with Somen *Khola*. Other villages



in this ward which are potentially endangered by the flow of water are Chaney Gaon, Pakcho Gaon.

Category of Lands  
&  
Infrastructure Facilities  
In  
Namok Watershed.

**DETAILED NAME OF THE VILLAGES, AREA AND INFRASTRUCTURE FACILITIES IDENTIFIED UNDER THE PROJECT "TREATMENT OF LANDSLIDE AND SOIL EROSION" IN RANGRANG WATERSHED CATCHMENT OF TEESTA RIVER, NORTH SIKKIM UNDER TDET.**

Sl. No.	Name of Watershed and Code No.	Name of GPU	Name of the Ward	Name of the villages	Area Details			Infrastructures							Remarks				
					Pvt. Agr. Land	Forest Land	Comm. Land	Monas-teries	Temples/ Mandirs	Churches	Schools/ ICDS	Hospitals/ Dispen-saries	Panchay at Ghar	Other Deptt. Offices					
2	Namok Watershed 3A1B3-T2	Namok, Swayem GPU-6	Swayem Ward No.1	Taarphey	05 ha.	75 ha.	01 acre	01 no.				Tribal School, Swayem, Jr. H.S.S.							
				Khemshey	15 ha.	---	---												
				Swayem	25 ha.	---	---							01 ICDS					
				L/dikchu Bazaar Line	01 acre	---	04 ha.												
				Shingdham	12 ha.	---	---												
				Lingding	05 ha.	---	---												
			Deythang, Ward No. 02	Deythang	30 ha.	50 ha.	20 ha.	01 no.											
				Dopchong	02 ha.														
				Salep	04 ha.														
				Damshyak	10 ha.									01 ICDS					
				Naadu	02 acre														
				Lungbangthang	05 ha.														
				Cosong	01 ha.														
				Phellay	05 ha.														
			Tikpo, Ward No. 03	Phyaglakha	10 ha.														
				Junayphayak	15 ha.	75 ha.	11 ha.												
				Maashey	10 ha.														
				Phyaglakha	15 ha.														
				Gyagando	18 ha.														
				Kharkyong	10 ha.														
			Namok, Ward No. 04	Shyarpo	12 ha.									01 ICDS					
				Kyurung Gaon	19 ha.														
				KhushyLakha Khong	14 ha.	100 ha.	10 ha.												
				Khongu	04 ha.		02 ha.	02 nos.							01 Dis.				
				Khongmek	10 ha.														
				Mandong	02 ha.									01 ICDS					
Khyongba	03 ha.																		
Dolumphyak	Dooring	05 ha.		03 ha.							01 Jr. High Sch.		01 no.	Teacher Qtr					
	Dolumphyak	07 ha.												01 Post Office					

**DETAILED NAME OF THE VILLAGES, AREA AND INFRASTRUCTURE FACILITIES IDENTIFIED UNDER THE PROJECT "TREATMENT OF LANDSLIDE AND SOIL EROSION" IN RANGRANG WATERSHED CATCHMENT OF TEESTA RIVER, NORTH SIKKIM UNDER TDET.**

Sl. No.	Name of Watershed and Code No.	Name of GPU	Name of the Ward	Name of the villages	Area Details			Infrastructures						Remarks		
					Pvt. Agr. Land	Forest Land	Comm. Land	Monas-teries	Temples/ Mandirs	Churches	Schools/ ICDS	Hospitals/ Dispen-saries	Panchayat Ghar		Other Deptt. Offices	
	Namok Watershed 3A1B3-T2	Namok, Swayem GPU-6	Rabi Chongthang Ward No. 05	Chongthang	10 ha.	10 ha.	05 ha.									
				Pathang	02 ha.						01 ICDS					
				Roobi	03 ha.		01 acre									
				Devithang	01 ha.		1/2 acre								01 Diary Farm	
				Chuvey Thang	03 ha.											
				Thogey	01 ha.											
				Rhukhang	02 ha.											
				Robi road Line	03 ha.								VLW Office & Co-Operative store			

ANNUAL ACTION PLAN  
OF  
NAMOK WATERSHED  
FOR THE YEAR  
2007-08

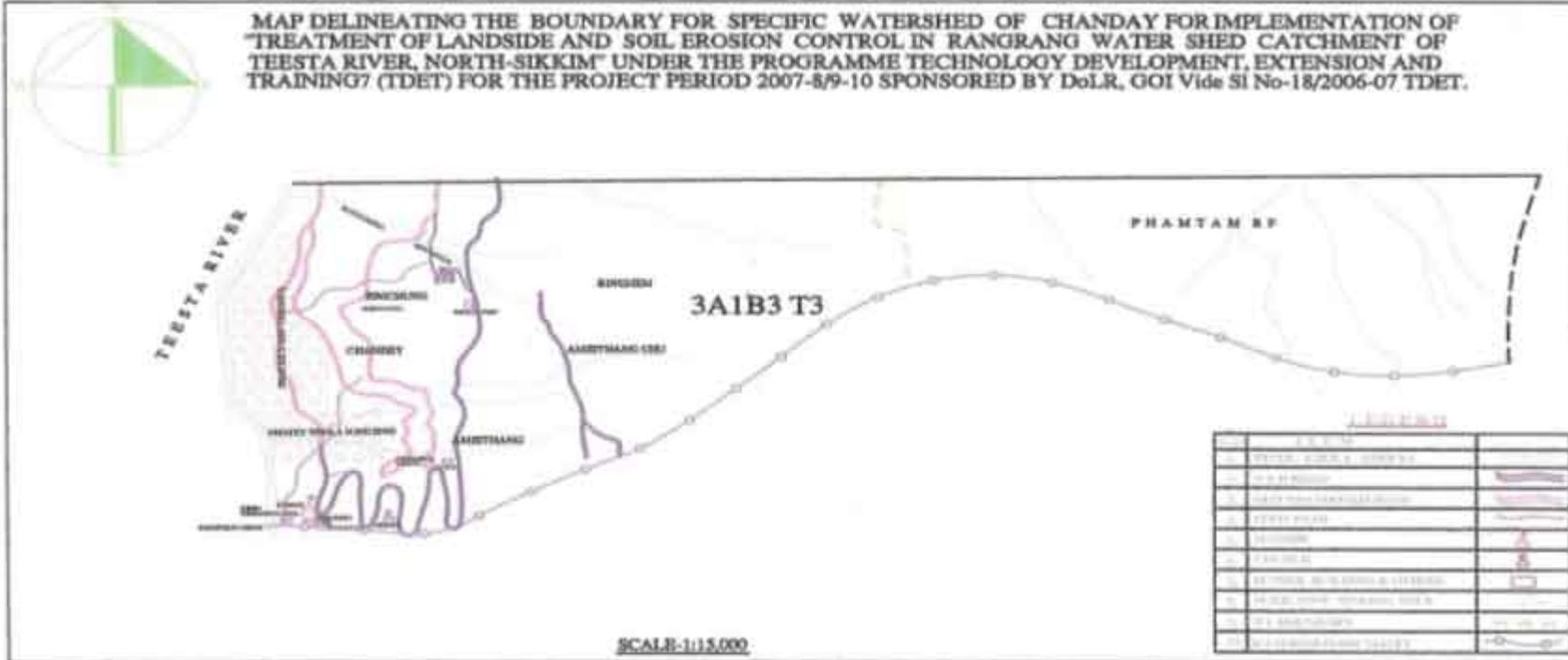
**Work Programme for implementation of different activities in Namok Watershed under the Scheme TDET during the year 2007-08.**

Sl. No.	Activities	Location	Rupees (in lakhs)		Target	
			Unit	Rate	Phy.	Fin.
1.	Protective Works					
A.	HP Stone wall inside sausage in landslide area.	Kerong Gaon Slip	Rmt.	4400/-	45	1.98
		U. Rabi Khola	Rmt.	4400/-	45	1.98
		Thalung Gaon Slip	Rmt.	4400/-	45	1.98
		Bar Khola Slide	Rmt.	4400/-	47	2.07
	<b>Sub Total</b>				<b>182</b>	<b>8.01</b>
B.	Stream training works					
i.	HP Stone wall inside Sausage for river training.	U. Chupeything, Namok.	Rmt.	4400/-	184	8.10
	<b>Sub Total</b>				<b>184</b>	<b>8.10</b>
ii.	G.I. wire sausage wall with 1:2:4 PCC lining	L. Chupeything, Namok	Rmt.	6400/-	42	2.69
	<b>Sub-Total</b>				<b>42</b>	<b>2.69</b>
2.(a)	Soil & Moisture Cons.	L. Chupeything	Ha.	33000/-	10	3.30
	<b>Sub Total</b>				<b>10</b>	<b>3.30</b>
3.	Bamboo plantation with seed broadcasting	U. Chupeything	Ha.	25700/-	08	2.06
		Bandookay Khas	Ha.	25700/-	10	2.57
	<b>Sub Total</b>				<b>18</b>	<b>4.63</b>
4.	Bally Benching.	U. Barkhola, Gaira Gaon	Ha.	24850/-	05	1.24
	<b>Sub Total</b>				05	1.24
5.	Application of geo-synthetics & polymers.	Chupeything Slip	Sq. ft.	185/-	300	0.56
	<b>Sub Total</b>				<b>300</b>	<b>0.56</b>
6.	Re-grading of slopes	Bar Khola, Gaira Gaon	Cum	55/-	2000	1.10
	<b>Sub Total</b>				<b>2000</b>	<b>1.10</b>
7.	Anchoring / shoteeting	Namok	Mtr	6500/-	13	0.85
	<b>Sub Total</b>				<b>13</b>	<b>0.85</b>
8.	Total of works (Total area 2525.78 ha out of which 271 ha is private wasteland					<b>30.48</b>
9	Beneficiary contribution in terms of material and labour for 271 ha. Of private land @ 40 % share.				<b>18.94</b>	<b>1.26</b>
10	DoLR share for works component (Sl. No. 8 minus Sl.No. 9)				---	<b>29.22</b>
11	Supervisor				<b>01</b>	<b>0.22</b>
12	Sub-total (Sl.No. 8 + Sl.No.11)				---	<b>30.70</b>
13	Administrative Overhead 12% of sub-total given above in Sl.No. 12				---	<b>3.68</b>
14	<b>Grand Total (Sl.No. 12+Sl.No. 13)</b>				---	<b>34.38</b>
15	Beneficiary contribution in terms of material and labour for 271 ha. Of private land.				<b>18.94</b>	<b>1.26</b>
16	<b>Total DoLR share (Sl.No. 14 Minus Sl.No. 15)</b>					<b>33.12</b>

**(Rupees Thirty Three Lakh Twelve Thousand) only**

Chanday Watershed  
3A1B3T3  
Micro-Planning  
2007-08

MAP DELINEATING THE BOUNDARY FOR SPECIFIC WATERSHED OF CHANDAY FOR IMPLEMENTATION OF "TREATMENT OF LANDSIDE AND SOIL EROSION CONTROL IN RANGRANG WATER SHED CATCHMENT OF TEESTA RIVER, NORTH-SIKKIM" UNDER THE PROGRAMME TECHNOLOGY DEVELOPMENT, EXTENSION AND TRAINING7 (TDET) FOR THE PROJECT PERIOD 2007-8/9-10 SPONSORED BY DoLR, GOI Vide SI No-18/2006-07 TDET.





**Meeting with the panchayat and the public,  
to inform about the project in Chanday Watershed.**



### **Chanday Watershed.**

This watershed is in Ringhim Nampatam GPU where altogether 6 (six) wards exists viz. Namaptam, Kalay, Ringhim (Ringhim Rikzing Choling *Gumpa*), Upper Singhik, Maling and Lower Singhik. In this, Nampatam and Kalay fall under Rangrang watershed. Only Ringhim ward comes under Chanday Watershed.

### **Boundary:**

North: In the north there is Ramte Khola.

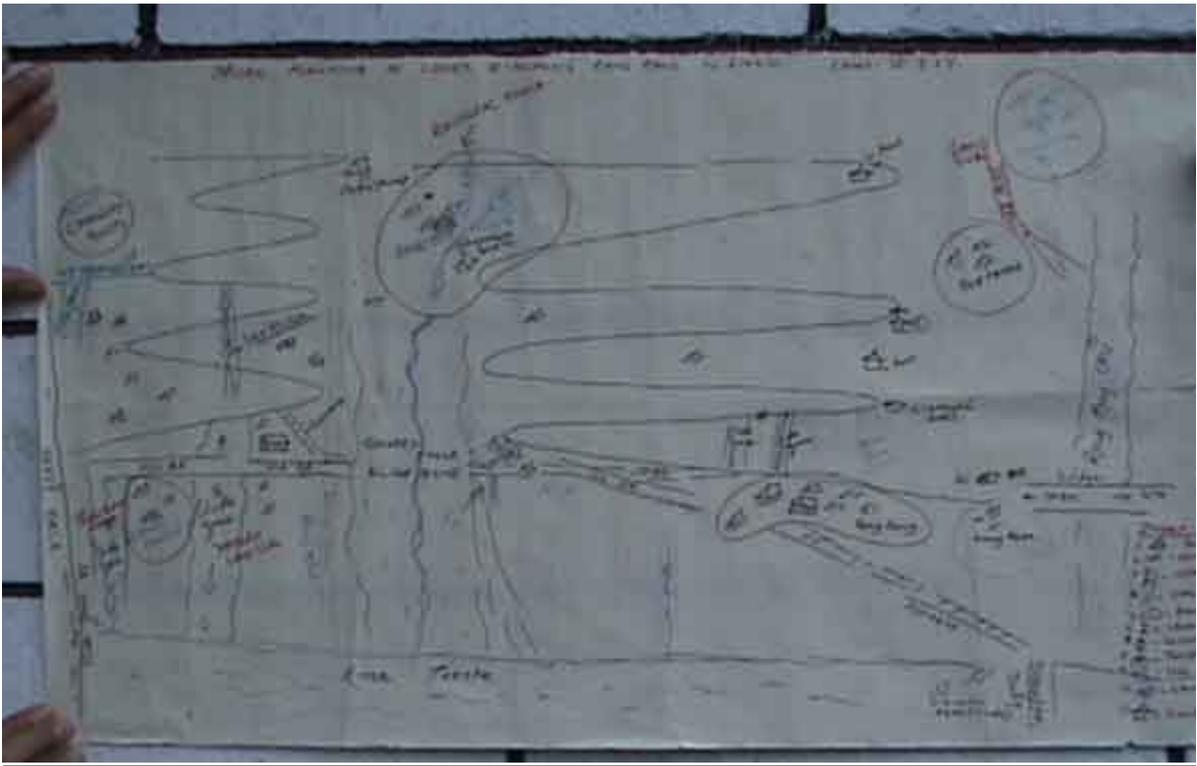
East: The Eastern site extends upto Kalay R.F.

South: At southern side is Rangrang River.

West: At west there flows Teesta River.



**Meeting with the panchayat and the public,  
to inform about the project in Chanday Watershed.**



**Micro-Plan drawn up by the people.**

**Micro-Planning for Chanday Watershed.**

This watershed falls in Ringhim Nampatam GPU and the Panchayat wards falling under this watershed are as under:

**Lower Zimchung Ward.**

The constant landslide, owing to fragility of the Chanday aspect, added with perennial flow down of Ghattey *Khola*, has already caused diversion of North Sikkim Highway at this point for three times. The panchayat of the area along with other village elders assumed that the land slope has become so weak because of the seepage of water accumulated due to formation of reservoir at the juncture of river Rangrang and river Teesta. One of the participants stated that this natural process of forming reservoir for short period is called rapid draw down.

## **Field Trip.**

After drawing of micro-planning, all panchayat members and some other interested public carried out field inspection. Firstly, the team came across the army occupied area. Once, this area was washed away by flood, this resulted in the shifting of the army camp. Later on the army took some mitigation measures and resettled there.

Second instance of rapid soil erosion has been at the site of the confluence of River Rangrang and River Teesta. The local panchayat and public are particularly concerned about this process because



of existence of cremation ground which is becoming congested by every death in the locality and finding adequate space for cremation has become a cause of major worry.

In the whole scenario, it has been seen that the water is the main factor that is causing instability of land slope. Hence, lined and adequate drainage is required to check it.



## Ghattey khola

This *Khola* has been playing active role in dragging down the whole landscape to Teesta River. So the participants suggested treating it in toe portion of it. They cited the example of treatment given at Rangit River in South Sikkim.



Lastly, the team visualized, a *Jhora* situated at Rangrang is active enough to carry down the garbage and waste product as the local people are not aware for proper disposal of garbage.

Therefore, littering of waste may choke the natural drainage system and ultimately cause rapid draw down process at a juncture of it with Teesta river.

Category of Lands  
&  
Infrastructure Facilities  
In  
Chanday Watershed.

**DETAILED NAME OF THE VILLAGES, AREA AND INFRASTRUCTURE FACILITIES IDENTIFIED UNDER THE PROJECT "TREATMENT OF LANDSLIDE AND SOIL EROSION"**  
**IN RANGRANG WATERSHED CATCHMENT OF TEESTA RIVER, NORTH SIKKIM UNDER TDET.**

Sl. No.	Name of Watershed and Code No.	Name of GPU	Name of the Ward	Name of the villages	Area Details			Infrastructures							Remarks		
					Pvt. Agr. Land	Forest Land	Comm. Land	Monas-teries	Temples/ Mandirs	Churches	Schools/ ICDS	Hospitals/ Dispen-saries	Panchayat Ghar	Other Deptt. Offices			
3	Chanday Watershed 3A1B3-T3	Ringhim, Nampatam GPU(8)	L/Zimchung Ward no. 02	Rangrang	12 ha.	---	03 ha.	---	---	---	---	One ICDS Sch. & One Pry. School	---	---	---		
				L/Ambithang	15 ha.	---	---	---	---	---	One ICDS Sch.	---	---	---			
				Borpakha	08 ha.	---	20 ha.	---	---	---	---	---	---	---			
				U/chandey	15 ha.	---	15 ha.	---	---	---	One ICDS Sch.	---	---	---			
				L/chandey	25 ha.	---	05 ha.	---	---	---	---	---	---	---			
		Ringhim, Nampatam GPU	Nampatam Ward 03	Kalay	15 ha.	50h ha.		01 no.					01 no. Pry. School	---	---	---	
				Jethey Gaon	09 ha	---	---	---	---	---	---	---	One ICDS Sch.	---	---	---	
				Nampatam	20 ha.	---	---	---	---	---	---	---	One ICDS Sch. & One Pry. School	---	---	---	
				U/Ambithang	25 ha.	---	---	---	---	---	---	---	---	---	---		

ANNUAL ACTION PLAN  
OF  
CHANDAY WATERSHED  
FOR THE YEAR  
2007-08

**Work Programme for implementation of different activities in Chanday Watershed under the Scheme TDET during the year 2007-08.**

Sl. No.	Activities	Location	Rupees (in lakhs)		Target	
			Unit	Rate	Phy.	Fin.
1.	Protective Works					
A.	HP Stone wall inside sausage in landslide area.	L. Chanday	Rmt.	4400/-	62	2.73
		L.Chanday, Solopdang	Rmt	4400/-	61	2.68
	<b>Sub Total</b>				<b>123</b>	<b>5.41</b>
B.	Stream training works					
i.	HP Stone wall inside Sausage for river training.	Ghattey Khola, Chanday	Rmt.	4400/-	182	8.01
	<b>Sub Total</b>				<b>182</b>	<b>8.01</b>
ii.	G.I. wire sausage wall with 1:2:4 PCC lining	L. Chanday, Heyong..	Rmt	6400/-	41	2.62
	<b>Sub-Total</b>				<b>41</b>	<b>2.62</b>
2.(a)	Soil & Moisture Cons.	L.Chanday	Ha.	33000/-	05	1.65
		U. Chanday	Ha.	33000/-	05	1.65
	<b>Sub Total</b>				<b>10</b>	<b>3.30</b>
(b)	Afforestation including maintenance	Menyong Khas	Ha.	20340/-	06	1.22
	<b>Sub Total</b>				<b>06</b>	<b>1.22</b>
3.	Bamboo plantation with seed broadcasting	U. Chanday	Ha.	25700/-	12	3.08
	<b>Sub Total</b>				<b>12</b>	<b>3.08</b>
4.	Bally Benching.	U. Chanday, 20 Mile	Ha.	24850/-	05	1.24
	<b>Sub Total</b>				<b>05</b>	<b>1.24</b>
5.	Application of geo-synthetics & polymers.	L. Chanday	Sq.ft.	185/-	300	0.55
	<b>Sub Total</b>				<b>300</b>	<b>0.55</b>
6.	Re-grading of slopes	U. Chanday	Cum	55/-	2000	1.10
	<b>Sub Total</b>				<b>2000</b>	<b>1.10</b>
7.	Anchoring / shoteeting	U. Chanday	Mtr.	6500/-	13	0.85
	<b>Sub Total</b>				<b>13</b>	<b>0.85</b>
8.	Total of works (Total area 2525.78 ha out of which 271 ha is private wasteland					<b>27.38</b>
9	Beneficiary contribution in terms of material and labour for 271 ha. Of private land @ 40 % share.				<b>17.02</b>	<b>1.14</b>
10	DoLR share for works component (Sl. No. 8 minus Sl.No. 9)				---	<b>26.24</b>
11	Supervisor				<b>01</b>	<b>0.20</b>
12	Sub-total (Sl.No. 8 + Sl.No.11)				---	<b>27.58</b>
13	Administrative Overhead 12% of sub-total given above in Sl.No. 12				---	<b>3.31</b>
14	<b>Grand Total (Sl.No. 12+Sl.No. 13)</b>				---	<b>30.89</b>
15	Beneficiary contribution in terms of material and labour for 271 ha. Of private land.				<b>17.02</b>	<b>1.14</b>
16	<b>Total DoLR share (Sl.No. 14 Minus Sl.No. 15)</b>					<b>29.75</b>

**(Rupees Twenty Nine Lakh Seventy Five Thousand) only.**

**CONSOLIDATED PLAN FOR THE PROJECT.  
2007-08-09-10**

**Final abstract of financial implication of the project “Treatment of Landslide & Soil Erosion” in Rangrang Watershed Catchment of Teesta River under the scheme Technology Development, Extension & Training (TDET).**

<b>Project Year</b>	<b>Project Year</b>	<b>Financial Arrangement</b>		<b>Total</b>
		<b>DoLR Share</b>	<b>Beneficiaries Share</b>	
1 <sup>st</sup> Year	2007-08	126.76	04.83	131.59
2 <sup>nd</sup> Year	2008-09	243.83	09.25	253.08
3 <sup>rd</sup> Year	2009-10	102.54	04.66	107.20
	<b>Total</b>	<b>473.13</b>	<b>18.74</b>	<b>491.87</b>

**(Rupees Four Crore Ninety One Lakh Eighty Seven Thousand) only**

**Abstract of detailed action plan for the project “Treatment of Landslide & Soil Erosion” in Rangrang Watershed Catchment of Teesta River, North Sikkim under the scheme TDET for the year 2007-08.**

Sl.No.		Particulars	Amount (in lakhs)	Remarks
A.	1	Rangrang Watershed	58.79	DoLR Grant 126.76 Beneficiaries Share: <u>04.83</u> - <u>131.59</u>
	2	Namok Watershed	30.48	
	3	Chanday Watershed	27.38	
		<b>Sub Total</b>	<b>116.65</b>	
B		Employment of Supervisors	00.84	
C		Administrative Overhead 12 % of Works.	14.10	
<b>Grand Total</b>			<b>131.59</b>	

**(Rupees One Crore Thirty One Lakh Fifty Nine Thousand) only.**

**Watershed wise physical targets and financial outlay for treatment of Landslide & Soil Erosion in Rangrang Watershed Catchment of Teesta River, North Sikkim for the year 2007-08.**

Sl. No.	Activities	Rate		Watersheds						Total	
				Rangrang		Namok		Chanday			
		Units	Rate	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1.	Protective Works										
A.	HP Stone wall inside sausage in landslide area.	Rmt	4400	304	13.38	182	8.01	123	5.41	609	<b>26.80</b>
B.	Stream training works										
i.	HP Stone wall inside Sausage for river training.	Rmt.	4400	243	10.69	184	8.10	182	8.01	609	<b>26.80</b>
ii.	G.I. wire sausage wall with 1:2:4 PCC lining	Rmt.	6400	55	3.52	42	2.69	41	2.62	138	<b>8.83</b>
2.(a)	Soil & Moisture Cons.	Ha.	33000	10	3.30	10	3.30	10	3.30	30	<b>9.90</b>
(b)	Afforestation including maintenance	Ha.	20340	50	10.17	---	---	6.00	1.22	56	<b>11.39</b>
3.	Bamboo plantation with seed broadcasting	Ha.	25700	30	7.71	18	4.63	12	3.08	60	<b>15.42</b>
4.	Bally Benching.	Ha.	24850	30	7.46	05	1.24	05	1.24	40	<b>9.94</b>
5.	Application of geo-synthetics & polymers.	Sqt. Feet.	185	300	0.56	300	0.56	300	0.55	900	<b>1.67</b>
6.	Re-grading of slopes	Cum.	55	2000	1.10	2000	1.10	2000	1.10	6000	<b>3.30</b>
7.	Anchoring / shoteeting	Mtr.	6500	14	0.90	13	0.85	13	0.85	40	<b>2.60</b>
8.	Total of works (Total area 2525.78 ha out of which 271 ha is private wasteland				<b>58.79</b>		<b>30.48</b>		<b>27.38</b>		<b>116.65</b>
9	Beneficiary contribution in terms of material and labour for 271 ha. Of private land @ 40 % share.			36.53	2.43	18.94	1.26	17.02	1.14	72.49	4.83
10	DoLR share for works component (Sl. No. 8 minus Sl.No. 9)			---	56.36	---	29.22	---	26.24	---	111.82
11	Supervisor			01	0.42	01	0.22	01	0.20	03	<b>0.84</b>
12	Sub-total (Sl.No. 8 + Sl.No.11)			---	59.21	---	30.70	---	27.58	---	<b>117.49</b>
13	Administrative Overhead 12% of sub-total given above in Sl.No. 12			---	7.11	---	3.68	---	3.31	---	<b>14.10</b>
14	<b>Grand Total (Sl.No. 12+Sl.No. 13)</b>			---	66.32	---	34.38	---	30.89	---	<b>131.59</b>
15	Beneficiary contribution in terms of material and labour for 271 ha. Of private land.			36.53	2.43	18.94	1.26	17.02	1.14	72.49	<b>4.83</b>
16	<b>Total DoLR share (Sl.No. 14 Minus Sl.No. 15)</b>				63.89		33.12		29.75		<b>126.76</b>

(One Crore Twenty Six Lakh Seventy Six Thousand) only.

**Abstract of detailed action plan for the project “Treatment of Landslide & Soil Erosion” in Rangrang Watershed Catchment of Teesta River, North Sikkim under the scheme TDET for the year 2008-09.**

Sl.No.		Particulars	Amount (in lakhs)	Remarks
A.	1	Rangrang Watershed	133.34	DoLR Grant                    243.83 Beneficiaries Share: <u>09.25</u> <u>253.08</u> -
	2	Namok Watershed	44.51	
	3	Chanday Watershed	47.27	
	<b>Sub Total</b>	<b>225.12</b>		
B	Employment of Supervisors	00.84		
C	Administrative Overhead 12 % of Works.	27.12		
<b>Grand Total</b>			<b>253.08</b>	

**(Rupees Two Crore Fifty Three Lakhs Eight Thousand) only**

**Watershed wise physical targets and financial outlay for treatment of Landslide & Soil Erosion in Rangrang Watershed Catchment of Teesta River, North Sikkim for the year 2008-09.**

Sl. No.	Activities	Rate		Watersheds						Total	
				Rangrang		Namok		Chanday			
		Units	Rate	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1.	Protective Works										
A.	HP Stone wall inside sausage in landslide area.	Rmt	4400/-	900	39.60	300	13.20	300	13.20	1500	66.00
B.	Stream training works										
i.	HP Stone wall inside Sausage for river training.	Rmt.	4400/-	400	17.60	80	3.52	320	14.08	800	35.20
ii.	G.I. wire sausage wall with 1:2:4 PCC lining	Rmt.	6400/-	110	7.04	110	7.04	110	7.04	330	21.12
2.(a)	Soil & Moisture Cons.	Ha.	33000/-	25	8.25	15	4.95	10	3.30	50	16.50
(b)	Afforestation including maintenance	Ha.	20340/-	160	32.54	---	---	---	---	160	32.54
3.	Bamboo plantation with seed broadcasting	Ha.	25700/-	45	11.57	35	8.99	10	2.57	90	23.13
4.	Bally Benching.	Ha.	24850/-	43	10.68	15	3.73	14	3.48	72	17.89
5.	Application of geo-synthetics & polymers.	Sqt. Feet.	185/-	980	1.81	210	0.39	210	0.39	1400	2.59
6.	Re-grading of slopes	Cum .	55/-	3000	1.65	3000	1.65	3000	1.65	9000	4.95
7.	Anchoring / shoteeting	Mtr.	6500/-	40	2.60	16	1.04	24	1.56	80	5.20
8.	Total of works (Total area 2525.78 ha out of which 271 ha is private wasteland			---	133.34	---	44.51	---	47.27	---	225.12
9	Beneficiary contribution in terms of material and labour for 271 ha. Of private land @ 40 % share.			70.26	4.66	36.43	2.41	32.73	2.18	139.42	9.25
10	DoLR share for works component (Sl. No. 8 minus Sl.No. 9)			---	108.80	---	56.41	---	50.66	---	215.87
11	Supervisor			01	0.42	01	0.22	01	0.20	03	0.84
12	Sub-total (Sl.No. 8 + Sl.No.11)				133.76		44.73		47.47		225.96
13	Administrative Overhead 12% of sub-total given above in Sl.No. 12			---	16.05	---	5.37	---	5.70	---	27.12
14	Grand Total (Sl.No. 12+Sl.No. 13)				149.81	---	50.1	---	53.17	---	253.08
15	Beneficiary contribution in terms of material and labour for 271 ha. Of private land.			70.26	4.66	36.43	2.41	32.73	2.18	139.42	9.25
16	Total DoLR share (Sl.No. 14 Minus Sl.No. 15)			---	145.15	---	47.69	---	50.99	---	243.83

(Two Crore Fourty Three Lakh Eighty Three Thousand) only.

**Abstract of detailed action plan for the project “Treatment of Landslide & Soil Erosion” in Rangrang Watershed Catchment of Teesta River, North Sikkim under the scheme TDET for the year 2009-10.**

Sl.No.		Particulars	Amount (in crore)	Remarks
A.	1	Rangrang Watershed	64.68	DoLR Grant                    102.54 Beneficiaries Share: <u>04.66</u> <u>107.20</u>
	2	Namok Watershed	15.06	
	3	Chanday Watershed	15.13	
	<b>Sub Total</b>	<b>94.87</b>		
B	Employment of Supervisors	00.84		
C	Administrative Overhead 12 % of Works.	11.49		
<b>Grand Total</b>			<b>107.20</b>	

**(Rupees One Crore Seven Lakh Twenty Thousand) only**

**Watershed wise physical targets and financial outlay for treatment of Landslide & Soil Erosion in Rangrang Watershed Catchment of Teesta River, North Sikkim for the year 2009-10.**

Sl. No.	Activities	Rate		Watersheds						Total	
				Rangrang		Namok		Chanday			
		Units	Rate	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1.	Protective Works										
A.	HP Stone wall inside sausage in landslide area.	Rmt	4400	640	28.16	80	3.52	80	3.52	<b>800</b>	<b>35.20</b>
B.	Stream training works										
i.	HP Stone wall inside Sausage for river training.	Rmt.	4400	120	5.28	90	3.96	90	3.96	<b>300</b>	<b>13.20</b>
ii.	G.I. wire sausage wall with 1:2:4 PCC lining	Rmt.	6400	63.00	4.03	63	4.03	64.00	4.10	<b>190</b>	<b>12.16</b>
2.(a)	Soil & Moisture Cons.	Ha.	33000	10	3.30	05	1.65	05	1.65	<b>20</b>	<b>6.60</b>
(b)	Afforestation including maintenance	Ha.	20340	34	6.92	---	---	---	---	<b>34</b>	<b>6.92</b>
3.	Bamboo plantation with seed broadcasting	Ha.	25700	20	5.14	---	---	---	---	<b>20</b>	<b>5.14</b>
4.	Bally Benching.	Ha.	24850	27	6.71	05	1.24	05	1.24	<b>37</b>	<b>9.19</b>
5.	Application of geo-synthetics & polymers.	Sqt. Feet.	185	300	0.56	---	---	---	---	<b>300</b>	<b>0.56</b>
6.	Re-grading of slopes	Cum	55	3600	1.98	1200	0.66	1200	0.66	<b>6000</b>	<b>3.30</b>
7.	Anchoring / shoteeting	Mtr.	6500	40	2.60	---	---	---	---	<b>40</b>	<b>2.60</b>
8.	Total of works (Total area 2525.78 ha out of which 271 ha is private wasteland				<b>64.68</b>		<b>15.06</b>		<b>15.13</b>		<b>94.87</b>
9	Beneficiary contribution in terms of material and labour for 271 ha. Of private land @ 40 % share.			29.76	2.34	15.43	1.21	13.85	1.11	59.05	4.66
10	DoLR share for works component (Sl. No. 8 minus Sl.No. 9)			---	56.55	---	29.32	---	26.34	---	<b>112.21</b>
11	Supervisor			01	0.42	01	0.22	01	0.20	<b>03</b>	<b>0.84</b>
12	Sub-total (Sl.No. 8 + Sl.No.11)			---	65.10	---	15.28	---	15.33	---	<b>95.71</b>
13	Administrative Overhead 12% of sub-total given above in Sl.No. 12			---	7.82	---	1.83	---	1.84	---	<b>11.49</b>
14	<b>Grand Total (Sl.No. 12+Sl.No. 13)</b>			---	72.92	---	17.11	---	17.17	---	<b>107.20</b>
15	Beneficiary contribution in terms of material and labour for 271 ha. Of private land.			29.76	2.34	15.43	1.21	13.85	1.11	59.05	4.66
16	<b>Total DoLR share (Sl.No. 14 Minus Sl.No. 15)</b>			---	70.58	---	15.90	---	16.06	---	<b>102.54</b>

(One Crore Two Lakh Fifty Four Thousand) only

**Consolidated Work Plan for the Project “Treatment Of Landslide & Soil Erosion In Rangrang Watershed Catchment Of Teesta River, in North Sikkim” under Technology Development Extension & Training (TDET) Scheme for the period 2007-08 to 2009-10.**

Sl. No.	Activities	Rate		Watersheds						Totzl	
				Rangrang		Namok		Chanday			
		Unit	Rate	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1.	Protective Works										
A.	HP Stone wall inside sausage in landslide area.	Rmt	4400	1844	81.14	562	24.73	503	22.13	<b>2909</b>	<b>128</b>
B.	Stream training works										
i.	HP Stone wall inside Sausage for river training.	Rmt	4400	763	33.57	354	15.58	592	26.05	<b>1709</b>	<b>75.20</b>
ii.	G.I. wire sausage wall with 1:2:4 PCC lining	Ha.	6400	228	14.59	215	13.76	215	13.76	<b>658</b>	<b>42.11</b>
2.(a)	Soil & Moisture Cons.	Ha.	33000	45	14.85	30	9.90	25	8.25	<b>100</b>	<b>33</b>
(b)	Afforestation including maintenance	Ha.	20340	244	49.63	---	---	06	1.22	<b>250</b>	<b>50.85</b>
3.	Bamboo plantation with seed broadcasting	Ha.	25700	95	24.42	53	13.62	22	5.65	<b>170</b>	<b>43.69</b>
4.	Bally Benching.	Ha.	24850	100	24.85	25	6.21	24	5.96	<b>149</b>	<b>37.02</b>
5.	Application of geo-synthetics & polymers.	Sqt. Feet	185	1580	2.93	510	0.95	510	0.94	<b>2600</b>	<b>4.82</b>
6.	Re-grading of slopes	Cum	55	8600	4.73	6200	3.41	6200	3.41	<b>21000</b>	<b>11.55</b>
7.	Anchoring / shoteeting	Mtr	6500	94	6.1	29	1.89	37	2.41	<b>160</b>	<b>10.40</b>
8.	Total works (Total area 2525.78 ha. Out of which 271 ha is privity wasteland				256.81		90.05		89.78		<b>436.64</b>
9	Beneficiary contribution in terms of material and labour for 271 ha. Of private land @ 40% share			136.55	9.43	70.80	4.88	63.60	4.43	<b>270.95</b>	<b>18.74</b>
10	DoLR share for works component (Sl.No. 8 minus Sl.No. 9)				247.38		85.17		85.35		<b>417.90</b>
11	Supervisor			03	1.26	03	0.66	03	0.60		<b>2.52</b>
12	Sub-Total (Sl.No. 8 + Sl.No. 11)				258.07		90.71		90.38		<b>439.16</b>
13	Administrative Overhead 12% of sub-total given above in Sl.No. 12				30.98		10.88		10.85		<b>52.71</b>
14	Grand Totral (Sl.No. 12 + Sl.No. 13)				289.05		101.59		101.23		<b>491.87</b>
15	Beneficiary contribution in terms of material and labour for 271 ha. Of private land.			136.55	9.43	70.80	4.88	63.60	4.43	<b>270.95</b>	<b>18.74</b>
16	Total DoLR share (Sl.No. 14 Minus Sl.NO. 15)				279.62		96.71	96.80	96.80		<b>473.13</b>

# Summary

After the conduction of micro-planning exercise based on ground reality, we perceive water being the main factor behind the cause of landslide and soil erosion. Also the biotic factors responsible are grazing of cattles and faulty method of cultivation. Along the stretch of two roadways in North Sikkim, in the North Sikkim highway (NSH) from Gangtok to Chungthang, the first point of concerned is at B-II. This point has been very vulnerable due to landslide since long time.

Now this is being restored to a great extent. The reasons are obvious that:

1. Labour Camp of GREF has been evacuated from the adjoining site.
2. Bamboo Plantation along with Stone Wall Fencing taken up by the Social Forestry Division.

Secondly, there is Chawang slide which started during 2004 and it has been causing trouble to the traffic immensely.

Further, along the by-pass road of Mangan to Singtam, there exist Namok landslide at 4<sup>th</sup> Mile and Lausooney at 5<sup>th</sup> Mile. These major slides have been visited by Dr. Prof. B.M. Banerjee of Delhi University. He had suggested to canalize the sporadic water in these sites to the natural course by using hume or synthetic pipes of required diameter. The inputs suggested by him may be relevant in some area under this project being a site specific problem.

To go ahead in the implementation of this project in the field, the objective of the project would be kept in top priority.

We have also learned from the success stories of stabilization of Chandmari, Tathangchen slide in the East District and Rongdol in Lower Dzongu in the North District.

MAP DELINEATING MICRO PLANNING FOR "TREATMENT OF LANDSIDE AND SOIL EROSION CONTROL IN RANGRANG WATER SHED CATCHMENT OF TEESTA RIVER, NORTH-SIKKIM" UNDER THE PROGRAMME TECHNOLOGY DEVELOPMENT, EXTENSION AND TRAINING (TDET) FOR THE PROJECT PERIOD 2007-08 SPONSORED BY DoR, GOI Vols: SI No-16/2006-07 TDET.

D Z O N G U A R E A

