

**Tour Report**  
**(May 29<sup>th</sup> to June 4<sup>th</sup>, 2011)**

**Objective**

The primary objective of the tour was to monitor the physical activities in the catchment of selected springs and to suggest corrective measures in some of the springs identified by RMDD on their own.

**Travel Schedule**

Mr. Rajesh Kumar and Dr. Sunesh Sharma from PSI visited Sikkim from May 29<sup>th</sup> to 4<sup>th</sup> June, 2011. Visit was made to four springs located in different districts and blocks. The schedule of the visit is given below:

<b>S No.</b>	<b>Schedule</b>	<b>Activities</b>
1	May 29, 2011	Departure of Mr. Rajesh Kumar and Dr. Sunesh Kr Sharma from Dehra Doon.
2.	May 30, 2011	Arrival of Mr. Rajesh Kumar and Dr. Sunesh Sharma at SIRD office, Jorethang
3.	May 31, 2010	Field visit of Melli Dhara in Namchi block of South District .
4.	June 1, 2011	Field visit to Vermilli dhara in Menam Wildlife Sanctuary of Revangla block of South District.
5.	June 2, 2011	Field visit to Devithan dhara in Satam GPU of Yangang block of South district.
6.	June 3,2011	Field Visit to Saajbotay Dhara, in Badong GPW of Khamdong block of West district. Departure for Bagdogra
7.	June 4,2011	Arrival at Dehra Doon.



**Melli Dhara Location**

### **Detailed Report**

#### **May 29<sup>th</sup>, 2011: Visit to Melli Dhara**

A visit was made to Melli Dhara in Namchi block of South Sikkim district. Mr. Suraj Subba from WWF Gangtok, assisted Mr Rajesh Kumar and Dr Sunesh Sharma. This site was selected by SIRD and the physical activities were in progress. The place is located at an elevation of 1800 msl and 36 km from Namchi, district headquarter of South district. A total of 100 ha of land is selected for the Springshed development programme. Slope direction of treatment area is almost towards North and North East. There were 90 unskilled labours from the village engaged in the activity.

At present this spring is a source of drinking water for 70 households. Mr. Sandeep a resident of surrounding village (catchment) is supervising the work. The quality of work was good and the digging was done mostly on contours. The sizes of the trenches were correct and varied with the slope and the soil type. The recharging pits, which were located at lesser slopes should have been little bigger. This was conveyed to the supervisor. Out of 100 ha about 20 ha area was treated and almost one fifth of the work was finished.

**June 1st, 2010: Visit to Vermilli Dhara**

On the second day visit was made to Vermilli Dhara. Mr. Suraj Subba WWF and SIRD Field Facilitator Uday Chamling, assisted us.

**Characteristics of Bermeli Dhara Spring shed development programme**

Name of Spring: Vermilli Dhara

Location: 10,400 feet in Menam Wildlife Sanctuary

Block: Ravangla

District: South District

Discharge as on 20 May 2011: 18 LPM

Area Selected for treatment: 20 ha

Total no. of recharge pits: 400 (10\*10\*2)

Total No. of Trenches: 2000 (6\*2\*2)

No. of Unskilled Labour: 81

Treatment work started on 21 May 2011 and completed on 1 June 2011.

**Detail of Bermeli Dhara**

Bermeli dhara is located at the elevation of 3169 meters in the Mainam wildlife sanctuary (protected area). This spring is the source of water for two urban centers Namchi, district headquarter of south district and Ravangla. At present this spring is providing water to a population of about 5000.

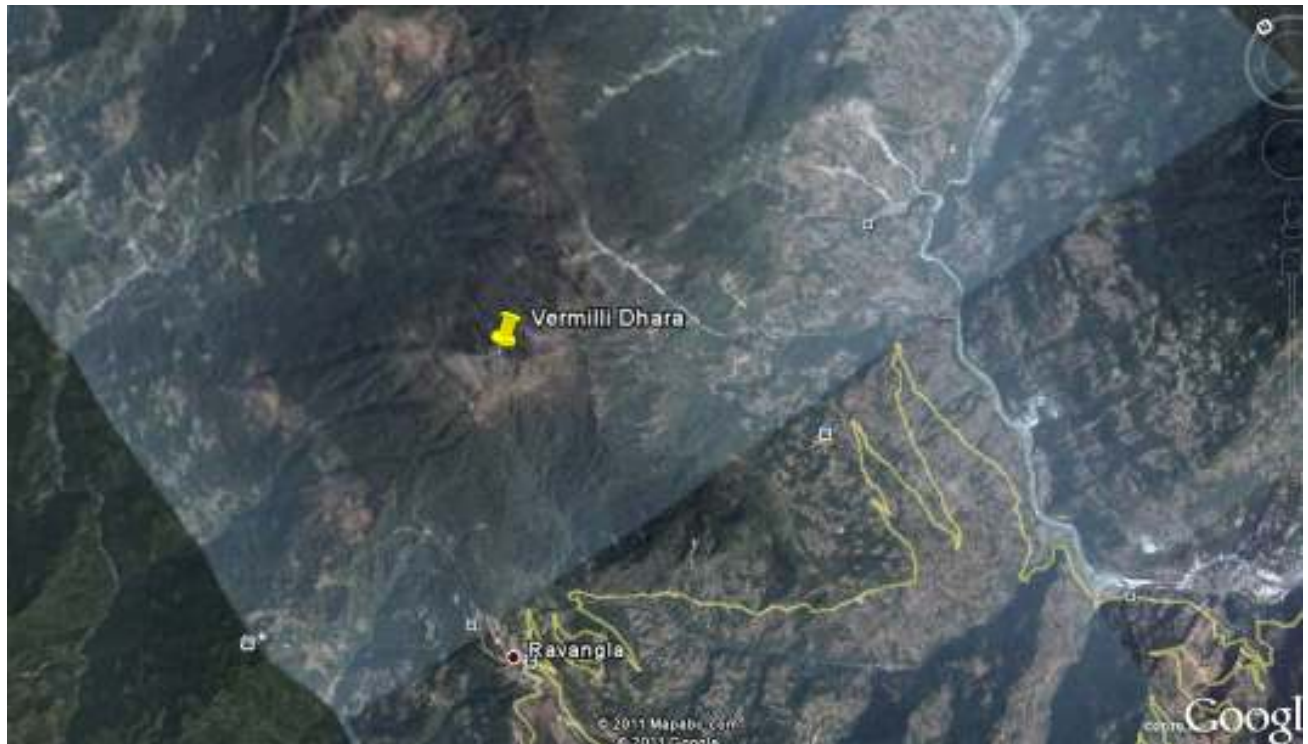
The treatment area is divided into two portion -18 hectares on the North and North-East facing slopes downstream of which the spring originates and the rest of the two hectares is located on the southern slopes. The altitude of the treatment area varies from about 2950 msl to the top of the ridge at about 3200 msl. This ridge divides the Rangit and Testa basins. The forest on the northern slope is very dense with good ground cover. The slope of the area varies from about 20-40%. The slope on the southern side has less vegetation with the slope varying from 20-30%. The soil in the area is loamy. The rock formation of the area are quartzite and phyllite and in hydrogeological point of view these rocks types are known as fissured formation (comparatively less infiltration of water).

The southern slope was selected for treatment by people from ACWADAM. This according to them, lie on a scarp slope and would add to the discharge of the spring located on the other side of the slope. As mentioned above, two hectare of land has been identifies for the treatment.

The treatment area falls under a protected area (Mainam Wildlife sanctuary). Care was taken by the workers not to uproot any plants during digging. At certain places where it was absolutely necessary, the plants were uprooted with care and replanted at the edge of the trenches/recharge pits. This was to ensure that flora and fauna of the wild life sanctuary was not disturbed by the treatment activity.

There was very sparse vegetation in the treatment area and there are some remains of burnt trees, because upper area of this forest is burnt by local people during the people agitation against monarchy system in the Sikkim in 1973. The soil type is loamy soil which is known for slow infiltration of water. It will best for recharge because it will increase the duration of water discharge in springs and it will provide sufficient water in lean period i.e. in the month of March and April. All the recharging structures were constructed good as per the requirement of the locations.

**Bermeli Dhara Location :**



## **Map: Locations of Dhara(Spring) visited during the Sikkim visit**

### **2<sup>nd</sup> June,2011: Devithan Dhara**

On the third day the PSI team visited to Devithan Dhara with Suraj Subba WWF, BAC field facilitator, and Satam GPU president. Devithan Dhara is located in Satam GPU of Yangang block of South district. SIRD selected this location for spring shed development programme. SIRD conducted survey on this site and no any treatment activity is begin till now. On geological point of view it seems that there is a lineament or fracture occurs in the recharge zone of Devithaan dhara. The spring has an immediate catchment area of about 6ha out of which the treatment need to be done in only about 2-2.5ha since the most of the area have high slope. It is suggested by PSI experts that trenches should be dug at the center of the existing terraces. Since existing terraces are narrow the recharge pits are not possible. Average Annual rainfall is 1200 mm in Yangang block. The water discharge of this spring is 5 lpm and it is the source of drinking water of 80 households (430 people).

### **3<sup>rd</sup> June 2011: Saajbotay Dhara**

Saajbotay dhara is located in Badong GPW of Khamdong block of West district. This dhara is located at 27°27.376'N , 88 °16.775'E and at an altitude of 4703 feet. Total discharge of the spring was 12 lpm. This spring is the source of drinking water for 35 households (200 person).

SIRD APO Mr. Ghanshyam, Suraj Subba ,WWF, BDO Khamdong, GPU President, Khamdong and Babha Atomic Research Center Scientists, Dr. Gurbachan Singh, Dr. Sinha and Mr. Kulkarni were accompanied in the visit.

Mr. Rajesh Kumar from PSI, monitored the structured constructed under the spring shed development programme in recharge zone of Saajbotay dhara. The treatment area was about 5ha with terraces. All the trenches were dug at the center of black cardamom fields (terraces). The average size of trenches is 6x2x2 feet. No recharge pits were constructed. PSI experts Mr. Rajesh Kumar suggested some important precautions during the construction of trenches and also shared his earlier experiences on recharging structures. This activity is conducted under MGNREGA programme, which also ensure employment to rural people beside infrastructural development. According to the B D O, the total annual rainfall of the area is 1500 mm.

Dr. Gurbachan Singh, scientist from BARC, gave a brief introduction on role of isotopic techniques in ground water recharge. According to Dr Singh this techniques will be helpful in finding the ground water channel and to identify the recharging zone of each spring.

After the field visit we departed for Silliguri on 3<sup>rd</sup> June, 2011 and arrived in Dehradun the next day i.e. 4<sup>th</sup> June, 2011.

### **Observations and suggestions:**

The following observations were made during the field visit:

1. It was observed that the efforts carried out last year by PSI/WWF was fruitful in the sense that the trained personnel have understood the techniques and have been properly implemented in the field. All credit to the WWF/RMDD/SIRD staff.
2. In the last year all the treatment work were done in the immediate catchment of the springs. It was brought to the notice of the RMDD and WWF that any infrastructural activities (like construction of roads/dams etc) in these catchment would have negative impact on the discharges of the springs and therefore efforts should also be made to treat a larger catchment which lie most in forest areas at peaks. Ponds, lakes, trenches constructed at peaks of the catchment would be more sustainable. It was good to see such efforts now be taken seriously. Treatment in Maenam Sanctuary area is one such example.
3. It was observed that in some of the trenches and recharge pits, the dugout soil was bunded on all the four sides. This will not allow the runoff to collect in these trenches/pits. It is therefore suggested that these trenches/pits be bunded from three sides only. The upstream side of the pit/trenches should not be bunded.
4. Where terraces are wider or where slope of the land is less than 20%, the size of the recharge pits can be increased as in case of catchment of Melli Dhara. This observation was conveyed to the Field Facilitator.
5. Bermelli Treatment area is located on the top of Maenam Sancturay at the elevation of 3170 msl. The slope is comparatively gentle varying from 20-30%. It is suggested that plantation activities should be followed. Efforts should be taken to also include horticultural species to contain wild animals within the sanctuary.
6. Recharge structures will provide drinking water to the animals and birds of Maenam Sanctuary and it will also increase the soil moisture hence there will be improvement in the status of vegetation in the upper area of the sanctuary. There should long term collaboration between SIRD and Forest Department for the maintenance of these recharging structures.
7. During and after the monsoon, the discharges of springs where interventions have been done should be measured along with the rainfall measurements. This would be useful to see the impact of such activities on the discharges and the duration of flow of these springs.
8. In and around areas with land subsidence, effort should be taken to discharge water as quickly as possible. Water conservation activities might result in more subsidence.