

## **Indicator 2a. Ground Water Level From Participatory Resource Maps**

This is a quick, easy, and inexpensive way to measure ground water levels in selected areas of a watershed. This indicator assumes that the water level in local wells can be used as a proxy measure for ground water in that locality. Through participatory discussions with frequent users of local wells, researchers can map the water levels in these wells.

While the results obtained by this method are accurate and reliable, they are not precise. If evaluators need fine-grained results, this method will be of little use to them. They may wish to use indicator 2b instead.

### **TEAM MEMBERS (NUMBER AND SKILLS)**

1. Hydrologist. At the outset of the programme, the hydrologist will select the wells to be monitored. His decision will be based on expectations of where programme impacts should be felt.
2. Social Scientist. The social scientist will periodically monitor the water levels in these wells. This will be done with resource maps in a group participatory session.

### **NECESSARY TOOLS AND SUPPORT**

1. A water resource map. These can be drawn by hand.
2. Coloured Pens

### **FREQUENCY OF USE**

The data for this indicator will be collected during periodic evaluations.

### **TIME REQUIRED TO USE INDICATOR**

Making a water resource map should take no longer than one hour per well.

### **SEQUENCE OF USE**

The resource mapping should be done during the “field visit” portion of the evaluation. The social scientist can visit the selected wells when he/she is collecting data for the “Use” and “Outsiders” indicators.

### **SAMPLING**

Ground water levels will be monitored in the selected villages. The hydrologist will determine the number and location of the wells necessary to monitor the water table in each locality. The social scientist will conduct participatory sessions in the village nearest the test wells.

## PROCEDURES AND METHODS

1. The hydrologist selects the wells to be monitored at the outset of the programme.
2. The social scientist visits the selected wells during the periodic evaluations.
3. The social scientist gathers a group of three to eight people who frequently use the well.
4. The people are asked to fill in a water resource map for the well.
5. The social scientist asks the participants to explain why water levels are the way they are.
6. On repeat visits, the social scientist will ask the beneficiaries to explain any variations between the old and new maps and the cause/causes for the apparent changes?

## DATA MATRIXES AND QUESTIONNAIRES

Data can be stored on water resource maps-one for each well surveyed.

## FINAL PRESENTATION AND ANALYSIS

1. Summarise the individual and aggregate findings from the water resource maps.
2. Discuss instances of change.

If desired, the results of the resource maps could be coded and turned into data that could be analysed and presented graphically.

## **Indicator 2b. Ground Water Level Using Technical Measurements**

For this indicator, the data on local ground water levels is to be collected extractively. The water level in local wells is taken as a proxy for the ground water level. Hydrological assistants will collect data on local water table levels everyday, at fixed times, at selected sites. This data is then analysed for changes over time. In order to locate casual explanations for empirical observations, the results of this analysis will then be the subject of participatory discussions.

### **TEAM MEMBERS (NUMBER AND SKILLS)**

1. Hydrologist. The hydrologist will establish Ground Water Monitoring Stations (GWMS) and see to their staffing. The hydrologist will then periodically collect and analyse the data.
2. A team of Hydrological Assistants. These assistants must be hired locally (e.g., teachers, or literate farmers) as they will need to perform their duties on a daily basis over long periods.
3. Social Scientist. The social scientist will discuss the hydrological data with the beneficiaries through participatory sessions.

### **NECESSARY TOOLS AND SUPPORT**

The tools required depend upon the approach taken. If the programme chooses to bore its own wells to construct GWMS, construction equipment will be necessary. This protocol is written under the assumption that, for reasons of cost minimisation, programme managers will choose to monitor the water table level in selected existing wells. In this case, the following equipment will be needed:

1. Water level sensor
2. Five rain gauges (these can be the same five used to measure soil loss).
3. Record book.
4. In order to make contacts in the selected villages, the social scientist will need to arrive with a representative of the partner NGO or state department.

### **FREQUENCY OF USE**

The empirical data for this indicator must be collected continuously, on a daily basis. This data must be transmitted to the project headquarters periodically for storage and analysis. This collection must occur for at least two years before investigators can begin to measure change.

Participatory sessions (to interpret the extractively collected data with beneficiaries) should take place along with the periodic evaluations that take place every three to five years.

### **TIME REQUIRED TO USE INDICATOR**

Executing a single depth measurement should take no more than five minutes. Participatory discussions of the empirical data should last no longer than thirty minutes per well.

## SEQUENCE OF USE

If the GWMS are in place, the latest empirical data is gathered and analyzed before the Assessment Team arrives at the site. Participatory discussions of this data will occur towards the end of the assessment, when all of the participatory sessions are conducted.

## SAMPLING

Water table levels will be monitored in the select villages. The hydrologist will determine the number and location of the wells necessary to monitor the water table in each locality.

The social scientist will conduct participatory sessions in the village nearest the test wells.

## PROCEDURES AND METHODS

1. The hydrologist selects the wells to be monitored.
2. Ground Water Monitoring Stations (GWMS) are established (using the water level sensors). Control GWMS should also be established.
3. The hydrological assistants monitor ground water levels on a daily basis and record it in their record books.
4. Hydrological assistants will also monitor the rates of rainfall.
5. The hydrologist collects and analyses this data.
6. Based on this data, the social scientist discusses change in water table levels at the participatory sessions.