

2021

# IoT Data Integration

IOT BASED MODELLING  
NIC DDWS CELL

Department of Drinking Water and Sanitation | Ministry of Jal Shakti

## Workflow

### IoT Agency Registration

- Create new account for login

### User Activation (by admin)

- Registered user is activated after approval by admin

### IoT Agency Login

- Login using Registered Email Id as User ID
- Password is 10-digit registered password

### Site Setup

- Enter Village Level Information

### Sensor Registration

- Enter Sensor devices details

### Gateway Mapping Information

- Gateway Device ID/Name mapping with Sensor Device ID/Name

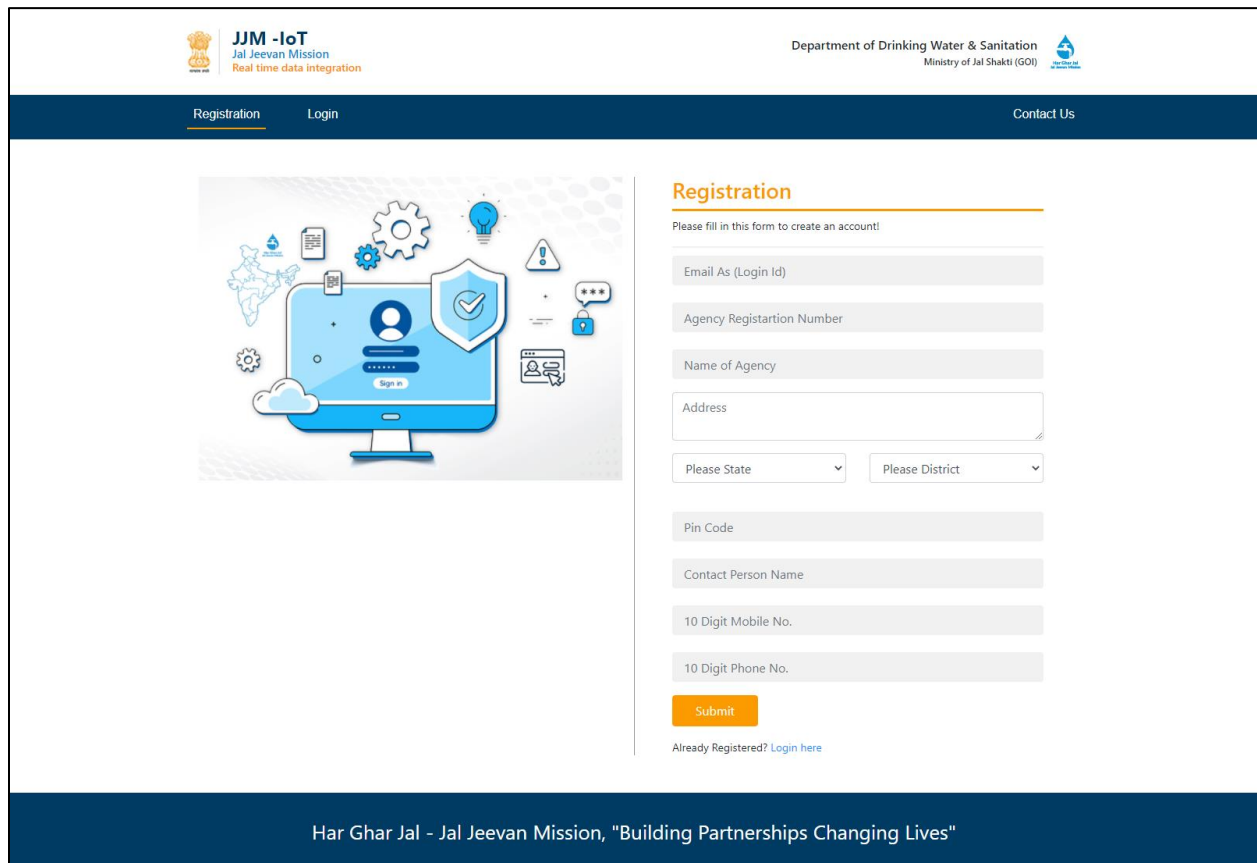
### Data Synchronization using Web API POST Method

- Flow Meter
- Chlorine Analyzer
- Ground Water
- Pressure Sensor
- ph Level
- Turbidity

# Registration

Steps to register on IoT website are illustrated as follows:

1. Open URL for [https://ejalshakti.gov.in/IoT\\_Web/Registration](https://ejalshakti.gov.in/IoT_Web/Registration)
2. Registration form appears on screen as shown here:



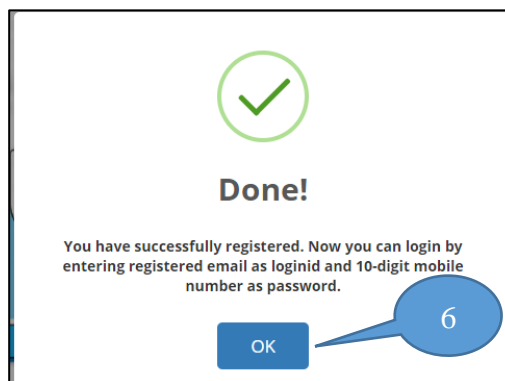
The screenshot displays the registration page for the JJM - IoT (Jal Jeevan Mission) website. The page header includes the JJM - IoT logo and the Department of Drinking Water & Sanitation, Ministry of Jal Shakti (GOI). The navigation bar contains links for Registration, Login, and Contact Us. The main content area features a registration form with the following fields: Email As (Login Id), Agency Registration Number, Name of Agency, Address, Please State (dropdown), Please District (dropdown), Pin Code, Contact Person Name, 10 Digit Mobile No., and 10 Digit Phone No. A Submit button is located at the bottom of the form. Below the form, there is a link for 'Already Registered? Login here'. The footer of the page contains the slogan 'Har Ghar Jal - Jal Jeevan Mission, "Building Partnerships Changing Lives"'. On the left side of the form, there is an illustration of a computer monitor with various IoT-related icons such as gears, a lightbulb, a shield, and a map of India.

3. Fill details in form to create an account.

4. Click the **Submit** button. as shown in figure below:

The screenshot shows the JJM -IoT registration page. The header includes the JJM -IoT logo and the Department of Drinking Water & Sanitation. The navigation bar has 'Registration', 'Login', and 'Contact Us' links. The main content area is titled 'Registration' and contains a form with the following fields: email (newiottestuser@gmail.com), mobile number (10000), name (New IoT Test), city (Delhi), region (Delhi, South West), and password (110004). A blue callout bubble with the number '4' points to the 'Submit' button.

- As soon as Submit button is clicked, the alert message appears on screen
5. Click **OK** to proceed further.



**Note:** Once, the registration has been done successfully, user can login into website using Email Id as login Id and password as 10-digit mobile number.

## User Activation (by Admin)

Steps to activate user (by Admin) into IoT website are illustrated as follows:

1. Click **Log in** tab available on home screen to login into website.
2. Once, **Log in** tab is clicked, login form appears on screen.
3. Admin enters his/her credentials and captcha.
4. Admins clicks **Log in** button

Registration Login Contact Us

**Log In**

Enter Registered Email

Enter Registered Mob Number

ZrfmxW

Enter above captcha text

Log In Register

As soon as Admin clicks **Log in** button, following screen appears:

**JIM - IoT**  
Jal Jeevan Mission  
Real time data integration

Department of Drinking Water & Sanitation  
Ministry of Jal Shakti (GOI)

Welcome : Administrator

Email : Mob : Logout

Agency Registration Approval Registered Agency Site Setup Information

**Agency Approval**

Choose Agency Please choose Agency

Now, Admin can approve Agency by choosing agency from **Choose Agency** drop-down menu, as shown in figure below:

Agency Registration Approval Registered Agency Site Setup Information

**Agency Approval**

Choose Agency New IoT Test

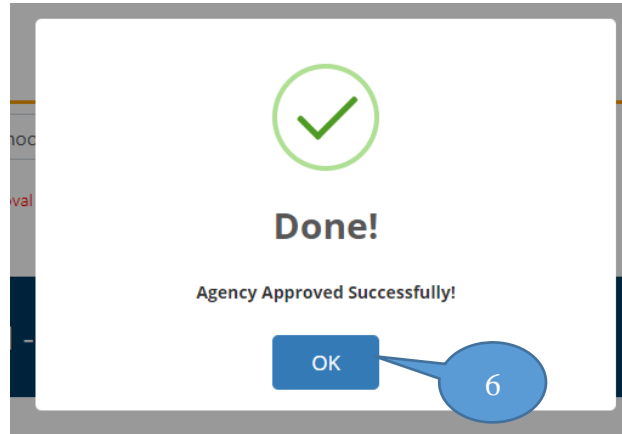
Agency Information			
Agency Name:-	New IoT Test	Email Id:-	newiotttester@gmail.com
Registration No.:-	10000	Address:-	Delhi
State:-	Delhi	District:-	South West
Pin Code:-	110004	Contact Person Name:-	New IoT Test User
Mobile No.:-	9012345678	Phone No.:-	9012345678

Click here to Approve

5. Click **Click here to Approve** button available on screen to approve the Agency.

As soon as **Click here to Approve** button is clicked, following alert message appears, as shown in figure.

6. Click **OK** button to proceed further.



When Admin approves Agency, its information will be displayed under **Registered Agency** tab, as shown below:

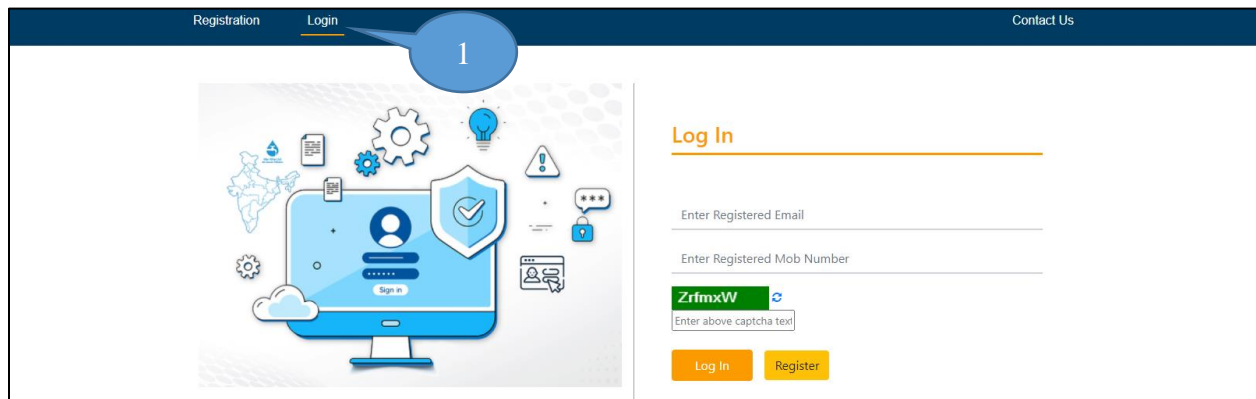
Sr No.	Registration No.	Agency Name	Address	Contact Person Name	MobileNo	Email	More Information
1	10000	New IoT Test	Delhi	New IoT Test User	9012345678	newiottestuser@gmail.com	<a href="#">Show More..</a>

Once, Agency is approved by Admin, user can login using his/her credentials to login into IoT website.

## Login (By Approved User)

Steps to login into IoT website are illustrated as follows:

1. Click **Login** tab available on home screen to login into website.
2. Once, **Login** tab is clicked, login form appears on screen:



The screenshot shows the website's navigation bar with 'Registration', 'Login', and 'Contact Us' links. The 'Login' link is underlined and highlighted by a blue callout bubble with the number '1'. Below the navigation bar is a large illustration of a computer monitor displaying a login form, surrounded by IoT-related icons like gears, a lightbulb, a shield, and a map of India. To the right of the illustration is the actual login form titled 'Log In'. The form contains the following fields and elements:

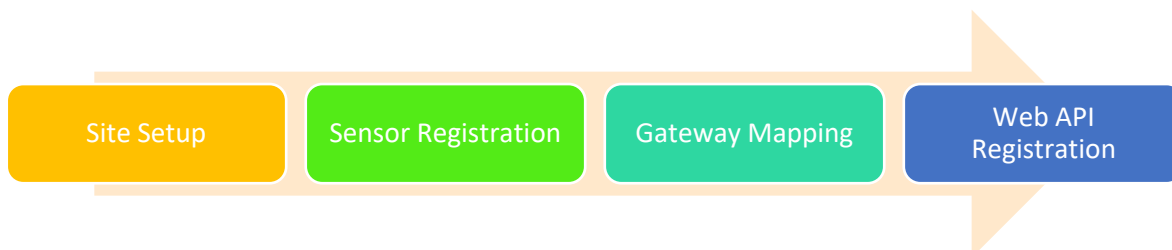
- 'Enter Registered Email' text input field.
- 'Enter Registered Mob Number' text input field.
- A green captcha box displaying 'ZrfmxW' with a refresh icon.
- A text input field for the captcha with the placeholder 'Enter above captcha text'.
- 'Log In' and 'Register' buttons.

3. Enter registered **Email Id** and **Mobile number** to login.
4. Enter **Captcha** displayed on screen.
5. Click **Log in**, as shown in figure below:



This screenshot shows the same login page as the previous one, but with the form fields filled out. A blue callout bubble with the number '3' points to the 'Enter Registered Email' field, which contains 'newiottestuser@gmail.com'. Another blue callout bubble with the number '4' points to the captcha box, which now displays 'rxVW33'. A third blue callout bubble with the number '5' points to the 'Log In' button. The 'Register' button is also visible.

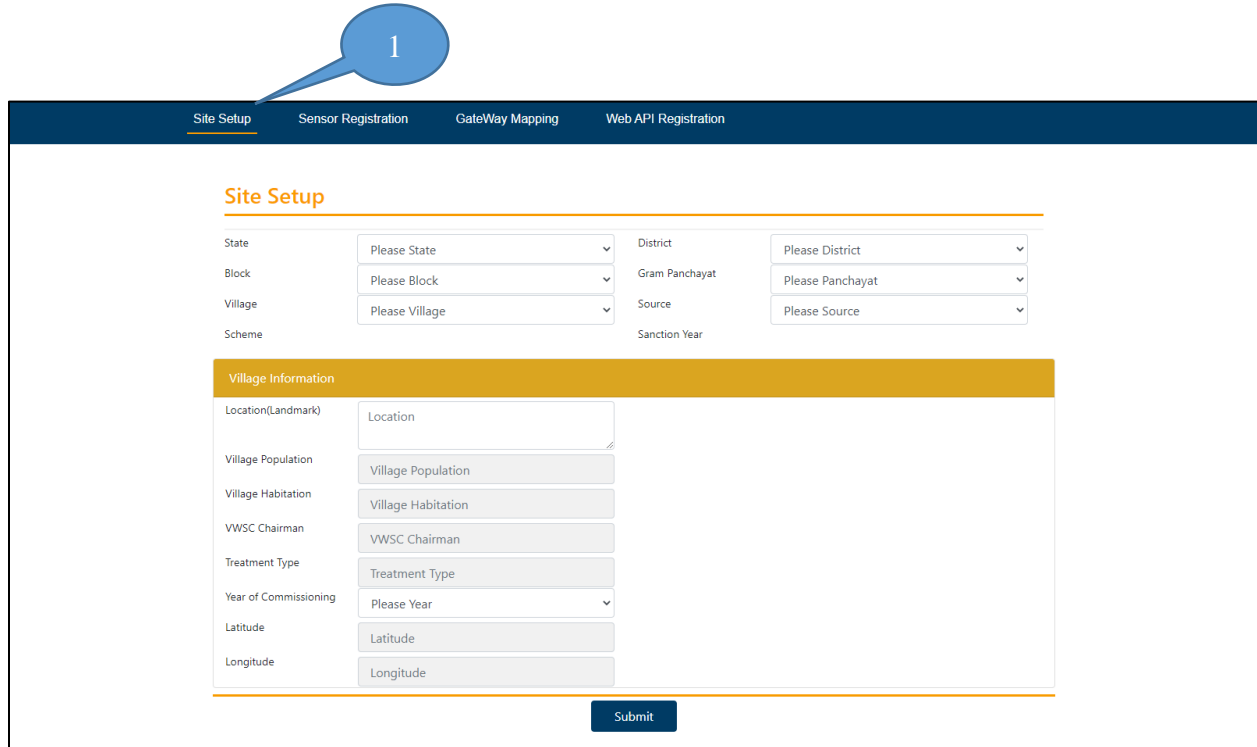
After successful login, user can enter details in the following order for:



# Site Setup

Steps to enter details for site related information are illustrated as follows:

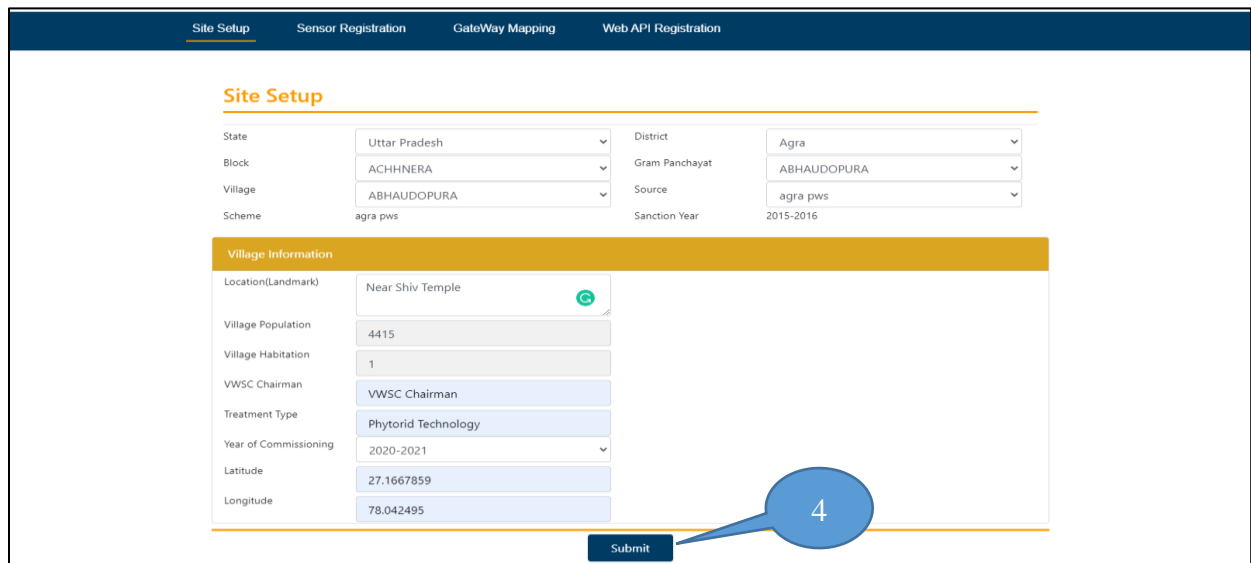
1. After login, click **Site Setup** tab and following screen appears:



The screenshot shows the 'Site Setup' form in a web application. The navigation bar at the top includes 'Site Setup', 'Sensor Registration', 'GateWay Mapping', and 'Web API Registration'. The 'Site Setup' tab is highlighted. The form contains several dropdown menus for 'State', 'District', 'Block', 'Gram Panchayat', 'Village', 'Scheme', and 'Sanction Year'. Below these is a 'Village Information' section with input fields for 'Location(Landmark)', 'Village Population', 'Village Habitation', 'VWSC Chairman', 'Treatment Type', 'Year of Commissioning', 'Latitude', and 'Longitude'. A 'Submit' button is located at the bottom right of the form. A blue callout bubble with the number '1' points to the 'Site Setup' tab in the navigation bar.

**Note:** By default, **Site Setup** tab is displayed, after login.

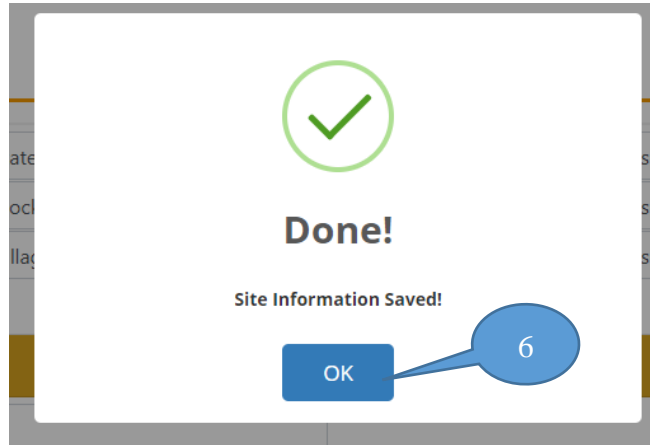
2. Select **State** → **District** → **Block** → **Gram Panchayat** → **Village**
3. Select the **Source** from drop-down menu and, **Scheme** and **Sanction Year** appear automatically.
4. Enter **Village Information** details and click **Submit** button, as shown below:



The screenshot shows the 'Site Setup' form with the following data entered: State: Uttar Pradesh, District: Agra, Block: ACHHNERA, Gram Panchayat: ABHAUDOPURA, Village: ABHAUDOPURA, Source: agra pws, Scheme: agra pws, Sanction Year: 2015-2016. The 'Village Information' section contains: Location(Landmark): Near Shiv Temple, Village Population: 4415, Village Habitation: 1, VWSC Chairman: VWSC Chairman, Treatment Type: Phytorid Technology, Year of Commissioning: 2020-2021, Latitude: 27.1667859, Longitude: 78.042495. A 'Submit' button is at the bottom right. A blue callout bubble with the number '4' points to the 'Submit' button.



5. As soon as **Submit** button is clicked, the following alert message appears on screen, as shown in following figure:



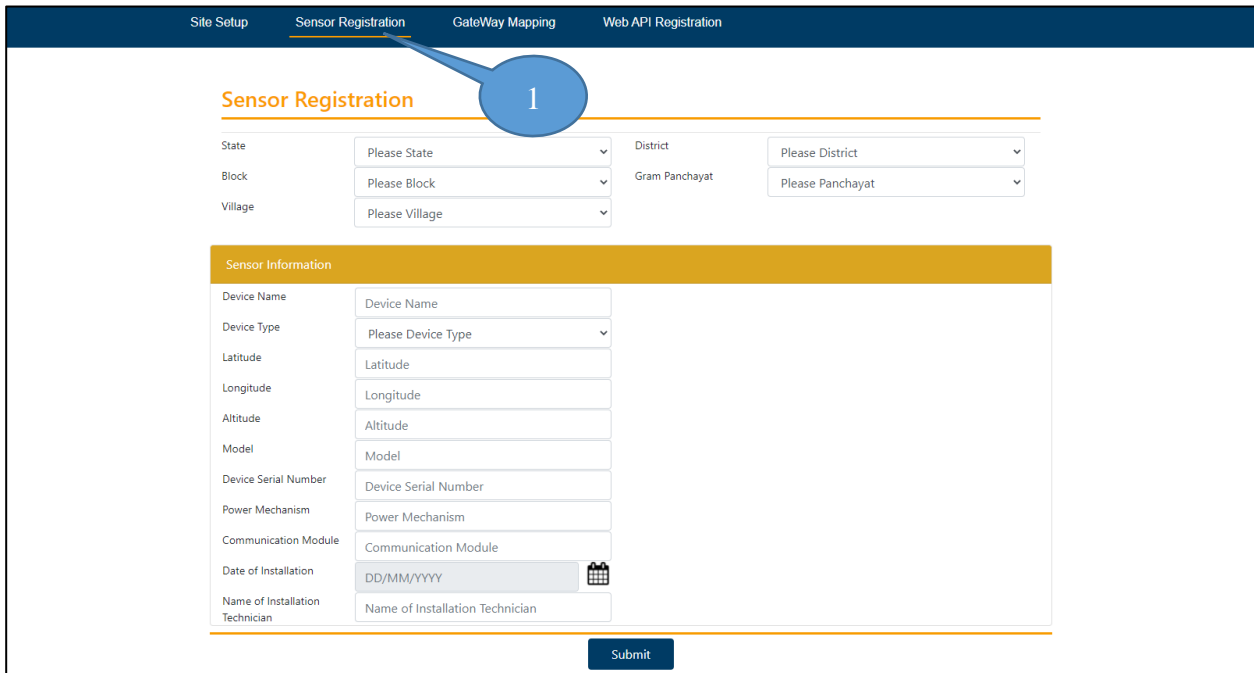
6. Click **OK** to proceed further.

Once, site setup information has been entered, user can perform the next step to enter sensor related information into the website.

# Sensor Registration

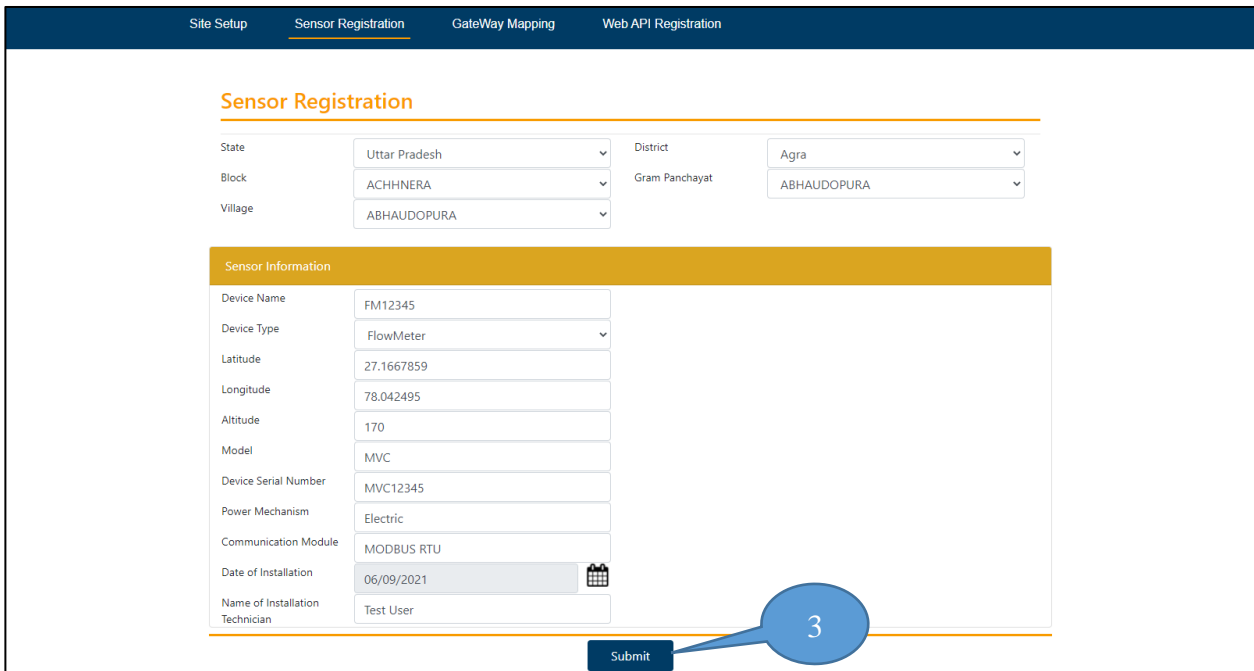
Steps to enter details for sensor related information are illustrated as follows:

1. Click **Sensor Registration** tab and following screen appears:



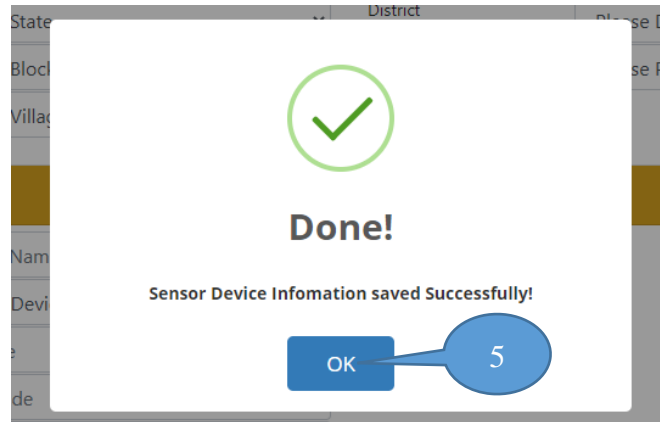
The screenshot shows the 'Sensor Registration' form. At the top, there are four tabs: 'Site Setup', 'Sensor Registration', 'GateWay Mapping', and 'Web API Registration'. The 'Sensor Registration' tab is selected and highlighted with a blue circle containing the number '1'. Below the tabs, the form is titled 'Sensor Registration'. It contains several dropdown menus for location selection: 'State' (Please State), 'District' (Please District), 'Block' (Please Block), 'Gram Panchayat' (Please Panchayat), and 'Village' (Please Village). Below these is a section titled 'Sensor Information' with a yellow header. This section contains input fields for: 'Device Name', 'Device Type' (Please Device Type), 'Latitude', 'Longitude', 'Altitude', 'Model', 'Device Serial Number', 'Power Mechanism', 'Communication Module', 'Date of Installation' (DD/MM/YYYY with a calendar icon), and 'Name of Installation Technician'. A 'Submit' button is located at the bottom right of the form.

2. Select **State** → **District** → **Block** → **Gram Panchayat** → **Village**
3. Enter **Sensor Information** details and click **Submit** button, as shown below:



The screenshot shows the 'Sensor Registration' form with the following data entered: 'State' is 'Uttar Pradesh', 'District' is 'Agra', 'Block' is 'ACHHNERA', 'Gram Panchayat' is 'ABHAUDOPURA', and 'Village' is 'ABHAUDOPURA'. In the 'Sensor Information' section, the fields are filled with: 'Device Name' (FM12345), 'Device Type' (FlowMeter), 'Latitude' (27.1667859), 'Longitude' (78.042495), 'Altitude' (170), 'Model' (MVC), 'Device Serial Number' (MVC12345), 'Power Mechanism' (Electric), 'Communication Module' (MODBUS RTU), 'Date of Installation' (06/09/2021), and 'Name of Installation Technician' (Test User). A blue circle with the number '3' highlights the 'Submit' button at the bottom right of the form.

4. As soon as **Submit** button is clicked, the following alert message appears on screen, as shown in following figure:



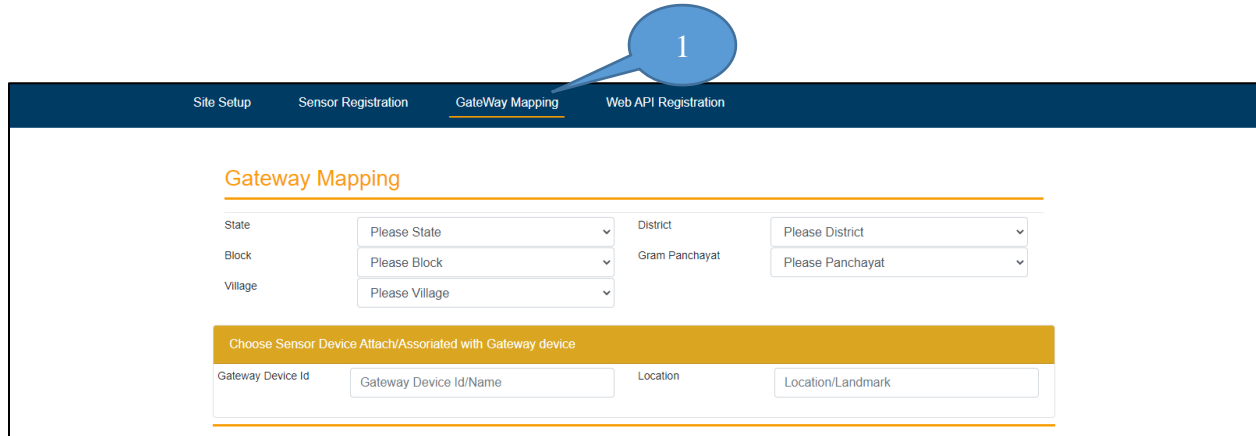
5. Click **OK** to proceed further.

Once, sensor information has been entered, user can perform the next step to enter gateway mapping information into the website.

# Gateway Mapping

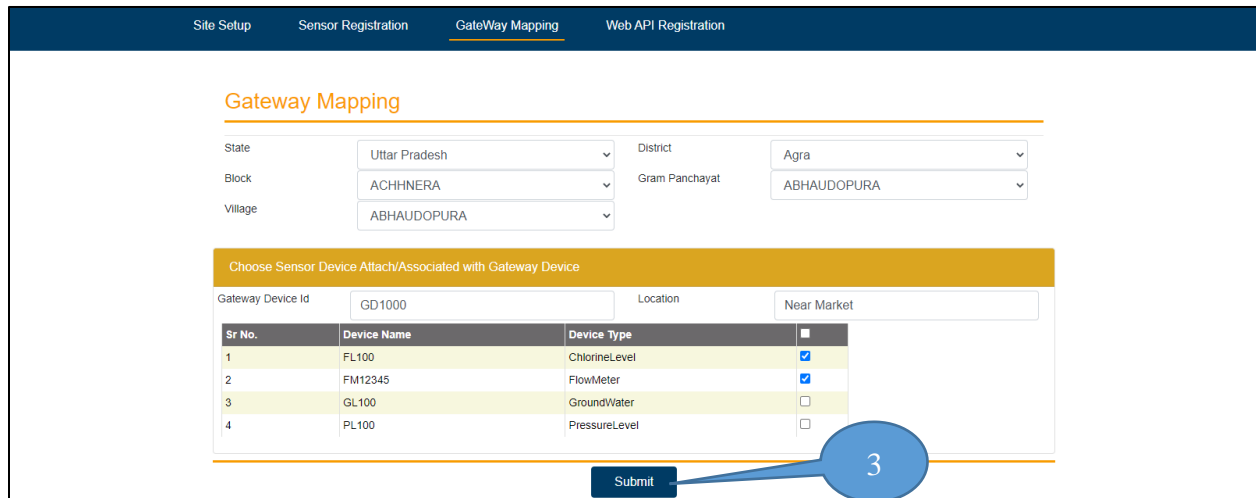
Steps to enter details for gateway mapping related information are illustrated as follows:

1. Click **Gateway Mapping** tab and following screen appears:



The screenshot shows the 'Gateway Mapping' form. The navigation bar at the top includes 'Site Setup', 'Sensor Registration', 'GateWay Mapping' (highlighted with a callout '1'), and 'Web API Registration'. The form contains several dropdown menus for location selection: State (Please State), District (Please District), Block (Please Block), Gram Panchayat (Please Panchayat), and Village (Please Village). Below these is a section titled 'Choose Sensor Device Attach/Associated with Gateway device' with input fields for 'Gateway Device Id' (Gateway Device Id/Name) and 'Location' (Location/Landmark).

2. Select **State** → **District** → **Block** → **Gram Panchayat** → **Village**
3. Enter **Choose Sensor Device Attach/Associated with Gateway device** details and click **Submit** button, as shown below:

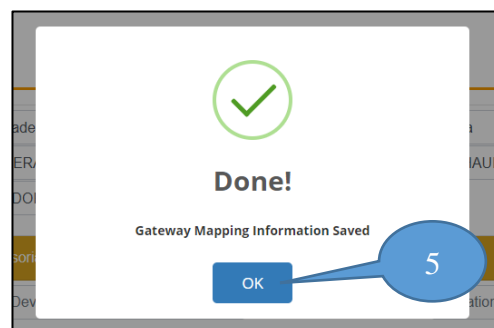


The screenshot shows the 'Gateway Mapping' form with the following details filled in: State: Uttar Pradesh, District: Agra, Block: ACHHNERA, Gram Panchayat: ABHAUDOPURA, and Village: ABHAUDOPURA. The 'Choose Sensor Device Attach/Associated with Gateway Device' section shows a table with the following data:

Sr No.	Device Name	Device Type	
1	FL100	ChlorineLevel	<input checked="" type="checkbox"/>
2	FM12345	FlowMeter	<input checked="" type="checkbox"/>
3	GL100	GroundWater	<input type="checkbox"/>
4	PL100	PressureLevel	<input type="checkbox"/>

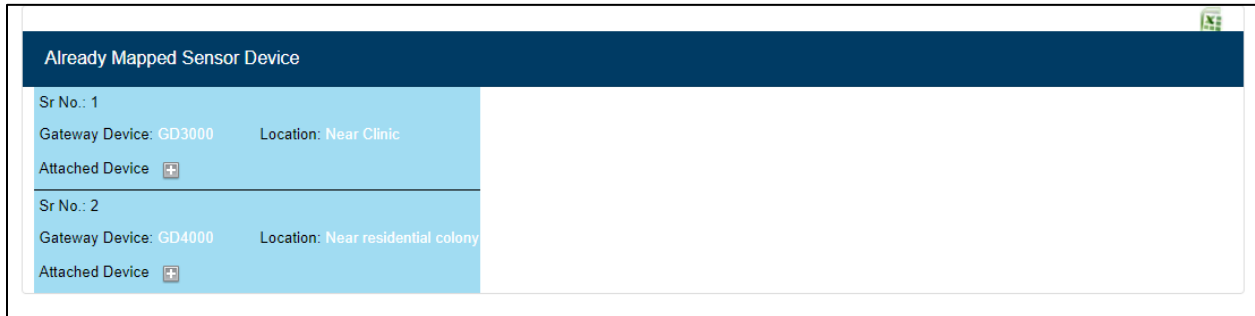
The 'Gateway Device Id' is GD1000 and the 'Location' is Near Market. A 'Submit' button is visible at the bottom, with a callout '3' pointing to it.



4. As soon as **Submit** button is clicked, the following alert message appears on screen, as shown in following figure:



5. Click **OK** to proceed further.

Once, gateway mapping information has been entered, the mapped sensor device details appears on screen, as shown in figure below:



Already Mapped Sensor Device	
Sr No.: 1	
Gateway Device: GD3000	Location: Near Clinic
Attached Device 	
Sr No.: 2	
Gateway Device: GD4000	Location: Near residential colony
Attached Device 	

User can also click on **Excel** icon to download the details of already mapped devices.

**Note:** The excel sheet will be downloaded in **Downloads** folder of computer.

Now, user can perform the last step to enter Web API information into the website.

# Web API Registration

Steps for gateway mapping related information are illustrated as follows:

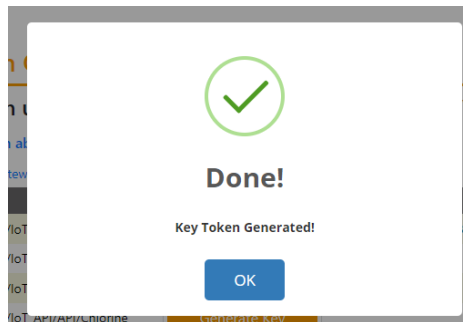
1. Click **Web API Registration** tab and following screen appears:

Sr No.	Api Method	URL	Action	Key Token
1	FlowMeter	https://ejalshakti.gov.in/lo_T_API/API/FlowMeter	Already Key Generated	acd2968aa67d16fc2daf91212090a90a55c45cbb68973ec0e09d60e704ae75af
2	PressureLevel	https://ejalshakti.gov.in/lo_T_API/API/Pressure	Already Key Generated	acd2968aa67d16fc2daf91212090a90a55c45cbb68973ec0e09d60e704ae75af
3	GroundWater	https://ejalshakti.gov.in/lo_T_API/API/GroundWater	Already Key Generated	c611524a355c0832068555baf3070dca77b1f2fdcef489e538f21b8525317d6c96
4	ChlorineLevel	https://ejalshakti.gov.in/lo_T_API/API/Chlorine	Already Key Generated	bda2b8a6955effb712aa8c42409629ede041654ab3aa5a9c1800f70de8b210ba1
5	pHLevel	https://ejalshakti.gov.in/lo_T_API/API/PhLevel	Generate Key	
6	TurbidityLevel	https://ejalshakti.gov.in/lo_T_API/API/TurbidityLevel	Generate Key	

By using **Web API registration**, user can:

- Generate Key for Web API header authorization, by clicking **Generate Key** button.

When **Generate Key** button is clicked, alert message appears as shown below:



Click **OK** to proceed further.

- Download master of Village ID and Gateway ID, by clicking **Excel** icon from screen.

Sample Excel sheet has been displayed for reference, as shown below:

Sr_No	StateName	districtname	BlockName	PanchayatName	VillageName	Villageld	GateWayId	AgencyName
1	Uttar Pradesh	Agra	ACHHNERA	ABHAUDOPURA	ABHAUDOPURA	0000397110	GD1000	New IoT Test
2	Uttar Pradesh	Agra	ACHHNERA	ABHAUDOPURA	ABHAUDOPURA	0000397110	GD2000	New IoT Test
3	Uttar Pradesh	Agra	AKOLA	ABHAYPURA	ABHAYPURA	0000396946	GD3000	New IoT Test
4	Uttar Pradesh	Agra	AKOLA	ABHAYPURA	ABHAYPURA	0000396946	GD4000	New IoT Test

**Note:** The excel sheet will be downloaded in **Downloads** folder of computer.

## IoT Web APIs Description

Note: You can view web API description from [https://ejalshakti.gov.in/IoT\\_API/Help](https://ejalshakti.gov.in/IoT_API/Help) and check functionality of Web APIs using **Postman** App.

### 1. FlowMeter API

- URL: [https://ejalshakti.gov.in/IoT\\_API/API/FlowMeter](https://ejalshakti.gov.in/IoT_API/API/FlowMeter)
- Service method: POST
- Input Parameters:

Name	Description	Type	Additional information
Villageld	10 digit Village ID	string	Required
GatewayId	Gateway ID	string	Required
WaterSupply	Water supply	integer	Required
LPCD	Liter per capita per day	decimal number	Required
Date	Date in format YYYY-MM-DD	date	Required

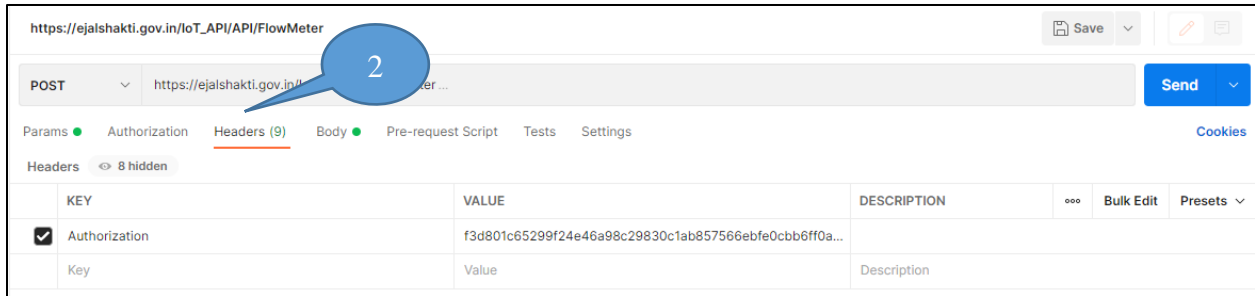
- Sample Input Format:

```
{
  "Villageld": "sample string 1",
  "GatewayId": "sample string 2",
  "WaterSupply": 3,
  "LPCD": 4.0,
  "Date": "2021-09-06"
}
```

Note: You can copy the Village ID and Gateway ID from Excel downloaded from **Web API registration** tab

Steps to check functionality of wen APIs using Postman App:

1. Open **Postman** app on your computer, select method as **POST** from drop-down menu.
2. Enter URL in the **URL** section and in **Header** tab of **Postman**, enter **Authorization Key** as shown in figure below:



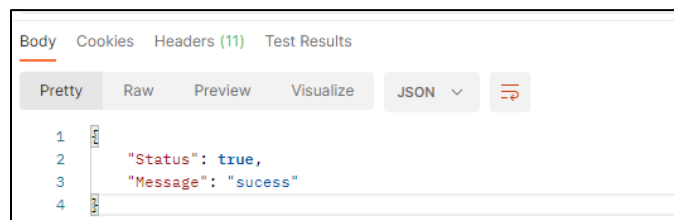
Note: You can copy the **Authorization** key from **Web API Registration** tab of [https://ejalshakti.gov.in/loT\\_Web](https://ejalshakti.gov.in/loT_Web)

- Now, click **Body** tab and select radio-button option as **raw** and **JSON** from drop-down menu, as shown in figure.
- Enter input parameters and click **Send**, as shown below:



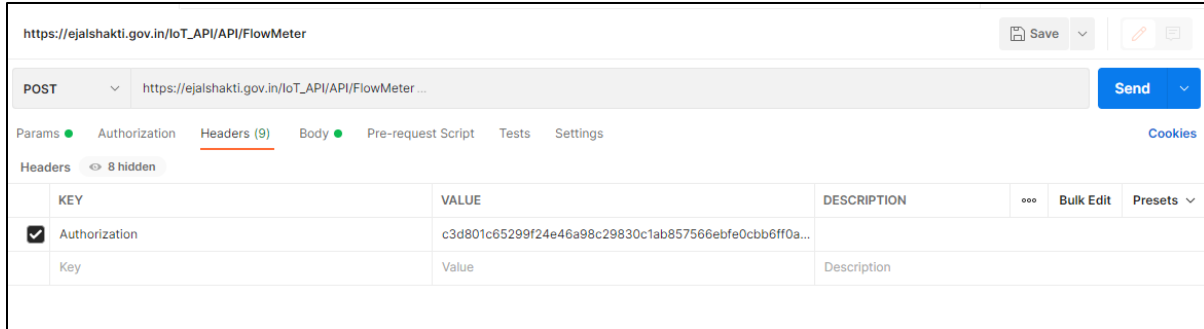
- Output:**

As soon as **Send** is clicked, the output appears on screen as shown in figure below:

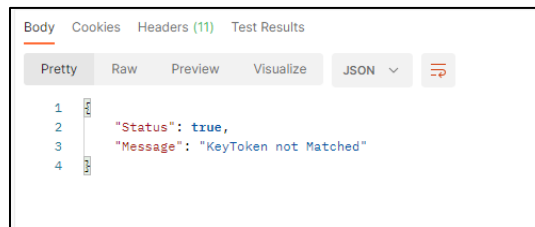


In case, you enter incorrect **Authorization** key, (for instance replaced first letter 'f' with 'c'), as shown in figure below:





Now, when **Send** button is clicked, following output appears on screen:



Similarly, output for other Web APIs can be checked using **Postman** app.

## 2. GroundWater API

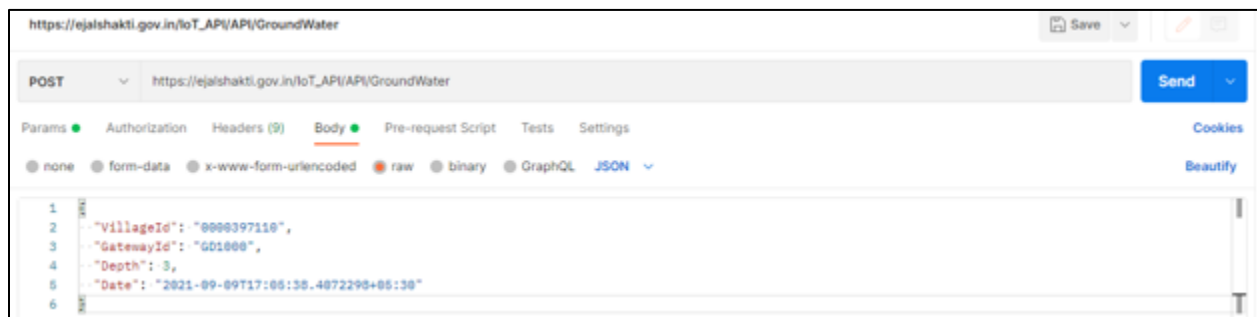
- URL: [https://ejalshakti.gov.in/IoT\\_API/API/GroundWater](https://ejalshakti.gov.in/IoT_API/API/GroundWater)
- Service method: POST
- Input Parameters:

Name	Description	Type	Additional information
Villageld	10 digit Village ID	string	Required
GatewayId	Gateway ID	string	Required
Depth	Depth of Ground Water	integer	Required
Date	Date in format YYYY-MM-DD	date	Required

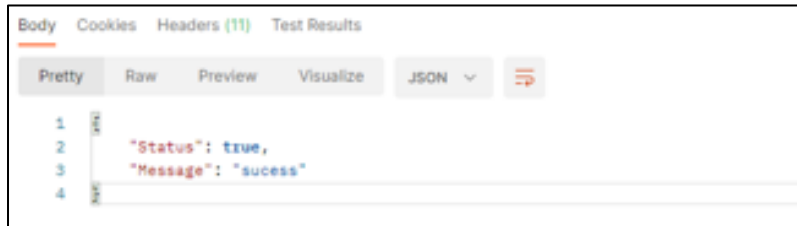
- Sample Input Format:

```
{
  "Villageld": "sample string 1",
  "GatewayId": "sample string 2",
  "Depth": 3,
  "Date": "2021-09-06"
}
```

Input entered are displayed in figure:



- Output:



### 3. Chlorine API

- URL: [https://ejalshakti.gov.in/IoT\\_API/API/Chlorine](https://ejalshakti.gov.in/IoT_API/API/Chlorine)
- Service method: POST
- Input Parameters:

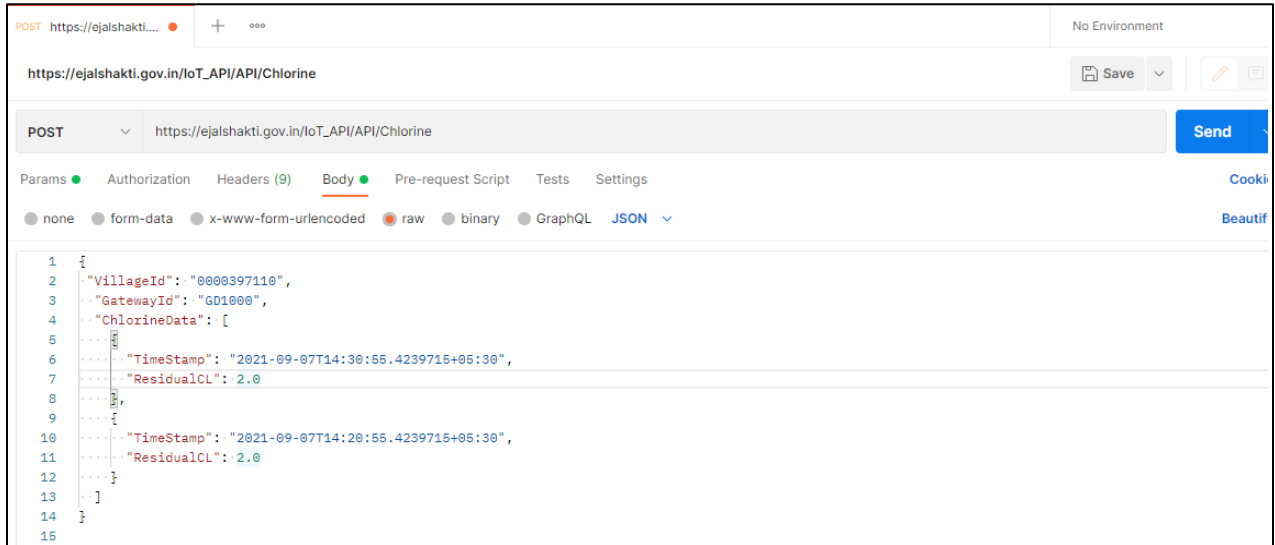
Name	Description	Type	Additional information
Villageld	10 digit Village ID	string	Required
GatewayId	Gateway ID	string	Required
ChlorineData	Comprises set of date-time and Residual chlorine level	Collection of Chlorine Data	Required

- Sample Input Parameters:

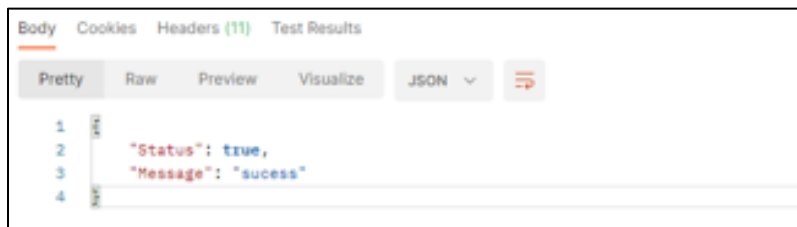
```
{
  "Villageld": "sample string 1",
  "GatewayId": "sample string 2",
  "ChlorineData": [
    {
      "TimeStamp": "2021-09-06T14:30:55.4239715+05:30",
      "ResidualCL": 2.0
    },
    {
      "TimeStamp": "2021-09-06T14:30:55.4239715+05:30",
      "ResidualCL": 2.0
    }
  ]
}
```

```
]
}
```

Input entered are displayed in figure:



- **Output:**



#### 4. Pressure API

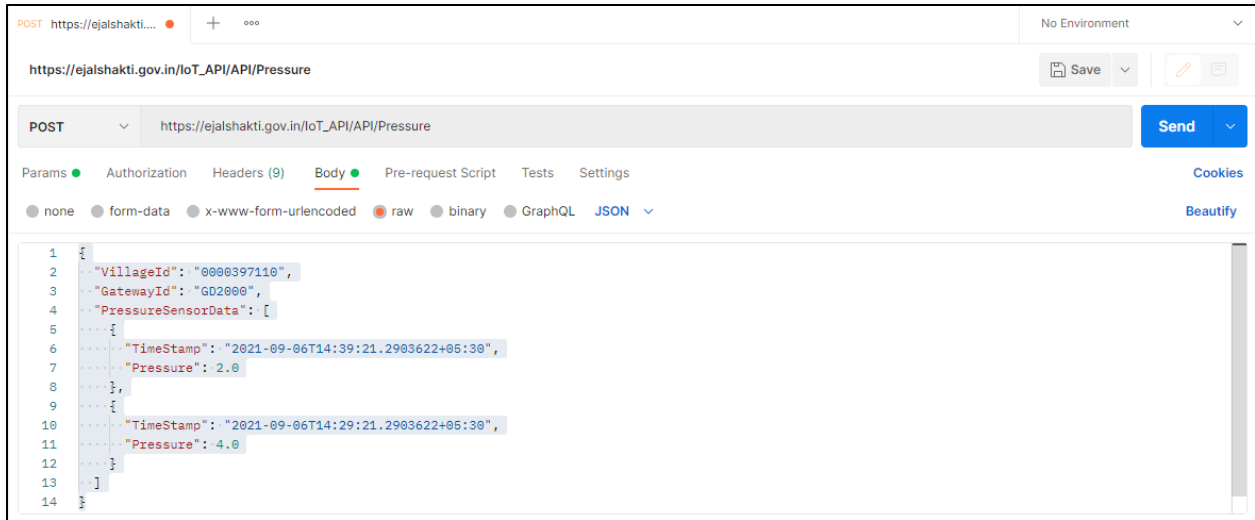
- URL: [https://ejalshakti.gov.in/IoT\\_API/API/Pressure](https://ejalshakti.gov.in/IoT_API/API/Pressure)
- Service method: POST
- Input Parameters:

Name	Description	Type	Additional information
Villageld	10 digit Village ID	string	Required
GatewayId	Gateway ID	string	Required
PressureSensorData	Comprises set of date-time and pressure level	Collection of Pressure Sensor Data	Required

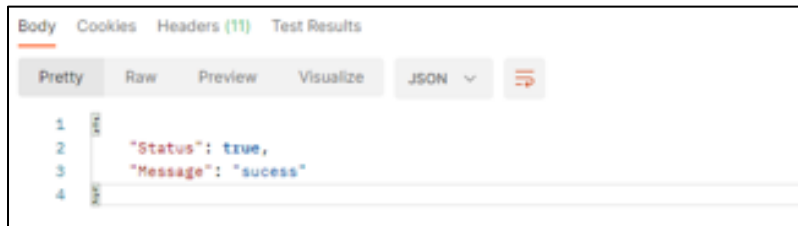
- Sample Input Parameters:

```
{
  "Villageld": "sample string 1",
  "GatewayId": "sample string 2",
  "PressureSensorData": [
    {
      "TimeStamp": "2021-09-06T14:39:21.2903622+05:30",
      "Pressure": 2.0
    },
    {
      "TimeStamp": "2021-09-06T14:39:21.2903622+05:30",
      "Pressure": 2.0
    }
  ]
}
```

Input entered are displayed in figure:



• Output:



5. PHLevel API

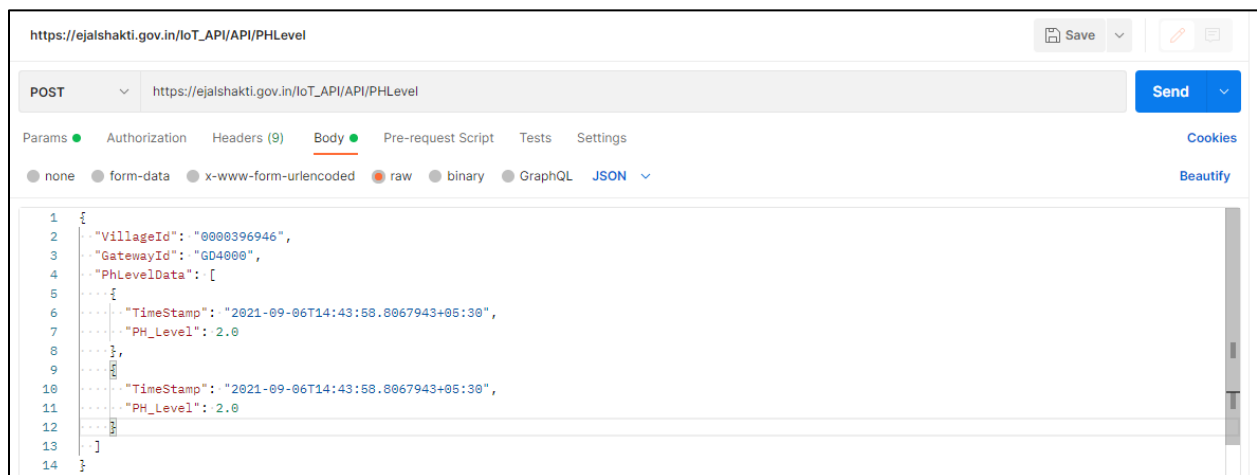
- URL: [https://ejalshakti.gov.in/loT\\_API/API/PHLevel](https://ejalshakti.gov.in/loT_API/API/PHLevel)
- Service method: POST
- Input Parameters:

Name	Description	Type	Additional information
VillageId	10 digit Village ID	string	Required
GatewayId	Gateway ID	string	Required
PhLevelData	Comprises set of date-time and PH level	Collection of Ph Level input Data	Required

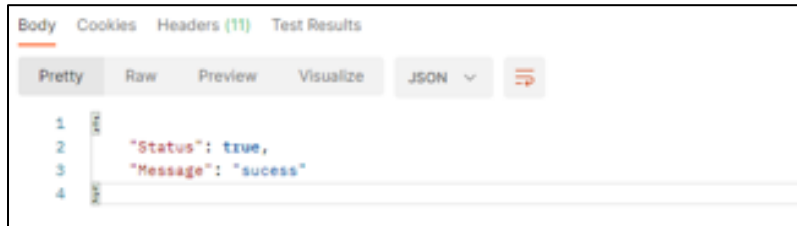
- **Sample Input Parameters:**

```
{
  "VillageId": "sample string 1",
  "GatewayId": "sample string 2",
  "PhLevelData": [
    {
      "TimeStamp": "2021-09-06T14:43:58.8067943+05:30",
      "PH_Level": 2.0
    },
    {
      "TimeStamp": "2021-09-06T14:43:58.8067943+05:30",
      "PH_Level": 2.0
    }
  ]
}
```

Input entered are displayed in figure:



- **Output:**



## 6. TurbidityLevel API

- **URL:** [https://ejalshakti.gov.in/loT\\_API/API/TurbidityLevel](https://ejalshakti.gov.in/loT_API/API/TurbidityLevel)
- **Service method:** POST
- **Input Parameters:**

Name	Description	Type	Additional information
Villageld	10 digit Village ID	string	Required
GatewayId	Gateway ID	string	Required
TurbidityLevelData	Comprises set of date-time and turbidity level	Collection of Turbidity Level Data	Required

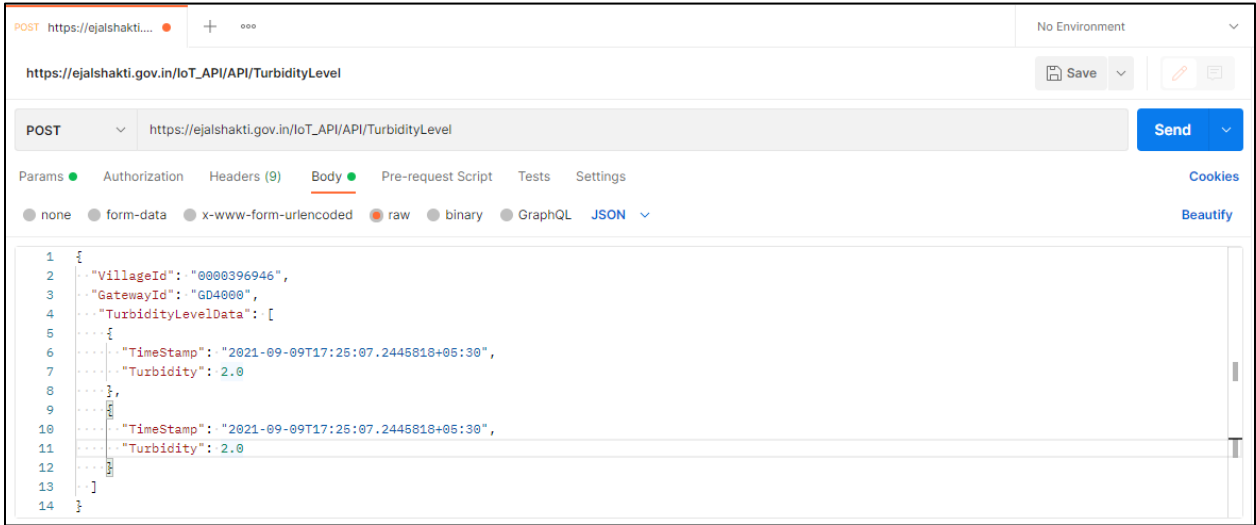
- **Sample Input Parameters:**

```
{
  "Villageld": "sample string 1",
  "GatewayId": "sample string 2",
  "TurbidityLevelData": [
    {
      "TimeStamp": "2021-09-06T14:48:56.1470563+05:30",
      "Turbidity": 2.0
    },
    {
      "TimeStamp": "2021-09-06T14:48:56.1470563+05:30",
      "Turbidity": 2.0
    }
  ]
}
```

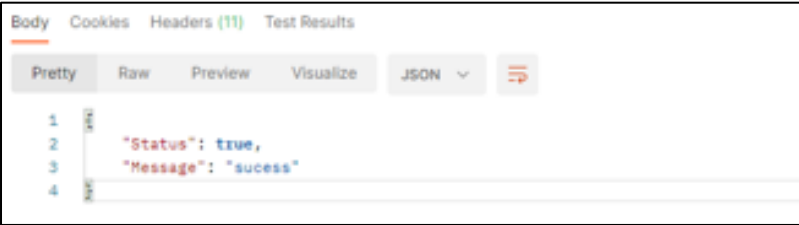


```
}  
]
```

Input entered are displayed in figure:



- **Output Parameters:**



# IoT Reports Viewed by Admin

Reports that can be viewed by Admin after login using his/her credentials are:

- Registered Agency
- Site Setup Information

## Registered Agency:

Steps to view **Registered Agency** report by Admin:

1. Login using credentials.
2. After successful login, select **Registered Agency** tab available on screen.
3. Click **Show More** option, as shown in figure below:

Sr No.	Registration No.	Agency Name	Address	Contact Person Name	MobileNo	Email	More Information
1	10000	New IoT Test	Delhi	New IoT Test User	9012345678	newiottestuser@gmail.com	Show More..

As soon as **Show More** is clicked, alert message box appears as displayed on screen:

**Registered Agency Information**

Registration No.-: 10000  
Agency Name:- New IoT Test  
Email:- newiottestuser@gmail.com  
MobileNo:- 9012345678  
PhoneNo:- 9012345678  
Contact Person Name:- New IoT Test User  
Address:- Delhi  
State:- Delhi  
District:- South West  
Pin Code:- 110004

Close

4. Click **Close** to close alert message box.

## Site Setup Information:

Steps to view **Site Setup Information** report by Admin:

1. Login using credentials.
2. After successful login, select **Site Setup Information** tab available on screen.
3. Click **Show More** option, as shown in figure below:

Sr No.	State	District	Block	Gram Panchayat	Village	More Information
1	Uttar Pradesh	Agra	AKOLA	ABHAYPURA	ABHAYPURA	Show More Information
2	Uttar Pradesh	Agra	ACHHNERA	ABHAUDOPURA	ABHAUDOPURA	Show More Information

As soon as **Show More** is clicked, alert message box appears as displayed on screen:

**Site Setup Information-Village Level**

**Agency Name:-** New IoT Test      **State:-** Uttar Pradesh  
**District:-** Agra      **Block:-** AKOLA  
**Panchayat:-** ABHAYPURA      **Village:-** ABHAYPURA

**Source:-** Caupal Par  
**Scheme:-** Caupal Par  
**Sanction Year:-** 2015-2016  
**Location(Landmark):-** Nera Market  
**Village Population:-** 3611  
**Village Habitation:-** 2  
**VWSC Chairman:-** VWSC Chairman  
**Treatment Type:-** Phytorid Technology  
**Year of Commissioning:-** 2019-2020  
**Latitude:-** 11.623377  
**Longitude:-** 92.726486

Close

4. Click **Close** to close alert message box.