The flow of early warning system messages in SIKAD is as follows:

a. Media Centre receives information from an early warning and field monitoring tools;
b. Media Centre team processes the information and coordinates it with BPPTK & BPBDs;
c. BPPTK & BPBDs respond to Media Centre and then distribute it to citizens via SMS and radio communications; and
d. Citizen nodes receive information from the Media Centre, and then disseminate it to the public via the agreed means.

Whereas the flow of feedback information system is as follows:

a. Media Centre receives reports from the public;
b. Media Centre team processes the information and coordinates it with BPBD;
c. BPBD follows up the report and forwards it to relevant agencies;
d. BPBD conveys the forwarded follow-up information to the Media Centre and then forwards it to the informant who provided the report and relevant parties via SMS.

Submission of information and reports is as follows:

Type Info [space] message-to report current Merapi conditions
Type Report [space] message-to report development process in Merapi
Send to: 0812 2 999 4144

Until 2012, activities carried out within this programme included:

1. Merapi SIKAD dissemination workshop
2. Merapi SIKAD development
3. Procurement of hardware for the nine pilot villages and the media centre
4. SIKAD training in 10 clusters for 2 days
5. SIKAD management training for media centre
6. Aggregated training cluster for the nine pilot villages
7. Workshop on Merapi SIKAD empowerment
8. Installation of hardware in nine pilot villages
9. Merapi SIKAD technical management assistance in nine pilot villages

The Merapi SIKAD can be explored through the following link:
www.mrr.combine.or.id

Village Disaster Information System

As described above, one of the important features of VIS is that its dual function as a Village Disaster Information System (Sistem Informasi Kebencanaan Desa/SIKAD). SIKAD functions to accelerate the dissemination of early warnings to the residents at risk of eruptions (primary threat) and cold lava flows (secondary threat) and a means of monitoring and evaluating of the development programmes in Merapi.

SIKAD is one of the sub-activities of the intensive post-Merapi eruption disaster mitigation programme launched in 2010, named “Risk Analysis, Hazard Assessment, Information based on an early warning system and communities Awareness of Merapi” (RAHASIA Merapi), a cooperation between BNPB and the Geological Agency. The Merapi SIKAD programme is operated through collaboration between the Volcano Technical Research Centre (Balai Penyelidikan dan Pengembangan Teknologi Kegunungapi/ BPPTK) and Combine Resource Institution, supported by Lingkar Society and IDEA, and facilitated by MRR.

SIKAD training activities involved the 41 villages (kelurahan) throughout Magelang, Boyolali, Klaten, Sleman and Yogyakarta regencies that were threatened by the cold lava flows. These villages are located along the rivers of Mount Merapi, namely rivers Gendol, Opak, Kuning, Boyong/Code, Putih, Pabelan and Woro rivers. Nine villages out of the 41 villages were further selected as pilot villages in the hope that SIKAD could be used and developed properly in these villages and could be replicated in other locations. The pilot villages were equipped with information technology hardware such as computers, modems, and handheld transceiver and a team capable of organizing the community and operating the technology was set up.

The nine pilot villages were selected based on risk level criteria, readiness of the local government, accessibility, potentials for development and sustainability, and security. The villages are:

1. Kepuharjo Village, Cangkringan Subdistrict, Sleman District, Yogyakarta Special Region.
2. Glaharjo Village, Cangkringan, Sleman District, Yogyakarta Special Region.
3. Sindumartani Village, Ngemplak District, Sleman District, Yogyakarta Special Region.
4. Tamanagung Village, Muntilan Subdistrict, Magelang District, Central Java Province.
5. Jumoyo Village, Salam Subdistrict, Magelang District, Central Java Province.
6. Sirahan Village, Salam Subdistrict, Magelang District, Central Java Province.
7. Sukorini Village, Manisrenggo District, Klaten District, Central Java Province
8. Klakah Village, Selo District, Boyolali District, Central Java Province.

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6. Sirahan Village, Salam Subdistrict, Magelang District, Central Java Province.
7. Sukorini Village, Manisrenggo District, Klaten District, Central Java Province.
8. Klakah Village, Selo District, Boyolali District, Central Java Province.
The eruptions of Mount Merapi, which began in October 2010 and continued into November 2010, affected more than 300 villages in 3 municipalities in Central Java Province (Boyolali, Klaten, magelang) and 1 municipality in DI Yogyakarta (Sleman), affected 53,315 household, describe 275 died, 576 injured and 303,233 lives of refugees. Pyroclastic flows caused destruction in villages close to the summit. Approximately 130 million cubic meters of volcanic materials were deposited on Mount Merapi’s slopes. Triggered by rains, a secondary disaster occurred as cold lava flowed down nine rivers in Yogyakarta and Central Java. The cold lava flows caused destruction in eight districts in 2011, and with the amount of pyroclastic material deposited on the slopes of Merapi, lava flows are predicted to recur during the rainy seasons in the next three years.

In the aftermath of the eruptions and cold lava flows, the United Nations Development Programme (UNDP) set up the Merapi Recovery Response (MRR) initiative, under the umbrella of Disaster Risk Reduction based Rehabilitation and Reconstruction (DR4) Project. Initiated in 2011, MRR supports the recovery programme in the Special Region of Yogyakarta and Central Java through five main project components, namely:

1. Building government capacity to lead and manage the post-disaster needs assessments and coordinate post-disaster early recovery activities;
2. Building government capacity to plan and implement recovery activities;
3. Restoring functional capacity of the local government to help ensure the provision of public and basic social services;
4. Assisting in the recovery of livelihoods, with a focus on alternative productive uses of existing natural resources and input into rural markets;
5. Incorporating principles of disaster risk reduction into recovery activities.

As part of the project’s efforts to restore local government capacity, MRR undertook activities to help develop a Village Information System.

**Disaster based Rural Information System (VIS)**

The eruptions and cold lava flows caused widespread losses in communities, including losses of lives, houses, land, and livestock. The eruptions worsened socio-economic conditions in surrounding villages and caused environmental degradation, increasing the vulnerability of communities due to losses of livelihood assets. Because of the cyclic nature of Mount Merapi’s volcanic activity, eruptions and lava flows are a permanent threat or hazard. In order to cope with a hazard of this nature, an information system was needed to provide relevant information on the current status of Mount Merapi’s activity, eruptions and lava flows are predicted to recur during the rainy seasons in the next three years.

The VIS, or Sistem Informasi Desa (SID) is designed to provide relevant information on disaster contexts and is accessible to the public and media through the Internet. By being accessible to the public, it supports awareness (preparedness) in communities and media monitoring of the implementation of the Action Plan for the rehabilitation and reconstruction based on community participation. VIS includes a number of features:

1. Population and rural disaster data;
2. Village resources and assets;
3. Superior products of the rural areas
4. Interactive map of the villages (WebGIS);
5. Post-eruption Rehabilitation and Reconstruction Action Plan programme information (Presidential Decree No. 16/2011);
6. Merapi SIKAD, which serves as an early warning system (EWS); and
7. Monitoring and evaluation of the implementation of the Action Plan programme
8. Community feedback system through Short Message Service (SMS).

Initially (up to May 2012) VIS was applied and piloted in 4 (four) villages namely Glagaharjo and Kepuharjo in Sleman District, Sirahan and Jumoyo in Magelang District. Those villages were selected as a pilot villages to respond both Merapi eruption in 2010 as well as cold lava flood in 2011.

VIS is planned, managed, and utilized by existing local institutions such as the village government, village consultative board (BPD), community organizations, villagers, CSOs and BPBD (Regional Disaster Management Agency)

VIS was developed through the following phases:

1. Assessment and formulation of needs;
2. Preparation of the management team;
3. Initial data collection;
4. Provision of technology;
5. Dissemination to the users (public and other stakeholders);
6. Data/information utilization; and
7. Periodical updates and maintenance

Until May 2012, a number of activities have been carried out to establish the VIS. The activities were as follows:

1. Workshop on VIS disaster management coordination and participatory monitoring for the parties (Magelang and Sleman districts)
2. VIS team coordination and recruitment
3. Demographic and disaster data collection training
4. Demographic and disaster data collection
5. Data Input training
6. Demographic and disaster data input into the system.

From June 2012 to June 2013, MRR has developed VIS in 4 (four) other pilot villages in Sleman district, Yogyakarta and Magelang District, Central Java Province. Those four villages are Wukirsari, Tamanmartani, Tamanagung and Ngargomulyo. Sister village concept is applied for two villages in Magelang District namely Tamanagung and Ngargomulyo they supported by MRR-DR4 through cooperation Local Agency for Disaster Management Agency (BPBD). As Ngargomulyo village is in the disaster-prone areas, Tamanagung will then be considered as village buffer for Ngargomulyo. Sister Village concept originated from the eruption event in 2010 where many IDPs are not managed properly. This concept adopts fraternity in family relationships to support emergency response process. VIS concept is expected to also facilitate information on evacuation routes, IDP camps, and other necessary information of the village buffer.

Here is an example display VIS-based website:

<table>
<thead>
<tr>
<th>VIS website address in 7 (seven) pilot villages in Magelang and Sleman District are:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <a href="http://www.tamanagung-magelang.info">www.tamanagung-magelang.info</a></td>
</tr>
<tr>
<td>2. <a href="http://www.sirahan-magelang.info">www.sirahan-magelang.info</a></td>
</tr>
<tr>
<td>3. <a href="http://www.jumoyo-magelang.info">www.jumoyo-magelang.info</a></td>
</tr>
<tr>
<td>4. <a href="http://www.kepuharjo-sleman.info">www.kepuharjo-sleman.info</a></td>
</tr>
<tr>
<td>5. <a href="http://www.glagaharjo-sleman.info">www.glagaharjo-sleman.info</a></td>
</tr>
<tr>
<td>6. <a href="http://www.wukirsari-sleman.info">www.wukirsari-sleman.info</a></td>
</tr>
<tr>
<td>7. <a href="http://www.tamanmartani-sleman.info">www.tamanmartani-sleman.info</a></td>
</tr>
</tbody>
</table>

For Ngargomulyo Village, Magelang district website is in development.