

The Information of Shang-an Station

In 1996, typhoon Herb caused more than one thousand millimeters of heavy rain a day in Shang-an area. The forests in upstream of Sanbukeng river were damaged, causing serious debris flow in midstream and upstream of Sanbukeng river, and Chenyoulan river risen suddenly. Jiji earthquake in 1999 caused collapse of 40 buildings, and the broken geological structure became more loose. Furthermore, in 2001, typhoon Toraji brought torrential rain and debris flow pour down the Sanbukeng river, causing disasters such as casualties, bridges, roads and buildings were collapsed. In order to pre-warn the occurrence of debris flow, Soil and Water Conservation Bureau completed the construction of the Shang-an station in Shang-an Village, Shuili Township, Nantou County in 2002 (The potential debris flow torrent number, Nantou County DF165).

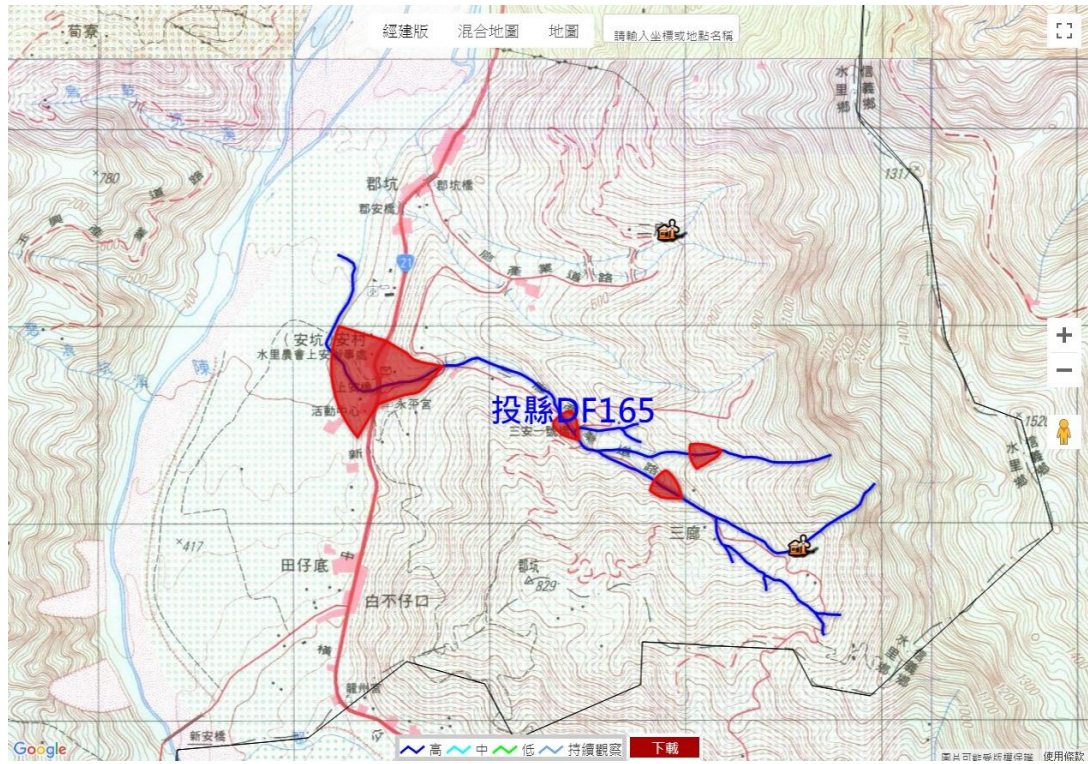
The information of station		Last updated : 2023/06/30	
District	Shang-an Village, Shuili Township, Nantou County	Debris Number	Nantou County DF165
Drainage	Zhuoshui River	River	Sanbukeng river
Rainfall threshold value for debris flow warning	300 mm	Disaster	Stream debris flow
River length	6.89 km	Catchment area	364 hectares
Geology	Palaeogene period metamorphic rock	Slope	30~50°
Scale landslide in catchment area	Small-scale landslide, landslide > 5%	Downstream material accumulation	The average size of debris flow stones are > 12"
Plant growth in the catchment area	Natural forest, dense vegetation	Hazards	Silting, burying and bumping
Facility	Revetment	Priority processing level	High
Elevation	828 m	Coordinate (TWD97)	X coordinate : 237412 Y coordinate : 2624605
Protected object	Residential	Public building	Transportation facilities

	5 or more	Activity Centre	Provincial Highway 21, Shang-an bridge
Historical disaster	Typhoon Herb in July, 1996. Typhoon Toraji in July, 2001.		
Monitoring results	<ol style="list-style-type: none"> 1. In 2007, typhoon Krosa caused Shang-an accumulated precipitation risen to the warning (10/7 04:00), but did not occur debris flow. 2. In 2008, typhoon Kalmaegi caused Shang-an accumulated precipitation risen to the warning (7 /18 03:20), and steel wire 1 was fractured (7/18 02:44). 3. In 2008, typhoon Sinlaku caused Shang-an accumulated precipitation risen to the warning (9/14 06:30), but did not occur debris flow. 4. In 2008, typhoon Jangmi caused Shang-an accumulated precipitation risen to the warning (9/29 05:10), but did not occur debris flow. 5. In 2009, typhoon Morakot caused Shang-an accumulated precipitation risen to the warning (8/8 22:00), but did not occur debris flow. 6. In 2012, typhoon Saola caused Shang-an flooding. <ol style="list-style-type: none"> (1) Accumulated precipitation risen to the warning (8/2 10:10). (2) Steel wire (down) was fractured (8/2 10:46). 7. In 2013, typhoon Soulik caused Shang-an accumulated precipitation risen to the warning (7/13 11:43), but did not occur debris flow. 8. In 2013, typhoon Trami caused Shang-an accumulated precipitation risen to the warning (8/22 02:53), but did not occur debris flow. 9. The extremely heavy rain on June 1, 2017. Shang-an accumulated precipitation risen to the warning (6/3 08:24), but did not occur debris flow. 		

Note: Landslide rate= landslide in watershed area/watershed area

Geographical position map

Basic topographic map



Three-dimensional map



The instrument erection of Shang-an station

Position map of instrument erection

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Shang-an
Debris Flow Monitoring Station

350

雨量警戒
標準值



農業部農村發展及水土保持署
Agency of Rural Development and Soil and Water Conservation, MOA

/// 土石流觀測站 ///

📍 南投縣水里鄉上安村



資料接收中心 | Data Center
接收並記錄現場儀器所收集之資料，將資料上傳至資料接收中心。
It receives and records data from sensors and instruments, and uploads it to a central data processing center for storage and analysis.

CCD攝影機 | CCD Camera
提供即時影像畫面，可遠端監控現場狀況，並可透過網路傳輸影像至資料接收中心。
It provides real-time video images and can be used to monitor the site remotely. Images can be transmitted to the data center via network.

雨量計 | Rain Gauge
提供即時降雨量資料，可協助現場人員進行防災工作。
It provides real-time rainfall data to assist field staff in disaster prevention work.

鋼索感知器 | Wire Sensor
利用鋼索感知器偵測鋼索是否斷裂，並即時上傳斷裂位置之資料。
The sensor is used to detect if the steel wire is broken and immediately upload the location of a broken wire to the data center.

土壤含水量感知器 | Soil Moisture Sensor
土壤含水量感知器可偵測土壤含水量，並即時上傳含水量之資料。
The sensor can detect soil moisture and immediately upload the moisture data.

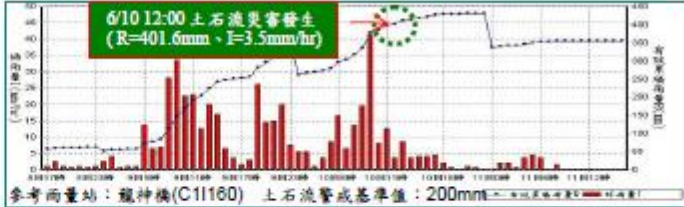
Instrument description of Shang-an station

Instrument name	Purpose	Quantity
CCTV	Monitoring the live situation of river, gather the information of real-time image on site.	1
Rain gauge	Measuring the local rainfall of monitoring station to be an important basis for release the debris flow warning.	1
Wire sensor	The impact of debris flow fractured the steel wire and send out the debris flow warning, which can obtain the time data of debris flow.	1

Debris flow disaster report

95年0609豪雨

南投縣—水里鄉上安村



950609 豪雨-南投水里-001
 ◆災區位置：水里鄉上安村 (三廊坑溪)
 ◆災害發生時間：6月10日12時
 ◆災害類型：土石流災害
 ◆有效累積雨量：401.6mm

◆災情描述與統計：
 ✓安山三號橋旁道路遭淤埋 80 公尺。
 ✓右岸支流土石溢流河道，淤埋三廊巷 20 號前庭院及左側道路。
 ✓支流匯流口下游河道土石堆積堵塞。
 ✓安山三號橋孔遭土石堵塞。
 ✓人命損失：0 人 ✓房屋受損：0 棟
 ✓道路致損：約 80 公尺。

