



Republic of the Philippines

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

MINES AND GEOSCIENCES BUREAU R-10

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RESULTS OF THE MGB RAPID GEOHAZARD ASSESSMENT OF BARANGAYS IN ILIGAN CITY, LANA DEL NORTE

In line with the recent Presidential Directive and NDCC resolutions following the February 17, 2006 Southern Leyte landslide incident, and the need to fast-track the geohazard mapping program of the Philippines, three (3) geologists from the Mines and Geosciences Bureau (MGB), namely; Osin A. Sinsuat, Jr., Marino B. Uncad, and Joy Christine V. Asis conducted a field assessment of the 44 barangays of Iligan City, Lanao del Norte on March 22 – 26, 2010. The field assessment focused on both the landslide and flood susceptibilities of the barangays. In terms of landslide susceptibility, each barangay was rated low, moderate or high. The rating parameters are as follows:

High

- Presence of active and/ or recent landslides
- Presence of numerous and large tension cracks
- Areas with drainages that are prone to debris damming
- Areas with numerous old landslides/escarpments
- Steep slopes
- Presence of weak/rock slope materials
- Structures (joints, beds) dipping towards the slope face
- Nearness to faults

Moderate

- Areas with indicative and/or old landslides
- Presence of small tension cracks
- Moderate slopes

Low

- Low to gently sloping
- No evidence of mass movement

The rating of each barangay, unless specified, refers to the barangay proper.

The barangays were presented with a *Landslide Threat Advisory*, when appropriate. The Advisory informs the barangays of their susceptibility to landslides and contains the corresponding recommendations particular to the barangay.

In terms of flood susceptibility, the barangays were defined in terms of the depth and frequency of flooding.

The result of the MGB Rapid Field Assessment is as follows:

1. Barangays Bonbonon, Buru-un, Panoroganan, Rogongon, Suarez, Tomas Cabili and Tominobo Upper have high landslide susceptibility as well as parts of Barangays Digkilaan, Luinab, Palao, Pugaan, Tipanoy and Tubod. Barangay Mainit, on the other hand, has moderate to high landslide susceptibility.
2. Barangays Abuno, Acmac, Dalipuga, Del Carmen, Dulag, Hindang, Kiwalan, Maria Cristina, Pugaan and San Roque have moderate landslide susceptibility as well as parts of Barangays Santa Elena, Ubaldo Laya and Santa Filomena whereas Barangays Kalilangan and Lanipao have low to moderate landslide susceptibility.
3. The rest of the barangays have none to low landslide susceptibility.

Table 1. Result of Landslide Assessment of the Barangays

	Barangay Name	Landslide Susceptibility Rating	Remarks
1	Bonbonon	High	<ul style="list-style-type: none"> - landslides present in Puroks 3, 4 and 13 - barangay will be affected if landslide in Purok 5 Lerop, Brgy. Kiwalan progresses
2	Buru-un	High	<ul style="list-style-type: none"> - Purok 13 Agus landslide in 2008, near MCCI and bridge, no houses affected - roadcuts along the highway are prone to landslides - steep slopes across the highway from barangay hall is prone to landslide, many houses situated on slopes
3	Panoroganan	High	<ul style="list-style-type: none"> - minor landslide in Purok 1 affecting coffee plantation - Aug 2009 major landslide in Purok Kitaw-an where 2 has. forest area slumped down to Budacanan Creek
4	Rogongon	High	<ul style="list-style-type: none"> - Brgy. Rogongon is characterized by steeply dissected to mountainous terrain
5	Suarez	High	<ul style="list-style-type: none"> - tension cracks / landslide present in 7 zones - Saturn, Hillside, Matinabago, Pisces, Aries II, Begonia and Mauswagon, damaged many houses (2006-09), affected residents were relocated to Camp Pintoy - houses downslope of resettlement site (St. Vincent Bel-Air Village) have tension cracks - resettlement site is steep and evidence of ground creep was observed in the area - acc. to a kagawad, in 2002, 7 houses were damaged because of ground

			movement in the resettlement area
6	Tomas Cabili (Tominobo Proper)	High	<ul style="list-style-type: none"> - landslides present in Purok 15A Masinag Subdivision, along the road to Sta. Elena in Scion and Purok 1 Camague - Jan. 14, 2009 tension crack in Scion Subdivision damaged 1 house - Jan. 14 2009 landslide in Purok 9 affected 1 house and injured 1 person - numerous houses situated on steep slopes in Purok 17 Hilltop
7	Tominobo Upper	High	<ul style="list-style-type: none"> - recent landslide (2 yrs ago) reported but no houses affected - barangay is characterized by steep slopes
8	Digkilaan	None, High (Puroks Maglabid and SARDAB)	<ul style="list-style-type: none"> - many houses near the tension crack in Purok Maglabid (boundary of Digkilaan and Dodiongan) - tension crack also reported in Purok SARDAB
9	Luinab	Low, High (Purok 9)	<ul style="list-style-type: none"> - 2007 landslide in Abigail Homes in Purok 9 damaged 1 house
10	Palao	Low, High (Purok 15)	<ul style="list-style-type: none"> - landslide in Purok 15, no houses affected - several houses on steep slopes in Purok 15
11	Puga-an	Moderate, High (Puroks Tatuntunan, Lumbatin, Ruanga and Calauag)	<ul style="list-style-type: none"> - landslides occurred in Puroks Tatuntunan, Lumbatin, Ruanga and Calauag in 2008 - landslide in Purok Tatuntunan affected houses - landslide in Purok Lumbatin damaged 3 houses - landslides were also reported in Nov. 2007
12	Tipanoy	Low (barangay proper), High (other puroks)	<ul style="list-style-type: none"> - landslides occurred in Puroks Mibala, Mibolo and Mirador in 2006, 2007 and 2008 - road impassable due to landslide in Puroks Mibala and Mibolo - landslide in Purok Mirador damaged crops - tension crack was reported in 2007 in Puroks Mibala and Mibolo, tension crack is approx 200m long with max. displacement of 1m, 7-8 houses nearby - 1995/96 large landslide in Mibala and

			Mibolo, residents relocated but is still within the danger zone
13	Tubod	Low, High (Purok Duranta, Carbide Village)	<ul style="list-style-type: none"> - June 2009 landslide in Carbide Village damaged the barangay road - June 2009 landslide in Purok Duranta caused crop damage - Carbide Village and Purok Duranta are located on hilltops - Nov. 2007 landslide in Purok Ubhai, Upper Baraas damaged 1 house, affected several others
14	Mainit	Moderate to High	<ul style="list-style-type: none"> - 2008-2009 landslides in Puroks 2 and 3 destroyed crops - 2004 landslide in Purok 13 claimed 2 lives
15	Abuno	Moderate	<ul style="list-style-type: none"> - landslides occur in the land owned by Marivic Mabayo in Zone 7 (esp. during heavy rains), area is situated along the river - landslides present in Zone 21 and between Zones 4 and 1 - 2009 landslide in Zone 12 affected crops - May 18, 2009 heavy rains brought about landslides in Puroks 15 and 19
16	Acmac	Moderate	<ul style="list-style-type: none"> - landslides present in Puroks Santan and Sampaguita - 2009 landslide in Purok Santan damaged 1 house
17	Dalipuga	Moderate	
18	Del Carmen	Moderate	<ul style="list-style-type: none"> - Patchy minor landslides along steep slopes, no houses affected. - Ground creeping threatens Elementary School at Purok 1A
19	Dulag	Moderate	<ul style="list-style-type: none"> - Minor landslide in Purok PTH - Occurrences of landslides at Purok Litag and Tabangao affected road accessibility - Most affected by previous landslide are travelers - Brgy. Center is threatened by potential landslide
20	Hindang	Moderate	<ul style="list-style-type: none"> - 2009 minor landslide in Zone 6 tilted 1 house
21	Kiwalan	Moderate	<ul style="list-style-type: none"> - 1950s and 2009 slump in Purok 5 Lerop
22	Maria Cristina	Moderate	<ul style="list-style-type: none"> - recent landslides in Zone 1, Purok Nonocan affected 3 houses

			<ul style="list-style-type: none"> - landslide also present in Purok 23 Springville along Candiis Creek - roadcuts and steep hills prone to landslide
23	San Roque	Moderate	<ul style="list-style-type: none"> - 2009 minor landslide along abandoned road - landslide in Purok 4 affected 2 houses
24	Santa Elena	Low, Moderate (Purok 5)	<ul style="list-style-type: none"> - small landslides on roadcuts
25	Ubaldo Laya	Low, Moderate (Purok Kaplag)	<ul style="list-style-type: none"> - landslides along the river in Puroks 5 and Toliban - 25-50m long tension crack reported in Purok Kaplag
26	Santa Filomena	Moderate (Puroks Hillside & Roadside)	<ul style="list-style-type: none"> - 2007 landslides in Purok Roadside buried 1 house, damaged several houses, 2009 landslide caused no major damage
27	Kalilangan	Low to Moderate	<ul style="list-style-type: none"> - Recent landslide at Sito Unayan - Landslide common along riverbanks but no house affected
28	Lanipao	Low to Moderate	<ul style="list-style-type: none"> - Common landslide occurrences at Puroks 2, 5, 6, 7, 8, 10, 11, and 13 - Minor landslide in Purok 7 affected 2 houses
29	Bunawan	Low	<ul style="list-style-type: none"> - 2009 landslide along creek in Zone 5, farm affected
30	Ditucalan	Low	
31	Kabacsanan	Low	<ul style="list-style-type: none"> - minor landslide in Zone Kalapanit, crops damaged
32	Mahayahay	Low	
33	Mandulog	Low	<ul style="list-style-type: none"> - No reported landslide
34	Poblacion	Low	
35	San Miguel	Low	
36	Santo Rosario	None to Low	<ul style="list-style-type: none"> - Along alluvial flat
37	Saray-Tibanga	Low	
38	Tambacan	Low	
39	Tibanga	Low	
40	Upper Hinaplanon	Low	<ul style="list-style-type: none"> - Landslide occurrences are in Puroks 3, 8, 9, 10 and 11.
41	Hinaplanon	None to Low	<ul style="list-style-type: none"> - No reported landslide
42	Santiago	None to Low	<ul style="list-style-type: none"> - Residences near the bank could be affected by mudflow in case of major landslide upslope
43	Bagong Silang	None to Low	<ul style="list-style-type: none"> - Possibility affected by mud flow in case of major landslide upslope
44	Villa Verde	None to Low	<ul style="list-style-type: none"> - Possibility affected by mud flow in case

			of major landslide upslope.
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Barangays particularly those given moderate to high landslide susceptibility ratings are advised to:

1. Monitor progress of mass movement (e.g. landslides, tension, cracks.)
2. Observe for presence of mass movement (e.g. landslides, tension, cracks).
3. Develop an early warning device / system.
4. Identify evacuation site.
5. Observe for rapid increase / decrease in creek / river water levels, possibly accompanied by increased turbidity (soil content).
6. Observe for saturated ground or seeps in areas that are not typically wet.
7. Observe for sunken or displaced road surfaces.
8. Have constant communication and updates with neighboring barangays on geohazard situation.
9. Create / Strengthen Barangay Disaster Coordinating Council or BDCC.

In terms of flood susceptibility, the 44 barangays experience varying degrees of flooding. The results are as follows:

	Barangay Name	Flood Rating	Remarks / Recommendations
1	Abuno	Common	<ul style="list-style-type: none"> - Flooding along Iligan River and its tributaries (Malindawag Creek) - 2007 flooding - 5 submarine bridges impassable, 1 child drowned, inundated numerous houses - 1986 flooding caused 0.5m high floods in Purok 5, washed away 2 houses in Purok 12, caused by cloudburst - Jan. 2009 floods damaged Panul-iran bridge and affected houses in Zone 2 while it rendered a bridge impassable because of 1m deep floods and damaged several houses along the riverbanks in Zone 5 - May 18, 2009 floods caused 0.2m high floods - floods caused crop damage - moderate flood turbidity - moderate flood depth (0.5-1m) - resettlement area (Isla Verde Village) is located between Iligan River and Malindawag Creek - Riverine erosion along the Iligan River side of the resettlement area was observed
2	Acmac	Common	<ul style="list-style-type: none"> - urban flooding
3	Bagong Silang	Rare and Low	<ul style="list-style-type: none"> - Sustainable drainage and regular cleaning are recommended.
4	Bonbonon	Rare	<ul style="list-style-type: none"> - Jan. 2009 flooding event inundated numerous houses, affected industrial sand and gravel

			<p>(ISAG) quarries along Mandulog River, Bonbonon Creek eroded portions of the barangay road</p> <ul style="list-style-type: none"> - 1.6 has. proposed relocation site in Purok 6 is characterized by flat to slightly undulating terrain. Areas nearby are reportedly flooded occasionally. According to interviews, appropriate distance will be provided away from Mandulog River and tree-planting will be conducted along the riverbank. River control measures are presently being undertaken along Mandulog River.
5	Bunawan	Rare	<ul style="list-style-type: none"> - creek in Zone 2 overflowed due to heavy rains, fish pond, banana farm & gabi plots affected - high flood depth (>1m)
6	Buru-un	Rare	<ul style="list-style-type: none"> - Flash flood along Linamon River in 2007 affected Purok 1A, 2 houses were washed out, caused by cloud burst
7	Dalipuga	Common	<ul style="list-style-type: none"> - Moderate flood turbidity - moderate sheet flood depth (0.5-1m) - seasonal sheet flood
8	Del Carmen	Common	<ul style="list-style-type: none"> - Low sheet wash affects all 14 puroks - Sustainable drainage and regular cleaning are recommended.
9	Digkilaan	Common	<ul style="list-style-type: none"> - Jan. 2009 flooding event damaged a bridge across Digkilaan River - Riverine erosion was observed along Mandulog River in So. Dodingan - High flood turbidity - moderate sheet flood depth (0.5-1m) - Seasonal sheet flood
10	Ditucalan	None	
11	Dulag	Common	<ul style="list-style-type: none"> - low sheet wash at Purok PTH, Mosque affected
12	Hinaplanon	Common	<ul style="list-style-type: none"> - Low flooding - Bank erosion caused by flash flooding threatens Puroks 1, 2, 3, 4, 5, 6, 7 and 8 - Mitigating measures could be deeply founded rip-rapping and or dike
13	Hindang	Rare (barangay proper), Common (Zone 9)	<ul style="list-style-type: none"> - 2 people drowned as they crossed Digkilaan River in Zone 9 during the Dec. 2009 flooding event - High sheet flood depth (>1m) - Seasonal sheet flood
14	Kabacsanan	Rare	<ul style="list-style-type: none"> - Flooding along Kitongan River affects Zone 5 & 6, Impassable even to trucks during flooding events, motorcycles are easily washed away by floods

			<ul style="list-style-type: none"> - High to very high flood turbidity - High sheet flood depth (>1m) - Seasonal sheet flood
15	Kalilangan	Common	<ul style="list-style-type: none"> - only low sheet wash, no house affected
16	Kiwalan	Rare	
17	Lanipao	Common	<ul style="list-style-type: none"> - Only Sheetwash but no house affected
18	Luinab	Rare	<ul style="list-style-type: none"> - Flooding affects Puroks 1, 2, 3 and 5 - Waist to chest-deep floods inundates houses in Purok 3
19	Mahayahay	Common	<ul style="list-style-type: none"> - Flooding along Tubod River affects Puroks Concepcion, Sampaguaita, Bayanihan, Sta. Lucia, Gumamela, Adelfa West, Riverside I & II, Manuang and Talilimbangon (high flood depth of >1m) - Sheet flood affects Puroks Madasigundos, Love and Devotion, Masidlakon, Bagong Silang, Abistilla, Bagong Lipunan, Bagong Pag-asa, Garcia, Dama de Noche, Asocena, Lerio I & 2 and Narra - waist deep floods in National Highway - 3-4 houses along Tubod River were washed out during a previous flooding event, Many houses along Tubod River were damaged - Riverine erosion was observed along Tubod River in Purok Bayanihan
20	Mainit	None	
21	Mandulog	Rare	<ul style="list-style-type: none"> - Moderate flash flooding affects Puroks 17, 18, 19 & 21 - Jan. 2009 flooding event affected Puroks 18, 19 and 21 (So. Tulay) where it destroyed several houses and banana plantations - Active bank erosion observed in Purok 21 - Flooding also occurred in 2008
22	Maria Cristina	Rare	<ul style="list-style-type: none"> - Dec. 2008 - Jan. 2009 flooding affected puroks along the highway, rivers and the coast, (esp. Puroks 17, 18 & 19A), Purok 19A is located along Agus River
23	Palao	Common	<ul style="list-style-type: none"> - Flooding affects Puroks 5, 6, 7, 10 and 15 - May 18, 2009 floods practically washed out Purok 5 leaving very few houses left standing, affected puroks 6 and 7 and destroyed crops (high flood turbidity) - Flooding in Purok 13A caused by insufficient drainage
24	Panoroganan	Common	<ul style="list-style-type: none"> - flooding along Bayug River is common - submarine bridge was slightly damaged by floods in 2005 and in 2009, the bridge suffered

			<p>major damage</p> <ul style="list-style-type: none"> - 1 person drowned while crossing the river during the 2009 flooding event - High sheet flood depth (>1m) - Seasonal sheet flood in Bayug River
25	Poblacion	Common	<ul style="list-style-type: none"> - Flooding along Tambacan River affects Zone 1 - Flooding along unnamed creek affects Zone 3 De Oro, Zones 7 and 8 - Zone 1 experienced chest-deep floods in Jan 2009 - moderate flood turbidity
26	Puga-an	Rare	<ul style="list-style-type: none"> - Flooding along Pugaan River affects Puroks 1A, 1B, 1C, 1D, 2A, 2B, 2D, 3, 4, 5, Calauag II and Ruanga - 2008 flashflood washed out many houses and destroyed crops - May 18, 2009 flooding event destroyed 2 hanging bridges located in Puroks 1B and 1D - water level increased by 4-5m in Pugaan River during the May 18, 2009 flooding event - very high flashflood turbidity
27	Rogongon	Rare	
28	San Miguel	Common	<ul style="list-style-type: none"> - Urban flooding affects Miguel Sheker Street, floods usually knee to waist deep (moderate flood depth of 0.5-1m), floods subside 1 hour after rains stop - unnamed creek floods Sudlunon area
29	San Roque	Common	<ul style="list-style-type: none"> - Purok 13 along Mandulog River but with river control structures - 1 person drowned in Mandulog River during the Nov. 2009 flooding event - Mandulog River overflowed to Purok 13 in Jan. 2009 (Nov. 2009 - river did not overflow) - Jan. 2009 floods destroyed numerous houses - high flood turbidity - high flood depth (>1m) - Flooding in barangay proper (Purok 3A) during 1956, 1971 & 1982 with >1m flood depth, no flooding after 1982 - residents in Purok Adelfa are still living along riverbanks (flood-prone)
30	Santa Elena	None	
31	Santa Filomena	Rare, Common (Puroks San Francisco, Ilang-ilang,	<ul style="list-style-type: none"> - flooding along Mandulog River affects Puroks San Francisco, Ilang-ilang, Duranta A & B - Jan. 2009 flooding destroyed 14 houses - Jan 2009 flooding in Purok San Francisco produced 2m deep floods

		Duranta A & B)	
32	Santiago	Seasonal (Puroks 5, 6, 7 and 13)	<ul style="list-style-type: none"> - Low flash flooding and sheet flooding common at Purok 5, 6, 7 and 13, caused bank erosion - Dike and/or rip-rapping as mitigating measure for bank erosion - Some houses along the coast are partially submerged during high tides
33	Santo Rosario	Rare	<ul style="list-style-type: none"> - Low sheet wash flooding is caused by canal clogging - Regular cleaning of drainage facilities is recommended
34	Saray-Tibanga	Rare	<ul style="list-style-type: none"> - Urban flooding affects Puroks 5, 7 and 8 - Puroks 5, 7 and 8 experienced knee-deep floods in 2009
35	Suarez	Rare	<ul style="list-style-type: none"> - Zone Kaugmaran is flood-prone since it is a low lying area
36	Tambacan	Common	<ul style="list-style-type: none"> - Coastal flooding affects Puroks 1, 4, 6, 7 and 8 - Flooding along Tambacan River affects Puroks 2A, 2B and 2C (moderate flood turbidity, high flood depth of >1m) - flooding events in 2007, 2008 and 2009 washed out more than 100 houses - Riverine erosion observed along Tambacan River
37	Tibanga	Rare	<ul style="list-style-type: none"> - Urban flooding affects Puroks 15 and 16
38	Tipanoy	Common	<ul style="list-style-type: none"> - all puroks along rivers and creeks are affected by flooding (Iligan River - So. Pindugangan, Puroks 1A, 2A, 2B, 3, 4, Bernales, Pindugangan Creek - Purok 4) - yearly flooding since 2006 - 1.5m high floods in Purok 2A (brgy hall) - flooding destroyed crops and killed livestock - 2007 flooding damaged 4 houses in Purok 2B - May 18, 2009 flooding produced 1m high floods that damaged many houses in Purok 2B and deposited 0.5m thick mud in the area - Jan. 2009 floods damaged Tulay ng Pangulo in Purok 8 - high flood turbidity - high flood depth (>1m)
39	Tomas Cabili (Tominobo Proper)	Rare	<ul style="list-style-type: none"> - flooding along an unnamed creek affects Scion and squatters' area in Purok 16, no houses damaged by flooding
40	Tominobo Upper	None	
41	Tubod	Common	<ul style="list-style-type: none"> - Flooding along Iligan River affects Puroks La Purisima, Emanuel and Manuang

			<ul style="list-style-type: none"> - Flooding along Tubod Creek affects Puroks Bagong Silang, Maharlika, Mauswagon and Sto. Niño - Jan. 2009 flooding washed out 30 houses in Puroks Manuang, La Purisima and Emanuel - floodwaters inundate Tubod Bridge during flooding events - recent flooding events: Nov. 2008, June 2009 - numerous flooding events occurred during the 70s, 80s and 90s
42	Ubaldo Laya	Common	<ul style="list-style-type: none"> - Flooding affects Puroks Katilingbangon, Greenhills, Green Valley, Greenfield, Malipayon, 5, 7 Kaplag, San Roque, Tolibas, Mabination, Manuang and Merilados - Dec. 2008 – Jan. 2009 flooding washed out many houses in Puroks 5, 7, Merilados and Kaplag and damaged several others, flood height was >1.5m, floods destroyed crops, damaged submarine bridges in Puroks Greenfield and Tolibas
43	Upper Hinaplanon	Rare	<ul style="list-style-type: none"> - Moderate flash flooding in Puroks 3, 4, 5, 7, 9 and 10 - High flash flooding at Purok 7 several houses affected in 2009 - Jan. 2009 flooding destroyed numerous houses and washed away 4 saw mills - Flashflood also occurred in 2008 - Rip-rapping and/or dike as mitigating measures
44	Villa Verde	Seasonal	<ul style="list-style-type: none"> - Low sheet wash flooding in Brgy. Center and other puroks - Sustainable drainage and regular cleaning are recommended.


Aside from landslide and flooding, other geologic hazards that affect the area are listed in the table below:


	Barangay Name	Other Hazards
1	Buru-un	Storm Surge <ul style="list-style-type: none"> - Affects Puroks 1, 2, 3, 4, 5, 9, 10, 12 and 13 - Nov. 2007 storm surge destroyed numerous houses along the coast
2	Maria Cristina	Storm Surge <ul style="list-style-type: none"> - Occurred in 2006, 2007 and Dec. 2008 - Affects Puroks 6, 14, 15, 15A and 16 - Dec. 2008 storm surge damaged 4 houses along the coast
3	Poblacion	Storm Surge <ul style="list-style-type: none"> - Affects Puroks 9 and 10

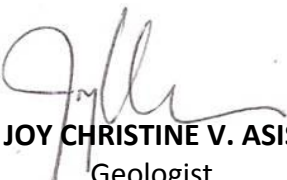
		- Jan. 2009 storm surge damaged establishments in Puroks 9 and 10
4	Santiago	Storm Surge - Affects Puroks 1, 3, 4, and 5 - Nov. 2007 storm surge destroyed 249 houses - Waves during the Nov. 2007 storm surge reached 2-3m high, the seawall was only 1m high
5	Saray-Tibanga	Storm Surge - Affects Puroks 3, 3A, 4, 5 and 6 - Nov. 2007 storm surge damaged 12 houses
6	Tambacan	Storm Surge - Affects Puroks 1, 4, 7 and 8 - Purok 8 is most affected
7	Tibanga	Storm Surge - Affects Puroks 5, 7, 8, 13 and 14 - Jan. 2009 storm surge destroyed and damaged numerous houses - Nov. 2007 storm surge destroyed 30 houses
8	Tomas Cabili (Tominobo Proper)	Storm Surge - Affects Puroks 4, 5, 10A, 10B and 10C - Jan 14, 2009 storm surge destroyed 19 houses and damaged approximately 50 houses - More than a hundred houses were affected by the Jan. 2009 storm surge

It should be noted that these susceptibility ratings were arrived at as of this field assessment. However, the rating could advance (e.g., from low to moderate, and moderate to high) as the mass movement progresses. Hence, the MGB constantly recommends strict and continuous monitoring by the barangays.

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PHOTOS



Photo 1. Landslide along Iligan River in Zone 12, Brgy. Abuno



Photo 2. Flooding along Malindawag Creek affects nearby Zone 4 in Brgy. Abuno.



Photo 3. Riverbank erosion was observed along Iligan River in Isla Verde Village, Zone 4, Brgy. Abuno.



Photo 4. Ground creep was observed along the highway in Brgy. Buru-un as evidenced by bent coconut trees.



Photo 5. Coastal puroks such as Purok 1A in Brgy. Buruun are prone to storm surge.



Photo 6. Numerous houses (indicated by red arrow) were built on steep slopes along the highway in Purok 1B, Brgy. Buruun.



Photo 7. Linamon River, which serves as the boundary between Iligan City and neighboring Municipality of Linamon, is prone to flashfloods that devastate puroks along the river in Brgy. Buruun.



Photo 8. St. Vincent Bel-Air Village, Brgy. Suarez' resettlement area is characterized by relatively steep slopes. Extensive ground creeping was also observed in the area indicating ground movement.



Photo 9. Houses built on steep slopes such as these in Purok 17 Hilltop in Brgy. Tomas Cabili are high risk in terms of landslide.



Photo 10. Houses proximal to this limestone cliff in Masinag Subdivision, Purok 15A in Brgy. Tomas Cabili are high risk in terms of landslide.



Photo 11. Barangay Upper Tominobo is characterized by hilly to steeply dissected slopes and widespread ground creep.



Photo 12. The hanging bridge across Pugaan River in Purok 1B, Brgy. Pugaan was destroyed by flashfloods on May 18, 2009. It has since been repaired.



Photo 13. Floodwaters from Mibolo and Mibala Creeks which are tributaries of Iligan River cause flooding in nearby Purok 2B, Brgy. Tipanoy.



Photo 14. Purok 2B of Brgy. Tipanoy located adjacent to the confluence of Mibala and Mibolo Creeks was inundated by 1m deep floodwaters on May 18, 2009.



Photo 15. The Tulay ng Pangulo in Purok 8, Brgy. Tipanoy was damaged during the January 2009 flooding event. Riprap structures have since been constructed to protect the base of the bridge from scouring.



Photo 16. Extensive scouring along this stretch of Iligan River in Purok La Purisima, Baraas, Brgy. Tubod destroyed several houses along the river.



Photo 17. Coastal puroks such as Purok 8 in Brgy. Tibanga are prone to storm surge.



Photo 18. Scouring was observed along the riverbanks of Bonbonon River in Purok 6, Brgy. Bonbonon.



Photo 19. The submarine bridge across Bayug River along the boundary of Purok Kiambong, Brgy. Rogongon and Purok Kadiis, Brgy. Panoroganan was slightly damaged in a 2005 flood and was eventually destroyed by floods in 2009.



Photo 20. This section of the road in Purok 10, Brgy. Lanipao is prone to landslides.



Photo 21. A landslide scar (indicated by red arrow) was observed in So. Comya, Brgy. Dulag.



Photo 22. A large crack was observed along the road in Purok 5 Lerop, Brgy. Kiwalan. The crack is reportedly 175 meters long with an average vertical and horizontal displacement of about 0.7 meters and 0.3 meters, respectively. The red arrow indicates one end of the crack.