



Do Earthquakes Occur in Mtwara?

68. Chidya

Mathias Kapenda and Jimmy Kibala

Introduction:

This project was designed to investigate why earthquakes occurs mostly in other continents than Africa continent. In working with this project we had dealt with the meaning of earthquake, how the earthquake can occur. However, we looked the factors that cause the occurrence of earthquakes in other continents, also we try to check some solution which can minimize the occurrence of earthquake.

The reason for doing this project is; in other continents apart from Africa there is a high occurrence of earthquakes, so we are doing this project so as to know why there is a high frequency of earthquake occurrence in other continents and how we can reduce them. As we see in the table below there is high occurrence of earthquakes in the world



Most people think there are no earthquakes in Africa; this is due to the continent consisting of one solid tectonic plate rather than several that may shift against each other which are a cause of earthquakes. In South Africa 2014 an earthquake occurred, but only for 30 seconds. Another reason why Africa has fewer earthquakes is that every plate surrounding Africa is moving away from it. There are less earthquakes in divergent areas and are much smaller in size, also the plate borders are far out to sea making it less likely for people to feel them.

The map shows the occurrence of earthquakes among the World from 1995 – 2015 and you can see in Africa that fewer earthquakes occurred.



Results:

Seismic waves The two general types of vibrations produced by earthquakes are body waves, which travel through the Earth and surface waves, which travel along the Earth's surface. Surface waves usually have the strongest vibrations and probably cause most of the damage done by earthquakes. Surface waves are also the slowest of the waves. The surface waves do the most damage because they are in contact with the area for the greatest period of time and they have a vertical motion to lift and drop objects in the affected area. Compression (P waves) and shear (S waves) are the two types of body waves. Both body waves pass through the Earth's interior from the focus of an earthquake to distant points on the surface. Only compression waves travel through the Earth's molten outer core. Because compression waves travel at great speeds (5 m.p.s.) and ordinarily reach the surface first, they are often called "primary waves" or simply "P waves". P waves push tiny particles of Earth material directly ahead of them or displace the particles directly behind their line of travel. P waves are the fastest waves and warn of upcoming S, L and R waves.

The following is basic facts about earthquake-prone areas in [Tanzania](#).

Two major geological faults run parallel from north to south in Tanzania, forming the country's major earthquake-prone belts with one running from Mount Kilimanjaro to Dodoma via Arusha and the other from Kigoma to Mbeya.

Both geological faults are part of the East African Rift Valley system that is a zone of 50-60 km wide with active volcanoes.

Tanzania is less prone to earthquakes in the east and more prone to tremors in the west, especially along the shores of Lake Tanganyika in westernmost Tanzania bordering the Democratic Republic of Congo. Most of Tanzania's 26 administrative regions are located in Zone 0 or "safe zone" where the magnitude and impact of rare quakes are minimal as this zone experiences mostly unfelt quakes measuring 0-3 on the open-end Richter scale.

The regions between the two faults and the [Indian](#) Ocean coast are in Zone 1 where earthquakes measure between 3 and 5 on the Richter scale in magnitude. Zone 2 includes regions of Kilimanjaro, Arusha, Dodoma, Iringa and Ruvuma along the Mount Kilimanjaro-Arusha-Dodoma fault. The area saw earthquake measuring 5-6 on the Richter scale.

Zone 3 or regions along the eastern shores of Lake Tanganyika encounter frequent and strong earthquakes that measure 6-7 on the Richter scale. It was in Lake Tanganyika, the deepest and longest on the African continent, where the strongest earthquakes affecting Tanzania had been recorded. Tanzania's ever-recorded strongest earthquake was a 7.4- magnitude jolt that occurred in 1910 in Lake Tanganyika, followed by the second strongest quake of 6.8 on the Richter scale on Dec. 5, 2005.



- 2 months ago 5.2 magnitude, 10 km depth Madimba, Mtwara, Tanzania
- 3 months ago 4.8 magnitude, 10 km depth Galappo, Manyara, Tanzania
- 6 months ago 4.8 magnitude, 10 km depth Uvira, South Kivu, Democratic Republic of the Congo
- 8 months ago 4.3 magnitude, 10 km depth Kigoma, Kigoma, Tanzania
- 10 months ago 4.8 magnitude, 10 km depth Vukindu, Pwani, Tanzania
- 11 months ago 4.3 magnitude, 10 km depth Bukavu, South Kivu, Democratic Republic of the Congo
- 11 months ago 5.5 magnitude, 10 km depth Cyangugu, Western Province, Rwanda
- 11 months ago 5.8 magnitude, 11 km depth Cyangugu, Western Province, Rwanda
- about a year ago 4.6 magnitude, 10 km depth Madimba, Mtwara, Tanzania
- about a year ago 4.4 magnitude, 10 km depth Gitaga, Cibitanga, Burundi

MAGNITUDE	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
8.0 - 9.9	1	1	0	1	2	1	2	4	0	1	1	1	2
7.0 - 7.9	14	15	13	14	14	10	9	14	12	16	23	19	11
6.0 - 6.9	146	121	127	140	141	140	142	178	168	144	150	185	96
5.0 - 5.9	1344	1224	1201	1203	1515	1693	1712	2074	1768	1896	2209	2276	1295
4.0 - 4.9	8008	7991	8541	8462	10888	13917	12838	12078	12291	6805	10164	13315	8710
3.0 - 3.9	4827	6266	7068	7624	7932	9191	9990	9889	11735	2905	4341	2791	2174
2.0 - 2.9	3765	4164	6419	7727	6316	4636	4027	3597	3860	3014	4626	3643	2721
1.0 - 1.9	1026	944	1137	2506	1344	26	18	42	21	26	39	47	34
0.1 - 0.9	5	1	10	134	103	0	2	2	0	1	0	1	0
No magnitude	3120	2807	2938	3608	2939	864	828	1807	1922	17	24	11	6
Total	22256	23534	27454	31419	31194	30478	29568	29685	31777	14825	21577	22289	15049
Estimated Deaths	231	21357	1685	33819	228802	88003	6605	712	88011	1790	320120	21953	629

Acknowledgments

Our special gratitude should go to our lovely friends SHAMMA CRISTOPHER, SIDE STAR, PETER SAID and WARREN NJAME for provided to us good idea and cooperation in accomplishment of this project work. Without forgetting our supervisor Mr. SEIF LUKINDO much appreciation should go to him for his physically powerful and close support in preparing this project, all the way through our project we have been enriched by his liberal expertise, experiences, advices, as well as correction where we went wrong, therefore toughness of this work is very of this donation