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OCCURRENCE OF NATURAL DISASTERS IN AFRICA AND INTERNATIONAL COOPERATION IN THE FIELD OF COUNTERACTING THEIR EFFECTS

Summary: The article is part of a research project which concerns counteracting the effects of natural disasters in the southern hemisphere. Its goals are to conduct an analysis of the occurrence of natural disasters and their influence on the environment and to describe the international cooperation for counteracting the effects of these kind of phenomena in Africa. After the conducted analysis, the following conclusions can be drawn. Africa is a region marked by average vulnerability to natural disasters, mainly floods and epidemics. The cooperation of African countries is manifested in their participation in international, global and regional institutions such as the United Nations, the African Union and Caritas.

Keywords: natural disaster, regional cooperation, Africa, counteraction, effect.

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1. Introduction

Africa is located between the Atlantic Ocean to the west, the Indian Ocean to the east and the Mediterranean Sea to the north. Africa (including Madagascar and other archipelagoes) occupies approximately 30.2 million km². It has about 1 billion inhabitants. It is the second most populous and the second largest continent in the world with 9 territories and 56 states in different stages of development, population and geography.

It is worth noting that Africa has the third world's largest desert, after Antarctica and the Arctic – the Sahara. Its great continental rivers are the Nile, the Congo and the Niger. The highest mountain in Africa is a volcano known as Kilimanjaro. A distinctive feature of the region is the existence of the Great Rift Valley which is the result of splitting the tectonic African Plate into two new separate plates.

The existence of geographic phenomena in Africa such as the Congo River and the Great Rift Valley is connected with the occurrence of the natural disasters. Floods, earthquakes, volcanic activity and other events often occur in Africa. Natural disasters cause economic loss and the death and injuries of many people.

Usually only international assistance can help in overcoming the effects of natural disasters. It makes African states participate and cooperate in international organizations such as the African Union, the United Nations and Caritas.

The aim of the article is connected with the above mentioned problems. The author's intention is to conduct an analysis of the occurrence of natural disasters and their influence on the environment, and to describe the international cooperation for counteracting the effects of natural disasters in Africa. It is worth noting that this article is part of a research project which concerns counteracting the effects of natural disasters in the southern hemisphere.

2. Occurrence and exposure of natural disasters in the examined continent

Africa is a region marked by an average vulnerability to natural disasters [EM-DAT, *World...* 2013]. As we can see in Figure 1, analysis of the type of natural disasters reveals that the region mainly experiences floods and epidemics. According to D. Alexander, a flood can be defined as the height, or stage, of water above some given point, such as banks of a river/channel [Alexander 1999]. Floods are caused by several factors such as: local thunderclouds, abundant rainfall lasting for days, storm surges at coasts, short-lived natural dams made by landslides or other things [Abbott 2009], e.g. in the year 2000, in Mozambique, 4.5 million people were affected by flooding.

According to the United Nations classification, floods are hydro-meteorological disasters. Epidemics often accompany floods. They are caused by biological factors. For example, in 1901 in Uganda, which at that time was a British protectorate [Ward (ed.) 1912], approximately 200 thousand people were killed by an epidemic. The last group of the United Nations classification is geological disasters [*United Nations...* 2009].

As we can see on Map 1, states which mainly experience mainly natural disasters are: Algeria, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Nigeria, Sudan, South Africa, the Democratic Republic of Congo, the United Republic of Tanzania and Uganda.

The occurrence of floods in Africa is mostly caused by the monsoon season which precipitates floods mainly of largest rivers of Africa: the Nile River (approx. 6800 km long), the Congo River (approx. 4700 km long) and the Niger River (over 4100 km long). After the confluence of the Blue Nile and the White Nile, the Nile River flows through Sudan and Egypt to the Mediterranean Sea [*Google Maps...* 2013]. In 1994, flooding in Egypt killed 600 people, affected over 160 thousand persons and caused approximately 140 million US dollars of damage. However, it is worth noting that there are also benefits of flooding of the Nile River, especially for agriculture [Piepiora 2012].

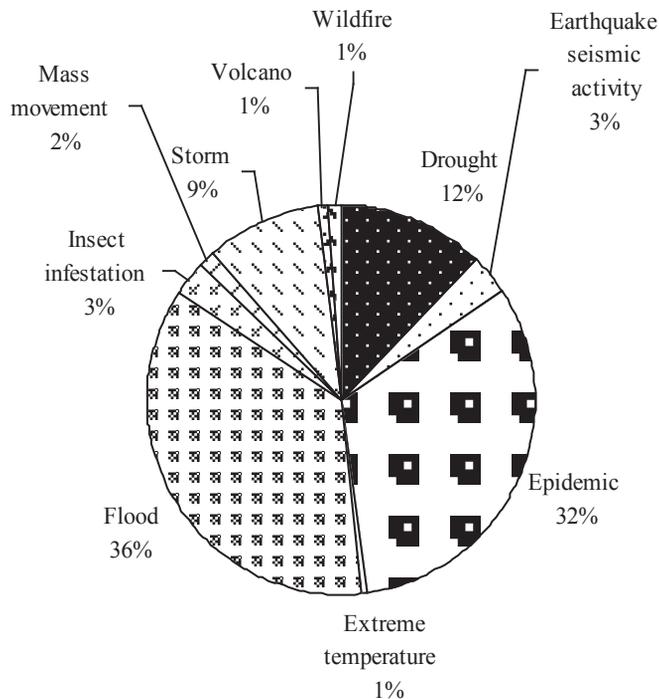


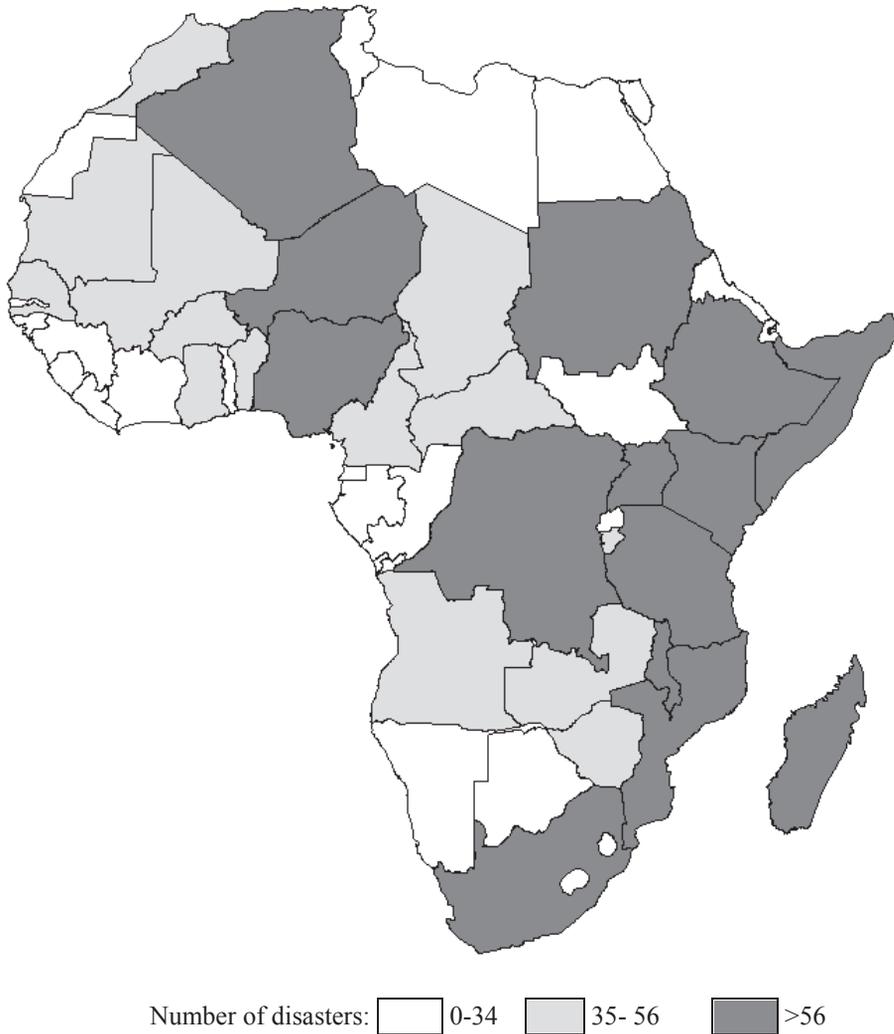
Figure 1. The occurrence of natural disasters in the region of Africa in the period 1900-2013 according to the type of natural disaster

Source: [EM-DAT... 2013].

The Congo River flows through the Republic of the Congo, the Democratic Republic of the Congo and the Republic of Angola to the Atlantic Ocean [Oberg 2008]. In 2002, 40 people died and over 2.5 thousand people were affected during the flooding of the Congo River.

The Niger River enters Niger, and later, Nigeria in the west. It flows southward through tropical rain forests and swamps to the delta in the Gulf of Guinea [*The World Factbook. Africa...*, 2013]. In 1998, in Nigeria there was a flood which killed 130 persons and affected approximately 300 thousand. In 2001, a flash flood in Nigeria killed 200 people and affected approximately 84 thousand persons. It caused damage that amounted to approximately 3 million US dollars.

Flash floods occur e.g. in Algeria because a part of it is located in the area of the Sahara, which covers approximately 10 mln km² and is the world's hottest desert [*The World's...* 2013], where there are *Wadi's* – dry valleys which contain water only after a long spell of rain [*International...* 2013; *GWADI...* 2011]. One of floods that took place in Algeria on 1st November, 1927, killed approximately 3000 persons.



Map 1. The number of natural disasters in Africa by country in the period 1900-2013

Source: own study on the basis of: [EM-DAT, *World...* 2013].

People living in Africa also experience epidemics. These are caused by viral and bacterial infectious diseases, e.g. cholera, acute watery diarrhoeal syndrome, HIV/AIDS, meningococcal disease, meningitis, yellow fever, bubonic plague and Lake Nyos disease [EM-DAT... 2013]. Epidemics are conditioned by the climate and the poor living conditions of many people; e.g. in 1991, 7289 people died and ten thousand were affected by an epidemic of cholera in Nigeria.

The appearance of storms in the African continent is conditioned by its location between the Atlantic Ocean to the west, the Indian Ocean to the southeast, the Red Sea and the Suez Canal and the Sinai Peninsula to the northeast, and the Mediterranean Sea to the north [Google Maps... 2013]. Tropical and winter storms above the western Atlantic and eastern Pacific are called *Hurricanes*, above the Indian Ocean and South Pacific – *Cyclones*, above the western Pacific – *Typhoons* [EM-DAT... 2013; Piepiora 2012]. Kenya, Tanzania and Mozambique are situated by the Indian Ocean and Madagascar is surrounded by it [Google Maps... 2013]. In 1976, a tropical cyclone in Madagascar killed 16 people, affected over 500 thousand persons and caused damage that amounted approximately to 17 million US dollars. On 18th January 1999, a storm in South Africa killed 21 persons and affected over 600 people.

Long lasting extreme temperatures and lowering totals of precipitation cause drought in the examined continent. Drought entails the decline in vegetation and desertification. In the years 1983-1985, drought in Sudan killed 150 thousand people and affected nearly 9 million persons. Lowering totals of precipitation connected with the increasing population and the demand for water in agriculture have caused an ecological catastrophe in Central Africa. The vanishing Lake Chad can initiate a water crisis in coming years [Circle... 2013].

The occurrence of volcanism, earthquakes and tectonic activity in Africa is a result of the location of some areas of the continent at junctions of tectonic plates [USGS, 2013]. Algeria is situated at the junction of the Eurasian and African plates. In 2003, an earthquake in the mentioned state killed 2226 persons. Over 200 thousand people were affected. Estimated damage amounted to approximately 5 billion US dollars. The states of Eastern Africa are situated at the junction of the Arabian and African plates. There is also the Great Rift Valley which is a result of the splitting of the African Plate into two new separate plates [Ayele et al. 2006]. In 2004, nearly 300 persons were killed and over 105 thousand were affected by the earthquake and tsunami in Somalia. Estimated damage totaled 100 million US dollars.

It is worth noting that the highest mountain in Africa is also located in the examined area. It is a composite volcano known as Mount Kilimanjaro. It is approximately 6 thousand meters high [Briggs 2009]. The eruption of another volcano, Nyiragongo, killed 64 people in Ethiopia in 1977.

In total, in the region of Africa in the examined period there were registered in EM-DAT 2371 natural disasters which killed 1 367 741 persons, affected 454 987 152 people and caused 27 088 042 US dollars estimated cost of damage in the current prices. The most deadly natural disaster was drought. In the period 1983-1984, this kind of phenomena killed 300 thousand people and nearly 8 million were affected in Ethiopia. In 1999-2002, 23 million people were affected by drought in Kenya.

One of the worst natural disasters in the examined area in 1900-2013 was epidemic. In 1901, 200 thousand persons died in Uganda.

Most economic damage was caused by earthquakes. In 1980, an earthquake in Algeria caused approximately 5200 million US dollars of damage. It killed 2633 persons, approximately 930 thousand people were affected.

3. International cooperation in the region in the field of preventing the negative consequences of natural disasters

In order to prevent the effects of natural disasters, countries of the African region cooperate at international level. Particular states are members of regional international organizations, such as: the United Nations (UN), the Arab League (AL), the African Union (AU), the Economic Community Of West African States (ECOWAS), the Intergovernmental Authority on Development (IGAD), the Southern African Development Community (SADC), the African Development Bank Group, the International Federation of Red Cross and Red Crescent Societies (IFRC), Médecins Sans Frontières (MSF), Caritas [Wulf, Debiel 2009; Piepiora 2012]. Chosen examples of natural disasters in Africa and international cooperation in the field of counteracting their effects are presented in Table 1.

Table 1. Synthetic typology of natural disasters in Africa and international cooperation in the field of counteracting their effects – chosen examples

Year	Spatial differences (regions of Africa)	Type of disasters	Damage	Type or efficiency of international cooperation
1994	Nile River – North-Eastern Africa	flood	600 persons killed and over 160 thousand people affected 140 million US dollars	international assistance for victims of floods in the southern part of Egypt, 1.4 million US dollars
2002	Congo River – Central Africa	flood	40 persons killed and over 2.5 thousand people affected	International Federation of Red Cross and Red Crescent Societies, approx. 1.7 million CHF
2003	Algeria – North Africa	earthquake	approx. 2000 persons killed, over 200 thousand people affected and 5 billion US dollars	United Nations Disaster Assessment and Coordination (UNDAC) Deployment, 100 thousand US dollars (Norway & US), 40 thousand euros (Denmark)

Source: own study on the basis of: [Reliefweb, IFRC].

The first of the above mentioned organizations is the United Nations (UN). It consists of almost all the countries of Africa, and countries in other parts of the world. To prevent the negative consequences of natural disasters in a global perspective the

United Nations has established a variety of agencies and international organizations or initiatives, such as the International Strategy for Disaster Reduction (UN/ISDR), the Office for the Coordination of Humanitarian Affairs (OCHA), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Meteorological Organization (WMO), the World Health Organization Regional Office for the Western Pacific (WHO/WPRO) and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). These institutions often cooperate with the previously mentioned regional and international intuitions [*United...* 2013].

The next institution is the Arab League. This is an organization that consists of independent Arab States. It operates in the territory of the north and north-eastern part of Africa and southwest Asia. The League's goal is to look after their members' economic, political, cultural, national and religious interests. The objective is executed by the Charter of the Arab League [*League...* 2013].

The third of the examined organizations is the African Union. It was created to accelerate the process of integration in the continent and to overcome multifaceted social, economic and political problems. One of the objectives of the AU is promote international cooperation within the framework of the United Nations. In 1985, the AU executed Africa's Priority Programme for Economic recovery (APPER). This was an emergency programme to counteract drought and famine. In 1990, the OAU Declaration on the Political and Socio-Economic Situation in Africa and the Fundamental Changes taking place in the World were stated. The AU has initiated collective action in the protection of the environment, in combating the scourge of the HIV/AIDS pandemic, malaria and tuberculosis or dealing with humanitarian issues such as refugees [AU... 2013]. The technical body of the African Union is the New Partnership For Africa's Development [*NEPAD...* 2013].

The fourth institution is the Economic Community Of West African States. This is a regional group of fifteen countries. Its mission is to promote economic integration in all fields of economic, social and other activities. Two of its institutions are the Commission and the Bank for Investment and Development (EBID). These are the main institutions designed to implement policies, pursue a number of programmes and carry out development projects in states which are associated in the ECOWAS. Such projects include agricultural, energy and water resources development [*Discover...* 2013].

Another organization is the Intergovernmental Authority on Development in Eastern Africa. It was created because of famine, ecological degradation and economic hardship in the mentioned region caused by drought and other natural disasters between 1974 and 1984. The individual countries made substantial efforts to cope with the situation and received generous support from the international community, however the magnitude and extent of the problem argued strongly for a regional approach to supplement national efforts [*IGAD...* 2013].

The sixth of the mentioned institutions is the Southern African Development Community. It is committed to regional integration and poverty eradication within southern Africa through economic development and ensuring peace and security. Its goal is to promote sustainable and equitable economic growth and socio-economic development through efficient productive systems, deeper co-operation and integration, good governance and durable peace and security among its member states [*The Southern...* 2013].

The next institution is the African Bank Development Group. It consists of the African Development Bank, the African Development Fund and the Nigeria Trust Fund. Its shareholders are regional (African) and non-regional member countries. Its goal is to promote sustainable economic growth and reduce poverty in Africa. Cumulative Loan and Grant Approvals totaled UA 63.66 billion in the years 1967-2012 [African Development... 2013].

Another organization is the International Federation of Red Cross and Red Crescent Societies. It is the world's largest humanitarian organization. The IFRC carries out relief operations to assist victims of disasters, and combines this with development work to strengthen the capacities of its member national societies from Africa and other continents. The International Federation of Red Cross and Red Crescent's work focuses on four core areas: promoting humanitarian values, disaster response, disaster preparedness, and health and community care [*International Federation...* 2013].

The next institution is Médecins Sans Frontières. It is an worldwide, independent, medical humanitarian organization. It is a neutral non-profit, self-governed institution. It delivers emergency aid to people affected by epidemics, natural disasters and exclusion from healthcare. The MSF's work is based on humanitarian principles. It rejects the idea that poor people deserve third-rate medical care and strives to provide high-quality care to patients. Through the Access Campaign, and in partnership with the Drugs for Neglected Diseases initiative, this work has helped in lowering the price of HIV/AIDS treatment and stimulated research and development for medicines to treat malaria and neglected diseases like sleeping sickness and kala azar [*Médecins...* 2013].

The last examined organization is Caritas. It shares the mission of the Catholic Church to serve the poor and to promote charity and justice throughout the world. It is organized at local (parish), diocesan, national, regional and international level. It responds in a practical way to humanitarian crises such as natural disasters and the effects of climate change. It saves lives, relieves suffering and helps rebuild livelihoods and communities in the longer-term. Caritas allows women and men in the poorest and most vulnerable communities to survive and recover from crises and to live in a safe and secure environment. Caritas works all over sub-Saharan Africa. African members of Caritas focus on human development and economic justice, while responding to some of the world's largest and most complex humanitarian emergencies such as food crises [*Caritas...* 2013].

4. Conclusion

Africa is a region marked by average vulnerability to natural disasters. The analysis reveals that the region experiences mainly floods and epidemics.

In total, in the region of Africa in the examined period there were registered in EM-DAT 2371 natural disasters which killed 1 367 741 persons, affected 454 987 152 people and caused 27 088 042 US dollars of estimated damage at current prices.

States which experience mainly natural disasters are: Algeria, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Nigeria, Sudan, South Africa, the Democratic Republic of Congo, the United Republic of Tanzania and Uganda.

The cooperation of African countries is manifested in their participation in international, global and regional institutions such as: the United Nations (UN), the Arab League (AL), the African Union (AU), the Economic Community Of West African States (ECOWAS), the Intergovernmental Authority on Development (IGAD), the Southern African Development Community (SADC), the African Development Bank Group, the International Federation of Red Cross and Red Crescent Societies (IFRC), Médecins Sans Frontières (MSF), Caritas.

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WYSTĘPOWANIE KATASTROF NATURALNYCH W AFRYCE I MIĘDZYNARODOWA WSPÓLPRACA W ZAKRESIE PRZECIWDZIAŁANIA ICH SKUTKOM

Streszczenie: Artykuł jest częścią projektu badawczego, który dotyczy przeciwdziałania skutkom katastrof naturalnych na Globalnym Południu. Jego celami są przeprowadzenie analizy występowania katastrof naturalnych i ich oddziaływania na środowisko oraz przybliżenie międzynarodowej współpracy w zakresie przeciwdziałania skutkom tego typu zjawisk w Afryce. Przeprowadzona analiza pozwala wysnuć następujące wnioski. Afryka jest regionem średnio zagrożonym przez katastrofy naturalne. Głównie są to powodzie i epidemie. Współpraca krajów afrykańskich przejawia się w ich członkostwie w międzynarodowych, globalnych i regionalnych instytucjach, takich jak Organizacja Narodów Zjednoczonych, Unia Afrykańska czy Caritas.

Słowa kluczowe: katastrofy naturalne, współpraca międzynarodowa, Afryka, przeciwdziałanie, skutki.