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## DESERTIFICATION: ON SIGNIFICANCE OF THE TERM AND RESEARCH OF THE PHENOMENON

**Abstract:** First elaborations on desertification come from the Renaissance, but the term was used for the first time by Aubréville in 1949. In later years, many significantly varying in meaning definitions were elaborated.

In later periods, researchers' attention concentrated on different areas. At the turn of the XIX<sup>th</sup> century, interest was mainly focused on Asia, later on the peripheries of the Sahara, in recent years on desertification in post-soviet Central Asia, China and Mongolia.

**Key words:** desertification, definitions, regional analysis.

### AMBIGUOUSNESS OF THE TERM DESERT

The term desertification (also in English desertisation, in French *désertification*, *désertisation*, in Russian *opustynivaniye*, in Polish *pustynnienie*) is intuitively understood as “transformation into a desert”, “evolution of the natural environment in the direction of a desert”. The first significant problem in regards to the meaning of the term is that the noun “desert” (*désert*, *Wüste*, *pustyniya*, *pustynia*) stems from colloquial language and the range of its meaning is not rigorous. In addition, in many languages it significantly changed in the XIX<sup>th</sup> and XX<sup>th</sup> centuries. In French, and subsequently in English, it is related to desertion (in French – *désertion*). In Polish, with the lack of everything, with emptiness. Examples are the Polish translations of an excerpt of the Gospel of St. Matthew about John the Baptist, where Isaiah's prophecy is evoked (the voice of one crying in the forest, desert, wilderness [St. Mathew 3.3]). In the Polish language all the terms have a similar meaning and all have the same origin which means shortage, privation and finally, discussions as to whether Kalahari is a desert (it is popularly called a desert even though it neither fulfils the climate nor the vegetation criteria of a desert).

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## DESERTIFICATION OR DESERTISATION?

Literature on the subject generally recognizes that the term desertification was used for the first time by A.M. Aubréville in 1949 as *désertification*. It dealt with anthropogenic forest destruction and decrease of the number of trees on the borders of humid equatorial forests in Africa and in the savannah zone. In accordance with French etymology, the term *désert* meant rarefaction of vegetation and consequently, the transformation of these lands into a desert was only a distant phase of these changes. The term *désertification* proved to be very popular. After ten years, it was commonly used in accordance to the meaning given to it by Aubréville as well as in regard to degradation processes taking place in the semi-arid zone, located directly on the border of the desert and resulting in enlargement of the desert.

Such duality of meaning was the cause of multiple misunderstandings and as early as the 1960's a shorter term – *désertisation* – was introduced. Its objective, from the point of view of its proponents, was to have a narrower range than *désertification* and be applied solely in regard to processes taking place on the desert border. H.N. Le Houéroux (numerous papers, including 1968), its ardent proponent is sometimes recognized as the originator of the term. The term *désertisation* gained significant popularity, not only amidst foresters and naturalists but also among specialists from other disciplines. In 1997, in Nairobi, a United Nations conference on desertification took place. Following it, a well known FAO/UNESCO map of desertification was published. The term desertification/désertification was used in the name of the conference as well as in the name of the special map in regard to processes taking place in both arid and semi-arid areas. Soon, under the auspices of the United Nations, the *Desertification Control Bulletin* was started to be published in Nairobi. The term desertification appeared in official documents and specially ordered publications (*Desertification...*, 1977). This led to protests on the part of proponents of the term *désertisation* but their effectiveness proved to be minimal.

In the documents which were published on occasion of the Conference, the following was accepted as the official definition:

“Desertification is the diminution or destruction of the biological potential of land and can lead ultimately to desert-like conditions. It is an aspect of the widespread deterioration of ecosystems, and has diminished or destroyed the biological potential. i.e. plant and animal production, for multiple use purposes at the time when increased productivity is needed to support growing population in quest of development” (UNCOD, 1978).

This definition, with only minor modifications, for several years was very often used in the English, French, Spanish, Polish and Russian language literatures. The individual wording of the definition, however, is being questioned. In the arid and semi-arid zones, seasonal and cyclical changes in the condition of the environment, its deterioration and improvement, are visibly being observed. The above definition has no time

horizon. On its basis, selected stages of cyclical processes may be called desertification. Also, it is not known what "desert-like conditions" means. It is imprecise and one may further conclude that processes which will lead to real desert conditions should no longer be described as desertification (missing *like*). Placing key stress on earth and vegetation draws back water related issues. Introducing into the definition of these natural environment elements stems from the fact that in the initial stage of research on desertification a great input was made by foresters, meadow farmers, agronomists. They also proposed several easily measured desertification assessment indicators, especially in the case of vegetation cover. However, there were no such indicators on water relations. From the definition (also from the sound of the word) it is understood that processes taking place in the desert can not be called desertification. However, in the desert we often come across degradation processes leading to further deterioration of the earth and vegetation covers. In these cases, the approach of individual authors differs. Sometimes they write about "extreme desertification" and on other occasions about "desertification". Sometimes they limit themselves to the term "degradation". Various terms referring to similar degradation processes taking place in deserts may be found, for example, in H. Meckelein (1980).

The decade following the Nairobi conference brought numerous definitions, sometimes very different, especially in the case of:

- a) territorial range of desertification (only in the arid zone or also in other areas),
- b) identification of processes being discussed (should processes of social degradation be recognized as an integral component and be included in the definition of desertification or should they be acknowledged as a consequence of this process),
- c) role of natural and anthropogenic factors.

M. Mainguet (1991) discussed some of these definitions and proposed several of her own. On the basis of her example we clearly see how difficult it is to define the complex desertification process. Desertification, revealed by drought, is *caused* by human activities in which carrying capacity of land is exceeded; it proceeds by exacerbated natural or man-induced *mechanisms*, and is made manifest by intricate steps of vegetation and soil deterioration which *result, in human terms*, in an irreversible decrease or destruction of the biological potential of the land and its ability to support population" (italics according to Mainguet, 1991, p. 4).

It is one of the best known, cited and exact definitions. In reality, it also comprises fairly imprecise terms ("in human terms, in an irreversible decrease..."). It may even be said that it is not a definition of a process but a short treatise in which information on its causes and effects is enclosed.

A modification of the official UN definition was made in 1992 at the Earth Summit in Rio de Janeiro. According to it desertification is "land degradation in arid, semi-arid and sub-humid areas resulting from various

factors, including climatic variations and human activities". This is a very wide definition, comprising all the *land degradation* processes, from micro to continental scale. Therefore, the definition is little precise. On the UNCOD website it was recorded even more succinctly: Desertification is the degradation of drylands (<http://www.uncod.int/publicinf/factsheets>). It, however, seems that the participants of the Earth Summit wanted to achieve not only scientific precision but foremost, to satisfy everybody and not to exclude anyone from research on desertification and programs aiming at its eradication. Therefore, the only limiting criterion was the territory (climatic conditions), very widely expressed (arid, semi-arid, sub-humid areas) Actually, in the past dozen or so years, the controversy on the definition of desertification has visibly lost on acuteness. As an example, the issue was not discussed at the Earth Summit +10. As in the case of the region, it turned out that reality is too complicated to allow for unequivocal definition.

Thus, there are numerous different definitions of desertification:

According to H.E. Dregne (1986), it comprises all aspects of anthropogenic degradation: "Desertification is the impoverishment of terrestrial ecosystems under the impact of man. It is the process of deterioration in these ecosystems that can be measured by reduced productivity of desirable plants, undesirable alterations in the biomass and the diversity of the micro and macro fauna and flora, accelerated soil deterioration, and increased hazard for human occupancy". Therefore, this definition excludes desertification caused by natural factors. The aim to widen the definition primarily concerns Soviet and subsequently Russian geography. For example, I.S. Zonn (1990), acknowledging that the Nairobi definition as too limited, proposed its enlargement and presented an original classification adapted to processes taking place on individual continents. The value of classification comprises an explicit indicator approach, stressing of the role of anthropogenic desertification and especially, emphasis of the so called technogenic desertification. The definition proposed by I.S. Zonn is very wide and at the same time, narrow...: "Desertification is a general definition of the total processes related to the degradation of natural ecosystems in arid and semi-arid areas caused by man's irrational activities (p.23). According to this definition, for example, river pollution by wastewaters in a semi-arid zone could be referred to as desertification but it does not comprise the natural desertification processes caused by climate changes. It is also worth noting that in his other elaborations the same author uses somewhat different definitions of desertification. On the contrary, he likes to experiment with definitions. The widest definition, however, is proposed by S.V. Zonn (1983, p. 59). According to him desertification is "the impoverishment or total degradation of the Earth's biological balance caused by unfavorable factors". According to this definition it is justified, for example, to speak of desertification in Amazonia. In fact, in his elaborations on desertification, the author writes about them.

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A SHORT HISTORICAL SKETCH OF RESEARCH  
ON DESERTIFICATION

Numerous researchers dealt with the problem of desertification long time prior to the emergence of this term in the middle of the XX century. It is worth remembering that the researcher Miguel Servet was burnt at the stake (in Geneva, at the initiative of J. Calvin), to a large extent for elaborations on desertification. In 1830, following the occupation of Algeria, the French took up the issue of transformation of land in the semi-arid zone into a desert. At the time, a point of view decidedly prevailed that significant desertification took place in North Africa following the fall of the Romans and occupation of this area by nomads. To justify this thesis, the chronicles of Ibn Khaldun depicting the conquest of the Maghreb by Arab tribes were referred to readily. However, in their works, French researchers used the descriptive form, i.e. the transformation of steppes into a desert. I never came across the term *désertification* nor *désertisation*.

At the turn of the XIX<sup>th</sup> century, it was common to write on the “*dessiccation, desséchement*” of climate and vegetation. Such terms were used, among others, by Kropotkin (1904), E. Huntington (1906) or the Anglo-French Forest Mission to West Africa in the years 1936-37 (Mission Forestière... 1973), and even later by R.M. Prothero (1962). It is especially symptomatic that the Forest Mission did not use the term desertification because its objective was to precisely establish whether desertification processes do occur at the southern border of the Sahara. At this time, the opinion on the natural desertification processes related to long-term climate changes decidedly dominated, above all in regard to the general warming and desiccation lasting since the last glacial age. In the beginning of the XX<sup>th</sup> century, majority of elaborations dealt with Asia. This was associated with the great discussion on the role of desiccation in Asia in the creation of tremendous waves of migration and stimulating (delaying) Europe's development. However, an interest in Africa which was undoubtedly linked with the inability to conduct research in Central and Inner Asia increased in the twenties and began to dominate in the thirties. At the time, authors, for example E.W. Bovill, 1921, write about the expansion or the encroachment of the Sahara.

In the fifties and sixties of the XX<sup>th</sup> century, a few elaborations dealt with the issue of desertification. It was a relatively moist period of time in Africa. In Socialist countries an opinion on man's enormous potential in combating the nuisances of nature dominated. It was similar in the United States. A turning point came in the years 1968-1973 (74) with the drought in the Sahel. In the seventies of the XX<sup>th</sup>, the issue of desertification becomes popular in many countries of the world. However, a one way approach dominates, stressing man's degrading role which accelerates desertification. Rush in conducting research and publishing the results, interest on the part of politicians and media leads to the fact that many

elaborations are of a superficial character and the expressed judgments are simply flippant.

The decade of the seventies of the XX<sup>th</sup> century, possibly the beginning of the eighties, may be acknowledged as the "Sahel decade" The eighties are the "decade of desertification". Numerous elaborations were then developed in which attention was paid to the fact that desertification occurs in many parts of the world, among others in Australia, India and South America. A breakthrough came with the publication of a series of regional studies on desertification (Mabbutt J.A., Floret C., eds., 1980). It was followed by numerous other regional studies. In the nineties, elaborations dealing with desertification in Central Asia are the most popular are, above all those related to the desiccation of the Aral Lake. Numerous Russian elaborations on the desiccation of this lake and desertification date back as far as the eighties but remained unknown outside the Soviet Union. Only in the nineties of the XX<sup>th</sup> century one can observe an enormous interest on the part of Western researches in this subject matter, especially Americans and international organizations. This trend did not by-pass Poland, including the Faculty of Geography and Regional Studies.

In the last few years the interest in the Aral Lake diminishes . It is hard to say which region is becoming "trendy". Perhaps, due to greater exposure and easier access it is Western China and Mongolia. Therefore, the elaboration by K.T. Rost, J. Böhner, K.H. Pörtke (2003) may be regarded as the classical example of the new interest. Above all, the number of Internet publications on the region has greatly increased.

A characteristic of the elaborations on desertification being currently developed is an ever-increasing specialization. The latter has many advantages, i.e. more profound elaborations come into being, hypothesis are verified more reliably, we have fewer irresponsible opinions. On the other hand, it is difficult to resist the impression that it is ever more difficult to obtain a synthetic picture of desertification on Earth. Geologists and geomorphologists do not use historical sources, sociologists and social psychologists have no idea about natural processes occurring in the natural environment, etc. The generation of great experts on arid lands is dying out.

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