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STUDIES DIRECTED TO THE CLIMATE IN THE RURAL AREA IN CATALÃO (GO)

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Abstract: The present article was based on concepts and studies of geographic spaces and place working with climate scales, mainly the microclimate according to Tuan. In addition, he sought to highlight climate studies and relationships with agriculture. The main objective was to show the importance, foundation and understanding of climate for the farmer.

Keywords: Agriculture; climate; scales.

INTRODUCTION

Climate is the atmospheric environment constituted by the series of states of the atmosphere and in a certain place and their usual succession (SORRE, 1934), it refers to the characteristics of the atmosphere inferred from continuous observations during a long period (AYOADE, 1991). Studies on the climatology of a place or region try to characterize the average state of the atmosphere in a given period of time. allow the identification of possible alterations in the climatic characteristics of the development area and, eventually, provide subsidies for the elaboration and quantification of corrective measures.

The description of atmospheric phenomena in temporal rhythm provides sequential average values on a predetermined scale, which define the climatic conditions of a specific location. Climatology indicates the meteorological conditions of a given location, in a certain time interval, with a minimum of 30-35 years of observations, in such a way that decision-making regarding the use of geographic space must take into consideration, the associated climate variability to the performance of atmospheric systems.

In this sense, the need to have a body of concepts and a simple terminology led to the distinction of discrete spatial categories, which are always arbitrary and artificial, since atmospheric phenomena are, by nature,

continuous (OKE, 1987). Orlansky (1975) distinguished the microscale phenomena (typical dimension up to 2km in length), mesoscale (2 to 2000km) and macroscale (200 to 2000km).

The combination of meteorological elements, such as altitude, latitude, continentality and air mass dynamics, contributes to the formation and determination of different climate types on Earth. The occurrence of imbalances in the combination of these elements can bring drastic consequences to society (SOUSA et al., 2002).

Climatic data can be obtained from meteorological stations and stations. The stations have equipment and sensors that record precipitation data, relative humidity, minimum, average and maximum temperatures, insolation, cloudiness and atmospheric pressure (OLIVEIRA NETO, 2002).

In Brazil these stations are found in small numbers - due to their high cost - and are inadequately distributed. Meteorological stations are more numerous because they require less investment and less qualified labor, since they only collect and make available precipitation data, which are insufficient when used alone, but are valuable when they complement others from meteorological stations (OLIVEIRA NETO, 2002).

Real-time access, through an integrated network of automatic meteorological stations that feed climatic databases, aims to provide information such as: air temperature, relative humidity, solar radiation, rain, speed, wind direction and evapotranspiration, which are essential to the decision-making process in various agricultural activities, as well as in other human activities that require this information (SILVA, 2008).

This quarterly report aims to analyse, based on data from automatic stations of the

National Institute of Meteorology (INMET), the behavior of climatic elements in the months of October, November and December 2008 in the cities of Guarda Mor – MG, Catalão – GO, Pires do Rio – GO and Cristalina – GO, with the aim of carrying out a climate analysis of the region to be impacted by the UHE Serra do Facão.

The research aimed to evaluate the climatological parameters in the rural area of Catalão (GO) in order to obtain data from the climatological station, associated with the installation of humidity sensors, in addition to evaluating the thermal comfort in the rural area and analyzing the importance of from climatology to the farmer.

METHODOLOGY

Temperature measurement sensors can be used to carry out thermal mapping, continuous monitoring, heat penetration tests in medicines and foods, product stability studies and thermal qualification. For each application there is an ideal sensor that has software to control and analyze the data recorded by the equipment.

The transmitter plays the role of transmitting the information to the microcontroller, in other words, the microcontroller collects the data from the temperature and humidity sensor which sends the information to the coordinator.

In partnership with the Mining Engineering course and the Climatology Laboratory of ``Universidade Federal de Catalão``, an automatic sensor was developed that takes hourly readings of the maximum and minimum air temperature.

RESULT AND DISCUSSION

CONCEPT OF GEOGRAPHIC SPACE AND PLACE

The concepts/categories of space and place in Humanist Geography were used, developing

them in the sense of Phenomenology and analyzing them mainly from Tuan's conceptions.

According to Holzer (2003), "Place" is a spatial concept that for a long time was used by geographers to express the locational meaning of a given site. Due to this definition, it was relegated to a secondary plane in relation to other spatial concepts such as landscape, space and territory. Today, however, "place" is considered a fundamental concept in the study of Geography.

Phenomenology and existentialism, as a philosophical basis, and the choice of "place" as a spatial concept that best served their purposes were appropriated by some exponents of the collective - Tuan, Buttmer and Relph - committed to renewing cultural Geography, or rather, of Geography itself, in addition to claiming the recognition of Humanist Geography as an autonomous field of study. (HOLZER, 2003, p. 3)

In the first half of the 1970s, the names of Tuan and Buttmer can be highlighted as the ones that most contributed to the search for an identity of their own for Humanist Geography. These authors were pioneers in the use of the concepts of place and lived world, both associated with an existentialist phenomenological theoretical basis, a contribution that would later allow the identification of their work as humanist. (HOLZER, 2009, p. 3)

In *Spnce nrt d Plnce: Humanistic Perspective*, Tuan stated that "space" and "place" are the concepts that define the nature of Geography and also introduced time as a concept in constant interaction with space. (HOLZER, 2009, p. 5)

the totality of means by which we arrive *h* understanding of the world: we know the world through sensation (feeling), perception and conception. The understanding of space by geographers is abstract, although less than that of a pure

mathematician (TUAN, 1979, 388). For Tuan “The importance of “place” to cultural and humanist geography is, or must be, obvious. As functional nodes in space, places are subject to the techniques of spatial analysis. But as a single, complex whole - rooted in the past and growing into the future - and as a symbol, place cries out for humanist understanding. In the humanist tradition, places have been studied from historical and literary-artistic perspectives... We lack, however, systematic analysis... Except for the dissertation Edward Relph, the literature on this topic - surely of central importance to geographers - has been, and continues to be, neglected. We learn to appreciate spatial analysis, historical scholarship and fine descriptive prose, but philosophical understanding, based on the method and point of view of the phenomenologists, is still beyond the reach of our knowledge. In this essay the phenomenological perspective will be introduced. However, I will not stop there and try to avoid technical language. (TUAN, 1979, 389; quoted by HOLZER, 2003, p. 6, emphasis added by the author)

For Tuan (1979, p. 390), time and space are linked by the notion of distance, with both concepts guided and structured by the intentionality of being. Thus, space and time are inseparable in locomotor activity, despite being separable in speech and thought. (HOLZER, 2009, p. 6)

If, on the one hand, this spatialization of matter requires active behavior, on the other hand, man is made by the geographic environment. Distance is a primordial element of this environment that acts on man, thus being primordial for the structuring of the world that surrounds us. (HOLZER, 2009, p. 6).

According to Tuan (1979, p. 404 quoted by HOLZER, 2003, p. 8), “The mythic-conceptual space is always linked to the ego and direct experience, but it extrapolates beyond sensory evidence and immediate needs towards most abstract structures in the world.”

Investigating the different meanings of space, Tuan dedicated himself to the place. He noted that place, in colloquial language, has two meanings: position in society and spatial location. But, in addition to these, there is another deeper one: it has “spirit”, “personality”, there is a “sense of place” (TUAN, 1979, p. 409). This sense of place refers to visual or aesthetic appreciation, as well as hearing, smell, taste and touch, which require close contact and a long association with the environment. (HOLZER, 2009, p. 8)

Tuan (1979) concluded that: “space and place are the central subjects of geography. These subjects are seen by the positivists through the analysis of the spatial organization, for the humanists they assume other characteristics. Both perspectives would be valid: positivist concepts interest humanists because they are the extreme example of the universal tendency towards abstraction; humanist works may interest positivists because they promote self-knowledge, making use of their highest value, the humanities”.

In *Place: an experiential perspective*, Tuan (1975a) characterized the place based on experience. The place being evaluated as home, in its various scales: the home itself, the neighborhood, the city, the region (which attributed similar characteristics to the neighborhood) and the nation-state. He also discussed the role of art, education and politics in shaping the experience that makes places visible. (HOLZER, 2009, p. 9).

THE CLIMATE SCALES

According to Ribeiro (1993), the climate is governed by an integrated set of phenomena that merge in time and space, revealing a unit or type that can be measured in its size (extension) and rhythm (duration). The climate phenomenon consists of a set of elements of different natures that coexist at the same time in the same space, in a regime of reciprocal and

interdependent energy exchanges. Therefore, its rational abstraction requires a scalar reference with methodological possibilities, that is, a taxonomic scale as part of the very methodology of climatological research. For each scalar level, a specific approach must correspond, in the sense of coherence between the extension and duration of the climatic phenomenon with the analytical techniques, from obtaining the data, passing through its statistical-mathematical treatment, to its graphical and cartographic presentation.

Ribeiro (1993), before proposing a taxonomic system for the climate phenomenon, explained that it is necessary to present the guiding criteria for this system, as follows:

- a) Higher scales are those closest to the planetary level and lower scales are those closest to the individuals inhabiting the surface of the Earth;
- b) Combinations of interactive physical processes on a higher scale result in successive modifications in the behavior of the atmosphere on lower scales;
- c) The particular combinations of physical processes at lower scales have limited repercussions at higher scales;
- d) The degree of dependence on extraterrestrial radiation in the definition of climate is greater at higher scales, while the influence of surface elements, including anthropic action, becomes more pronounced as the lower scales are reached;
- e) The more extensive the result of a certain combination, the longer will be the time of its permanence, the inverse being equally true;
- f) The extension of a certain combination in the atmosphere results in a three-dimensional attribute, therefore, the

notion of extension in Climatology is volumetric, and having the limit of the terrestrial atmosphere as its upper limit.

Considering the possibilities of interaction, over time and space, between the flows of matter/energy and the conditioning elements of their definition, it is possible to present, for a first analysis, three interactive levels, bases for a future taxonomic proposal.

Macroclimatic level: - Interaction between solar radiation, Earth's curvature and its rotation and translation movements. Macroclimatology is "concerned with aspects of the climates of large areas of the Earth and with large-scale atmospheric movements".

Mesoclimatic level: - Interaction between the available energy (for the evaporation process and the generation of pressure fields) and the features of the terrestrial environment. Mesoclimatology is "concerned with the study of climate in relatively small areas, between 10 and 100 kilometers wide, for example, the study of urban climate and severe local weather systems such as tornadoes and thunderstorms".

Microclimatic level: - Interaction between particular environmental systems in the modification of energy, humidity, mass and momentum fluxes. Microclimatology is "concerned with the study of climate close to the surface or of very small areas, less than 100 meters in length".

CLIMATE ANALYSIS AS A FOUNDATION FOR UNDERSTANDING THE CLIMATE

Dynamic Climatology, called modern climatology, has air masses as its most important object of analysis, which must be understood in its broadest sense, including fronts, mobile cyclones and anticyclones and other dynamic phenomena, that is, the study of atmospheric circulation, which, through these, seeks to relate the facts of atmospheric

circulation, the performance of action centers with the facts of weather and climate (NIMER, 1979).

Atmospheric circulation is also used as an instrument to explain persistent climatic phenomena, that is, certain types of cyclones and fronts, in their tendency to follow certain trajectories and in their differences or analogies from one region to another, as well as to understand why one year is wetter than another (NIMER, 1979).

Therefore, the air mass can be defined as a vast volume of air, whose structure presents more or less uniform characteristics in the horizontal plane. An air mass normally covers many hundreds of thousands of square kilometers, and its basic characteristics are: temperature, pressure and humidity. The prevailing meteorological conditions over a given region, in a given period of time, depend on the characteristics of the predominant air mass over that region, or on the action of two or more masses acting together over the same region.

The fundamental characteristics of an air mass are determined by its region of origin, that is, its place of formation, as an example we can cite a given volume of air at rest on an icy surface (terrestrial poles) which, as that remains in contact with the ice, gradually acquires the characteristics of that surface, such as: low temperatures, high pressures and low humidity (the evaporation rate of the ice is minimal). According to the nature of the regions of origin, air masses can be considered Maritime, when they form over the oceans, and Continental, when they have the continents as their regions of origin. The thickness of the air mass and the greater or lesser horizontal uniformity of its characteristics depend on the time that said mass is in contact with the region of origin.

As a way of understanding the behavior of these masses, one must take into consideration

the isobaric distribution at different latitudes, both at ocean level and on the continent, especially in summer, when it rains. Serra and Ratisbonna (1942, p. 71) summed up the isobaric distribution in the summer, through analysis of pressure charts in South America:

a) the semi-fixed anticyclones or centers of action of the Atlantic that touch the coast. Their maximum pressures are 1021 to 1023 mb respectively. Such centers are at their highest latitude at this time of year;

b) the circumpolar zone of low pressures from latitude 40°, with a slight curvature to the north over the continent, given the warming of the latter, relative to the sea at that time of year;

c) continental thermal depression resulting from strong terrestrial heating in the summer and whose central pressure is 1008 mb. It produces on the coast an inflection in the isobars of the Atlantic action center;

d) the cold anticyclone of the Antarctic, much weakened in the summer and retreated towards the pole;

e) the Atlantic anticyclone, in the Northern Hemisphere, touching the northern coast of the continent.

The masses that leave the Antarctic continent to the west of the thermal depressions penetrate the oceans where they warm up and become humid quickly in the lower levels. As long as there is subsidence, instability will be weak. This way, the air, at first, then becomes transitional Antarctic, to finally transform into marine polar. It is with this structure that the Polar Mass invades the South American continent between the two high pressure cells (anticyclone) of the Atlantic and the Pacific, to then follow three different trajectories conditioned by orography. The first, west

of the Andes, is traveled mainly in summer, when the continent's great distance from the Pacific Polar Front allows free access to the polar masses. These then walk along the coast of Chile, constituting the so-called "suradas". The two other trajectories of the polar mass occur east of the mountain range, in the form of small ridges or large end-of-family anticyclones. The paths of least resistance in this region are: the continental geographic depression (through the Chaco lowland and the states of Mato Grosso and Amazonas) west of the Brazilian Massif and the Atlantic Ocean, east of this Massif. The mass can also park in Patagonia and remain there for several days (SERRA; RATISBONNA, 1942).

Nimer (1979) comments that, between the end of spring and the beginning of autumn, the interior of Brazil is frequently subjected to winds from the West and Northwest, brought by tropical instability lines, which can cause rain and thunderstorms.

THE REGIONAL CIRCULATION OF THE SOUTHEAST REGION

The Southeast region is located on the western edge of the Atlantic Ocean and is located between parallels from 14° to 25° south, which means that almost all of its lands are located in the tropical zone. It has a coastline along its entire length, which shows that it has an oceanic surface available for an intense process of evaporation and condensation.

From these aspects of the atmospheric circulation in Southeast Brazil, especially in summer, derives the climatic unit of this Region, in terms of Synoptic Meteorology: Southeast Brazil is a region over which the collision between the circulation system of the polar mobile anticyclone and the circulation system of the Atlantic semi-fixed subtropical anticyclone is often in dynamic equilibrium (NIMER, 1979, emphasis added).

Thus, the Atlantic Polar Front is formed by means of the frontal collision between the Polar Mass and the Atlantic Tropical, that is, in the atmosphere, the warmer and more humid air is violently propelled upwards, resulting in its cooling and the condensation of water vapor. water to produce rain. They are rains of great duration, reaching areas with medium intensity. May be accompanied by strong winds with cyclonic circulation.

FINAL CONSIDERATIONS

Climatology has been standing out more and more. Studying the climate for the rural area, specifically in agriculture, is to show how much the farmer is dependent on the climate to produce, and also that space and place, according to Tuan, are concepts that are linked to climate scales.

It can be concluded that the space is in constant transformation, mainly because in agriculture man constantly alters/modifies the area. But the fact is that the farmer needs to be well-informed on a daily basis about the climate (when it will rain, the amount of rain, whether it will be cold or very hot, whether it will wind or not); there is so much information that if he does not have it, he will probably not have a good production in the field.

Research and investigations never exhaust a topic, as they are done and redone all the time exposing previously unappreciated points of view, there is never too much, so it is important that research is updated so that it can be useful to farmers and people in general. It must be noted that not all sites and information are reliable.

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