

The introduction of geography today



1. Introduction

“ Today Geography is an extremely diverse discipline covering several areas of study and involving researches with different backgrounds from all over the world (Alzona & Marsh, 2003)”. Thus Geography is a discipline that has evolved through time. Since the beginning of this discipline, it was regarded as a study for mapping features, however the definition later expanded.

Geography is again, a multidisciplinary subject that is divided into a number of sub-fields. According to Hughes (1863), “ Traditionally, Geography as well as geographers has been viewed as the same as cartography and people who study place names. As space and place affect a variety of topics such as economics, health, climate, plants and animals, Geography is highly interdisciplinary”.

“ While Geography has followed almost all 19th and 20th Century social and biophysical sciences along the reductionist route, we have, in my view, tried to keep an eye on the “ big picture” better than most. We have been criticised for this holistic (and traditionally rather generalist) approach by other disciplines because breadth across a range of disciplines tends to require a somewhat less deep appreciation of any one discipline (Pitman, 2005, p. 137)”. Therefore there is a need to expand the discipline in terms of further research but keep it within its context (that is., within the spatial science). Hence, there were changes that were encountered such as understanding the Earth System Science in a holistic approach rather than sub diving it and with the development of computers Geographic Information Systems. Pitman (2005, p. 140) stated that, “ Earth System Science is

gaining considerable momentum". Thus it can be developed within geography as the two are related in terms of the biophysical aspects.

Geography is not entirely included as a discipline that can assist in contributing to this new science that is gaining momentum. Pitman (2005, p. 140) argues that "the international scientific community has developed Earth System Science with little reference to the Geography community". The role that geography has to offer in the discipline of Earth System Science remains highly ignored.

The aim of this paper is to examine and assess the change in direction within the discipline of Geography towards Earth System Science. To gain insight to this matter, this paper will therefore, define Geography, outline the history of Geography as a discipline and also define Earth System Science, establish a relationship between Geography and Earth System Science, assess the change of Geography towards Earth System Science and lastly the conclusion.

2. The definition of Geography

2. 1. What is Geography?

Geography is defined as the study of spatial phenomena and the interaction between society and nature consequently describing and explaining the spatial patterns and processes. It therefore, studies the lands description, population and incidents of the Earth. Geography is thus a study of spatial science. According to the online dictionary. com, "geography is the science dealing with the areal differentiation of the earth's surface ... arrangement and its interrelations over the world of such elements as climate, elevation, soil, vegetation, population, land use, industries, or states, and of the unit <https://assignbuster.com/the-introduction-of-geography-today/>

areas formed by the complex of these individual elements". It further defines geography as " the science of place, that is, the study of the surface of the earth, the locations and distribution of its physical and cultural features, the areal patterns or places that they form, and the interrelation of these features as they affect humans".

Hence geography can be divided into two main subfields, namely, Human and Physical Geography. However, there is a third subfield known as Environmental Geography that focuses on how humans affect the environment through their activities and ways of managing the environment (in other words, ways of conserving the environment from being depleted). For the purpose of this assignment, only Human and Physical Geography will be discussed.

2. 1. 1. Human Geography

Narsh (2003, p. 30) describes Human Geography as a "... study of human activities on the Earth surface". Indeed Human Geography studies the human activities, how they have change the Earth surface, how they affect it and how the processes of the Earth such as climate affect human activities or productivity. Human Geography is further divided into Urban Geography, Economic Geography, Population Geography, Cultural Geography and Political Geography to name a few. Therefore people (geographers) who specialise in Human Geography normally focus on one aspect of the subfields. However, two or more subfields can be studied simultaneously in a research project to enhance the understanding of the spatial science.

2. 1. 2. Physical Geography

According to Ernst (2000), “ Physical Geography is a discipline for those that are concern with the vital matter of the environmental quality”. Hence Physical Geography is mainly concern about the landforms, temperature, soils and climate, how these factors influence the habitants in terms of their structure and attributes. Hughes (1863) describes Physical Geography as a study “...which concerns the Earth’s physical environment (the atmosphere, biosphere, hydrosphere, and lithosphere)”.

“ Physical geography also studies the interrelationships of these phenomena to human. This area of geography has seen very intense interest and growth in the last decades because of the acceleration of human induced environmental degradation. Thus, physical geography’s scope is much broader than the simple spatial study of nature. It also involves the investigation of how humans are influencing nature (Pidwirny, 2006)”. Hence the emphasis that physical geography is concerned with the importance of environmental worth.

Physical Geography can therefore be subdivided into the following:

Geomorphology, Climatology, and Environmental Geography to name a few.

Physical Geography is regarded as the basis for Earth System Science since these fields studies the Earth surface and its processes. As a result, Earth System Science is viewed as the modern physical geography.

2. 2. Geography as a discipline

Geography has contributed to the science field by means of publications and application of certain methodologies in solving problems that are associated with the spatial phenomena. It is considered as a Science subject because it <https://assignbuster.com/the-introduction-of-geography-today/>

uses the scientific method as basis of the research projects within the discipline. Like any other academic discipline, geography has the following aspects:

- Institutionalisation, meaning that it is identified by the fact that it is taught in universities;
- Professionalism, geography is being practiced by people who are qualified in the field of geography as a result they become experts in this field;
- Original research and publishing the findings
- Has bodies to promote the discipline Conferences, seminars, journals and publications
- Conferences, seminars, journals and publications that contribute the academic discipline. The publications and journals provide insights as to what has been studied in the past and how to advance the knowledge within this discipline. Conferences and seminars are a platform to discuss the arising matters and finding the solution to it.

Having inspected geography as a discipline it will be vital to establish the history of geography as a discipline, how it started and the future that it holds as new discoveries are made. Therefore, resulting in new focus for the discipline such as the Earth System Science that geography is changing towards it. This is discussed in the next section of the paper.

3. History of Geography

Geography as a discipline has a long history that can be dated back Before Christ (BC), whereby geography became a separate field of study. ' The widely accepted goal of geography is given by the etymology of its name

describing the earth. According to Johnston (199, p. 139), this has ancestry of established numerous subject history (which the author distinguishes from disciplinary histories, reserving the latter term for surveys of academic discipline as practised in universities and comparable establishment)'. Hence geography has developed and has become institutionalised which is one of the characteristics of an academic discipline.

“ The principal founders of geography can be traced to the ancient cultures, such as the Greeks, who were the first to explore geography as both art and science, and this might have been through different approaches including cartography, philosophy, literature and mathematics. Throughout the middle ages, the fall of the Roman Empire led to a shift in the evolution of geography from Europe to the Islamic world (Baker, 1963)”.

“ The 16th and the 17th century are considered as the age of discovery where many new lands were discovered and had contributors such as Christopher Columbus, Marco polo and James cook, review a desire for both accurate geographic detail and more solid theoretical founders (Baker, 1963)”.

“ Geography became recognised as a discrete academic discipline during the 18th and the 19th centuries and became part of a typical university curriculum in Europe, especially France and Germany. Over the past two centuries the advancement in technology such as computers has led to a development of geomatic and new practises such as participant observation and geostatistics being incorporated into geography’s portfolio of tools (Baker, 1963)”. The geography subject started to be taught in primary

schools as a tool for listing and naming places, therefore, progressed to the stage that it is now offered at higher institutions (universities) as a spatial science subject.

Throughout the history of Geography as a discipline it can be established that since the early ages of geography, it explored the spatial science of humans and its physical content.

4. The definition of Earth System Science

Earth is a multifaceted and full of life entity that includes the disciplinary circuits for lithosphere, atmosphere, hydrosphere and life forms as a result there is no process that takes place in total isolation within the system.

Pitman (2005, p. 138-9) defines Earth System Science as "...the study of the Earth as a single integrated physical and social system. Earth System Science views the Earth-System holistically based on the new understanding of the processes, non-linearities and feedbacks which dominate the system and contribute to emergent phenomenon". A clear and concise definition comes from ESSP (1997) which states that " Earth System Science is the study of the Earth System, with emphasis on observing, understanding and predicting global environmental changes involving interactions between land, atmosphere, water, ice, biosphere, societies, technologies and economies". Hence, Earth System Science involves a number of disciplines, such as Geology, Geography, Meteorology, Environmental Sciences, Energy and Economic studies. The structure of Earth System Science is illustrated in figure 1.

According to Johnston (2005, p. 7), the focus of Pitman's concern is the emergence of a new discipline called earth system sciences which he terms 'a re-invention of Geography'. "Earth system sciences study the functioning of and interactions between humans, (including population change, economic growth, social change and biophysical systems, oceans, cryosphere and ecology) via biogeochemical cycles (Johnston, 2005, p. 8)".

"Earth system sciences is presented as important because is 'genuinely four dimensional' though the meaning of the phrase is far from clear.

Another Australian author has recently described this as 'environmental science' (Wasson, 2004) as cited by Johnston (2005, p. 8)". Earth system sciences have impacts on other disciplines such as psychology, neuroscience and education and notable feature of these references is a range and integration of different areas. It is very difficult to give a precise definition of earth system sciences as it brings a broad range of disciplines and allows them to interact (Ernst, 2000, p. 520)".

"In certain extents, Earth systems sciences has simple taken the mantle of systems based on physical geography. This perception of defining earth system sciences may have spread more widely, as noted by the following author who is based in the department of Geological and Environmental sciences at Stanford University: Earth system sciences is actually twenty-first century geography that encompasses the study of environmental physical and life sciences and engineering, coupled with analysis of human constructs and political and economical policies. It employs space age technologies to identify, measure, and manage diverse global databases that serve as a framework and foundation for coherent discipline (Ernst, 2000, p. 520)". As a <https://assignbuster.com/the-introduction-of-geography-today/>

result physical geography is considered to be the core discipline for Earth System Science.

5. The relationship between Geography as a discipline and Earth System Science

Geography and Earth System Science both seek to understand the importance of the environment and how humans affect it. The 21st century is highly affected by the human activities that result in the pollution of the atmosphere, lithosphere and hydrosphere which in some instances have resulted in climate change. Pitman (2005) review earth system sciences as a single, integrated physical and social system. " Earth system sciences have not been integral. This is due to the fact that specialization in physical geography, as far back as Davis (1901), tended to encourage the same reductionist approach common in our associated disciplines, within which we strive to be respected. With changes that had occurred in the environment, we now know that any notion that a single part of the earth system can be fully understood in isolation from other parts, or the element that might be within the realm of physical Geography can be understood without an appreciation of the role of humans, is inexperienced (Pitman, 2005, p140)".

" Significant matter of the environmental quality can be precisely defined by Physical geography as a core discipline. Physical geography defines the structure and character of the local and global habitat which includes features such as landforms, temperature, soils, and climatic conditions. It also observes the way in which those physical factors determine the pattern of occupancy by living systems that is; it seeks explanations for the development, through the interactions, of ecosystems. In contrast, it

attempts to explain how humans have settled on the land and have used it. Dressed up in a more modern name, Physical geography is Earth system sciences (Kennedy, 2000, p13)".

' It is remarkable that Geographers have been at the front position of assessments of the scale of land cover change having a major contribution by our discipline. It is now realised that looking at how the biophysical system works without including Humans at the core of any mathematical or conceptual model of that system is inexperienced. This has clearly been recognised by the International Geosphere Biosphere Program. The central role that Humans play in all aspects of modern Earth System Science was highlighted by Schellnhuber (1999), the director of the Potsdam Institute in Germany (Pitman, 2005, p. 141)'.

' Incorporation of Earth system sciences in Physical geography can play a major role in clarifying many uncertainties concerning the environment via observation of the functioning of the biophysical system, and by providing the climate modelling groups with knowledge on the spatial distribution key quantities, such as soil and vegetation type. Climate modelling groups can also be assisted to understand how biophysical processes of the world (Pitman, 2005, p. 141)'.

' Physical geography with earth system sciences can be applied in the general area of quaternary studies which include work on the reconstruction of palaeogeography. This can also help to understand climate variability or the likely sensitive of global climate to an external perturbation to assess

whether global temperatures in the last decade have been anomalous and whether the rate of global warming is anomalous (Pitman, 2005, p. 141)'.

6. Assessing the change with the discipline of Geography towards Earth System Science

“ The internal structure of the academic discipline of Geography has been debated recently, with some contending that it is fragmented while others counter that it is not...(Johnston, 1998, p. 139)”. Earth System science within the geography discipline is regarded as a threat to the core of this discipline, however, there is a relationship in Earth System Science and Geography through the subdiscipline called physical geography. There have existing attempts in the past to encourage Earth System Science of which today is causing controversy within this discipline. Thus Pitman (2005, p. 138) acknowledge the fact that there has been attempts to integrate geography with Earth System Science; as a result he states that “ some of these attempts are fundamental to the entire discipline of Physical Geography. Citing Davis (1901) who argued the need “ to consider the form of the Earth as a whole”, and Strahler (1951) who argued that while focussing on a chosen speciality, a Physical Geography should be able to “ assemble and integrate pertinent fragments of knowledge into a unified picture...”. Chorley et al. (1984) used knowledge of geology, chemistry, biology, hydrology, atmospheric and cryospheric processes, integrated in a systems framework to advance geomorphic knowledge. These, and very many others, were seminal works that made Physical Geography a sound discipline, while integrative and outwards looking to Human Geography. However, it is simply indisputable that the new thrust in Earth System Science is largely independent of Geography”. As an academic discipline geography should

contribute towards the scientific knowledge and should be integrated with other fields if possible to establish solutions that are threatening the society as geography is a spatial science and is concern about the environment without affecting the core of physical geography.

“ Instead, my focus is that Geography could make a major contribution to Earth System Science by leading the international agenda. Individuals within Geography with expertise across key components of Physical and Human Geography have the skills to contribute solutions to the problems inherent in this new science. It is my view that Geography has, to date, missed these changes and that this questions the relevance of the discipline in the eyes of the broader scientific community (Pitman, 2005, p. 138)”.

According to Castree et al., “ The question that arise from integrating earth system science as a discipline in Geography is as geographers, should we be involved in this dialogue, or have we already missed the boat on which it is taking place?. Earth system sciences are linked in the nexus of the physical and human worlds, which was the traditional definition of the discipline, despite such subsequent drift. In terms of studies of applied environmental change, few geographers would disagree with Bretherton’s conclusion that ‘(d) daunting though these tasks may be, they are matched by the significance of the goal. Human-kind is pressing on its environment in unprecedented ways, and we do not understand the implications. We must try, for we may not have a second opportunity’ (Bretherton, 1993; p. 1127). The development of earth system science perspective would also speak an approach using concepts of globalisation as discussed by Davies (2004)”.

7. Conclusion

Geography as a discipline should be moving towards Earth System Science due to the fact that geography is multidisciplinary and it studies nature quality in a form of physical geography. Although Pitman (2005, p. 146) argues that “ earth system science has invaded geographers academic territory, developing an understanding of the biophysical system with little reference to Physical Geography”, Johnston (2005, p. 8) in turn agrees that geography should be changing towards Earth System Science. He states that, “ we are a natural discipline to embrace the genuinely multidisciplinary science that is Earth System Science. We naturally view the Earth as a combination of biophysical and social sciences. Yet other disciplines that actively embraced the reductionist approach through the 20th Century have now discovered the need for more holistic perspective... If Geography does not take leadership in this arena, it will not be long before other disciplines fully take this opportunity from us and Earth System Science will continue to develop in parallel with geography-at our expense...”

“ It is hard to imagine a more important discipline than Earth System Science. We urgently need to overhaul our thinking and rejig our institutions to allow this crucial new science to flourish (Lawton, 2001)”. Physical geography is considered to be a weak sub-discipline of geography as compared to human geography. As a result changing toward Earth System science will assist in revitalizing this discipline.

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