

Complexity Theory and Collagist Approach in Geomorphic Systems

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Extended Abstract

Introduction

Nowadays, simple idea of how the world works changes and converts to complex and paradoxical idea. This is called complexity science. The theory through the assumptions of Newtonian which is based on quantum physics states that in a complex system cannot be said that a consensus will be repeated exactly twice, but just the opposite, in these systems, order and disorder complete each other.

Materials and Methods

In this article, it tried to provide an overview of the complexity and its variety and their role in nature and dynamic systems. To determine the best approach and method for the study of complex systems and scientific confrontation with them, positivist approaches, Post-positivism and pragmatism were studied.

Discussion and Results

Complex adaptive systems: As mentioned, complexity science is an approach to study, research and predict future that have different philosophical assumptions rather than Newton positivism approaches. The complex system is a system that has been formed of interconnected smaller parts and exhibit behavior that is not deducible from the behavior of the components alone, which means that by studding the individual components of a complex system cannot be achieved to collective behavior.

Table 1: Comparison between two paradigms positivism (Newtonian) and complexity

Complexity paradigm	Positivist Paradigm
Coexistence of certainty and uncertainty	Certainty
Non-linear relations (mutual causality)	Linear causality
limited predictability (understanding, analysis of sensitivity and explanation)	Complete forecast
Transitional phases	Entities and certain events
Belief universality	Reductionism
Observer inside observing	Observer outside observing
Focus on appearance and reality	The main focus on appearance
Quantum physics (the possible world and continuous)	Newtonian physics (predictable world)
Paradox	Logic
Focus on pattern	Focus on the beat
Focus on vibration	Focus on average
Focus on the United behavior	Focus on results or outcomes

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In general, we can define two viewpoints on complexity theory:

1. Chaos Theory: transitional stage from simple to complex (from order to chaos)
2. The self-organization theory: Transitional stage from complexity to simplicity (from chaos to order)

Positivism Paradigm: Positivism paradigm is based on realism and also based on the assumption that a series of facts that is undetectable and cannot be changed under the influence of natural mechanisms and laws. Thus, with an emphasis on originality of environment, believing that the environment have a fundamental impact on direction and forming of the phenomena. This paradigm generally believed in experiment-observational method.

Anti-positivist or Post-positivism paradigm: this approach has a great contribution in the contemporary knowledge production by using qualitative methodology and tries to keep away itself from subjectivism and positivistic reductionism. This paradigm based on relativism (Giddens 1984).

Pragmatism approach: the pragmatism paradigm by combined method tries to find a moderate field between positivism and post-positivism approach.

Analysis of geomorphic systems and collagism approach: Collage metaphor means interlaced. Collage is an art, which has held together objects, components, Pictures, drawings and heterogeneous and antonyms components make a new innovative and meaningful identity. Facing with complex non-linear systems that have multiple funds will not only be of a structure or a system for dealing and predict the behavior of the system. Therefore, for predicting the behavior a set of elements must be matched to be able to find the appropriate form. The approach which in this study called "collagism" by keeping all the complex concepts can put the environmental management in its definite framework.

Conclusions

- Complexity science is an approach for studying, researching and predicting future.
- Chaos is simple method to examine the phenomena and is a fast way to get the answer. Chaos looks at systems as they are and can be seen in most natural systems, including geomorphic systems.
- In geomorphic systems, caused turmoil, leads the system towards a new equilibrium in the end. In this view we cannot suppose equilibrium as a concept of absolute sustainability. In other words, when speaking about equilibrium between form and process, it means that it can be seen as a kind of trend in them to achieve stability
- The survey showed that old and conventional contrast between qualitative and quantitative methods not only were unacceptable but also create unidirectional, one-side and corrupt knowledge so pragmatism paradigm provided combination research methodology as a third methodological movement (after two positive and post-positivist approaches).
- Pragmatism that in this study called "Collagism", indicate on integration of paradigms, and integration of their techniques in the field of research.

Keywords: Complexity paradigm, chaos, self-organization, positivism paradigm, Post-positivism paradigm, pragmatism, collagism.

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