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PG Department of Geography, Patna University

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Niharika Narayan

Assistant Professor (Guest)

Email Id-narayanniharika@gmail.com

Quantitative Methods and Techniques in Geography

Introduction- Geography for than two hundred years was confronted with the problems of generalization and theory-building. In all other physical and social sciences theory building has a long tradition. After the Second World War, geographers, especially those of the developed countries, realized the significance of using mathematical language rather than the language of literature in the study of geography.

How Quantitative Revolution initiated the development of quantitative methods in Geography

History of Quantitative Revolution- The diffusion of statistical techniques in geography to make the subject and its theories more precise is known as the “Quantitative Revolution” in geography.

Traditionally, geography was considered to be a description of the earth surface, but in due course of time its definition and nature changed. But, after the Second World War, geographers, especially those of the developed countries, realized the significance of using mathematical language rather than the language of literature in the study of geography.

In order to achieve this objective and to obtain the real picture of a region, geographers began to use and apply quantitative tools and techniques to which qualitative geography was opposed, especially till the 1960s. Statistical methods were first introduced into geography in the early 1950s (Burton 1963). Consisting mainly of descriptive statistics, there was also some attempt at

hypotheses testing using, for example, Chi-Square. Bivariate Regression Analysis, the General Linear Model, etc. According to Yeates, “geography can be regarded as a science concerned with the rational development, and testing of theories that explain and predict the spatial distribution and location of various characteristics on the surface of the earth”

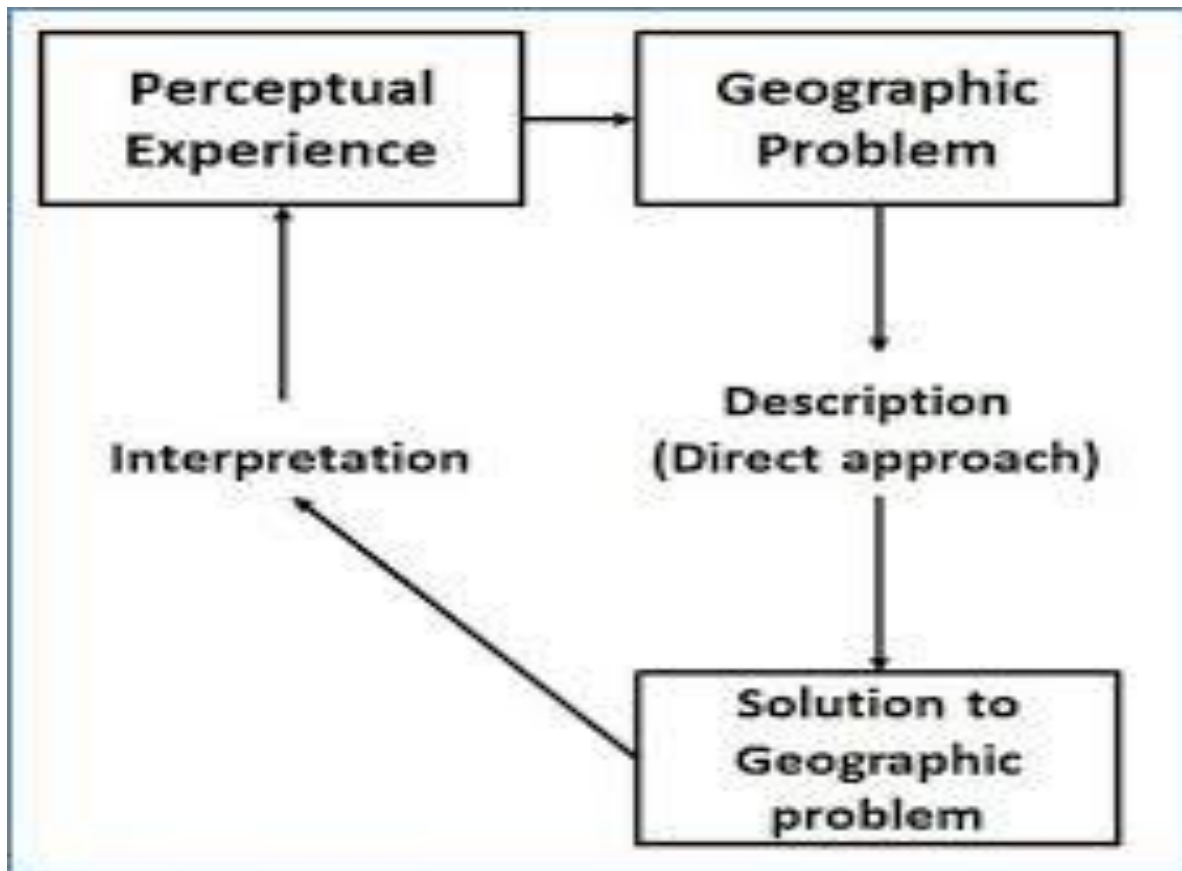


Fig: Geography before the development of quantitative geography

The statistical methods are employed in geography for the generating and testing hypotheses using empirical data, whereas the mathematical techniques and theorems are used for deriving models from a set of initial abstract assumptions. In other words, statistical methods are used to estimate, and test the significance of, various parameters associated with a given mathematical model such as the Distance Decay and Gravity Models.

The main objectives of quantitative revolution was:

- ✓ To change the descriptive character of the subject and to make it a scientific discipline.
- ✓ To use mathematical language instead of the language of literature.
- ✓ To explain and interpret the spatial patterns of geographical phenomenon in a rational, objective and cogent manner.
- ✓ To identify the ideal locations for the various economics activities so that the profit may be maximized by the resource users.
- ✓ To test hypotheses and formulate models, theories and laws.

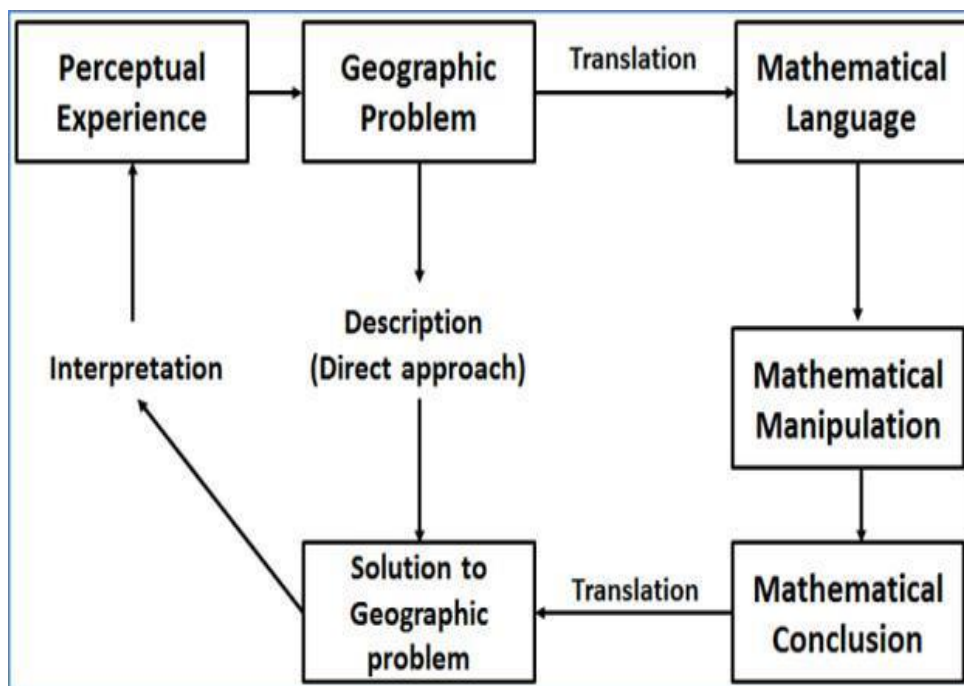


FIG: Geography after the development of quantitative revolution