

Spatial Distribution Patterns of Population Change for development in Sri Lanka with special reference to Mortality & Fertility (1992 – 2010) by using GIS

M.R.N.S. Sumanapala

Road Development Authority

Abstract: - The population change refers to change in the number of people during the specific time. The world population has not been stable. It has increased manifold. Mortality and Fertility are the key indicators which say about the development of specific country or a region. Sri Lanka has experienced the changes in the context of population with the fluctuating level of Fertility (birth rate) and Mortality (death rate) which had on previous years. Main reason is development in regional wise.

The Study main objectives are identification of Spatial Distribution of Crude Death Rate (CDR) (1992-2010) and Crude Birth Rate (CBR) in Sri Lanka (1992 -2010). Actually this study is focused on that changes as spatial variation to show mapping work by using Geographic Information systems. Mainly this study is based on Secondary Data which gathered around 1992-2010 from, Department of Census & Statistics in Sri Lanka, Annual Health Statistics, Central Bank reports and Necessary web pages. Statistically calculated Data were entered to the GIS application. Under that, Sri Lanka District Shape File was used to show the Spatial Variation of Population change in year wise. Added Data were symbolized according to the given ranges such as, Very Low, Low, High and Very High. Data were presented mainly by using Choropleth Maps which prepared by GIS. Tables were used to present the data effectively.

Results were shown as the pattern of both mortality and fertility component were changed from 1992 – 2010 according to CDR and CBR. Especially in the case of CDR Anuradhapura, Polonnaruwa and Nuwaraeliya District has significant distribution from 1992 to 2010. It means CDR were very high level category in 1992 but it reached to low level category to 2010. Advancement of health sector, Education development and high amount of Migration rate can be a cause for this significant change. Colombo and the Hambantota are the districts which shown in same distribution in CDR from 1992 to 2010. No any spatial variation. The reason is according to geographical features all the services are pointed to the Colombo city and it results high population rate from 1992 to 2010. Because majority of labor force are gathered around Colombo means western province in the country. The case of Hambantota is that people who living in the district is nominated as villages they are so isolated than others. Most of people are engaging with Chena cultivation and Paddy field works. In the context of CBR, Polonnaruwa and Nuwaraeliya District also shown significant spatial distribution from 1992 to 2010. Regional development acted for this variation among population.

Key Words: Development, Population, Spatial, Fertility, Mortality

I. INTRODUCTION

The population change refers to change in the number of people during the specific time. The world population has not been stable. It has increased manifold. Mortality and Fertility are the key indicators which say about the demographic situation of specific country or a region. Main reason is development in regional wise.

This is actually due to changes in the number of Births and Deaths. For an extremely long period of human history until the 1800s, the world's population grew steadily but slowly. Large number of babies were born but they died early too. This was as there were no proper health facilities. Sufficient food was not available for all the people. Farmers were not able to produce enough to meet the food requirements of all the people. As a result, Total increase in population was very low (Chandna 1998:53-54).

Sri Lanka has also experienced the changes in the context of population with the fluctuating level of Fertility (birth rate) and Mortality (death rate) which had on previous years. The Study main objectives are identification of Spatial Distribution of Crude Death Rate in Sri Lanka (1992-2010) and identification of Spatial Distribution of Crude Birth Rate in Sri Lanka (1992 -2010). Actually this study is focused on that changes as spatial variation to show mapping work by using Geographic Information systems.

II. METHODOLOGY

Mainly this study is based on Secondary Data which gathered around 1992-2010 from, Department of Census & Statistics in Sri Lanka, Annual Health Statistics, Central Bank reports and Necessary web pages. Statistically calculated Data were entered to the GIS application. Under that, Sri Lanka District Shape File was used to show the Spatial Variation of Population change in year wise. Added Data were symbolized according to the given ranges such as, Very Low, Low, High and Very High. Data were presented mainly by using **Choropleth Maps** which prepared by GIS.

2.1 Abbreviations and Acronyms

CDR - Crude Death Rate

CBR - Crude Birth Rate

2.2 Equations

2.2.1 Statistical Analysis method

Standardized Formulas in the context of Population Measurements.

$$CDR = \frac{\text{Number of deaths during specific year}}{\text{Total population in that year}} \times 1000$$

$$CBR = \frac{\text{Number of births during specific year}}{\text{Total population in that year}} \times 1000$$

III. RESULTS AND DISCUSSION

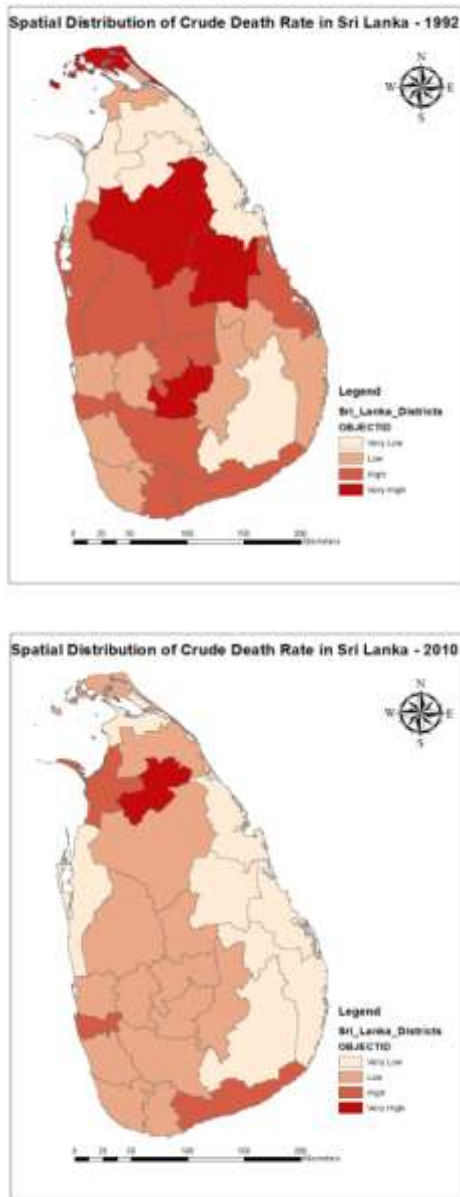


Figure 3.1: Spatial Distribution pattern of CDR in Sri Lanka (1992 – 2010)

3.1: Significance Comparison of Spatial variation of CDR between Districts

In 1992, Jaffna, Anuradhapura, Polonnaruwa and Nuwaraeliya were recorded very High level of Crude death rate. Jaffna – War situation can be the reason for it. Due to Anuradhapura and Polonnaruwa Districts have shown high rate. The reason may be the epidemics or poor sanitary condition. Nuwaraeliya District also has high range. The issues can be identifying as, poor educational attainment of Parents, Deprived sanitary conditions. Indian Tamil community conditions in that time period.

In 2010, This year Mullathive situation is changed. But when the Vavuniya is shown very high class. Mannar also is shown High level of CDR. Specific cause for this could not identified. Colombo and the Hambantota are the districts which shown in same distribution in CDR from 1992 to 2010. No any spatial variation.

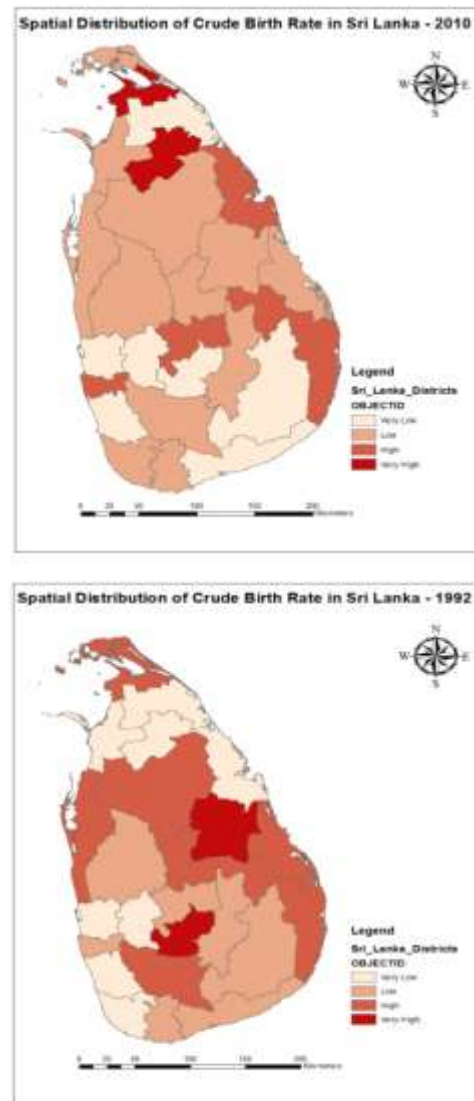


Figure 3.2: Spatial Distribution of CBR in Sri Lanka (1992 – 2010)

3.2: Significance Comparison of Spatial variation of CBR between Districts

In 1992, Polonnaruwa and Nuwaraeliya were shown very high level of CBR. Socio-economic background and also poverty level was cause for this distribution. Gampaha, Kaluthara, Kegalle in Western & Sabaragamuwa Province and some districts from Northern province CBR distribution is very low.

In 2010, During this year, only Kilinochchi and Vavuniya are showing Very High level of CBR. Monaragala, Hambantota and other specific districts also shown very low rate of CBR. Development of Health condition may cause for this distribution pattern. Nuwaraeliya District has significant difference of CBR from 1992 to 2010. Because the majority of Indian Tamil community is taking the advantages of advancement of estate sector health programs and also strong public welfare services.

IV. CONCLUSION

The pattern of both mortality and fertility component were changed from 1992 – 2010 according to CDR and CBR. Especially in the case of CDR Anuradhapura, Polonnaruwa and Nuwaraeliya District has significant distribution from 1992 to 2010. It means CDR were very high level category in 1992 but it reached to low level category to 2010. Advancement of health sector, Education development and

high amount of Migration rate can be a cause for this significant change. Colombo and the Hambantota are the districts which shown in same distribution in CDR from 1992 to 2010. No any spatial variation. The reason is according to geographical features all the services are pointed to the Colombo city and it results high population rate from 1992 to 2010. Because majority of labor force are gathered around Colombo means western province in the country. The case of Hambantota is that people who living in the district is nominated as villages they are so isolated than others. Most of people are engaging with Chena cultivation and Paddy field works. In the context of CBR, Polonnaruwa and Nuwaraeliya District also shown significant spatial distribution from 1992 to 2010. Regional development acted for this variation among population.

REFERENCES

- [1]. Abeykoon, A.P.T.L. 1998. *Population and Manpower Resources of Sri Lanka*. Colombo 7: Natural Resources, Energy and Science Authority of Sri Lanka. p. 8-9
- [2]. Annual Health Statistics Sri Lanka, 2005 -2010, DEPARTMENT OF HEALTH SERVICES MINISTRY OF HEALTHCARE AND NUTRITION SRI LANKA.
- [3]. Chandna, R.C. 1998. *Population*. New Delhi: Kalyani Publishers. P. 50-65
- [4]. www.statistics.gov.lk
- [5]. www.cbsl.gov.lk