ANALYZING SRI LANKAS POPULATION DYNAMICS AND ECONOMIC LIFECYCLE: PROGRESS AND FUTURE DIRECTIONS

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Introduction

Sri Lanka is committed to achieving the Sustainable Development Goals (SDGs) and must adopt evidence-based policies that consider population dynamics to create a better future for all. Reliable and comparable data that combines population change with equitable socio-economic development is essential for sustainable progress. National Transfer Accounts (NTA) provide insights into the age dimension of an economy, enabling the integration of population dynamics into sustainable development planning (United Nations, 2013; Dissanayake et al., 2021). Understanding demographic dividends and adapting to Sri Lanka's shifting age structure will support inclusive and sustainable growth.

The demographic dividend is a concept that denotes the positive demographic impact on economic development resulting from the changes in population age structure. Countries, where the working-age population predominates, have the opportunity to accelerate economic development, thus obtaining the demographic dividend (Soldan, 2023). To address economic inequality, policies promoting economic growth and addressing social protection for a changing population are crucial. Demographic changes, such as a growing proportion of young and older people, require adjusting public expenditures and adapting economic behaviours and societal institutions. Sri Lanka's age structure is undergoing a significant transformation with a "youth bulge" and population aging, presenting challenges and opportunities for social, economic, and environmental development. Proactive policies that consider changing population dynamics, guided by rights-based, evidence-informed, and gender-responsive approaches, are vital for a sustainable future.

More generally, studies on the economics of ageing are criticized for their failure to examine the full transfer system that governments, families, and individuals engage in to fund consumption across the lifecycle. With increased longevity and limited upward movement in the age at retirement, most high-income countries have developed an extended period at the end of the lifecycle with reduced labour market attachment (Temple et al, 2017:3). In addition, extensions of time in education have tended to delay full-time labour market participation at younger ages.

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Despite these trends, many studies gloss over the transfer systems that serve to fund consumption in the earlier and later stages of the life course. A further limitation of many economic studies on population ageing is their failure to generalize findings about the impact of ageing on the economy beyond the specific confines of their study - comparing countries at different times in demographic and economic development, with differing cultural, political and social systems (Temple et al, 2017: 3).

The economic life cycle consists of phases of dependence and independence, where children rely on adults' resources and older individuals accumulate assets. National Transfer Accounts provide a framework for understanding economic resource allocation among different age groups (United Nations 2013). By employing the NTA methodology, policymakers can design national frameworks for pensions, retirement age, healthcare, education, reproductive health, social institutions, and the economic implications of population aging. Understanding the relationship between age and economic activities is essential for evaluating the consequences of population dynamics, considering factors such as education, health, and consumption patterns. By utilizing NTA, policymakers can determine the consumption patterns of different age groups and examine age-specific labor income and income transfers within households, offering insights into the life cycle deficit or surplus.

Therefore, this study utilizes the concepts and methodology of NTA to analyze the dynamics of the population and economic lifecycle in Sri Lanka. The data used in this analysis is drawn from the System of National Accounts (SNA) and the Household Income and Expenditure Survey conducted in 2016 by the Department of Census and Statistics. By integrating NTA with SNA data, we gain a comprehensive understanding of the age-related economic behaviours and resource reallocations in the country. This approach allows us to examine the interplay between population dynamics and economic factors, providing valuable insights for policy-making and resource allocation decisions.

Data and methods

This analysis used the NTA Framework which documents the economic life cycle through the National Transfer Account (NTA) system (United Nations, 2013). That is, the age-related patterns of consumption and labour income that are associated with the life cycle of education, work, and retirement. Specifically, the NTA is:

> *a system of macroeconomic accounts that measures current economic flows by age in a manner consistent with the United Nations System of National Accounts. NTA measures age-specific labour income, asset income, consumption, transfers, and saving, accounting for flows within households, between households, through the public sector, and with the rest of the world. [UN, 2013, p.199]*

The NTA framework relies on three types of data sources to construct the age profiles of the economic flows (United Nations, 2013). So, for this analysis, the following data available in Sri Lanka was utilized.

1. Population data: The population data used for NTA calculations is derived from the 2012 Census of Population and Housing (CPH).
2. National account data: National account data is obtained from various sources, including the United Nations System of National Accounts (UNSNA), the Central Bank of Sri Lanka, and the Department of Census and Statistics.
3. Household income and expenditure data: The latest available survey for household income and expenditure at the national level is the Household Income and Expenditure Survey (HIES) conducted in 2016. This survey provides the necessary data on economic flows by age, which is essential for constructing the NTA.

The economic lifecycle input parameters for NTA are organized into categories such as consumption, public consumption, private consumption, and labor income. These parameters are estimated based on data from the HIES 2016 survey and adjusted using NTA methodology.

The NTA framework focuses on understanding the economic life cycle and the reallocation of resources across different age groups. It distinguishes between three sectors: the private sector (including households, corporations, and non-profit institutions serving households), the public sector (represented by the government), and the rest of the world.

NTA calculations involve two main steps: first, calculating the macro benchmark by deriving aggregate amounts from national accounts data and second, estimating the age pattern by combining sample survey data with administrative data. The age profiles are constructed to capture age-specific economic behaviour, including consumption, labor income, transfers, and reallocations.

The NTA methodology aligns with the United Nations System of National Accounts (SNA), ensuring coherence between the two frameworks. SNA values are used as macro controls in NTA construction to match the aggregate flows measured in the SNA.

Understanding the generational economy is a key objective of NTA, as it provides insights into the relationship between age and economic activities. Age-specific economic behaviour is influenced by factors such as education and health, which impact consumption patterns. NTA examines private consumption, government spending on education and health, and the flow of labor income and transfers between generations.

To estimate the basic NTA age profiles, the data sources and procedures outlined above are utilized. These include the allocation of expenditures on education, health, and other goods, as well as the estimation of labor income based on individual-level data from the HIES 2016 survey.

By employing these data sources and methods, NTA offers valuable insights into the economic lifecycle and resource reallocation patterns, providing a comprehensive understanding of the age dimension in national accounting and informing policy decisions related to social services and resource allocation. Table 1 shows the procedures used for estimating basic NTA age profiles.

Table 1: Procedures used for estimating basic NTA age profiles

Account	Data source	Age profile calculations
Life Cycle Deficit (LCD)		LCD= C-YL
Consumption		C-CF+CG
Private consumption (CF)		CF= CFE+CFH+CFX
Education (CFE)	HIES (2016)	School level-specific expenditure equality among those in the household attending school at the same time
Health (CFH)	HIES (2016)	Allocated to individuals using an age-specific approach and age-specific health facility utilizing rates from HIES
Other (CFX)	HIES (2016)	Allocated using using-age-specific weights described in the UN NTA Manual (2013)
Public consumption (CG)		
Education (CGE)	HIES (2016)	Enrollment by age level is proxied by enrollment rate by age of the general population
Health (CGH)	CBSL, 2019; IHP 2007	Public health facility utilization rates are proxied by utilization rates calculated from IHP 2007
Other (CGX)	CBSL 2019	Allocated equity across the resident population

Source: L Dissanayake et al, 2021, Population Dynamics and the Economic Life Cycle: An Analysis of National Transfer Accounts for Sri Lanka UN NTA Manual (2013)

Analysis and discussion

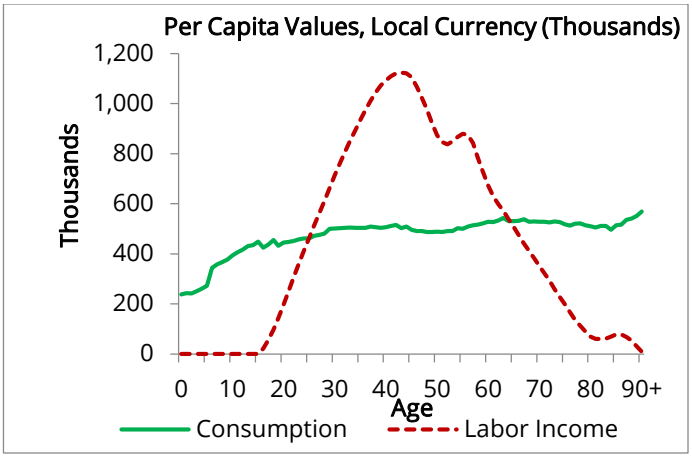
Examining the Impact of Sri Lanka's Youthful Age Structure on Consumption Patterns

The demographic transition in Sri Lanka has significantly impacted the age structure of the population, particularly since the 1960s. Despite progress in the fertility transition, Sri Lanka still maintains a pyramidal age structure due to higher fertility cohorts in the past.

In 2016, aggregate consumption in Sri Lanka amounted to Rs. 9,552 billion, with approximately 81 percent attributed to private consumption. When examining consumption by age group, children aged 15 years and younger accounted for around 32 percent of public consumption, reflecting the higher proportion of the child population. On the other hand, consumption by older individuals (age 60 years and above) represented less than 12 percent of total public consumption.

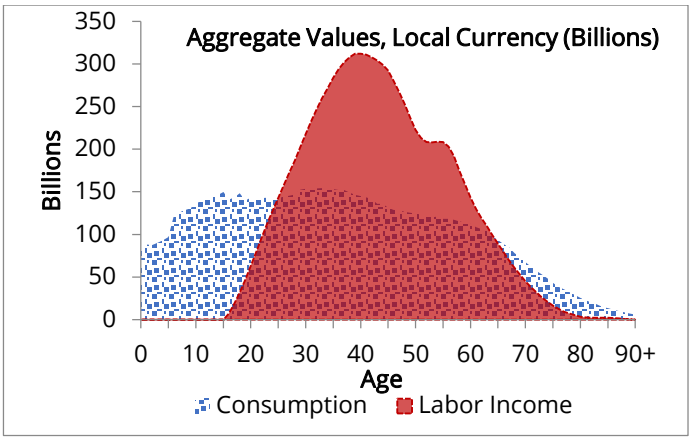
Figure 1 illustrates the age pattern of consumption and labor income. Consumption among very young children is initially low but increases significantly once they enter the education system. Education accounts for the peak of the consumption age profile during the school-age brackets. The age profiles also reflect lower average consumption between ages 40 and 50, when income and consumption are shared with dependent children. Labor income is a crucial resource for financing consumption, with the Sri Lankan economy generating Rs. 10,218,941 million in labor income in 2016. The majority of this income (86 percent) comes from wage employees, while self-employment contributes 14 percent.

Figure 1: Consumption and labour income, per capita values, 2016 (in Rs. 000')



Source: Author's calculations based on HIES, 2016; CBSL, 2019

Figure 2: Consumption and labour income, Aggregate values, 2016 (in Rs. Billions)



Source: Author's calculations based on HIES, 2016; CBSL, 2019

Figures 1 and 2 highlight the behavioural patterns of income and consumption across different segments of society. It is noteworthy that the aggregate life cycle surplus is observed only between ages 30 and 69, indicating that people earn more than they consume during these 39 years of their lives. This suggests that the labor force in Sri Lanka extends beyond age 60, which is positive for the economy, especially considering the anticipated decline in the labor force in the coming decades. Furthermore, this reveals the generational effects of individuals who have benefited from free education and healthcare services, particularly since the mid-1940s (Dissanayake, 1995).

Exploring the Relationship Between Age and Per Capita Health Consumption

One of the key challenges Sri Lanka faces due to its rapid aging process is not only increasing life expectancy but also ensuring that older individuals can enjoy fulfilling and productive lives (Dissanayake and Weeratunga, 2016). Good health is essential to achieve this goal. As the proportion of dependent older persons continues to grow, it puts pressure on public transfer systems' funding. To adapt to the changing age structure, it becomes crucial to consider options such as increasing the tax burden on the working-age population, reducing benefits for older individuals, or encouraging longer participation in the labor market. The first two options can impact both the working-age population and vulnerable older persons, and they may also face political sensitivity, making them less desirable for social protection schemes. On the other hand, increasing the retirement age and allowing the young-old (60-69 years) to remain in the labor force can be beneficial. This approach can help reduce healthcare costs, easing the burden on government expenditure. Table 2 demonstrates that per capita health consumption is higher for the older population in Sri Lanka compared to other age groups.

Private consumption per capita exceeds public consumption across all age categories. This highlights the potential burden that healthcare expenses for older individuals may pose on families and the government. An effective solution could involve extending the retirement age while offering a voluntary retirement option for those who prefer to retire early.

Table 2: Per capita health consumption by age, 2016, Sri Lanka

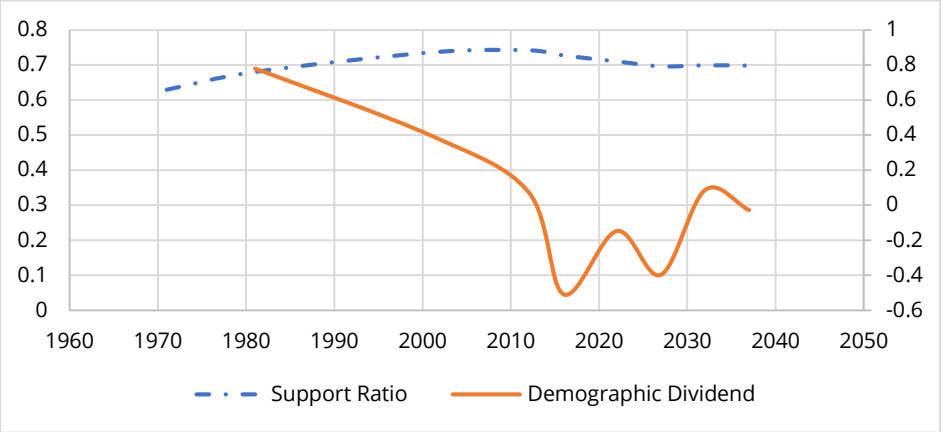
Age Group	0-14	15 - 29	30-59	60 -69	70 +
A. Per capita (LKR)					
Private Consumption, Health	9,232	10,531	10,781	13,039	16,678
Public Consumption, Health	6,766	7,240	7,240	8,955	9,385

Source: Authors' calculations based on HIES, 2016; CBSL, 2019, IHP 2007

Unlocking Sri Lanka's Demographic Advantage: Policies and Strategies for Sustainable Development

First Demographic Dividend: Figure 3 demonstrates that Sri Lanka can no longer rely on its first demographic dividend to finance necessary investments in enhancing productivity and human capital. Unfortunately, the demographic window of opportunity closed in 2018, although a rebound is expected after the mid-2020s due to a surge in fertility among older women around the year 2000 (Dissanayake, 2017). This sudden increase in fertility, which lasted for about 15 years, will result in additional individuals entering the labor force as effective workers by the mid-2020s. It is worth noting that the decline observed in the support ratio after 2000 was also influenced by the expanded base of the age structure pyramid resulting from increased fertility.

Figure 3: Support ratio and first demographic dividend, Sri Lanka



Source: Authors' calculations on HIES, 2016; CBSL, 2019

In Figure 3, the support ratio based on NTA estimates indicates the number of workers available to support each consumer in the economy. The first demographic dividend, represented by the growth in the support ratio, measures the impact of demographic change on income per person, assuming constant productivity and consumption patterns (Mason and Lee, 2006). The NTA-based support ratio reveals that there are generally only 7 effective workers for every 10 effective consumers in the economy, and this ratio is projected to remain relatively stable until 2037. It is unfortunate that Sri Lanka did not capitalize on its demographic advantage during the first demographic dividend, unlike many East Asian countries. The NTA analysis provides evidence for planners to harness the second demographic dividend and mitigate the challenges posed by the inevitable aging population structure that will occur in the mid-2030s.

Second Demographic Dividend: The second dividend is realized when demographic change leads to increased worker productivity. There is a strong association between the first and second demographic dividends. By focusing on enhancing the skills and health of the current labor force, the government can ensure improved productivity. This approach will result in asset growth that can fund the consumption needs of older individuals. Therefore, the government must implement appropriate education and skill development policies aligned with market demands to enhance labor force productivity. Increasing assets leads to higher productivity, thereby generating the potential for accelerated economic growth. However, the realization of demographic dividends depends on policy and behaviour that reflect changes in the population age structure. Sri Lanka must create a conducive environment, particularly through equitable human capital development policies, to minimize the burden of population aging on public expenditure.

To demonstrate the potential benefits of the second demographic dividend, we simulated a 0.5 percent annual increase in labor productivity on aggregate labor income. This rate was chosen as a conservative estimate compared to historical average labor productivity growth worldwide (Feenstra et al., 2015). The projected changes in population age distribution were used to assess the implied aggregate labor income until 2037. The results in Table 3 show that with demographic change alone, aggregate labor income is projected to increase to Rs. 4,572 billion in 2037 from Rs. 4,199 billion in 2016, an increase of Rs. 373 billion. Introducing labor productivity growth would further increase aggregate labor income by Rs. 872 billion in 2037 compared to the scenario with demographic change only. Therefore, Sri Lanka must explore potential funding sources to finance the necessary investments to harness the opportunities presented by the second demographic dividend.

Table 3: Simulated aggregate labor income (in Rs. Billions)

	2022	2027	2032	2037
Demographic change only	4361.40	4434.94	4494.89	4571.84
... with labor productivity growth	4492.24	4682.19	4864.11	5071.08

Source: Author's calculations on HIES, 2016; CBSL, 2019

Understanding Economic Behaviour by Age

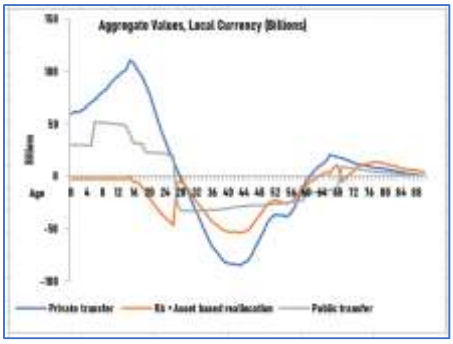
The NTA framework provides valuable insights into how the lifecycle is financed through resource reallocations. Various mechanisms contribute to the reallocation of resources among different age groups, including private transfers, public transfers, asset income, and savings. The existence of life cycle deficits among younger and older individuals raises questions about how consumption is funded when labor income falls short, particularly within those age brackets. The answer lies in the reallocation of resources, utilizing the surplus among the working-age group to finance the deficits of other age brackets.

Both the public and private sectors play a role in facilitating economic flows across different age groups. The public sector reallocates resources based on social obligations established through laws and regulations implemented at local, regional, and national levels. Education, public pensions, and healthcare programs are examples of public reallocation initiatives. On the other hand, private-sector reallocations are governed by voluntary contracts, social conventions, and established behavioural patterns, mediated through markets, households, families, charitable organizations, and other private institutions. Private saving, credit transactions, and familial support to children and older persons are notable examples of private reallocations.

Figure 4 demonstrates that per capita asset-based reallocation constitutes a significant portion of financing for older individuals, particularly those over 70 years of age. This indicates heavy reliance on assets rather than transfers among older age groups. This pattern persists at the aggregate level, as depicted in Figure 5. Younger individuals rely on net transfers to a significant extent for their consumption, while older Sri Lankans predominantly depend on assets. The analysis reveals that older individuals have accumulated real assets over time, which are used in later stages of life. They may have pension funds or personal savings accumulated during their working years, and they rely on asset income or gradually liquidate those assets after retirement. Another possibility is borrowing to finance current consumption and adjusting future consumption to repay the loans. These scenarios are reflected in Figure 4 and 5.

Figure 4: Transfers and asset-based reallocations, Sri Lanka

Figure 5: Aggregate transfers and asset-based reallocations, Sri Lanka



Source: Authors' calculations on HIES, 2016; CBSL, 2019, IHP 2007

Conclusion

In conclusion, Sri Lanka stands at a crucial juncture in harnessing its demographic advantage for sustainable development. The recommendations outlined in this policy brief emphasize the need for proactive and targeted policies to capitalize on the second demographic dividend, improve labor force participation rates, and address the evolving needs of the population.

Firstly, policymakers should prioritize the collection and utilization of data to inform investments and predict future public spending requirements based on projected demographic changes. Strengthening the national statistical system, particularly in capturing secondary distribution of income, will provide crucial insights for national planning and budgetary provisions. By understanding the age-specific economic behaviour and consumption patterns, Sri Lanka can better allocate resources and tailor policies to maximize the potential of its demographic advantage.

Secondly, Sri Lanka must focus on empowering women in the labor force by addressing barriers and creating favorable working conditions. Gender equity and equality should be promoted through equal employment opportunities, non-discriminatory work environments, recognition of women's unpaid care work, and social protection measures. A comprehensive strategy that includes improving the education system, providing skill development opportunities, and supporting women's entrepreneurship will contribute to equitable economic growth and ensure that no one is left behind.

By extending retirement ages, adjusting labor force ages, and encouraging longer labor force participation, Sri Lanka can mitigate the challenges posed by an aging population and optimize the contribution of older individuals to the economy. Mobilizing funding to finance investments and enhancing labor productivity will further boost economic growth and create better employment opportunities for the working-age population.

Moreover, future research and policy efforts should aim to capture the gender dimension of the generational economy by utilizing data from the Time Use Survey. By integrating age and gender-specific profiles, Sri Lanka can gain a comprehensive understanding of the demographic transition's implications, address gender disparities, and work towards achieving gender equality.

In summary, unlocking Sri Lanka's demographic advantage requires a multi-faceted approach that recognizes the importance of data-driven decision-making, gender empowerment, and strategic policy interventions. By embracing these recommendations, Sri Lanka can steer its demographic landscape towards sustainable development and inclusive growth.

References

Albrecht, S. L., & Kunz, P. R. (1980). The Decision to Divorce. *Journal of Divorce*, *3*(4), 319-337. https://doi.org/10.1300/J279v03n04_02

Amato, P. R. (2010). Research on Divorce: Continuing Trends and New Developments. *Journal of Marriage and Family*, *72*(3), 650-666. https://doi.org/10.1111/j.1741-3737.2010.00723.x

Ariplackal, R., & George, T. S. (2015). Psychological Components for Marital Distress and Divorce in Newlywed Indian Couples. *Journal of Divorce & Remarriage*, *56*(1), 1-24. https://doi.org/10.1080/10502556.2014.972210

Barnett, L. D. (2015). Explaining Law: Macrosociological Theory and Empirical Evidence. In *Explaining Law*. Brill. https://brill.com/display/title/26742

Becker, G. S. (1991). *A Treatise on the Family: Enlarged Edition*. Harvard University Press. https://doi.org/10.2307/j.ctv322v4rc

Bergvall, M., & Stanfors, M. (2022). *Intergenerational Transmission of Divorce in Sweden, 1905-2015* (pp. 1–46). Lund University.

Bernardi, F., & Martínez-Pastor, J.-I. (2011). Divorce risk factors and their variations over time in Spain. *Demographic Research*, *24*(31), 771-800.

Clayton, R. B. (2014). The third wheel: The impact of Twitter use on relationship infidelity and divorce. *Cyberpsychology, Behaviour and Social Networking*, *17*(7), 425-430. https://doi.org/10.1089/cyber.2013.0570

Donovan, R. L., & Jackson, B. L. (1990). Deciding to divorce: A process guided by social exchange, attachment and cognitive dissonance theories. *Journal of Divorce*, *13*(4), 23–35.

Hansen, H.-T. (2005). Unemployment and Marital Dissolution: A Panel Data Study of Norway. *European Sociological Review*, *21*(2), 135-148. https://doi.org/10.1093/esr/jci009

Jacob, S., & Chattopadhyay, S. (2016). Marriage dissolution in India: Evidence from census 2011. *Economic and Political Weekly*, *51*(33), Article 33.

Jalovaara, M. (2003). The joint effects of marriage partners' socioeconomic positions on the risk of divorce. *Demography*, *40*(1), 67-81. https://doi.org/10.1353/dem.2003.0004

Jones, G. W. (2023). Muslim and non-Muslim divorce trends in Southeast Asia in the 21st century. *Asian Journal of Social Science*, *51*(3), 137-145. https://doi.org/10.1016/j.ajss.2023.04.004

Kalmijn, M. (2007). Explaining cross-national differences in marriage, cohabitation, and divorce in Europe, 1990–2000. *Population Studies*, *61*(3), 243-263. https://doi.org/10.1080/00324720701571806

Kiernan, K., & Mueller, G. (1998). *The Divorced and Who Divorces?* (CASE paper CASE/7; pp. 1-40). London School of Economics.

Kreager, D. A., Felson, R. B., Warner, C., & Wenger, M. R. (2013). Women's Education, Marital Violence, and Divorce: A Social Exchange Perspective. *Journal of Marriage and the Family*, *75*(3), 565-581.

Maconachie, M. (1989). Exploring the marital histories of some white South Africans. *South African Journal of Sociology*, *20*(1), 47-52. https://doi.org/10.1080/02580144.1989.10432901

Maitra, S., & Gayathri, K. R. (2015). *Divorce Trends and its Implications for Children's Well-being: A Study of Family Court in Mumbai* (pp. 1-73). Tata Institute of Social Sciences.

Michael, E. M. (2013). *A study on the psychological well-being and quality of life of divorced Muslim women* [PhD Thesis, Mahatma Gandhi University]. https://shodhganga.inflibnet.ac.in:8443/jspui/handle/10603/42079

Mundu, G. B. (2015). *Marriage dissolution in India Pattern and associated factors* [PhD Thesis, International Institute for Population Sciences]. https://shodhganga.inflibnet.ac.in:8443/jspui/handle/10603/184670

Ngurthangpuii, & Geetha, V. J. (2017). Divorce Among Men And Women In Lawngtlai District, Mizoram: A Sociological Investigation Into The Causes. *International Journal of Engineering Development and Research(IJEDR)*, *5*(3), 1080-1086.

Nongbri, T. (2001). Democracy, Gender and Tribes: A Critical Appraisal of India's Constitutional Policies. *Indian Anthropologist*, *31*(2), 1-14.

Premsingh, J. G., & Philip, S. R. (2014). A Study on Increasing the Divorce Rate in Kerala. *IOSR Journal of Humanities and Social Science*, *19*(6), 58-60. https://doi.org/10.9790/0837-19615860

Rao, R., & Sekhar, K. (2002). Divorce: Process and Correlates A Cross-Cultural Study. *Journal of Comparative Family Studies*, *33*(4), 541–563.

Thadathil, A., & Sriram, S. (2020). Divorce, Families and Adolescents in India: A Review of Research. *Journal of Divorce & Remarriage*, *61*(1), 1-21. https://doi.org/10.1080/10502556.2019.1586226

Vasudevan, B., M, G. D., Bhaskar, A., Areekal, B., Lucas, A., & Chintha, C. (2015). Causes of divorce: A descriptive study from central Kerala. *Journal of Evolution of Medical and Dental Sciences*, *04*(20), 3418-3426. https://doi.org/10.14260/jemds/2015/494

Xaxa, V. (2004). Women and Gender in the Study of Tribes in India. *Indian Journal of Gender Studies*, *11*(3), 345-367. https://doi.org/10.1177/097152150401100304

Zohmangaihi, R. (2023). Divorce: Its Causes and Consequences in Mizo Society. *Indian Journal of Anthropological Research*, *2*(1), 43-61. https://DOI:10.47509/IJAR.2023.v02i01.04

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