

Ngawang Tendar, Chandrashekara Y P (2026). *Understanding Migration Trends of Tibetan Refugee in India: A Study of Tibetan Refugee in Karnataka. International Journal of Multidisciplinary Research & Reviews. 5(si2). 332-343.*



INTERNATIONAL JOURNAL OF  
MULTIDISCIPLINARY RESEARCH & REVIEWS

journal homepage: [www.ijmrr.online/index.php/home](http://www.ijmrr.online/index.php/home)

UNDERSTANDING MIGRATION TRENDS OF TIBETAN  
REFUGEE IN INDIA:  
A STUDY OF TIBETAN REFUGEE IN KARNATAKA

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**How to Cite the Article:** Ngawang Tendar, Chandrashekara Y P (2026). *Understanding Migration Trends of Tibetan Refugee In India: A Study of Tibetan Refugee In Karnataka. International Journal of Multidisciplinary Research & Reviews. 5(si2). 332-343.*



<https://doi.org/10.56815/ijmrr.v5si2.2026.332-343>

**Keywords**

*International Migration,  
Tibetancommunity,  
Demography.*

**Abstract**

This study focuses on Demography changes in Tibetan refugee community. It mainly emphasizes on the trends of international migration of Tibetan Refugee in South India (Karnataka). Drawing on successive census rounds and qualitative literature review, the study combines quantitative and qualitative methods to identify shifts in international migration trends. The analysis highlights the scale and direction of international mobility, and its demographic consequences. Despite its centrality to understanding contemporary Tibetan demography and community structure, international migration remains under-researched. This paper seeks to address this research gap.

**1. INTRODUCTION**

Migration has been long part of human existence, moving from place to place in search of better hunting grounds for survival. However, it was limited to short distances due to geographical barriers. The migration is the movement from one place, country and town to another within country or outside country. Migration is a form of geographical mobility or spatial mobility between one geographical unit to another, generally involving a change in residence from the place of origin or



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place of departure to the place of destination or place of arrival (United Nation, Multilingual Demographic). Migration is triggered by push and pull factors acting at place of origin and place of destination. Migrant according to the Indian Census, is a person whose place of birth is different from the place where he is being enumerated. During census survey, census considers place of last residence and place of immediate last residence

This paper focuses on international migration of Tibetan refugee of south India and trend associated with it. International migration is movement beyond international boundaries. A person is considered an international migrant if they moved across an international border to another country.

The refugee is not pulled out; she/he is pushed out". Kunz (1973:131). China's suppression of the Lhasa uprising of 1959 led to the flight of His Holiness the 14th Dalai Lama into exile followed by about 80,000 Tibetans (Planning Council 1998). Tibetans are one of the official refugees groups the Indian government has recognized and legally permitted to reside in India. Provided with R.C (Registration Certificate), a legal document issued by Indian authorities to Tibetan refugees. Refugee is a person who have fled their country because their lives, safety or freedom have been threaten by generalized violence, foreign aggression, internal conflicts, massive violation of human rights or the circumstances which have seriously disturbed public order. (Cartagena Declaration, 1984).

The Central Tibetan Administration (CTA), established in 1961 in Dharamshala, has the primary objective of preserving Tibetan identity and culture in exile. To address the evolving needs and grievances of the Tibetan community and settlements in India, the Planning Council was formed in 1988. Recognizing the importance of systematic and effective planning, the Council identified the need for comprehensive data across multiple fields. This led to the initiation of the Tibetan Demographic Survey (TDS). The first such survey, conducted in 1998 under the CTA, marked a milestone as the first comprehensive demographic study of Tibetans living outside Tibet.

## **2. OBJECTIVE**

The objective of this paper is to understand International Migration trend of Tibetan Refugee in India to show international migration induced population change in study area.

### **Study Area**

A Karnataka was formed on 1st November 1956 when the States Reorganization Act came into effect. At that time Karnataka was known as the State of Mysore. It was renamed Karnataka in the year 1973. Karnataka is geographically 191,791 square km (74,051 sq. mi) in area and counts for 5.83% of the total area of the country. Karnataka under leadership of former Chief Minister S. Nijalingappa extended generous support to Tibetan refugee by providing 3000 Acres of land in 1960 for Tibetan resettlement. Because of this, the very first kind of Tibetan settlement was established in 1961 in Byalakuppe.

This study is carried out for 5 major Tibetan settlements in Karnataka. Bylakuppe, Lugsung Samdupling, in Mysore district was established in 1961. A few years later another settlement Tibetan Dickey Larsoe 1968, also called TDL, was established. This was followed by the establishment of three more settlements in Karnataka State making it the state with the largest Tibetan refugee



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population; Rabgayling settlement in Gurupura village near Hunsur, Dhondenling settlement in Oderapalya near Kollegal; and Doeguling settlement at Mundgod in Uttara Kannada district.

### 3. METHODOLOGY

#### Sources of Data

Secondary data

#### Population Census Data

The present study is based on qualitative and quantitative data obtained from governmental sources such as Tibetan Demographic Survey (TDS), Tibetan Representative Zonal Office South, Regional office, Social and Resources Development Fund (SARD). TDS is the key source of Demographic data collected and this demographic data is published under decennial census. So far, Planning Council under administration of CTA has published two consecutive censuses, first one in 1998 and second in 2009. Census information gives a consolidated data on migration without specifying on administrative boundaries of Tibetan settlements in India. This roughly opens window to understand international migration trend

#### Data Analysis

Due to the inadequate and inconsistent data on international migration of Tibetan refugees, the data presented in this paper has been derived through extensive data available to the public, such as TDS reports and research paper published earlier. To give an overview on net migration figure of Tibetan refugees India.

#### 3.1. Trends of Traditional to International Migration

Migration is a common aspect when consider need of survival and identity existence likewise it revolves around place of origin and place of destination, like said a need of survival & existence Tibet in 1959 were forced to migrate from their homeland to neighboring countries like India, Nepal and Bhutan. This migration marks as first international migration of Tibetan people. What followed later were second wave of migration and third wave migration from Tibet.

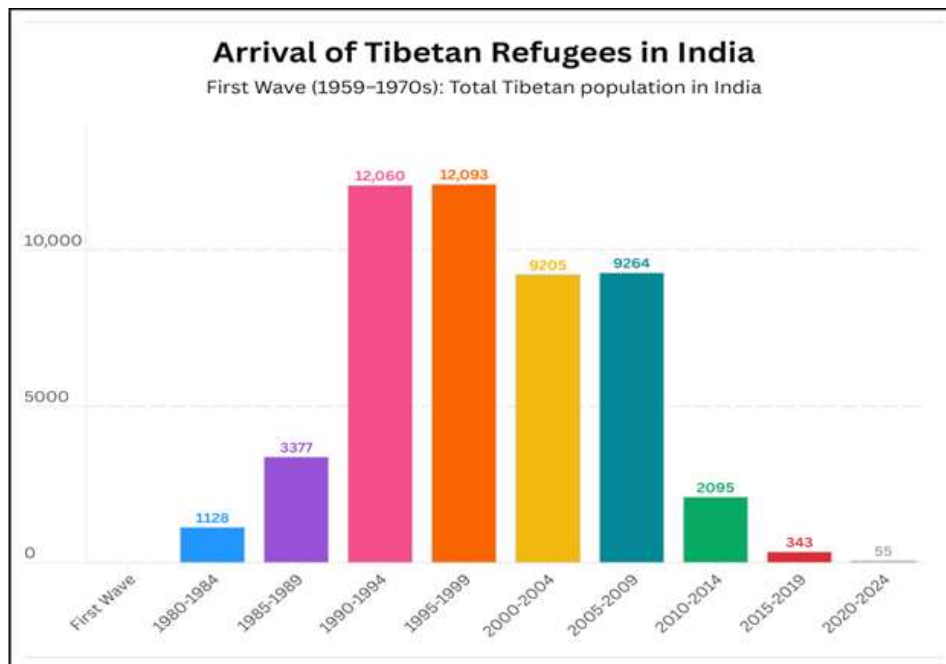
First Wave (1959–1970s): The first and largest wave followed the 1959 Tibetan uprising, when over 80,000 Tibetans fled with the Dalai Lama into India (Planning council, 1998).

Second Wave (1980s–mid-1990s): The second wave began in the 1980s, peaking between 1986 and 1996, when 25,000 Tibetans were admitted (Dorjee & Rinzin, 2004).

Third Wave (Late 1990s–present): The third and ongoing wave is smaller in scale, with declining refugee and visitor numbers. The flow is marked by a high proportion of monks and nuns seeking religious freedom and education. (MacPherson S, Bentz A, and Ghoso. D, 2008). Tibetan refugees coming from Tibet started declining in year 2008 for many reasons in particular to March 2008 protest and 2008 Beijing Olympics with massive surveillance at border area and high Himalayans passes. Tibetan fleeing from Tibet to seek refuge in India and Nepal became difficult.



Ngawang Tendar, Chandrashekara Y P (2026). *Understanding Migration Trends of Tibetan Refugee in India: A Study of Tibetan Refugee in Karnataka. International Journal of Multidisciplinary Research & Reviews. 5(si2). 332-343.*



**Figure 1: Tibetan Exodus after Chinese Occupation of Tibet 1959 in Form of Three Waves, 1959-2024**

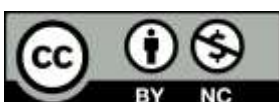
Source: Dorjee, T., & Rigzin, T. (2024). South Asia's Tibetan refugee community is shrinking, imperiling its long-term future. (Rigzin & Dorjee, 2024)

#### 4. TRANSNATIONAL MIGRATION

Another stream of international migration started from India to Western country which has given new trajectory to migration; in literary context it is expressed as transnational migration. Transnational is international movement of Tibetan refugees from their first country of asylum either India or Nepal to another country outside India or Nepal through lawful and regulated channels. Acquiring legal status and protection, as major of part of these international migration countries are signatories of the 1951 Convention on the Status of Refugees, the primary instrument establishing international norms for the treatment of refugees United Nations High Commissioner for Refugees (UNHCR, 1951). India is not a signatory of the 1951 Convention.

##### 4.1. Switzerland

The shift in Tibetan migration towards the West was first observed in the early 1960s, with Switzerland emerging as the first country to grant asylum to Tibetan refugees in 1960. Among the pioneers of this effort were Henri and Jacques Kuhn, owners of a metal manufacturing company in Rikon, who provided employment and housing for 1000 newly arrived exiles (Swissinfo.ch, 2010). Emphasizing the centrality of monasteries to Tibetan cultural and spiritual life, The Rikon

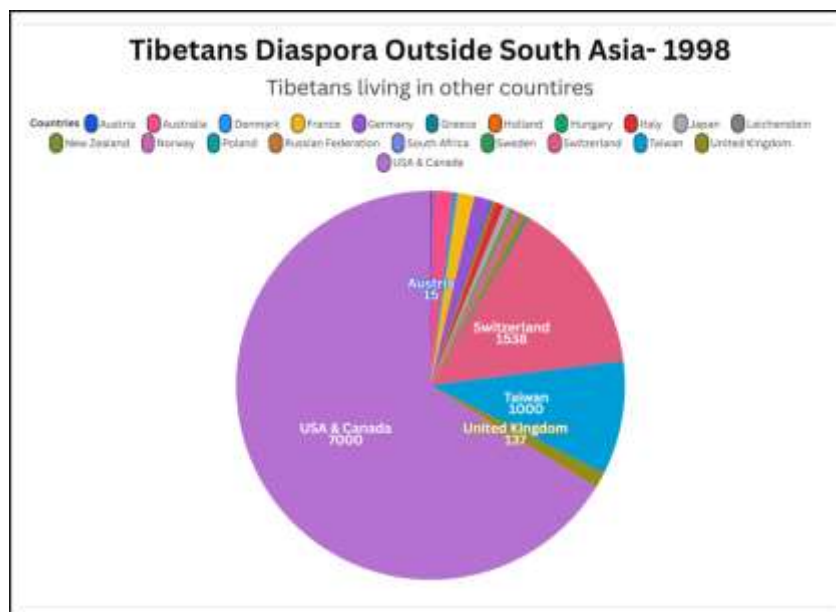


Ngawang Tendar, Chandrashekara Y P (2026). *Understanding Migration Trends of Tibetan Refugee in India: A Study of Tibetan Refugee in Karnataka. International Journal of Multidisciplinary Research & Reviews. 5(si2). 332-343.*

monastery was in 1968 by Trijang Rinpoche and Ling Rinpoche, marking a milestone in Tibetan third-country migration and cultural preservation. (Tibet Institute Rikon, 1968).

#### 4.2. North America (Canada & USA)

In 1971-1972, 228 Tibetans arrived in Canada from India and Nepal. The Canadian government organized this first wave of Tibetans into settlements in Ontario, Quebec, Manitoba, Alberta, and British Columbia. In 1990 U.S. Congress passed the Immigration Act of 1990. Section 134 of this act authorized the issuance of "1,000 immigrant visa to 'displaced' Tibetans living in India and Nepal" (MacPherson S, Bentz A, and Ghoso. D, 2008). The earliest known Tibetan community in North America was formed between 1967-69 when 27 Tibetans immigrated to the U.S to work as lumberjacks for the Great Northern paper company in Portage company, Maine (SARD,2020). This international migration adds to Tibetan Diasporas outside south Asia and continues to do so.



**Figure 2: Tibetan Diaspora outside Southeast Asia Data Compile from Planning Council 1998**

## 5. RESULTS

The Tibetan Demographic Survey (TDS) of 1998 and 2009 provide a comprehensive account of population change among Tibetans in exile. On 12 June 1998, the Tibetan exile population was enumerated at 122,078 from initial population of 80,000 in 1959, of this 85,147 live in India and 13,720 in Nepal. Increasing to 127,935 by 12 April 2009, a growth of 16,915. Of this, 94,203 lived in India; 13,514 in Nepal; 1,298 in Bhutan; and 18,920 in other countries (Planning Council 1998; Planning Commission 2009)

Migration remains a defining demographic process, 14.27 % in 1998 TDS and 20.16 % in 2009 TDS of Tibetans in exile have migrated. Intentions for future migration are high, with 68% of



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adults expressing plans to move abroad as per the survey conducted by TDS. Tibetans outside South Asia grew from 10,569 in 1998 to 18,920 in 2009, with over 8,430 migrating to other countries during this period (Planning Council 1998 & Planning Commission 2009).

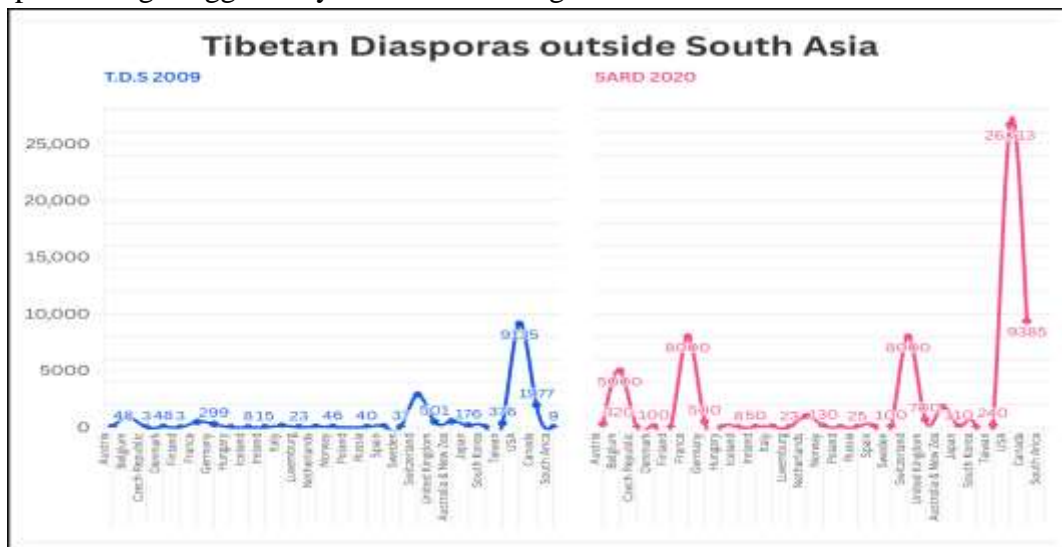
According to SARD report Social and Resources Development Fund, report 2020 international migration shows 62,477 a massive and vivid shift of 43,478 from TDS 2009 in demographic structure of Tibetan outside Southeast Asia. (SARD, 2020)

**Table 1: Tibetan Diaspora Population Change (Positive Growth)**

Planning Council 1998	Planning Council 1998	SARD 2020
10,569	18999	The Baseline Study of Tibetan Diaspora
Bhutan, Nepal excluded		26379 Europe, Australia
		36,098 North America
		62,477 Total
Diaspora growth	8,430 (Between TDS 1998&2009)	
	43,478 (Between TDS 1998& SARD 2020)	

Source: Compile data Planning Council 1998, Planning Council 1998, SARD 2020

Overall, the TDS 1998 and TDS 2009 indicate declining fertility and increasing migration, both at an increasing rate. Thus, resulting as the significant demographic change in the Tibetan communities in India. Study area over the past 6 decades has gone through a demographic change. Initial stage shows population change triggered by natural increase (TDS 1998). 1990 marks demographic change triggered by International Migration.



**Figure 3: Tibetan Diaspora outside South East Asia-Comparative Study**



Ngawang Tendar, Chandrashekara Y P (2026). *Understanding Migration Trends of Tibetan Refugee in India: A Study of Tibetan Refugee in Karnataka. International Journal of Multidisciplinary Research & Reviews. 5(si2). 332-343.*

Planning Council 1998, Planning Commission, SARD 2020

## 6. A STUDY OF SOUTH INDIA

### Demographic Change in Tibetan Settlements of Karnataka

Over the past seven decades, the Tibetan refugee settlements in Karnataka have experienced significant demographic shifts. In the initial stage, population change was primarily driven by natural increase, as reflected in the Tibetan Demographic Survey (TDS, 1998). Gradually, migration emerged as a silent but important factor, shaping long-term demographic outcomes. By the late 1990s, international migration had accelerated, influencing both the size and structure of the settlements. Following the first wave of settlement in South India during the 1960s, five major settlements were established—Lugsung, Doeguling, Dickey Larso, Rabgaling, and Dhondhenling making Karnataka the largest host of Tibetan refugees in India. The population trajectory of these settlements is outlined in the following tables.

**Table 1.1: Total of Population Major Settlements of South India, Karnataka**

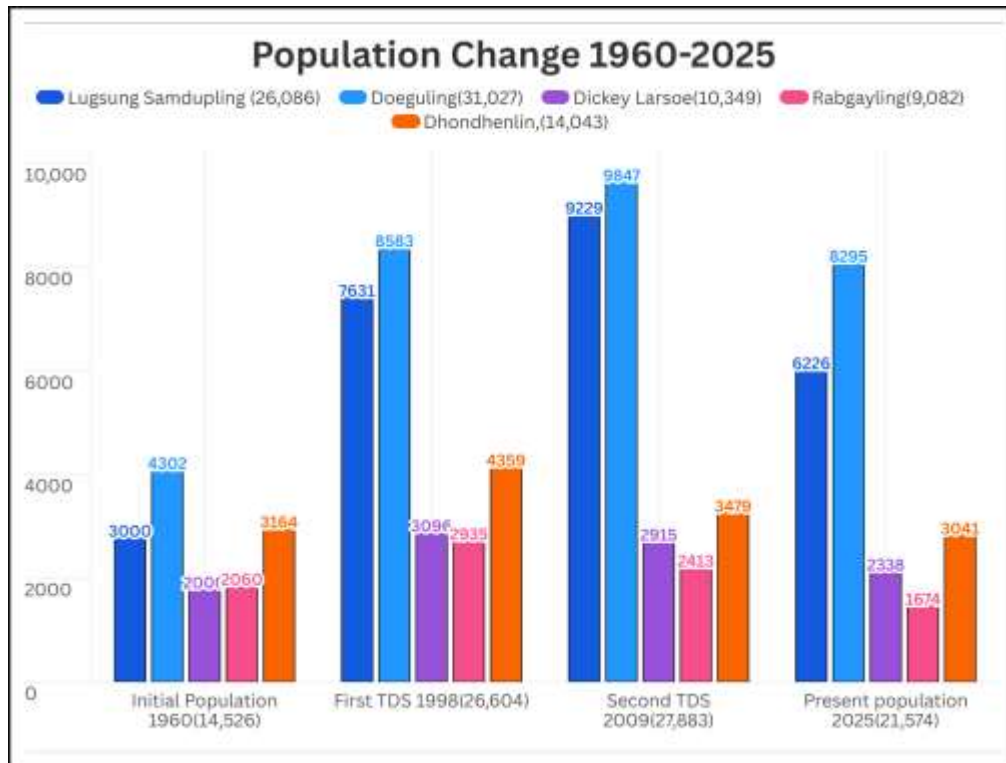
Settlements	Lugsung Samdupling	Doeguling	Dickey y Larsoe	Rabgayling	Dhondhenling
<b>Initial Population Year-1960</b>	3000	4302	2000	2060	3164
<b>14,526</b>					
<b>First Census Year- 1998</b>	7631	8583	3096	2935	4359
<b>26,604</b>					
<b>Second Census Year- 2009</b>	9229	9847	2915	2413	3479
<b>27,883</b>					
<b>Present population</b>	6226	8295	2338	1674	3041



Ngawang Tendar, Chandrashekara Y P (2026). *Understanding Migration Trends of Tibetan Refugee in India: A Study of Tibetan Refugee in Karnataka. International Journal of Multidisciplinary Research & Reviews. 5(si2). 332-343.*

<b>Year- 2025</b>					
<b>21,574</b>					

Source: Planning Council 1998, Planning Commission 2009, Tibetan Representative Office South



**Figure 4: Population Change from 1960-2025, Comparative Study Karnataka**

Source: Planning Council 1998, Planning Commission 2009, Tibetan Representative Office South  
 The demographic transition of Tibetan settlements in Karnataka over the past six decades reflects Warren Thompson’s Demographic Transition Model and C.P. Blacker’s five phases.

Stage 1, the high stationary phase, is not applicable, as Tibetan refugees were not tribal or isolated groups.

Cir\

Stage 2 emerged in the 1960s, when settlements such as Lugsung (3,000), Doeguling (4,302), Dickey Larso (2,000), Rabgaling (2,060), and Dhondhenling (3,164) were established, showing high fertility and declining mortality.

Stage 3 appeared in 1998, with Lugsung (7,631) and Doeguling (8,583) more than doubling due to natural growth and successive migration waves from Tibet.

Stage 4 was evident by 2009, with stabilization in Doeguling (9,847) and Lugsung (9,229), while smaller settlements stagnated. By 2025,



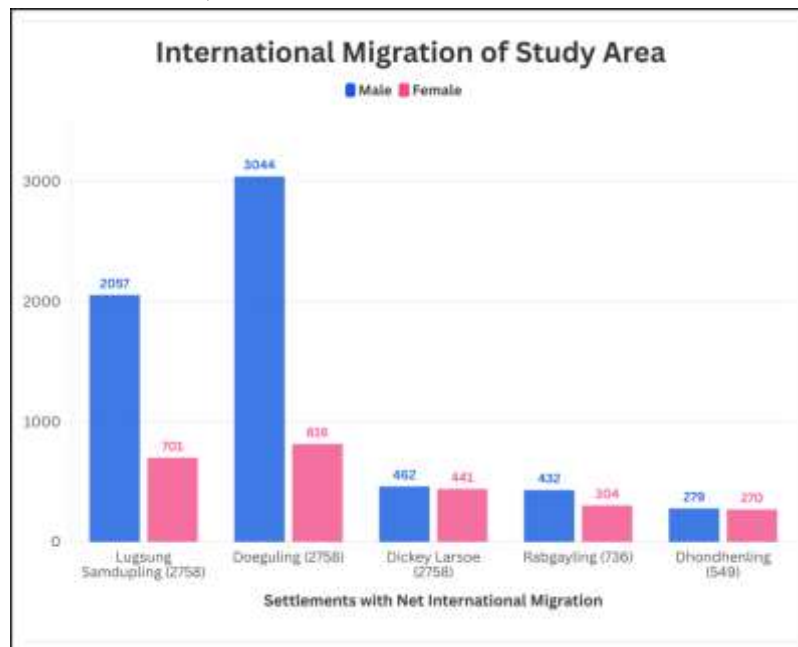
Ngawang Tendar, Chandrashekara Y P (2026). *Understanding Migration Trends of Tibetan Refugee in India: A Study of Tibetan Refugee in Karnataka. International Journal of Multidisciplinary Research & Reviews. 5(si2). 332-343.*

Stage 5 reflected decline, with Dickey Larso (2,338), Rabgaling (1,674), Lugsung (6,226), and Doeguling (8,295) contracting. This decline reflects aging, reduced in-migration, and youth out-migration to Western countries, with international migration being male-dominated, especially in Lugsung and Doeguling settlements.

**Table 1.2: International Migration Major Settlements of South India, Karnataka**

Settlements	Male	Female	Total
Lugsung Samdupling	2,057	701	2758
Doeguling	3,044	816	3860
Dickey Larsoe	462	441	903
Rabgayling	432	304	736
Dhondhenling	279	270	549

Source: Planning Commission 2009, CTA



**Figure 5: International Migration of Tibetan Refugee from South India, Karnataka**

Source: Planning Commission 2009

## 7. FINDINGS



Ngawang Tendar, Chandrashekara Y P (2026). *Understanding Migration Trends of Tibetan Refugee in India: A Study of Tibetan Refugee in Karnataka. International Journal of Multidisciplinary Research & Reviews. 5(si2). 332-343.*

This paper is primarily based on understanding international migration trend of Tibetan Refugee, narrowing down to study international migration of Tibetan refugee in Karnataka. Due to inadequate and inconsistent data on International migration this paper is compiled from various data sources with major themed around census data 1998 & 2009. Census data in it narrates whole demographic structure and population change.

### 7.1. International Migration Trends from India.

Over the past three decades, international migration has been the decisive factor shaping demographic/population change among Tibetan refugees in India. Demographic Transition Theory emphasizes fertility and mortality as central indicators of population change (Dyson, 2010), in the case of Tibetan settlements in India, international migration has overwhelmingly determined demographic patterns and population change.

Tibetan population has increased fourfold in Europe, threefold in Australia and decreased by a third in south Asia, since CTA 2009 TDS.

**Table 1.3: Threefold and fourfold increase in population in Europe, Australia, North America**

Country	TDS 1998	TDS 2009	SARD 2020
Switzerland	1538	2830	8000
France	158	486	8000
Belgium	0	863	5000
Netherland	0	65	1000
U.K	137	501	700
Australia	186	509	1817
North America	7000	11,112	36,098

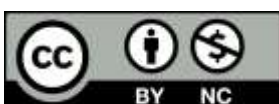
Year	TDS 2009	Latest 2022
Total Population in India	94203	63167
(Decrease by third)		

Tibetan Diaspora Outside South Asia	Total population in India 2020 (MHA)	Tibetan Population Survey 2022
62,477	72,312	63,167

Source: Planning Commission 2009, Planning council 1998, SARD 2020, CTA 202

### 7.2. Migration Dynamics from South India to the West

Karnataka host largest Tibetan population in India 21,574 and being first settlement in India with 14,526 Initial Population in 1960. Karnataka has witnessed profound demographic shifts. While



Ngawang Tendar, Chandrashekara Y P (2026). *Understanding Migration Trends of Tibetan Refugee in India: A Study of Tibetan Refugee in Karnataka. International Journal of Multidisciplinary Research & Reviews. 5(si2). 332-343.*

the first generation of Tibetans engaged primarily in agriculture, subsequent generations have increasingly abandoned farming in favor of education and professional careers. This occupational shift has encouraged international migration based on socio-economic aspirations, limited local opportunities, and expanding diasporas networks and family reunification. Tibetan International migrants in host countries are provided with asylum and eventually citizenship, enabling Tibetan refugees to secure stable futures abroad (Childs, 2008). As a result, Tibetan diaspora communities in North America and Europe have expanded significantly, while settlement populations in India have experienced stagnation or decline (Planning Commission, 1998 & 2009). Despite India's long-standing support in form of granting land for settlements, facilitating exile governance, and preserving cultural identity Tibetans remain classified as "foreigners" since India is not a signatory to the 1951 Refugee Convention Refugees (UNHCR, 1951). This legal limitation prevents Tibetans from owning land or working in government sectors, indirectly reinforcing migration aspirations.

## 8. SUGGESTION

Demographic information that reflects the characteristics of a society is fundamental to the development and socio-economic planning of any nation or community, and our exile situation is no different (Planning Council, 2009). Demographic information is a vital component of development planning and policymaking. Nations that conduct regular decennial or quinquennial censuses gain crucial insights into their demographic structure, allowing them to design appropriate interventions when required. One of the most significant gaps in demographic research relates to migration, particularly international migration, which alongside fertility and mortality constitutes a major driver of population change. Yet, in many cases, migration remains understudied and inadequately documented, leaving critical gap in our understanding of demographic dynamics. Regular censuses are essential in bridging this gap. Conducting population counts at fixed intervals ensures continuity of data along with availability of data in data bank and public domain, while prolonged vacuums in demographic information create wider gaps in policy design, resource allocation, systematic planning and sustainable development

As Auguste Comte aptly stated, "Demography is destiny."

## REFERENCE

- [1] Migration Policy Institute. (2008, May 1). MacPherson, S., & Ghoso, D. B. *Global Nomads: The Emergence of the Tibetan Diaspora (Part I)*, retrieved from (<https://www.migrationpolicy.org/article/global-nomads-emergence-tibetan-diaspora-part-i>), accessed on 12/09/2025.
- [2] Desal, T. (2014). Socio economic and fertility status of Tibetan communities in South India and impactsofmigration. Retrieved from ([http://shodhganga.inflibnet.ac.in:8080/jspui/bitstream/10603/120085/1/01\\_title.pdf](http://shodhganga.inflibnet.ac.in:8080/jspui/bitstream/10603/120085/1/01_title.pdf)), accessed on 14/09/2025.



Ngawang Tendar, Chandrashekara Y P (2026). *Understanding Migration Trends of Tibetan Refugee in India: A Study of Tibetan Refugee in Karnataka. International Journal of Multidisciplinary Research & Reviews. 5(si2). 332-343.*

- [3] Tsekyi, T., & Thimmaiah, N. (2014). Demographic Status of Tibetan Settlements in Karnataka. *International Journal of Advanced Research in Management and Social Sciences*, 3(10),21–30, retrieved from ([https://www.garph.co.uk/IJARMSS/Oct 2014/2.pdf](https://www.garph.co.uk/IJARMSS/Oct%202014/2.pdf)), accessed on12/09/2025.
- [4] Goldstein, M. C. (1981). High-Altitude Tibetan populations in the Remote Himalaya: Social transformation and its demographic, economic, and ecological consequences. *Mountain Research and Development*, 1(1), 5, retrieved from (<https://doi.org/10.2307/3672943>),accessed on 16/09/2025
- [5] Kunz, E. (1981). Exile and Resettlement: Refugee Theory. *International Migration Review*, 15, 42-51, retrieved from (<https://doi.org/10.2307/2545323>), on 16/09/2025
- [6] MacPherson Seonaigh, Ghoso, Dawa Bhuti (2008) :Global Nomads: The Emergence of the Tibetan Diaspora (Part I).Migration Policy Institute,
- [7] Planning Council,(1998). Tibetan Demographic Survey, 1998. Dharamsala, Central Tibetan Administration.
- [8] Planning Commission. 2009. Tibetan Community in Exile: Demographic and Socio-Economic Issues, 1998-2001. Dharamsala, Central Tibetan Administration.
- [9] Dorjee, T., & Rigzin, T. (2024). South Asia's Tibetan refugee community is shrinking, imperilling its long-term future. *The Online Journal of the Migration Policy Institute.*
- [10] MacPherson S, Bentz A, and Ghoso. D,2008. Global Nomads: The Emergence of the Tibetan Diaspora (Part I). *The Online Journal of the Migration Policy Institute.*
- [11] Bhatia, Shushum, Tsegyal Dranyi, and Derrick Rowley. 2002. "A Social and Demographic Study of Tibetan Refugees in India." *Social Science & Medicine* 54: 411 - 422.
- [12] Choedup, N. ( 2015). Washington University in St. Louis Washington University , WashU Scholarly Repository, From Tibetan Refugees to Transmigrants: Negotiating Cultural From Tibetan Refugees to Transmigrants: Negotiating Cultural Continuity and Economic Mobility Through Migration Continuity and Economic Mobility Through Migration.
- [13] Swissinfo.ch. (2010, March 26). *Why the Swiss accepted Tibetans with open arms.* Swiss Broadcasting Corporation, retrieved from ( <https://www.swissinfo.ch/eng/swiss-politics/why-the-swiss-accepted-tibetans-with-open-arms/8643062>), accessed from 19/09/2025
- [14] Bhatia, S., Dranyi, T., & Rowley, D. (2002). A social and demographic study of Tibetan refugees in India. *Social Science & Medicine*, 54(3), 411–422, retrieved from ([https://doi.org/10.1016/S0277-9536\(01\)00040-5](https://doi.org/10.1016/S0277-9536(01)00040-5)), accessed on16/09/2025.

