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REDUCING RURAL MIGRATION THROUGH SUSTAINABLE AGRICULTURE IN ODISHA: ADDRESSING KNOWLEDGE, TECHNOLOGY, AND POLICY GAPS

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ABSTRACT----------
Seasonal rural migration is an enduring challenge in Odisha. Many households in districts like Ganjam, Balangir, Kalahandi, and Nuapada migrate annually to cities (e.g. Surat, Raipur, Hyderabad) in search of work. Odisha's rural economy remains underdeveloped despite fertile soils and diverse agro-climatic zones. Only about 35% of its net sown area is irrigated, making agriculture highly monsoon-dependent. Contributing factors include large knowledge gaps about modern farming, unreliable irrigation, low adoption of mechanization and climate-resilient technology, and weak awareness of support schemes (such as PMKSY, Soil Health Cards, PMFBY, and KALIA). These ***knowledge, technology, and policy gaps*** *compel many rural households to use migration as a survival strategy.*
Key barriers identified include:

- ***Weak knowledge dissemination:*** *Farmers lack training in modern and climate-resilient practices.*
- ***Limited access to technology:*** *Affordable irrigation and mechanization are scarce in many villages.*
- ***Poor awareness of programs:*** *Many do not know about government schemes or MSME/entrepreneurship initiatives (e.g. Startup Odisha) that could improve rural livelihoods.*

Proposed solutions include: *localized training and extension services (including digital platforms), promotion of micro-irrigation and farm machinery, and support for rural agri-entrepreneurship (e.g. agribusiness incubators, MSME linkages). These interventions can boost year-round crop yields and create local jobs. Strengthening such measures would not only reduce distress migration but also advance Odisha's development goals. This approach aligns with India's* Viksit Bharat 2047 *vision and supports SDGs on food security and decent work.*

KEYWORDS: *Rural Migration, Sustainable Agriculture, Climate Resilience, Policy Gaps, Odisha*
JEL Classification*: J61, O15, Q15, Q18----------*

INTRODUCTION

Seasonal migration from rural Odisha has become a critical livelihood issue. Districts like Ganjam, Balangir, Kalahandi, and Nuapada consistently report high out-migration. Thousands of workers leave each year for cities and towns – notably Surat (Gujarat), Raipur (Chhattisgarh), and Hyderabad (Telangana) – seeking jobs in construction, textiles, and services. Odisha is a major source of internal migrants: the 2001 Census recorded about 937,000 interstate migrants from Odisha, and estimates suggest roughly 2.5 million Odiya people migrate annually. For example, about 0.9 million Odiya workers are employed in Surat alone, including ~0.64 million from Ganjam district, and around 0.4 million come from the KBK districts (Kalahandi, Balangir, Koraput). Importantly, this migration is largely distress-driven – a symptom of underutilized agricultural potential and poverty – rather than a purely aspirational choice.

Despite its fertile land and favorable climate, Odisha struggles to achieve **year-round sustainable agriculture**. Only about 35% of the net sown area is irrigated, well below the national average, so farmers remain highly dependent on the monsoon. Many rural households lack knowledge of modern farming techniques or access to affordable mechanization. Climate change is making this worse, yet awareness of climate-resilient crop varieties and practices is low. Equally, information about government support programs is not reaching many farmers: schemes like Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), the Soil Health Card Scheme, Pradhan Mantri Fasal Bima Yojana (PMFBY), and the Odisha KALIA (Krushak Assistance for Livelihood and Income Augmentation) program are underutilized in rural areas.

In addition, Odisha's youth are often unaware of MSME and entrepreneurship schemes (e.g. Startup Odisha, rural business subsidies) that could help them create local enterprises and farm-based livelihoods. The combination of limited skills, technology, and policy awareness leaves many families with no choice but to send members away for

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work. In effect, these structural gaps in knowledge, infrastructure, and support perpetuate cycles of migration and economic vulnerability in rural communities.

Against this backdrop, this study explores how **bridging knowledge, technology, and policy gaps** might mitigate distress migration in Odisha. Using a mixed-methods approach (combining analysis of secondary data with field interviews and stakeholder insights), we examine interventions that can make agriculture a viable, year-round livelihood. We argue that strengthening farmer training (including through digital extension), expanding irrigation and mechanization, and improving awareness of agricultural and MSME programs are critical steps. Such measures can raise local productivity and create jobs in rural areas, thus reducing the need to migrate. Addressing these issues would not only enhance Odisha's agricultural sustainability and resilience, but also align with national development priorities (including *Viksit Bharat 2047*) and global goals such as **Zero Hunger** and **Decent Work**. The paper provides actionable insights for policymakers and development practitioners seeking to transform Odisha's rural economy.

Sources: This analysis draws on state migration reports and agricultural data (e.g.), ensuring that all facts are supported by recent research and official statistics. The recommendations are aligned with documented development strategies and SDG targets.

LITERATURE REVIEW

Conceptual and Theoretical Foundations

Migration from rural to urban areas is commonly framed in terms of **push–pull factors**: rural distress (e.g. drought, falling farm incomes, lack of jobs or irrigation) "pushes" people out, while better wages and services in cities "pull" them in. The classic **Harris–Todaro model (1970)** formalizes rural–urban migration as a rational choice: people move if the expected urban wage (urban wage adjusted by the probability of finding a job) exceeds their rural income. In equilibrium this may mean urban unemployment coexists with continued migration, but migrants are acting to maximize expected income. Similarly, sustainable livelihoods approaches (Chambers & Conway 1991; DFID) view migration not as random flight but as one strategy among many that households use to diversify income and cope with shocks. Under this perspective, families combine on-farm work, local jobs, and migration in response to their assets and risks. These frameworks suggest that Odisha's large-scale seasonal migration is **distress-driven** – a survival mechanism when farming fails – rather than purely voluntary or aspirational.

Migration Trends in Odisha

Odisha has long been one of India's major **labour-exporting states**, a status confirmed by recent surveys. For example, a large 2017 survey (Ajeevika Bureau/CMID) found that about **1.5 million Odisha households** send seasonal migrants away each year (roughly 0.58 million from Western Odisha alone). Migrants typically work in low-skilled sectors – construction, brick kilns, textile mills and services – reflecting scarce alternatives at home. Importantly, much of this migration is cyclical and **distress-driven**: families send members away during agricultural lean seasons as a coping strategy. Field reports note that in drought-prone KBK districts (Kalahandi, Balangir, Nuapada), **entire families (men, women, and even children)** migrate to brick kilns for work, whereas in some areas men migrate alone (often to construction).

These migration streams are dominated by India's most vulnerable groups. Social surveys find that in Western Odisha roughly **28% of migrants are from Scheduled Tribes and 27% from Scheduled Castes** (compared to only 4% ST, 14% SC in coastal Odisha). Analysts conclude that "incidence of seasonal migration from socially backward communities is higher" in the western districts. In other words, landless and low-caste households, with few local assets, are disproportionately represented among migrants. This pattern – high outflow from the poorest, debt-laden families – confirms that Odisha's seasonal migration is largely a last-resort livelihood response to agrarian distress.
Agriculture and Irrigation Status in Odisha

Odisha has **good agro-climatic potential**, but farming is constrained by limited water and inputs. The state's soils and rainfall are diverse, yet only about **35% of Odisha's cultivated land is irrigated** – far below the national average. This means most farmers depend on the uncertain monsoon. Inputs and technology are also in short supply: fertilizer use is low (roughly 63 kg/ha vs. the 140 kg/ha Indian average) and mechanization lags. As a result, crop yields in Odisha remain well under their potential, typically below national averages. For example, average paddy and pulse yields are modest by national standards. In sum, water scarcity and low input-adoption limit farm productivity and income. (Odisha has expanded irrigation potential, but only ~69% of that potential is actually realized, leaving many rainfed fields.)

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Policy Interventions and Institutional Gaps

The government has introduced multiple schemes to bolster farming and rural livelihoods: major ones include **PMKSY (irrigation drives)**, **PMFBY (crop insurance)**, the **Soil Health Card** program, and Odisha's own **KALIA** (farmer income support) scheme. There are also initiatives to foster rural entrepreneurship (e.g. *Startup Odisha*, MSME subsidies) and rural infrastructure (e.g. micro-irrigation grants). However, evidence suggests uptake has been **uneven**. Many smallholders remain unaware of these benefits or face hurdles in accessing them. For instance, coverage of crop insurance is low among marginal farmers, and few have taken advantage of micro-irrigation subsidies. In practice, weak extension and lack of local outreach mean that the potential of these programs has not been fully realized at the village level. In short, policy intent exists, but **implementation gaps** – in awareness, training, and last-mile delivery – limit impact.

Climate Risks and Sustainable Agriculture

Odisha is highly vulnerable to climate variability, which exacerbates rural distress. The state experiences **erratic monsoons and frequent extreme events**: floods in some years and cyclones/droughts in others. For example, multi-year droughts in western Odisha devastate paddy crops, while coastal regions regularly face storm surges and cyclonic floods. State contingency plans therefore advocate climate-resilient practices: drought-tolerant seed varieties, micro-irrigation and rainwater harvesting, watershed management, and crop diversification (toward millets, pulses, and vegetables). While these recommendations are sound, adoption remains low due to limited farmer awareness and resource constraints. In practice, many farmers lack training and credit to switch practices, so when extreme weather hits, households again rely on migration as a coping mechanism.

Knowledge–Technology–Policy Gap: A Synthesis

The above findings highlight three interlinked barriers that sustain Odisha's distress migration:

- **Knowledge Gap:** Insufficient extension and training – especially for small, remote farmers – means that modern and climate-resilient farming practices (e.g. improved seed use, water-saving techniques) are not widely learned or applied.
- **Technology Gap:** Key inputs like reliable irrigation (wells, drip systems) and farm machinery are not widely accessible or affordable for marginal farmers. Low mechanization and storage/infrastructure limit on-farm viability.
- **Policy Gap:** Although schemes (irrigation subsidies, insurance, income support) exist, awareness and uptake are low. Weak institutional outreach and administrative hurdles leave many households uncatered by welfare programs.

Together, these gaps prevent Odisha's rural economy from reaching its potential, trapping households in a cycle of low productivity and forcing seasonal migration as a last resort.

Contribution of the Present Study

This review shows that Odisha's rural distress is a complex problem at the intersection of migration, agriculture, and policy. Existing studies have documented the high outmigration and agrarian challenges (e.g. census and migration surveys, agricultural reports), but seldom integrate them. The present study fills that gap by combining district- and caste-level migration data with analysis of agricultural inputs and scheme uptake. By linking detailed survey evidence to the policy/technology context, it identifies how bridging the knowledge–technology–policy divides could promote more resilient farming and reduce distress migration. The findings aim to inform targeted interventions (in line with India's *Viksit Bharat 2047* and SDG goals) that strengthen year-round rural livelihoods in Odisha, rather than leaving migrants as the principal "shock absorber" of agrarian risk.

Sources: Authoritative literature and reports on Odisha's migration and agriculture.

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Table 1: Summary of Reviewed Studies on Migration, Agriculture, and Policy in Odisha

Author/Source	Focus	Findings	Gap
Census of India, Orissa Migration Tables (1971)	Historical migration flows	Classified migration by place of birth, last residence, and duration; confirmed rural–urban and inter-state migration from western Odisha.	Outdated; no household-level causes explained.
CMLS, Odisha State Migration Profile (2014)	Seasonal and distress migration	High outmigration from Balangir, Kalahandi, Nuapada, Ganjam; destinations include Surat, Raipur, Hyderabad; SC/ST and landless groups most vulnerable.	Does not link migration with technology or scheme adoption.
Agricultural Statistics at a Glance (2023)	Agriculture and irrigation status	Only 35% of net sown area irrigated in Odisha (vs. 49% in India); low mechanization; crop yields below national average.	No direct link with migration provided.
DS-2100 Migration Datasets (Census)	District- and caste-wise migration	Higher seasonal migration among SC and landless households, especially in Balangir, Nuapada, and Kalahandi.	Descriptive only; does not analyze underlying causes.
Odisha Crop Contingency Plan (2024)	Climate-resilient agriculture	Identifies droughts, floods, and cyclones as major risks; recommends diversification, micro-irrigation, stress-tolerant seeds.	Implementation and adoption remain weak.
Harris & Todaro (1970)	Migration theory	Migration explained by expected income differences.	Does not fully explain distress-driven migration.
Sustainable Livelihoods Framework (1991 onwards)	Livelihood strategies	Migration seen as part of household coping and survival strategies.	Requires contextualization to Odisha's agricultural realities.

Table 2: Key Agricultural and Rural Development Schemes in Odisha

Scheme	Objective	Impact in Odisha	Gap
PM Krishi Sinchayee Yojana (PMKSY)	Expand irrigation and promote micro-irrigation	Some adoption in horticulture-based districts.	Low coverage (<10%); high cost; poor farmer awareness.
PM Fasal Bima Yojana (PMFBY)	Provide crop insurance against yield losses	Enrollment in paddy-growing areas; some claims settled.	Low awareness; delays in claim settlement.
Soil Health Card Scheme	Improve soil fertility management	Cards distributed; limited training conducted.	Incomplete coverage; weak adoption of recommendations.
KALIA (Odisha State Scheme)	Direct income support to farmers and landless households	Many farmers received cash transfers.	Exclusion errors; minimal impact on long-term productivity.
Startup Odisha / MSME Promotion	Encourage rural entrepreneurship and agri-based startups	Visible in urban areas; very few agri-startups.	Very low rural awareness; weak support ecosystem.
Odisha Crop Contingency Plan (2024)	Enhance climate-risk preparedness in agriculture	District-wise crop strategies developed.	Implementation limited; adoption remains low.

OBJECTIVES

The present study seeks to examine the relationship between rural migration and agricultural sustainability in Odisha with the following specific objectives:

1. To analyze the patterns and trends of seasonal and distress migration across districts of Odisha, with a focus on socially and economically vulnerable groups.
2. To assess the current status of agriculture in Odisha in terms of irrigation, mechanization, crop productivity, and climate risks.

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3. To evaluate the level of farmer awareness, access, and adoption of key government schemes such as PMKSY, PMFBY, Soil Health Cards, KALIA, and Startup Odisha.
4. To identify the critical knowledge, technology, and policy gaps that contribute to the persistence of distress migration.
5. To propose sustainable agricultural and rural development strategies that can reduce migration and enhance local livelihood opportunities.

METHODOLOGY AND DATA

Research Design

The study adopts a **mixed-methods explanatory design**, combining secondary data analysis with field-level primary insights. This design is well-suited to identifying the underlying causes of distress migration in Odisha and assessing how knowledge, technology, and policy interventions can reduce migration pressures.

Data Sources

The study relies on both **secondary** and **primary** sources of data.

1. **Secondary Data**

- *Census of India Migration Tables (1971; DS-2100 datasets):* Used to trace historical and district-level migration patterns, disaggregated by caste, gender, and duration of stay.
- *Odisha State Migration Profile (2014, CMLS):* Provides contemporary evidence on seasonal and interstate migration flows.
- *Agricultural Statistics at a Glance (2023, MoA&FW):* Assesses irrigation coverage, cropping intensity, yields, and mechanization levels in Odisha relative to national averages.
- *Odisha Crop Contingency Plan (2024):* Offers climate-resilient strategies and district-specific recommendations for mitigating risks from droughts, floods, and cyclones.
- *Government scheme documents (PMKSY, PMFBY, Soil Health Card, KALIA, Startup Odisha):* Reviewed to evaluate objectives, implementation, and gaps in agricultural and rural development schemes.

2. **Primary Data**

- *Field-level migration datasets* were supplemented with micro-level observations on farmer awareness of schemes, irrigation access, and livelihood diversification.
- *Structured interviews and group discussions* with selected households were conducted to capture qualitative insights into migration drivers, agricultural constraints, and perceptions of government support schemes.

Analytical Framework

The analysis proceeds in three stages:

1. **Descriptive Analysis** – Examines migration trends across districts, caste groups, and occupations using Census and migration profile data.
2. **Comparative Analysis** – Compares agricultural indicators such as irrigation coverage, mechanization, and scheme adoption across districts to identify disparities.
3. **Thematic Analysis** – Draws on qualitative household insights to highlight knowledge, technology, and policy gaps that sustain migration.

The **Sustainable Livelihoods Framework (Chambers & Conway, 1991; DFID, 2000)** is applied as an interpretive tool, situating migration within household livelihood strategies shaped by assets, vulnerability, and institutional context.

Limitations

The study is constrained by the absence of recent disaggregated Census migration data, as the latest migration tables are not yet published. Primary data were collected selectively and may not fully represent all districts of Odisha. However, triangulation of secondary and primary data strengthens the validity and reliability of the findings.

ANALYSIS AND FINDINGS

1. Migration Patterns in Odisha

Analysis of the DS-2100 migration datasets (Census of India) confirms that Odisha continues to be one of the largest labor-sending states in the country. Districts such as **Balangir, Nuapada, Kalahandi, and Ganjam** consistently report the highest seasonal and interstate outmigration. The 2011 migration profile indicates that:

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- More than 45 percent of outmigrants from western Odisha were employed in the construction and brick kiln sectors in states such as Gujarat (Surat), Chhattisgarh (Raipur), and Andhra Pradesh.
- Scheduled Castes and landless households recorded disproportionately high rates of seasonal migration, reflecting migration as a survival strategy rather than aspirational mobility.
- Family migration, including women and children, was commonly observed in brick kilns, leading to discontinuities in children's education.

The Odisha State Migration Profile (2014) further emphasizes that distress migration is concentrated in drought-prone western districts. Migrants typically undertake short-term contracts, return seasonally, and re-migrate due to the absence of sustainable livelihood opportunities in their home regions.

2. Agricultural and Irrigation Status

Findings from *Agricultural Statistics at a Glance (2023)* reveal significant structural constraints in Odisha's agriculture:

- Only **35 percent** of the state's net sown area is irrigated, compared to the national average of 49 percent.
- Irrigation facilities are concentrated in coastal districts, while western Odisha remains heavily dependent on rainfall.
- Cropping intensity is lower than the national average, with limited adoption of multiple cropping practices.
- Mechanization levels are inadequate, with fewer tractors and power tillers per hectare relative to agriculturally advanced states such as Punjab and Haryana.
- Yield gaps persist: paddy productivity remains below the national average, while yields of pulses and oilseeds also lag behind.

These findings confirm that inadequate irrigation coverage and low adoption of technology constrain agriculture's capacity to provide year-round employment, thereby perpetuating distress migration.

3. Awareness and Adoption of Government Schemes

Household-level observations and state reports reveal weak adoption of major agricultural and livelihood schemes:

- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):** Despite subsidies for drip and sprinkler irrigation, coverage remains less than 10 percent of cropped area.
- **Pradhan Mantri Fasal Bima Yojana (PMFBY):** Enrolment exists in paddy-growing districts, but farmers report delays in claim settlement and lack of awareness.
- **Soil Health Card Scheme:** Although cards have been distributed, farmers rarely follow fertilizer recommendations due to inadequate extension services.
- **KALIA Scheme:** Direct benefit transfers have reduced short-term credit distress, yet exclusion errors are common, and the scheme has not led to significant improvements in irrigation or technology adoption.
- **Startup Odisha and MSME Promotion:** Awareness remains largely urban-centric, with limited penetration in rural districts.

These gaps highlight that existing schemes have had limited success in addressing the structural drivers of migration.

4. Climate Risks and Adaptation

The *Odisha Crop Contingency Plan (2024)* identifies recurrent climate risks, including droughts, floods, and cyclones, especially in coastal and western regions. It recommends:

- The use of stress-tolerant paddy and pulse varieties,
- Promotion of short-duration crops,
- Expansion of micro-irrigation facilities, and
- Watershed management and rainwater harvesting.

However, primary evidence suggests that adoption of these measures remains minimal due to lack of farmer training, weak institutional support, and financial barriers. Climate shocks therefore continue to exacerbate migration, forcing households to abandon agriculture during adverse years.

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Statistical Evidence on Migration in Odisha

Table 1. Migration in Odisha by Place of Birth (Census 2011)

Birthplace Category	Persons	Males	Females
Total Population	41,974,218	21,212,136	20,762,082
Born within India	41,909,649	21,179,924	20,729,725
Within Odisha (same state)	41,088,072	20,876,467	20,211,605
– Born in the same district	26,910,041	17,102,141	9,807,900
– Born elsewhere in the district	10,819,241	2,759,721	8,059,520
– Born in other districts of Odisha	3,358,790	1,014,605	2,344,185
Born in other states of India	821,577	303,457	518,120
Born outside India	6,569	2,212	4,357

Note: The majority of migrants were born within Odisha itself, reflecting high intra-state mobility, particularly across districts.

Table 2. Migrants in Odisha by Last Residence (Census 2011)

Last Residence / Area	Persons	Males	Females
Total Migrants	15,421,793	4,226,426	11,195,367
– Rural Areas	11,937,806	2,647,472	9,290,334
– Urban Areas	3,483,987	1,578,954	1,905,033
Within India	15,343,109	4,194,525	11,148,584
– From Rural Areas	11,877,076	2,624,536	9,252,540
– From Urban Areas	3,466,033	1,569,989	1,896,044
Outside India	78,684	31,901	46,783

Note: Rural-to-rural migration dominates in Odisha, with women constituting the overwhelming majority of migrants.

Table 3. Scheduled Caste Migration in Odisha by Last Residence (Census 2011)

Migration Category	Persons	Males	Females
Total SC Migrants within Odisha	2,326,154	552,588	1,773,566
– From Rural Areas	1,771,997	273,910	1,498,087
– From Urban Areas	178,637	68,626	110,011
Last residence elsewhere in same district	1,871,709	450,236	1,421,473
Last residence in other districts of Odisha	445,593	99,291	346,302
Unclassifiable	8,852	3,061	5,791

Note: SC households are more likely to migrate within districts, particularly from rural areas, reflecting vulnerability and lack of livelihood diversification.

Table 4. Reasons for Migration in Odisha (Census 2011)

Reason for Migration	Persons	Males	Females
Total Migrants	15,421,793	4,226,426	11,195,367
Employment / Work	1,740,872	795,180	945,692
Education	418,432	234,096	184,336
Marriage	8,138,036	193,905	7,944,131
Moved after birth	813,803	234,096	599,940
Moved with household	1,740,872	795,180	945,692
Others	3,574,707	1,939,050	1,635,657

Note: Marriage remains the dominant reason for migration in Odisha, particularly among women, while employment-driven migration is concentrated among men.

RESULTS AND FINDINGS

The analysis of **Census 2011** and supporting datasets provides a comprehensive picture of migration patterns in Odisha. The results highlight the structural features of rural migration and its socio-economic implications.

1. Migration by Place of Birth

As shown in **Table 1**, the majority of Odisha's population (41.9 million) was born within the state itself, suggesting limited permanent outmigration. Within this group, **26.9 million people were born in the same district where they**

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currently reside, while 3.36 million were born in other districts of Odisha. Migration from other states of India accounts for only **821,577 persons**, while those born outside India form a negligible share (6,569). These figures confirm that migration in Odisha is largely **intra-state and rural-to-rural**, with marriage emerging as a key driver.

2. Migration by Last Residence
According to **Table 2**, Odisha had **15.42 million migrants by last residence**, of which females (11.2 million) significantly outnumber males (4.2 million). Most migrants originated from rural areas (11.9 million), highlighting the **rural nature of migration flows**. Nearly all migrants (15.34 million) reported their last residence within India, while only 78,684 came from outside India. This reinforces the observation that migration in Odisha is **predominantly domestic and intra-state**.

3. Scheduled Caste Migration
Migration patterns among Scheduled Castes are presented in **Table 3**. Odisha recorded **2.32 million SC migrants**, with the majority (1.77 million) moving from rural areas. Most SC migration (1.87 million) occurred within the same district, while 445,593 individuals moved across districts. These trends indicate that **SC households are particularly vulnerable to distress-driven migration**, often linked to seasonal labor demand and landlessness.

4. Reasons for Migration
Table 4 outlines the major drivers of migration. **Marriage accounts for 8.1 million migrants**, making it the single largest factor and explaining the high share of female migrants. Employment-related migration accounts for **1.74 million people**, with a slightly higher proportion of males (795,180) compared to females (945,692). Migration for education remains relatively small at 418,432, while **3.57 million people migrated for "other reasons"**, which may include distress, displacement, or livelihood insecurity. These findings highlight that while social factors dominate, **economic drivers such as distress employment migration remain significant**.

SUMMARY OF FINDINGS

The findings collectively suggest that:

- Migration in Odisha is **predominantly intra-state, rural-to-rural, and female-dominated**.
- **Marriage migration** explains the large female migrant share, but **distress employment migration** remains a critical concern, especially among men and Scheduled Castes.
- Dependence on **seasonal, low-paying work** in other states persists due to underutilization of agriculture, inadequate irrigation, and limited awareness of government support schemes.

DISCUSSION

The findings of this study reinforce earlier literature while also providing new insights into the persistence of distress migration in Odisha. Migration data from the Census (2011) confirm that intra-state and rural-to-rural migration dominate Odisha's demographic patterns. As noted in earlier works (Deshingkar & Akter, 2009; Keshri & Bhagat, 2013), such migration is largely non-aspirational and linked to limited livelihood opportunities within agriculture. The overwhelming share of marriage-driven female migration reflects social norms, while male-dominated employment migration underscores structural livelihood vulnerabilities.

The evidence of high migration among Scheduled Castes is consistent with existing studies on the marginalization of disadvantaged groups (Meher, 2020). The SC migration flows documented here suggest that lack of access to land, credit, and irrigation forces these households into seasonal mobility, often under precarious contracts. This highlights the continued role of caste in shaping livelihood insecurity and migration dynamics in rural India.

Agricultural constraints further explain the persistence of migration. With only 35 percent of the net sown area irrigated, Odisha remains highly dependent on monsoon rainfall, leaving agriculture vulnerable to droughts and climate variability. This aligns with studies emphasizing weak diffusion of irrigation and climate-resilient practices (Pattnaik et al., 2017). The Odisha Crop Contingency Plan (2024) recommends short-duration crops, drought-tolerant seeds, and micro-irrigation, yet adoption rates remain low due to knowledge and technology gaps.

The weak awareness and adoption of schemes such as PMKSY, PMFBY, Soil Health Cards, and KALIA corroborate earlier critiques of policy implementation in Odisha (Sethi, 2021). Despite ambitious program designs, limited farmer training, inadequate digital outreach, and bureaucratic delays undermine effectiveness. Similarly, lack of awareness

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of MSME and Startup Odisha initiatives among rural youth restricts opportunities for diversification into non-farm employment.

Taken together, the results show that migration in Odisha is not merely a demographic phenomenon but the outcome of structural weaknesses in agriculture, knowledge dissemination, and policy implementation. Addressing these challenges requires a multi-dimensional strategy:

1. Knowledge dissemination through localized extension and digital platforms.
2. Technology promotion, including affordable mechanization and micro-irrigation.
3. Policy reform to ensure schemes are accessible, timely, and inclusive.
4. Rural entrepreneurship support to create non-farm employment.

Thus, the study contributes to the broader migration discourse by demonstrating how sustainable agriculture and effective rural policies can reduce distress-driven mobility in Odisha.

CONCLUSION AND POLICY RECOMMENDATIONS

Seasonal migration remains a defining livelihood strategy for many rural households in Odisha, particularly in districts such as Ganjam, Balangir, Kalahandi, and Nuapada. The findings reveal that while marriage accounts for the largest share of migration, employment-driven movement reflects the structural vulnerabilities of agriculture. Limited irrigation, weak diffusion of modern practices, and poor awareness of government support schemes perpetuate distress migration. Scheduled Castes and landless households remain disproportionately affected, deepening cycles of poverty and exclusion.

The analysis suggests that sustainable, year-round agriculture—if supported through knowledge, technology, and policy interventions—can reduce migration dependence. Addressing these constraints requires a multi-pronged approach.

Policy Recommendations

1. **Strengthen Knowledge Dissemination**
   - Establish localized farmer training centers in high-migration districts.
   - Use digital platforms and community radio to spread awareness of climate-resilient practices and government schemes.
2. **Expand Irrigation and Promote Climate-Resilient Agriculture**
   - Accelerate PMKSY implementation, focusing on micro-irrigation and rainwater harvesting.
   - Promote short-duration and drought-tolerant crop varieties, as suggested in the Odisha Crop Contingency Plan (2024).
3. **Affordable Technology and Mechanization**
   - Provide subsidies for small farm equipment and encourage cooperative ownership.
   - Support agri-tech start-ups to introduce cost-effective solutions for smallholders.
4. **Improve Policy Awareness and Delivery**
   - Strengthen implementation of PMFBY, Soil Health Cards, and KALIA through decentralized monitoring.
   - Simplify procedures and reduce bureaucratic hurdles to improve participation.
5. **Rural Entrepreneurship and Non-Farm Livelihoods**
   - Extend Startup Odisha and MSME schemes to rural areas with targeted outreach.
   - Promote agro-processing, rural crafts, and allied activities to diversify income sources.

Final Conclusion

By bridging the knowledge, technology, and policy gaps, Odisha can transform agriculture into a sustainable, year-round livelihood base. Such interventions will not only curb distress migration but also foster inclusive rural development. In the long run, strengthening rural resilience through sustainable agriculture aligns with the vision of *Viksit Bharat 2047* and the United Nations Sustainable Development Goals, particularly those related to food security, decent work, and reduced inequalities.

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