



Karnataka State Multisectoral Action Plan for Salt Reduction

Acknowledgements

The Karnataka State Action Plan on Salt Reduction and Promotion of Healthy Dietary Habits is the outcome of a collaborative effort involving government departments, academic institutions, public health experts, development partners, and civil society organisations committed to advancing the prevention and control of non-communicable diseases in Karnataka.

We sincerely thank the Department of Health and Family Welfare, Government of Karnataka, for its leadership and continued commitment to promoting healthy dietary practices and reducing the burden of hypertension and cardiovascular diseases.

We express our profound gratitude to Dr Bhagavan B. C., Vice Chancellor, Rajiv Gandhi University of Health Sciences (RGUHS), Bengaluru, for his visionary leadership and guidance in chairing the Technical Advisory Group (TAG) on Salt Reduction and Promotion of Healthy Dietary Habits. We also acknowledge Dr Riyaz Basha S., Registrar (Evaluation), RGUHS, Bengaluru, for his valuable guidance and continued support towards the functioning of the TAG and the development of this Action Plan.

We are grateful to all members of the Technical Advisory Group (TAG) for their invaluable technical expertise, constructive recommendations, and sustained engagement, which have greatly enriched this Action Plan.

We also acknowledge Resolve to Save Lives (RTSL) and Vision for Social Development (VSD) for their technical support and for coordinating consultations, facilitating stakeholder engagement, providing technical and administrative support, and compiling this Action Plan.

We hope that the continued collaboration of all stakeholders will enable the effective implementation of this Action Plan, leading to reduced population salt intake, healthier dietary habits, and improved cardiovascular health for the people of Karnataka.

Executive Summary

Noncommunicable diseases (NCDs) are the leading cause of mortality globally and in India, accounting for nearly 75% of all deaths worldwide (1). In India, cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases are the major contributors to the burden of NCDs. Hypertension remains the most important modifiable risk factor for cardiovascular diseases and premature mortality.

Unhealthy diets are a key driver of the rising burden of NCDs. Diets high in salt, sugar and unhealthy fats contribute significantly to hypertension, obesity, diabetes and other cardiovascular diseases (2). Among these, excessive dietary salt intake is a major contributor to raised blood pressure and associated cardiovascular complications (3).

The World Health Organization recommends limiting salt intake to less than 5 grams per person per day to reduce the risk of hypertension and cardiovascular diseases (3). However, available evidence indicates that average salt consumption in India ranges between 8-11 grams per day (4), which is nearly double the daily recommended limit. Major sources of sodium intake include salt added during cooking or at the table, foods prepared outside the home such as restaurant and street foods and processed and packaged foods (5). The majority of salt (~80%) is consumed through food cooked at home; however, packaged food is on the rise. (4) An estimated 1.7 million deaths each year are associated with consuming too much sodium globally, a well-established cause of raised blood pressure and increased risk of cardiovascular disease (6).

In Karnataka, noncommunicable diseases account for a significant proportion of the disease burden, with cardiovascular diseases being the leading contributors to premature mortality (7). Population-based data, including the National Family Health Survey (NFHS-6), indicate that approximately one in four adults in the state has raised blood pressure or hypertension (8). Community-based studies from different districts in Karnataka have also reported hypertension prevalence ranging from about 22% to 26%, reflecting a substantial and growing public health concern (9).

Recent programme data further indicate that hypertension is increasingly being detected at younger ages, including among children and adolescents, highlighting an emerging public health challenge linked to changing dietary patterns including high salt intake and lifestyles. Dietary patterns in the state are characterized by high discretionary salt use, consumption of traditional high-salt foods such as pickles and papads and increasing intake of processed and outside food, all of which contribute to excessive sodium intake (4).

Reducing population-level salt intake is recognized globally as one of the most cost-effective public health interventions for preventing and controlling hypertension and cardiovascular diseases (10). Reducing unhealthy diets is one of WHO's best buy strategies for NCDs with a return of \$14 on every dollar spent.(11)

India has also ascribed to the goal of reducing population-level salt intake by 30% by 2030. Achieving this objective would require coordinated action across multiple sectors, including health, education, food safety, agriculture, the food industry and consumer affairs. This is also acknowledged in the National Multisectoral Plan 2017-2022 with 30% population-level salt reduction as one of the ten elements of the National NCD Monitoring Framework. (13)

This State-level Multisectoral Action Plan for Salt Reduction in Karnataka provides a strategic framework to guide coordinated efforts for reducing dietary salt intake and promoting healthier food environments. The vision of this initiative is to create a healthier Karnataka by promoting healthier diets and reducing dietary risk factors, including excessive salt intake, thereby contributing to lower hypertension prevalence, reduced cardiovascular mortality and improved quality of life across all age groups. The plan aligns with the Sustainable Development Goals, particularly SDG 3.4.

Successful implementation of this action plan will require sustained collaboration among government departments, public health institutions, civil society organisations, the food industry and other stakeholders.

Chapter 1

Introduction and Rationale	1
1.1 NCD burden globally and in India	1
1.2 Healthy Diets and Nutrients of Concern	1
1.3 Unhealthy Diets and NCDs	1
1.4 Role of Diet and Salt in Hypertension	2
1.5 Recommended Salt Intake and Current Consumption Patterns	2
1.6 Need for a Multisectoral Approach	3
1.7 Link to SDG 3.4 and National Context	3

Chapter 2

Evidence-Based Sodium Reduction Interventions	4
2.1 Sources of sodium intake	4
2.2 WHO Salt Reduction Framework	5
2.3 International Best Practices	8
2.4 Key Intervention Areas	9
2.4.1 Sodium Reduction Strategies for Packaged Food	9
2.4.2 Strategies to Reduce Sodium Consumed from Food Prepared Outside the Home	10
2.4.3 Strategies to Reduce Sodium Consumed at Home	10
2.4.4 Recommendations on Low-Sodium Salt Substitutes (LSSS)	11

Chapter 3

Situation Analysis in Karnataka	13
3.1 NCD Burden in Karnataka	13
3.2 Hypertension Prevalence and Dietary Patterns	13
3.3 Existing Programmes and Initiatives	14
PM POSHAN – Salt Reduction Initiative	14
Other Key Platforms	15
ICDS and Poshan Abhiyaan	15
NP-NCD Programme	15
Gruha Arogya Yojane	15

Chapter 4

Goals, Objectives and Principles	16
4.1 Vision	16
4.2 Goal	16
4.3 Objectives	17
4.4 Key Elements	17
4.5 Principles	18

Chapter 5

Governance Mechanism and Priority Intervention Areas	19
5.1 Establishment of a State Steering Committee on Healthier Food environment including Salt Reduction	19
5.2 Composition of the Committee	19
5.3 Roles and Responsibilities of the Steering Committee	20
5.4 State Target for Salt Reduction	20
5.5 Salt Reduction Strategy	21
5.6 Promotion of Low-Sodium Salt Substitutes (LSSS)	22

Chapter 6

Strategic Framework and Action Plan	23
Expected Public Health Impact	29
References	30

Abbreviations

ANM	Auxiliary Nurse Midwife
ASHA	Accredited Social Health Activist
AYUSH	Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy
BCC	Behaviour Change Communication
BP	Blood Pressure
CAGR	Compound Annual Growth Rate
CHO	Community Health Officer
CKD	Chronic Kidney Disease
FBO	Food Business Operator
FPS	Fair Price Shop
FSSAI	Food Safety and Standards Authority of India
HWC	Health and Wellness Centre
ICDS	Integrated Child Development Services
IEC	Information, Education and Communication
ICMR	Indian Council of Medical Research
IHME	Institute for Health Metrics and Evaluation
IIPS	International Institute for Population Sciences

LSSS	Low-Sodium Salt Substitutes
MO	Medical Officer
NCD	Noncommunicable Disease
NFHS-5	National Family Health Survey – 5
NMAP	National Multisectoral Action Plan
NNMS	National NCD Monitoring Survey
NP-NCD	National Programme for Prevention and Control of Non-Communicable Diseases
PDS	Public Distribution System
PHFI	Public Health Foundation of India
PM POSHAN	Pradhan Mantri Poshan Shakti Nirman
RAAS	Renin–Angiotensin–Aldosterone System
SDG	Sustainable Development Goal
SHAKE	Surveillance, Harness Industry, Adopt Standards, Knowledge, Environment
VHSND	Village Health Sanitation and Nutrition Day
WHO	World Health Organization

Chapter 1

Introduction and Rationale

Chapter 1

Introduction and Rationale

1.1 NCD burden globally and in India

Noncommunicable diseases (NCDs), including cardiovascular diseases, diabetes, cancers and chronic respiratory diseases, are among the leading causes of morbidity and mortality globally and in India. These diseases are largely driven by modifiable behavioural and metabolic risk factors such as unhealthy diets, physical inactivity, tobacco use and harmful use of alcohol. Among these, unhealthy dietary practices, particularly excessive salt intake, are a significant contributor to hypertension and cardiovascular diseases (1).

1.2 Healthy Diets and Nutrients of Concern

Healthy diets are essential for the prevention and control of noncommunicable diseases (NCDs). A balanced diet rich in fruits, vegetables, whole grains, and pulses, and low in processed foods, contributes to better health outcomes. However, current dietary patterns are increasingly characterized by high intake of certain nutrients of concern, particularly excess salt (sodium), sugar and unhealthy fats. These dietary risk factors significantly contribute to the rising burden of NCDs, including hypertension, obesity, diabetes and cardiovascular diseases (2).

1.3 Unhealthy Diets and NCDs

Unhealthy diets are one of the leading behavioural risk factors for NCDs globally and in India. Increasing urbanisation, changing lifestyles and the growing availability of processed and convenience foods have led to a shift in dietary patterns. The World Health Organisation has reported a steady increase in the consumption of processed and ultra-processed foods across low- and middle-income countries, contributing to rising dietary risks (5). These changes are directly associated with the increasing prevalence of hypertension, diabetes and cardiovascular diseases.

1.4 Role of Diet and Salt in Hypertension

Among dietary risk factors, excessive salt intake plays a central role due to its association with hypertension. Salt is composed of approximately 40% Sodium and 60% Chloride. It is this sodium content of edible salt that is responsible for the increased blood pressure when consumed in excess.

High sodium consumption is strongly associated with elevated blood pressure in a dose-response manner, becoming a major risk factor for hypertension, cardiovascular diseases, stroke and kidney disease. Reducing dietary salt intake has been identified as one of the most cost-effective public health interventions (3,10). According to WHO estimates, every unit of currency invested in interventions to reduce unhealthy diets can generate 14 units of economic benefit. (11)

1.5 Recommended Salt Intake and Current Consumption Patterns

The World Health Organization recommends limiting salt intake to less than 5 grams per person per day (approximately 2000 mg of sodium) (3). However, population studies indicate that average salt consumption in India is significantly higher than this recommended limit. Recent estimates suggest that average daily salt intake in India ranges between 8–11 grams per person per day (4).

Dietary sodium originates from multiple sources, including salt added during cooking or at the table, foods prepared outside the home such as restaurant and street foods and processed or packaged foods. Evidence suggests that approximately 80% of sodium intake in India comes from salt added during cooking at home (4), while processed food consumption is increasing (5). Salty snacks had a compound annual growth rate (CAGR) of 16.78% in retail sales between 2011 to 2021. Its share in the total ultra-processed retail sales value increased from 14% in 2011 to 18% in 2020 to 19% in 2021. (12)

Addressing excessive salt consumption therefore requires a comprehensive approach that includes behaviour change, improved food environments, healthier public procurement programs, promotion of low-sodium salt where appropriate, and regulatory measures to support healthier diets and reduce population salt intake. (13)

1.6 Need for a Multisectoral Approach

Reducing salt intake at the population level is recognised globally as a key strategy to reduce the burden of hypertension and cardiovascular diseases (10). Effective salt reduction strategies require coordinated action across multiple sectors.

1.7 Link to SDG 3.4 and National Context

The proposed action plan is guided by the principles outlined in India's National Multisectoral Action Plan (NMAP) for Prevention and Control of NCDs (2017–2022) (12) aligns with the Sustainable Development Goal (SDG) 3.4, which aims to reduce premature mortality from NCDs by one-third by 2030 and is consistent with Its core principles—multisectoral coordination, risk factor reduction and health system strengthening—continue to inform state-level strategies.

The Government of Karnataka proposes to implement a State Multisectoral Action Plan for Promoting Healthier Food Environment including Salt Reduction under the NP-NCD Programme to reduce hypertension and cardiovascular disease burden through coordinated interdepartmental action

Chapter 2

Evidence-Based Sodium Reduction Interventions

Chapter 2

Evidence-Based Sodium Reduction Interventions

Reducing population-level salt intake and improving overall quality of diets requires coordinated interventions addressing the major sources of nutrients of concern, including dietary sodium and promoting healthier food environments. Global evidence demonstrates that comprehensive strategies targeting households, food outside the home including public procurement programmes and processed foods can significantly reduce sodium intake and improve health outcomes (5).

2.1 Sources of sodium intake

Dietary sodium generally comes from three main sources (14):



Through food cooked at home or salt added while eating



Through food prepared outside of the home



Through packaged food

1. Salt added during cooking or at the table in households
2. Food prepared outside the home, including restaurants, street vendors, institutional kitchens and through public procurement and service programmes
3. Processed and packaged foods, such as snacks, instant foods and ready-to-eat products

Effective sodium reduction strategies therefore need to address all three sources simultaneously.

2.2 WHO Salt Reduction Framework

The World Health Organization identifies salt reduction as one of the most cost-effective “Best Buy” interventions for preventing noncommunicable diseases, with strong evidence indicating that reducing population salt intake can significantly lower blood pressure and reduce the risk of cardiovascular diseases, stroke and kidney disease (2,5). It is estimated that reducing global salt intake could prevent millions of deaths each year.

To support countries in implementing effective salt reduction strategies, the World Health Organization has developed the SHAKE technical package, a comprehensive framework designed for population-level sodium reduction interventions. The SHAKE package serves as a practical guide for countries to prepare, develop, implement, and monitor government-led sodium reduction programmes. Its primary objective is to reduce population sodium intake, thereby contributing to the prevention of hypertension and other non-communicable diseases, while also helping to save lives and reduce health-care costs.

According to the SHAKE technical package second edition (2026) developed by the World Health Organization (15), countries should prioritize a mandatory, government-led approach while developing and implementing comprehensive sodium reduction programmes. Such an approach is essential for creating and sustaining a healthier food environment, while also ensuring a level playing field for food businesses by providing equal opportunities and consistent standards across the sector.

WHO has identified a set of cost-effective and evidence-based sodium reduction policies and interventions, many of which are best buys for the prevention and control of NCDs.

Food Reformulation Policies

These policies set sodium limits for processed and packaged foods to improve the food supply and encourage healthier choices. The World Health Organization has developed global sodium benchmarks to guide countries in setting targets. (Best buy)

Front-of-Pack Labelling (FOPL)

FOPL provides simple nutrition information on packaged foods, helping consumers identify healthier products. It can also encourage industries to reduce sodium levels in food products. (Best buy)

Food Procurement and Service Policies

These policies restrict high-sodium foods in public institutions and government food programmes to promote healthier food environments. They may also include menu labelling and healthier food service practices. (Best buy)

Food Marketing Restrictions

Marketing restrictions protect children from exposure to advertisements promoting unhealthy and high-sodium foods. They help reduce the influence of unhealthy food marketing across media and public settings. (Best buy)

Taxation of Unhealthy Foods

Taxation increases the cost of unhealthy and high-sodium foods, encouraging consumers to make healthier dietary choices. It may also motivate industries to reformulate food products. (Best buy)

Behaviour Change Communication

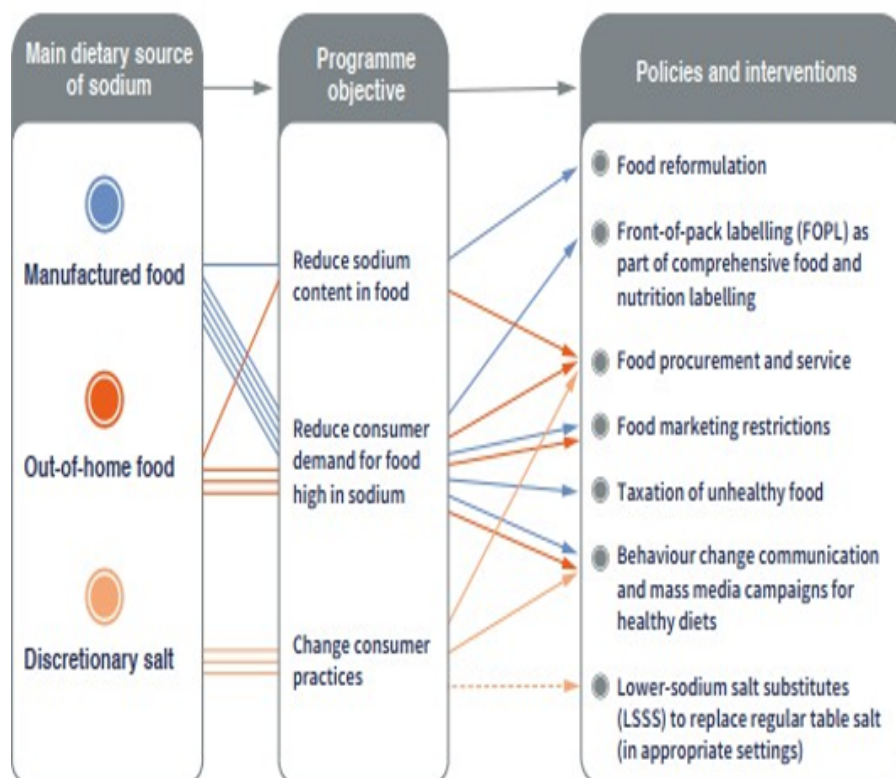
Mass media campaigns and awareness programmes help improve public knowledge and behaviours related to reducing sodium intake. These interventions are more effective when combined with supportive policies. (Best Buy)

Lower-Sodium Salt Substitutes (LSSS) (In appropriate settings)

Lower-sodium salt substitutes replace part of the sodium with potassium, helping reduce sodium intake and cardiovascular risk. They are especially useful where discretionary salt consumption is high. WHO has published a guideline recommending this intervention for settings where health systems have the capacity to detect promptly and manage potential cases of kidney disease.

Key Approaches for Developing and Implementing Sodium Reduction Interventions

- Prioritizing mandatory interventions as part of a comprehensive sodium reduction programme.
- Mandating nutrient declaration and developing nutrition criteria to support sodium reduction policies.
- Developing and implementing effective sodium reduction policies and interventions across multiple settings.
- Building capacity, allocating budgets, setting timelines, and planning monitoring mechanisms for implementation.



Prioritizing sodium reduction programme objectives, policies and interventions to tackle major sources of dietary sodium – Adapted from SHAKE technical package second edition (2026)

These interventions collectively help create healthier food environments and enable individuals to make informed dietary choices, thereby contributing to the reduction of hypertension and cardiovascular disease burden.

2.3 International Best Practices

Countries such as the United Kingdom and South Korea have successfully implemented national salt reduction strategies, resulting in reductions in salt intake and improvements in cardiovascular health (16).

Chile has implemented one of the world's most comprehensive packaged food labelling policies through its Food Labelling and Advertising Law (Law 20.606), which came into effect in 2016. The policy requires packaged foods and beverages exceeding defined thresholds for sugar, sodium, saturated fat, or calories to display prominent black octagonal front-of-package warning labels stating "High in...". In addition to front-of-pack warning labels, the law restricts the marketing of unhealthy foods to children, prohibits the use of child-directed characters on products carrying warning labels, and limits the sale of such foods in schools. Evidence from Chile shows that the policy has contributed to improved understanding of nutrition information among consumers and has driven reductions in sodium, sugar, and calorie content in packaged foods. (17)

A modelling study in the Philippines found that a 20% tax on packaged foods high in sodium or sugar could prevent approximately 2,800 deaths and 41,000 cases of cardiovascular disease and type 2 diabetes over a 20-year period. The study estimated around US\$46 million in health-care cost savings, US\$13 billion in tax revenue, and implementation costs of approximately US\$250 million. (18)

Argentina's sodium reduction strategy has centred on regulatory reformulation of processed foods through National Law 26,905, which established mandatory maximum sodium limits across selected food categories. (19)

Evidence from China demonstrates that low salt substitutes can significantly reduce stroke and cardiovascular events (20).

2.4 Key Intervention Areas

Effective population-level salt reduction requires a comprehensive set of interventions that address both food environments and individual behaviour. Based on global evidence, including the framework described by Ide et al. in “Priority Actions to Advance Population Sodium Reduction” (16), sodium reduction strategies can be grouped into three key domains: packaged food, food prepared outside the home, and food consumed at home.

2.4.1 Sodium Reduction Strategies for Packaged Food

The following four strategies affect packaged food either by directly altering the food manufacturing process or by regulating the price or promotion of packaged food items based on the content.

Front-of-Pack Labelling: Clear front-of-pack labels such as “high in” warning labels help consumers quickly identify unhealthy packaged foods and make healthier choices. They also encourage food industries to reformulate products by reducing sodium, sugar, and unhealthy fats.

Food Reformulation Targets: Setting mandatory sodium reduction targets for processed foods helps reduce salt content without requiring consumer action. Countries like the UK, South Africa, and Argentina have shown strong progress through this strategy.

Marketing Restrictions to Children: Restricting the marketing of unhealthy foods and beverages to children reduces their exposure to high-salt, high-fat, and high-sugar products. This helps prevent unhealthy food preferences and lowers the risk of high blood pressure later in life.

Fiscal Policies (Taxation): Taxes on foods high in salt, sugar, and fat discourage the purchase of unhealthy products, promote healthier alternatives, encourage industry reformulation, and can generate revenue for public health and nutrition programs.

2.4.2 Strategies to Reduce Sodium Consumed from Food Prepared Outside the Home

Public Food Procurement and Service Policies: Governments can improve population health by setting nutrition standards, including sodium limits, for food purchased, served, or sold in public institutions such as schools, hospitals, childcare centers, government offices, and prisons. These policies increase access to healthier food, reduce unhealthy food consumption, and can encourage food reformulation. Example: New York City implemented nutrition standards that impact around 240 million meals and snacks served annually across public institutions.

2.4.3 Strategies to Reduce Sodium Consumed at Home

Mass Media Campaigns: Mass media campaigns use TV, radio, posters, billboards, and print media to spread awareness about the dangers of high salt intake and encourage healthier behaviour. They are effective in reaching large populations and promoting reduced discretionary salt use at home. Example: In South Africa, the Salt Watch campaign increased awareness, and people exposed to the campaign were more likely to take steps to reduce their salt intake. Media campaigns are most effective when combined with other structural interventions; they have limited effectiveness and sustainability as a standalone intervention.

Increase Uptake of Low-Sodium Salt: Promoting potassium-enriched low-sodium salt substitutes, improving their availability, and providing subsidies can help reduce sodium intake at home. These salts replace part of the sodium with potassium, helping lower blood pressure and reduce cardiovascular risk. Example: A cluster-randomised trial in rural China found that subsidies for low-sodium salt nearly doubled household use compared with villages where no subsidy was provided. (21)

Strategies should be appropriate to the local context in terms of the sources of dietary sodium, existing regulatory mechanisms, and access to resources. No single strategy is enough to reach the WHO goal of a 30% reduction in sodium intake by 2030; a multi-component package is needed.

2.4.4 Recommendations on Low-Sodium Salt Substitutes (LSSS)

Recent evidence and expert consensus (22) support the use of potassium-enriched low-sodium salt substitutes (LSSS) as an effective public health intervention for reducing sodium intake, lowering blood pressure and preventing cardiovascular diseases. In India, where a major proportion of dietary sodium comes from salt added during cooking at home, LSSS offers a promising strategy to reduce population-level salt consumption.

A national consensus conference titled “Bridging Evidence and Practice: A Consensus Conference on the Use of Low-Sodium Salt Substitutes as a Public Health Intervention” was organised in December 2025 by The George Institute for Global Health India in collaboration with Resolve to Save Lives. The conference brought together cardiologists, nephrologists, physicians, public health experts, researchers and nutrition specialists to review the available evidence and develop consensus recommendations for the Indian context.

The consensus recommendations were grouped under four broad domains:

Effectiveness, efficacy and safety of LSSS:

Evidence indicates that replacing regular salt with potassium-enriched low-sodium salt substitutes can reduce blood pressure, lower the risk of stroke and cardiovascular events and contribute to reduction in premature mortality. The recommendations also emphasise the need for appropriate use among individuals with specific medical conditions such as advanced chronic kidney disease and those at risk of hyperkalaemia.

Individuals Who May Benefit from Low-Sodium Salt Substitutes (LSSS)

- General adults, including people with hypertension and those with early-stage chronic kidney disease (CKD stages 1–3) who do not have hyperkalemia or use potassium supplements or potassium-sparing diuretics.

Individuals Who Should Avoid Low-Sodium Salt Substitutes (LSSS)

- People with advanced CKD, hyperkalemia, or those taking potassium supplements or potassium-sparing diuretics.

Public health and policy recommendations:

The consensus recommends integrating LSSS into national and state NCD prevention strategies, strengthening food standards and labelling regulations and promoting the use of iodised low-sodium salt substitutes. Given the high contribution of discretionary salt to sodium intake in India, household-level adoption and use in community kitchens and public food programmes are considered important opportunities.

Recommendations for implementation:

Key implementation recommendations include improving affordability and accessibility of LSSS, supporting food industry engagement, promoting behaviour change communication and integrating counselling on low-sodium salt substitutes into routine healthcare services and public health programmes.

Recommendations for research:

The consensus also highlights the need for further implementation research, monitoring and evaluation, including studies on effectiveness in different population groups, long-term safety, consumer acceptability, affordability and scalability within the Indian context.

These recommendations provide an important evidence-informed foundation for exploring the appropriate promotion and integration of low-sodium salt substitutes within broader salt reduction strategies in Karnataka.

Chapter 3

Situation Analysis in Karnataka

Chapter 3

Situation Analysis in Karnataka

3.1 NCD Burden in Karnataka

Noncommunicable diseases are the leading cause of mortality in Karnataka, accounting for nearly two-thirds of all deaths in the state (7). Among these, cardiovascular diseases are the predominant contributors to premature mortality, with hypertension identified as the most important modifiable risk factor.

Available state-level data indicate that approximately one in four adults in Karnataka is affected by hypertension, with higher prevalence observed in urban areas compared to rural populations (8). Despite increasing detection through population-based screening programmes, a significant proportion of individuals remain undiagnosed or inadequately controlled.

3.2 Hypertension Prevalence and Dietary Patterns

Urban populations demonstrate higher prevalence of hypertension and obesity, largely driven by sedentary lifestyles and increased consumption of processed foods (9). Rural areas are also experiencing a rapid rise in NCD risk factors due to dietary transition, changing food environments and continued high discretionary salt use in home cooking (12).

Men show slightly higher prevalence of hypertension; however, gaps in awareness, treatment and control remain significant among both men and women.

Dietary Patterns and Salt Consumption

Multiple dietary factors contribute to high salt intake in Karnataka. Major contributors include:

- Discretionary salt used in home cooking, particularly in rice-based diets accompanied by curries, sambar and rasam
- Traditional high-salt foods such as pickles, chutneys, papads and preserved foods
- Packaged and processed foods including savoury snacks, instant noodles and bakery products
- Street foods and restaurant foods, particularly in urban and peri-urban settings (12)

Salt consumption often remains “hidden” from consumers as significant quantities originate from processed foods and foods consumed outside the home (4).

Addressing excessive salt intake is therefore essential for reducing hypertension and cardiovascular disease burden in Karnataka.

3.3 Existing Programmes and Initiatives

Karnataka has several ongoing programmes that can be leveraged to promote salt reduction and healthier diets:

PM POSHAN – Salt Reduction Initiative

Karnataka has emerged as a pioneer state in promoting healthier school meals by integrating salt reduction into the PM POSHAN Scheme. The Department of Education, Government of Karnataka, with technical support from Vision for Social Development and Resolve to Save Lives, has successfully trained all PM POSHAN functionaries on the health impacts of excess salt and strategies for reducing salt in midday meal preparation.

Through this initiative, around 1.08 lakh cook-cum-helpers have been trained, benefiting nearly 4.7 million students across Karnataka.

Other Key Platforms

ICDS and Poshan Abhiyaan

Karnataka has also made notable progress under the Women and Child Development Department. Under the ICDS programme, around 100 Anganwadi functionaries have been trained on salt reduction as master trainers to support community awareness and healthier dietary practices.

NP-NCD Programme

Around 70 master trainers have been trained in Karnataka under the NCD Division to address dietary habits, including salt reduction. District Programme Officers and District Programme Coordinators for NCDs from each district serve as these master trainers. They will, in turn, equip frontline workers with the knowledge and skills needed to educate communities on healthier practices, including reducing salt intake.

Gruha Arogya Yojane

One of the key components of the Gruha Arogya Yojane is hypertension screening and treatment. Education and awareness on limiting salt intake is also included in the programme's flipchart, which will be used by ASHAs to reach and educate communities.

Karnataka is also promoting healthier diets through Ayushman Bharat, Namma Clinics, and Village Health, Sanitation and Nutrition Days (VHSDs), strengthening community awareness and supporting NCD prevention efforts.

These platforms provide a strong foundation for integrating salt reduction interventions at scale.

Chapter 4

Goals, Objectives and Principles

Chapter 4

Goals, Objectives and Principles

Reducing dietary risk factors, including excessive salt intake, cannot be achieved by the health sector alone and requires coordinated action across multiple government departments. Key departments include the Department of Health and Family Welfare, Department of Medical Education, Department of Women and Child Development, Department of School Education and Literacy, Department of Food, Civil Supplies and Consumer Affairs, the State Food Safety Authority, Department of Agriculture and allied sectors, Department of Panchayati Raj and Rural Development and Department of Urban Development. In addition, active engagement with academic institutions, civil society organisations and the food industry is essential.

A structured multisectoral approach is therefore necessary to create supportive food environments, promote healthier dietary practices and achieve sustained reductions in population-level salt intake, including reduction of discretionary salt use through interventions such as low-sodium salt substitutes (LSS).

4.1 Vision

To create a healthier Karnataka by promoting healthier diets and reducing dietary risk factors, including excessive salt intake, thereby reducing the burden of hypertension and other noncommunicable diseases, reducing premature mortality and improving quality of life across all age groups.

4.2 Goal

To promote healthier food environments through coordinated, evidence-based multisectoral interventions.

4.3 Objectives

1. To promote healthier diets in Karnataka and reduce dietary risk factors for prevention of NCDs.
2. To reduce mean population salt intake by 30% by 2030 through:
 - a. Reduction of discretionary salt use at the household level
 - b. Reduction of salt in food consumed outside the home
 - c. Reduction of salt in processed and packaged foods
3. To integrate the promotion of healthier diets within existing public health and nutrition programmes.
4. To strengthen health system capacity for dietary counselling and prevention of hypertension.
5. To explore and promote the effectiveness, efficacy and safety of low-sodium salt substitutes (LSS) as a strategy for reducing discretionary salt intake.
6. To establish a coordination mechanism for operationalizing the action plan at the state and district levels.

4.4 Key Elements

- Reduction of salt intake (aligned to 30% reduction target)
- Reduction of trans fats and saturated fats
- Promotion of healthy diets (fruits and vegetables)
- Promotion, evaluation and appropriate use of low-sodium salt substitutes (LSS) while ensuring effectiveness, efficacy and safety
- Enhance consumer awareness and education on reading and understanding Back-of-Pack (BoP) nutrition labels to support informed food choices.
- Healthy settings approach (schools, workplaces and communities)
- Behaviour change communication (IEC/BCC)
- Engagement with food industry (reformulation)
- Regulatory and fiscal measures, where applicable

4.5 Principles

- **Multisectoral governance and convergence:**

Ensuring coordinated action across relevant government departments through a structured coordination mechanism led by the Health Department, with clearly defined roles and accountability.

- **Population-level risk reduction through a food systems approach:**

Addressing all major sources of dietary salt, including household use, food prepared outside the home and processed foods, through a combination of behaviour change, food environment interventions and industry engagement.

- **Behaviour change and community engagement:**

Promoting sustained reduction in discretionary salt use through culturally appropriate communication strategies, community platforms, school-based interventions and awareness on healthier alternatives such as low-sodium salt substitutes where appropriate.

- **Evidence-based and phased implementation:**

Adopting a gradual and evidence-based approach for salt reduction, including stepwise reformulation of foods and exploration of interventions such as low-sodium salt substitutes where appropriate.

- **Strengthening surveillance, monitoring and research:**

Establishing systems to track salt intake, sources of sodium and programme implementation and using data to inform policy decisions and course corrections.

- **Leveraging existing systems for scalability and sustainability:**

Establishing systems to track salt intake, sources of sodium, uptake of salt reduction interventions including low-sodium salt substitutes and programme implementation, and using data to inform policy decisions and course corrections.

- **Population-based approach for low-sodium salt substitutes (LSS):**

Promoting the use of low-sodium salt substitutes through household-level and community-based approaches, considering that a major proportion of sodium intake in India comes from discretionary salt used in cooking, while integrating LSS into appropriate public food and nutrition programmes where feasible.

Chapter 5

Governance Mechanism and Priority Intervention Areas

Chapter 5

Governance Mechanism and Priority Intervention Areas

5.1 Establishment of a State Steering Committee on Healthier Food environment including Salt Reduction

Effective implementation of the salt reduction strategy requires strong multisectoral coordination and high-level policy oversight. To guide the implementation of the State Action Plan, a State Steering Committee on Healthier Diets including Salt Reduction will be established under the leadership of the Department of Health and Family Welfare, Government of Karnataka.

The committee will provide strategic direction, facilitate coordination across departments and ensure alignment with national policies and global targets for NCD prevention.

5.2 Composition of the Committee

The State Steering Committee will consist of representatives from key government departments and relevant stakeholders.



Technical and Advisory Members

- Representatives from academic and public health institution
- Public health experts and nutrition specialists
- Clinicians
- Civil Society Organizations
- Non-profit organisations working in health and nutrition

5.3 Roles and Responsibilities of the Steering Committee

The State Steering Committee will perform the following functions:

- Provide overall policy direction and strategic guidance for healthier diets including salt reduction initiatives in the state.
- Facilitate inter-departmental coordination and integration of activities across sectors.
- Support resource mobilization and allocation for implementation of key interventions.
- Review implementation progress and recommend course correction when required.
- Promote collaboration with research institutions, development partners and civil society organisations.
- Monitor alignment with state, national NCD targets and global commitments.

5.4 State Target for Salt Reduction

Karnataka will align with global and national commitments to achieve a 30% reduction in population-level salt intake by 2030, with the aim of achieving the recommended level of less than 5 gms per day, in line with the World Health Organization targets for prevention and control of noncommunicable diseases.

Karnataka will also align with national commitments to achieve relative reduction in age-standardised prevalence of adults consuming fewer than 5 total servings (400 g) of fruits and vegetables per day. (13)

This will help Karnataka align with national commitments for NCD prevention and support progress toward healthier dietary habits, including reduced salt intake and improved fruit and vegetable consumption.

The dietary guidelines and advice will follow, ICMR-National Institute of Nutrition's Dietary Guidelines for Indians (2024)

5.5 Salt Reduction Strategy

To achieve the state target, Karnataka will adopt a comprehensive, source-based salt reduction strategy addressing all major contributors to dietary salt intake. The strategy will focus on achieving progressive reduction across the three primary sources of salt consumption, namely:

- Discretionary salt use at the household level through behaviour change communication, community engagement, promotion of low-salt cooking practices and promotion of low sodium salt substitutes.
- Food consumed outside the home, including restaurant and street foods, through engagement with food service providers, promotion of healthier cooking practices and consumer awareness. Karnataka is also working to reduce salt usage in meals provided under public procurement programmes such as Mid-Day Meals and the ICDS programme, supporting healthier diets and strengthening NCD prevention efforts.
- Encourage voluntary salt reduction initiatives among local food manufacturers and strengthen consumer awareness on healthier food choices through partnerships with industry and food safety authorities.

This approach recognises that in the Indian context, while a significant proportion of salt intake comes from household use, the contribution of food consumed outside the home and processed foods is increasing rapidly. Therefore, a balanced and integrated strategy targeting all three sources is essential to achieve an overall 30% reduction in population-level salt intake.

The strategy is guided by the principles of the National Multisectoral Action Plan (NMAP) for NCDs (2017–2022), particularly its emphasis on comprehensive dietary risk reduction, healthy food environments and multisectoral action.

5.6 Promotion of Low-Sodium Salt Substitutes (LSSS)

Low-sodium salt substitutes (LSSS) may be explored as a complementary strategy for population-level salt reduction in Karnataka, particularly considering that a large proportion of dietary sodium intake in India comes from discretionary salt used in household cooking. Evidence indicates that potassium-enriched low-sodium salt substitutes can help reduce blood pressure and cardiovascular risk when used appropriately.

The State may explore phased and evidence informed promotion, expert-led and context-specific use of LSSS through awareness generation, behaviour change communication, implementation research and integration into suitable public health and nutrition programmes where feasible. Efforts may also include supporting the improvement in awareness, accessibility, affordability, appropriate labelling and safe use of LSSS.

Other Strategies

Behaviour change communication strategies will be strengthened to improve public awareness on the health risks of excess salt intake and promote acceptance of healthier alternatives, including low-sodium salt substitutes where appropriate. Salt reduction counselling, including guidance on healthier alternatives to regular salt where appropriate, may be integrated into hypertension prevention and management services under NP-NCD and primary healthcare platforms.

The State may also explore phased integration of low-sodium salt substitutes into suitable public food and nutrition programmes and institutional kitchens, including schools, hospitals and community feeding programmes, based on feasibility, safety considerations and implementation experience.

Efforts may be undertaken in collaboration with relevant stakeholders to improve the accessibility, affordability and availability of low-sodium salt substitutes within the state. The State will also support alignment with national food safety standards and labelling regulations related to low-sodium salt substitutes and healthier food environments.

Special consideration should be given to public awareness regarding appropriate use and contraindications among individuals with advanced chronic kidney disease and other high-risk conditions, in line with national and global guidance.

Chapter 6

Strategic Framework and Action Plan

Chapter 6

Strategic Framework and Action Plan

Sl. No.	Department / Sector	Key Activities	Expected Output	Timeline
1	Medical Education & Universities	• Integrate salt reduction into medical, nursing and allied health curricula at undergraduate and postgraduate level • Include salt reduction in in-service training programmes for health professionals • Promote operational and implementation research on dietary salt reduction and lowsodium salt substitutes • Support clinical and implementation research on the safety and appropriate use of LSSS among CKD stages 4–5, dialysis and transplant recipients, and elderly patients on RAAS inhibitors. • Ensure standardised dietary counselling protocols in teaching hospitals and medical institutions • Conduct cluster trials and qualitative studies to assess different delivery models and identify acceptable and context-specific solutions for LSSS implementation.	Standardised curriculum across health professional courses; strengthened capacity of health workforce; increased research and improved counselling practices	Medium–Long

2	Health & Family Welfare	• Lead and coordinate programme implementation • Develop and operationalise State Action Plan • Integrate healthy diets and salt reduction into NP-NCD, HWCs and screening programmes • Develop IEC strategy (statewide) on healthy diets • Build capacity of ASHAs, ANMs, MOs, CHOs on healthier diets including salt reduction • Conduct population level salt intake studies Establish surveillance and monitoring system (salt intake, BP trends) • Pilot study on low sodium salt substitutes (LSS) where appropriate to support implementation research on LSSS • Integration of LSSS into NCD prevention strategies considering the high burden of hypertension.	Action Plan operational; salt reduction integrated in services; surveillance data available; improved service delivery	Short term
---	-------------------------	--	--	------------

3	Information & Public Relations IEC	• Design and implement statewide mass media campaigns (TV, radio, social media) on healthier diets • Support dissemination of standardised IEC messages on low sodium salt and use of other alternative flavours. • Align campaigns with health department priorities	Increased population awareness and demand for low-salt diets	Short–Medium
4	State Food Safety Department	• Promote front-of-pack labelling awareness • Train Food Business Operators (FBOs), street food vendors • Strengthen inspection and compliance mechanisms • Promote Eat Right initiatives with healthier diet and salt reduction focus • Advocate for alignment with national standards and support implementation of FSSAI regulations to recognise potassiumen rich iodised LSSS as an approved edible salt category, with appropriate consumer guidance and safety warnings.	Improved labelling compliance; reduced sodium in foods; strengthened regulatory oversight	Medium–Long

5	Food & Civil Supplies	• Integrate nutrition considerations in PDS and procurement policies • Promote availability of healthier food options through public distribution channels • Consumer awareness through FPS network	Improved access to healthier food options; increased consumer awareness	
6	Education Department	• Integrate salt reduction into school curriculum • Strengthen PM POSHAN guidelines on salt use • Train cook-cumhelpers (CCH) • Use School Health Programme & Wellness Ambassadors for behaviour change • Revise the salt standards in mid-day meals according to nutritional norms • Integrate sodium as a component within the monitoring indicators for mid-day meals.	Children adopt healthy dietary habits; reduced salt use in school meals	Medium

7	Panchayati Raj & Urban Local Bodies	• Promote low-salt diets through Gram Sabhas and urban platforms • Support local campaigns and community mobilization • Facilitate improved practices among street food vendors	Increased community participation; local level action	Medium
8	Women & Child Development (ICDS)	• Promote no added salt for children <2 years Integrate healthier diets including salt reduction into VHSND and Anganwadi sessions • Train Anganwadi workers and cooks, create awareness on low-sodium salt substitutes • Promote low-salt cooking practices at the household level	Improved infant and household dietary practices	Medium
9	AYUSH Department	• Integrate healthier diets and salt reduction into AYUSH lifestyle counselling • Promote use of herbs and spices as alternatives to salt and potassium-enriched low-sodium salt substitutes.	Increased community-level counselling and adoption of healthier practices	Medium

10	NGOs / Civil Society	• Support community mobilisation and outreach • Assist in research, monitoring and evaluation • Reach vulnerable and remote populations • Conduct implementation studies to compare different LSSS delivery models, including retail, community and health system-based approaches, and identify feasible and acceptable strategies for scale-up in diverse settings. • Assess the economics, equity and market dynamics related to scaling up LSSS in Karnataka	Improved outreach; strengthened implementation support	Medium
----	----------------------	--	--	--------

Expected Public Health Impact

Implementation of the Karnataka State Multisectoral Action Plan for Salt Reduction is expected to contribute significantly toward improving population health outcomes and strengthening prevention and control of noncommunicable diseases in the state. By promoting healthier dietary practices and reducing excessive salt consumption, the action plan aims to reduce the prevalence of hypertension and associated cardiovascular diseases, including stroke and heart disease.

The proposed interventions are also expected to improve public awareness regarding healthy diets, encourage behavioural changes at household and community levels and support the creation of healthier food environments across schools, public institutions and communities. Progressive reduction in salt intake may further contribute to lowering premature mortality associated with noncommunicable diseases and improving quality of life among the population.

Strengthening dietary counselling, community awareness and multisectoral convergence under existing public health and nutrition platforms is expected to enhance the overall capacity of the health system for NCD prevention. In the long term, the action plan may contribute to reduction in healthcare expenditure associated with hypertension and cardiovascular complications by reducing disease burden and improving early prevention practices.

The implementation of this action plan will also support Karnataka's progress toward achieving Sustainable Development Goal (SDG) 3.4 related to reduction of premature mortality from noncommunicable diseases and alignment with national and global commitments on healthier diets and salt reduction.

References

1. World Health Organization. *Noncommunicable diseases*. Geneva: WHO; 2023.
2. World Health Organization. *Healthy diet*. Geneva: WHO; 2020.
3. World Health Organization. *Guideline: Sodium intake for adults and children*. Geneva: WHO; 2012.
4. Shivashankar R, et al. *Dietary salt intake in India: current evidence and future directions*. Indian J Community Med. 2023.
5. World Health Organization. *Global report on sodium intake reduction*. Geneva: WHO; 2023.
6. World Health Organization. Sodium reduction [Internet]. Geneva: WHO; 2026 May 11 [cited 2026 Jun 2]. Available from: [WHO Sodium Reduction Fact Sheet](#)
7. ICMR, PHFI, IHME. *India State-Level Disease Burden Initiative*. 2017.
8. National Family Health Survey (NFHS-6), 2023–24: Fact Sheets. Mumbai: IIPS; 2026. Available from: NFHS-6 Fact Sheets
9. Ministry of Health and Family Welfare. *National NCD Monitoring Survey (NNMS) 2017–18*. 2020.
10. World Health Organization. *Salt reduction*. Geneva: WHO; 2023.
11. World Health Organization. *Saving lives, spending less: the global investment case for noncommunicable diseases*. Geneva: World Health Organization; 2025. Available from: <https://www.who.int/publications/i/item/9789240115859>
12. The growth of ultra-processed foods in India: an analysis of trends, issues and policy recommendations. New Delhi: World Health Organisation, Country Office for India; 2023. Licence: CC BY-NC-SA 3.0 IGO
13. Government of India. *National Multisectoral Action Plan (NMAP) for Prevention and Control of NCDs (2017–2022)*.
14. Resolve to Save Lives. *Sodium Reduction Framework*. New York: Resolve to Save Lives; 2023. Available from: <https://resolvetosavelives.org/how-we-savelives/healthier-food/sodium-framework>
15. SHAKE the salt habit, second edition. Geneva: World Health Organization; 2026. Licence: CC BY-NC-SA 3.0 IGO.

16. Ide N, Ajenikoko A, Steele L, Cohn J, J. Curtis C, FriedenAction Plan Draft_Final.docx TR, Cobb LK. Priority actions to advance population sodium reduction. *Nutrients*. 2020 Aug 22;12(9):2543.
17. Reyes M, Garmendia ML, Olivares S, et al. *Development of the Chilean front-of-package food warning label*. [BMC Public Health](#). 2019; 19:906
18. Saxena A, Koon AD, Curtis CJ, Goyena EA, Desnacido JP, Ducay AJ, Ferrer EB, Steele L, Cobb LK, Henry ME, Appel LJ. Estimated health impact, cost, and cost effectiveness of taxation on unhealthy packaged foods in the Philippines: a modelling study. *The Lancet Public Health*. 2025 Oct 1;10(10): e824-34
19. Allemandi L, Tiscornia MV, Ponce M, Castronuovo L, Dunford E, Schoj V. Sodium content in processed foods in Argentina: compliance with the national law. *Cardiovascular diagnosis and therapy*. 2015 Jun;5(3):197.
20. Li X, Huang L, Zhou B, Li Z, Sun J, Yu Y, Song H, Tian M, Yin X, Neal B, Zhang Y. Effects of salt substitution on cumulative blood pressure: a secondary analysis of the SSaSS. *European Journal of Epidemiology*. 2025 Mar;40(3):309-16.
21. Li N, Yan LL, Niu W, Yao C, Feng X, Zhang J, Shi J, Zhang Y, Zhang R, Hao Z, Chu H. The effects of a community-based sodium reduction program in rural China—a clusterrandomized trial. *PloS one*. 2016 Dec 9;11(12): e0166620.
22. The George Institute for Global Health India, Resolve to Save Lives India. Consensus on the Use of Potassium-Enriched Low-Sodium Salt Substitutes (LSSS) as a Public Health Intervention in India. New Delhi, India; 2025.

This action plan is endorsed by the following experts

Name	Designation	Organisation
Dr Bhagavan B C	Vice Chancellor	Rajiv Gandhi University of Health Sciences, Bengaluru
Dr B Dinesha	Director	Sri Jayadeva Institute of Cardiovascular Sciences and Research
Dr Riyaz Basha S	Registrar (Evaluation)	Rajiv Gandhi University of Health Sciences,
Dr Ravi K	Director	Karnataka Institute of Endocrinology and Research
Dr Kavya S T	Director-cum-Dean	Bangalore Medical College and Research Institute (BMCRI), Bengaluru
Dr Rajini M	Director	Directorate of Health & Family Welfare Services, Government of Karnataka
Dr Jnanesh Kamath K	Joint Director, NCD	Directorate of Health & Family Welfare Services, Government of Karnataka
Dr Raghunandhan	Deputy Director, NCD	Directorate of Health & Family Welfare Services, Government of Karnataka
Dr Indira R Kabade	Deputy Director, Nutrition	Directorate of Health & Family Welfare Services, Government of Karnataka

Dr Syed Sirajuddin Madni	District Health Officer	Bangalore urban
Dr Vishal Rao U S	Member	Consultative Group to Principal Scientific Advisor to PM – GoI
Dr Syed Imran Farooq	Executive Director	Resolve to Save Lives, India
Dr Manika Sharma	Principal Advisor, Food Policy	Resolve to Save Lives
Dr Upendra Bhojani	Professor	Institute of Public Health
Dr Chandrashekar Kottagi	Assistant Professor & Strategic and Operations Lead	Institute of Public Health
Dr Sunil Kumar A	Paediatrician	ESI Hospital, Peenya
Dr Edwina Raj	Chief Dietitian	Aster, Bangalore
Ms Sreemathy Venkatraman	Chief Dietitian	Trustwell Hospitals
Ms Hema Malini Y S	Dietitian	Laxmi Maternity Hospital, Bengaluru
Dr Venkatesh	Principal	Padmashree College of Hospital Administration, Bengaluru
Mr Amit Karnik	Director	Vision for Social Development
Dr Priya T Nandimath	Senior Consultant	Vision for Social Development
Ms Prutha P Handigol	Nutrition Consultant	Vision for Social Development

