



KIRIBATI AGRICULTURE STRATEGY (KAS 2020 – 2030)



Republic of Kiribati

Ministry of Environment, Lands and
Agriculture Development (MELAD)

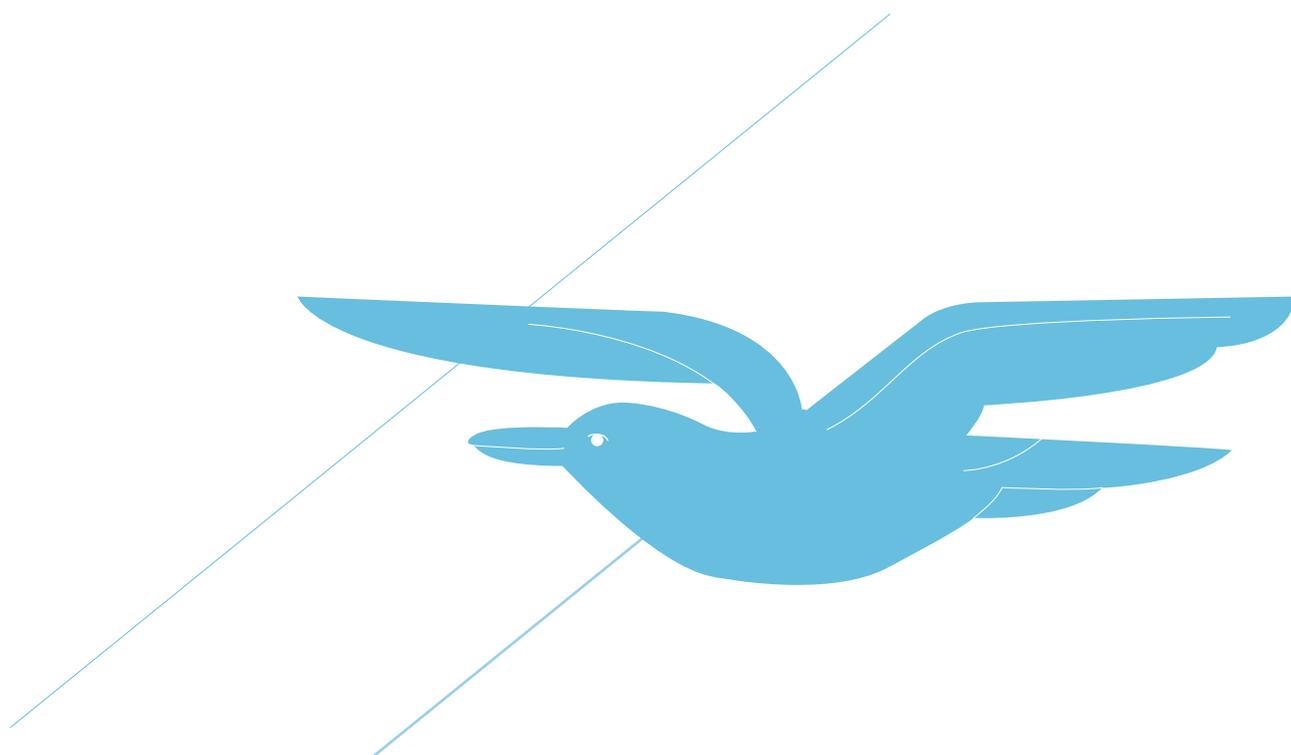
KIRIBATI AGRICULTURE STRATEGY (KAS 2020 – 2030)

AN ADDENDUM TO THE KV 20

March 2020

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Acronyms

ACIAR	Australian Centre for International Agricultural Research
ASP	Agriculture Strategic Plan
ALD	Agriculture and Livestock Division
CTA	Centre for Tropical Agriculture
ECD	Environment and Conservation Division
FAO	Food Agriculture Organization
GDP	Gross Domestic Product
GGGI	Global Green Growth Institute
GoK	Government of Kiribati
IC	Island Councils
IFAD	International Fund for Agricultural Development
KAS	Kiribati Agriculture Strategy
KDP	Kiribati Development Plan
KJIP	Kiribati Joint Implementation Plan
KV20	Kiribati 20 Year Vision
LDC	Least Developed Countries
NCDS	None Communicable Diseases
NAP	National Adaptation Plan
NDCs	Nationally Determined Contributions
PIU	Project Implementation Unit
PPPO	Pacific Plant Protection Organization
SAMO	Accelerated Modalities of Action
SDGs	Sustainable Development Goals
SIDS	Small Island Developing States
SPC	Secretariat of the Pacific Community
SRF	Strategy Results Framework
TOC	Theory of Change
UN	United Nations

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Foreword

The Kiribati Agriculture Strategy (KAS) 2020–2030, an addendum to Kiribati 20 Year Vision (KV20) was formulated by the Ministry of Environment, Lands, and Agriculture Development (MELAD). The plan was prepared through an extensive consultative process involving other stakeholders including representatives of several line ministries, government institutions, donors and international development organizations, non-governmental organisations, the private sector and community groups.

The KAS supports the achievement of KV20 long term development blueprint of Kiribati through diversifying and increasing agriculture production, productivity, livelihoods, jobs, food security, and improved nutrition and health for the Kiribati people. This document is an instrument to achieve the Vision and related development outcomes in the Kiribati Development (KDP) 2020-2023 and KV20.

The delivery of the KAS and the achievement of its results and impacts will be coordinated by MELAD through the implementation of the KAS Action Plan which will be developed as Phase 2 in 2020. The implementation effort requires adequate resources, time, and moreover the spirit of commitments and cooperation from all stakeholders to make the implementation successful and achieve intended development objectives and the KV 20 agenda and vision.

I wish to thank the Senior Management Team and staff of my Ministry including all stakeholders and parties that have contributed in one way or another to the preparation of the KAS without which its successful completion will not be possible.

I wish you all 'Te Mauri, te Raoi ao te Tabomoa'.



Honourable Alexander Teabo

Minister for Environment, Lands and Agriculture Development

The KAS was developed in a participatory manner with inputs from relevant stakeholders in the country.



1. Introduction



This document presents the Kiribati Agriculture Strategy (KAS) 2020-2030. It is an addendum to the Kiribati 20 Year Vision (KV20) which aims to operationalize the implementation of the Government's national goals, policies, plans and priorities in the agriculture sector. Kiribati is estimated to need 50% more food by 2030 to feed its growing population. Extreme weather conditions and rising sea levels threaten agriculture production and livelihoods. Overfishing and unregulated commercial development is reducing coastal fisheries and marine stocks. 25% of children under five are underweight; 38% of men and 54% of women, 20 years and above, are obese. An enhanced and coordinated multi-sector response, and complementary implementation would be useful to link agriculture with other sector to boost agricultural production and improve community health outcomes (CTA, 2019).

The purpose of the KAS is to guide a Government-led effort to induce a nation-wide re-engagement in agricultural production to increase national and household income, reduce poverty and ensure food security, improved nutrition and health standards, and biosecurity for Kiribati and its people. The KAS is a 10-year plan covering the period 2020 to 2030. It is a living document that will be reviewed at mid-point in 2025 to assess its results and effectiveness but also adapt it to the changing internal and external environment so it continues to remain relevant.

The KAS replaces the Agriculture Strategic Plan (ASP) 2013-2016 for the Agriculture and Livestock Division (ALD). To some extent, the KAS is an extension of the ASP in sections, objectives and outputs that are considered still relevant and effective. However, the KAS also has a broader scope and goals to ensure the integrated development of agriculture to bring about meaningful actions and positive transformational change at the community level across Kiribati not only in terms of increased agricultural production and outputs, but also improved incomes and livelihood, nutrition, health, and living standards.

The success in the implementation of the KAS will require an integrated approach driven from the very top of the Kiribati political leadership and government bureaucracy with the support and close partnership with the local communities, donors, civil society organizations, international development organizations, key stakeholders and other development partners. The KAS includes an action plan with priority projects for implementation and a Strategy Results Framework (SRF) for periodic monitoring and reporting of performance, results, achievements and impacts.

The KAS was developed in a participatory manner with inputs from relevant stakeholders in the country. These stakeholders are representatives of various government ministries, local communities, non-governmental organizations, private sector, women, local governments, youth, church groups, and selected farmers. A stakeholder analysis report and situation analysis report were prepared from these consultations which confirmed the interests, concerns, needs and expectations of the people of Kiribati and that fed into the development and strategic and planning directions of the KAS. This approach ensures that the stakeholders share a feeling of empowerment and ownership in the KAS's planning, development and implementation.

Finally, for the KAS to be successful and have significant transformational impacts in Kiribati, the citizens of Kiribati must take ownership, fully support and drive its execution for the benefit of the current and future generations.

2. Kiribati - An Overview



Kiribati is the world's smallest islets with the largest atoll in Christmas Island (Kiritimati). The nation is facing numerous economic, social, demographic and environmental challenges. It has limited natural resources and, for those natural resources it does possess sufficient capacity to exploit them for maximum national benefit. GDP per capita is the lowest amongst the Pacific Island Forum group and the economic outlook is fragile. With limited exports and rising costs of imports the country runs a deep trade deficit. The heavy dependence on imported staple foods (such as rice and flour), coupled with soaring global food prices is posing a serious threat to both food and nutrition security. Average annual household income is about A\$8,700 and an estimated 46 per cent is spent on food, which constitutes the single largest expenditure group. Increased urbanization on South Tarawa due to migration of population from the outer islands is accentuating social issues and environmental problems (FAO,2011).

2.1 Country Facts

Kiribati is an island republic located in the Central Pacific consisting of 32 atoll islands and one raised coral island, with a total land area of 811 km² scattered across 3.5 million km² of ocean (Figure 1 below). These low-lying atolls are highly vulnerable to climate change and affected by severe climate impacts including rising sea levels, increasingly frequent and severe storms, permanent erosion of the shoreline, frequent seawater inundation on freshwater resources, and reduced food security. The country also faces many economic challenges given its remoteness, small market size, and limited institutional capacity.

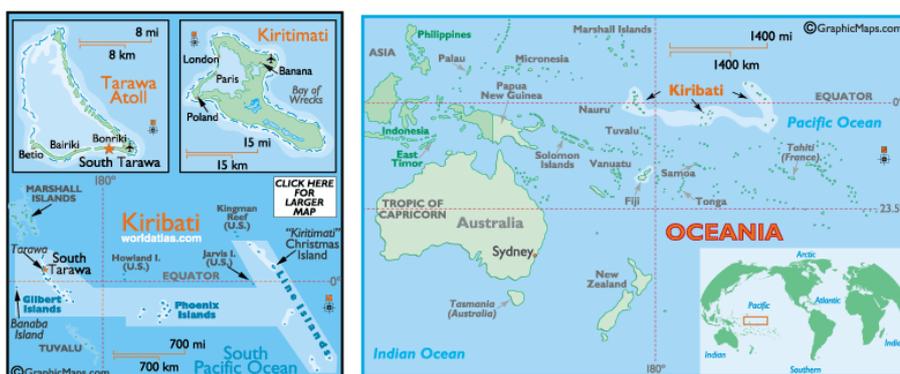


Figure1: Map of Kiribati - world atlas.com

Kiribati falls under the United Nations (UN) categories of SIDS and Least Developed Country (LDC). Its status as Least Developed Country was last revised in 2015 and while the criteria for graduation was fulfilled, the country retained its LDC status. According to the UN, and its Committee for Development Policy, Kiribati has graduated from LDC status; a final decision on its status will still need to be endorsed by the UN Economic and Social Council.

Lack of improved education/health services and opportunities for employment create an urban drift and severe overcrowding on the main islands of South Tarawa. There is a lack of access to water and sanitation, modern energy and other enabling infrastructure on the outer islands of Kiribati.

Given its size, land is scarce in Kiribati. In most island countries of South Pacific there is customary land, i.e. land held in accordance with traditional customs of indigenous people of those islands (USP, 2012). Around 37% of its total land area is under customary land ownership and the remaining is state land, including all islands in the Line and Phoenix Group are owned by the GoK. The country's population is heavily concentrated in the urban areas of South Tarawa where 52% of the population lives (GoK, 2016).

2.2 Agriculture and the Economy

The economic structure of Kiribati is reliant on remittances, revenue from fishing licenses, copra production and overseas aid. Other economic sectors namely, agriculture and tourism, account for 20% and 3.6% of Gross Domestic Product (GDP) respectively (GoK, 2017). Most of the economic activity of Kiribati takes place in the capital, South Tarawa.

Kiribati has enjoyed sustained economic growth in recent years. Figure 2 below shows Kiribati's GDP performance between 2016 and 2018 and forecasts for 2019 and 2020. The average growth rate between 2016 and 2018 was 2.56%. Growth has slowed down since 2017 compared with the previous 3 years due to a slowdown in revenue from fishing licences. In 2017, the size of Kiribati's GDP at current prices was around USD 164 million with agriculture, forestry and fishing accounting for 28% while industry and services accounted for 11.6% and 59.5% respectively (ADB, 2019)¹.

The national income of Kiribati is determined more by earnings from abroad including fishing licenses, remittances of Kiribati seamen and investment earnings from the Kiribati Sovereign Wealth Fund than the domestic production of good and services. Private sector development is constrained by the small size and scale of the economy, the high cost of doing business and the country's widely dispersed population.

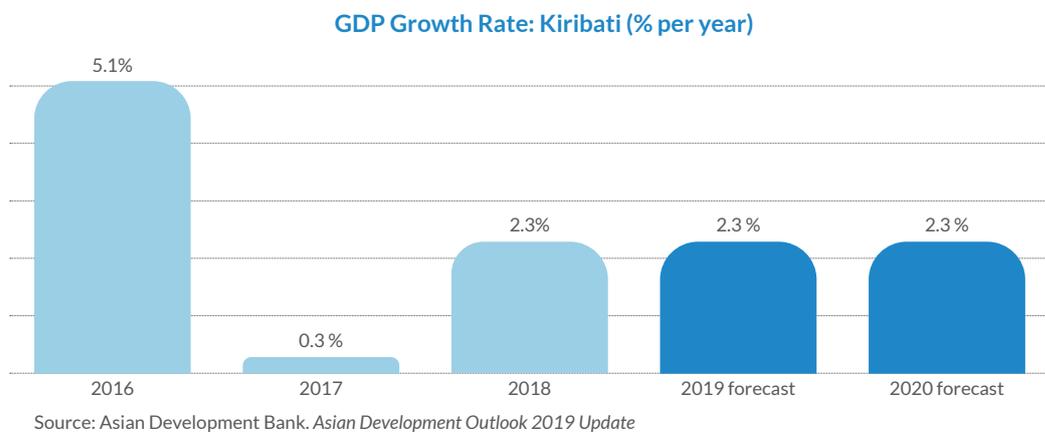


Figure 2: Kiribati GDP Growth, 2017-2020

Due to its limited natural resource base, Kiribati is highly dependent on imports. Key exports are limited to coconut products and fish. Kiribati's trade deficit is relatively high estimated at USD 86 million in 2015. This is attributed to a high import bill, mainly for foodstuff and low export trends due to limited product varieties and supply capacity in the sectors where Kiribati has comparative advantage (GoK, 2016). The main source of income in South Tarawa are wages and salaries at 47% of household income while the main sources of income in the other 22 inhabited outer islands are subsistence activities at 28% of total income (KNSO, 2006)².

South Tarawa is the main economic hub of Kiribati and with 55,000 people, it is home to close to half the population. The main employer in South Tarawa is the State. According to a document prepared by the Government of Kiribati (GoK) for the Development Partner's Forum held in 2016, recruitment for government employees only takes place in Kiritimati and South Tarawa (GoK, 2016).

While employment opportunities in the capital make it an attractive home to many, the increasing population is also the cause for a myriad of environmental challenges, as pressure to provide water, energy, housing and other necessities puts a stress on the island ecosystems and public infrastructure and finances.

The outer islands main economic activities are tied to subsistence economy. Their remoteness and limited natural and economic resource base make them especially vulnerable to the effects of climate change. Lack of improved education/health services and opportunities for employment are the main causes for internal migration and severe overcrowding on the main islands of South Tarawa.

1. ADB 2019, <https://data.adb.org/sites/default/files/kiribati-key-indicators-2019.pdf> (accessed on 2 December, 2019)

2. Most recent Household and Expenditure Survey took place in 2006

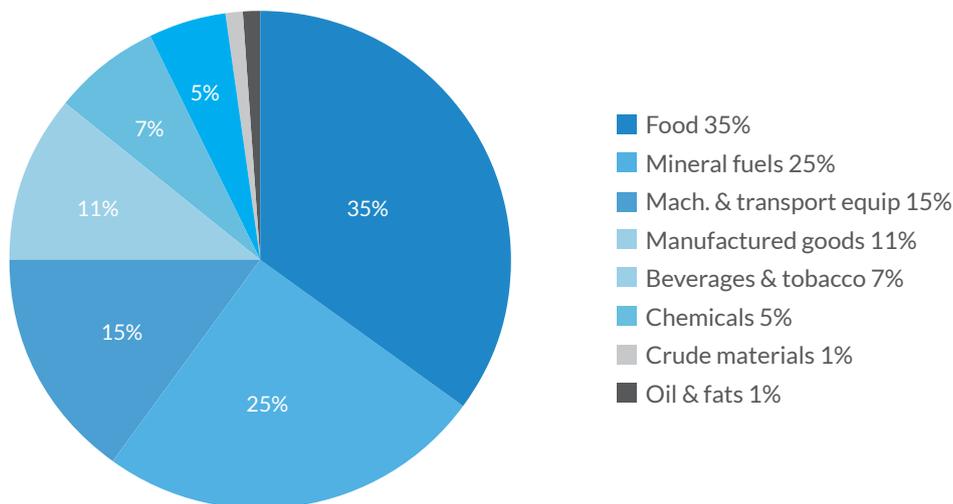


Figure 3: Imported Goods, 2006-2010. 2017. Trade Policy Framework. MCIC

The main employer in the outer islands are the Island Councils, the main governing body of the outer islands. Many islands have limited access to electricity, water and sanitation services and other enabling infrastructure. There are few infrastructure projects that target services for micro-businesses. For the people living on the outer islands, opportunities are limited to fisheries, tourism, and agriculture. Overall, the agriculture sector employs 4,110 people in Kiribati, while the public sector employs 3,521, wholesale and retail employ 3,457 and fisheries 2,708 people.

2.3 Human, and social development

Kiribati has one of the lowest per capita incomes in the Pacific, where 21.8 percent of the population fall below the basic needs poverty line (MFED, 2016). In 2010, GDP per capita was USD 1,468 (UNDP, 2010) while its human development index was 0.629 in 2013. Limited access to natural resources and employment opportunities cause hardship all along South Tarawa and the outer islands. In 2010, the unemployment rate was 30.6%, with youth unemployment rate at 54%. The annual labour force entrants in the formal and informal sector including the international market was 3,200.³ Three groups are especially vulnerable to this lack of opportunities, these include women, youth and people with disabilities.

Kiribati has come far in addressing gender inequality and has drafted a national policy on gender equality and women's development. Women in Kiribati are contributing greatly to economic, social and cultural life. The gender gap is narrow in education outcomes (2015, 999 males and 948 females had attained higher education) and government employment (53% male, 47% female). A gender gap still exists in the private sector labour markets (60% male, 40% female) and political representation, with only 7% of seats in parliament held by women in 2015, and gender-based violence is prevalent (68% of women have experienced physical and/or sexual violence by a partner in 2008).

The agriculture sector can help bridge some of these gender gaps by promoting equal opportunities for men and women in the sector. An understanding of the different roles of men and women in agriculture and their different access and control of productive resources will enable better design of agricultural policies and investments that benefits men and women farmers and increases household welfare and prosperity overall. Women carry large household and community responsibilities, which typically leave women with less time than men to spend on income generating activities. Tailored projects aimed at increasing the participation of women with the purpose of engaging women in income-generating activities close to home while also improving women's skills in value addition, and access markets, financial services and technologies can give women the opportunity to become financially empowered while still being able to meet family and traditional obligations. Youth also face challenges with gaining employment. According to the 2010 Census, 54% of youth were unemployed. As stated in section 2.1, the opportunities for employment are low in South Tarawa and even less in the outer islands. With adequate training, youth can develop agriculture and other relevant skills that can support their participation.

3. Kiribati Population Census 2010, KNSO

People with disabilities often face exclusion and access to education, training thus limiting employment opportunities and income generating activities. Those who can receive an education and fulfil job requirements must work through limited employment opportunities, employer attitudes and prejudices, and infrastructure that does not support their needs. Through the development of an inclusive agriculture sector, people with disabilities can have the opportunity to receive vocational training that can help them produce their own food and develop their own businesses. It is of utmost importance that future agriculture training considers the needs of people with disabilities to support them in their learning outcomes in the agriculture sector as well as potentially providing an income through agriculture production and value addition. Island Councils and Local authorities can play significant role to generate local resources, balance gender in equality and bring socially inclusive system through by-laws.

2.4 Environment sustainability

The sustainability of the agriculture and the environment sectors are directly linked as environmental damage can cause diminished productivity of the agriculture sector and unsustainable agriculture practices can cause irreparable environmental damage.

In Kiribati, the effects of climate change are already being felt. Some of the observed changes that will continue to have an impact on agriculture production include increase in air temperatures, changes in rainfall patterns, increased incidence of extreme weather events, and sea level rise through saltwater inundation of groundwater and the limited soil available. All these climate impacts are disrupting and impeding agricultural production in particular the rising sea level which is reducing available land for agriculture and human occupation.

Increases in air temperatures can increase the incidence of food-borne illnesses, trigger disease and pest outbreaks, reduce crop yields and cause stress on livestock, thereby reducing productivity. Changes in rain patterns and extreme weather events can both cause flooding and drought, also reducing productivity, and increase the incidence of food-borne diseases. Changes in weather patterns change the profile of existing pests and disease which can trigger pest/disease outbreaks at unusual times.

Another environmental issue that can affect agriculture production include water pollution due to poor waste management. Raising of domestic animals near water sources, and lack of appropriate waste management at farm levels threaten to pollute the water table. In the outer islands, limited water availability can lead to competition for water supply between crop and livestock production, and household use. Kiribati is already experiencing water scarcity in some islands. This risk is further exacerbated due to a growing population. There is therefore a critical link between improvements in water management, such as rainwater harvesting systems, and increased agricultural production.

2.5 Linkages between agriculture, food security, livelihoods, health, and nutrition

Traditionally, the people of Kiribati have engaged in fishing as the main source of food, and with agriculture as a secondary means of subsistence.

New challenges, including overfishing, and impacts of climate change in the fisheries sector and low land availability coupled with increasing population has led to the decline in agriculture production in South Tarawa have caused a relative decline in availability of local foods.⁴ To increase the availability of food, the reliance of imported food has increased. In 2015, 32% of imports were foodstuffs (MCIC, 2017). These include high calorie, low nutrition food such as rice, flour and sugar. Fresh foods such as fruits, vegetables are imported but due to transportation and logistics constraints, the supply is irregular and high-priced. Of the fruits and vegetables that arrive to Kiribati, most are sold on South Tarawa with little supply being sold in the outer islands.

The high reliance of food imports has also led to a high incidence of malnutrition, obesity, and non-communicable diseases (NCDs) (MHMS, 2015). This has large human and economic costs to the country through early deaths, lost employment days as a result of illness and a large health bill for the public health system. According to a technical

4. Local food is limited to fish and a few local crops, such as coconut, pandanus, bwabwai, breadfruit and bananas. More recently, Chinese cabbage, eggplants, cucumbers and others have been introduced to the local diet.

brief by the Centre for Tropical Agriculture (CTA), “the supply of dietary energy, mainly in the form of oils, sugars and other carbohydrates, has grown between 1990 and 2011. Consumption of vegetable oils and oil crops has increased significantly, contributing 25% of the total dietary energy supply in 2011, demonstrating a major shift in intake from 180 to 747 kilocalories per person per year between 1990 and 2011. Sugars and syrups accounted for 16% of food energy.”

Table 1: NCDs Kiribati 2008 (MHMS, 2015)

Health Indicator	Percentage
NCDs as a proportion of total deaths, all ages	69.0%
Proportion of population who are overweight (BMI \geq 25 kg/m ²)	81.5%
Proportion of population aged 25-64 years with \geq 3 NCD risk factors	72.7%
Proportion of population with elevated fasting blood glucose (\geq 6.1 mmol/L) or currently on diabetes medication	28.1%

Table 2: Kiribati Obesity, 2006⁵

Sex	Percentage
Male	59%
Female	42%

Diabetes and obesity can both be controlled with a balanced diet that includes fruits and vegetables. In the absence of availability of healthy imports, there is an opportunity to increase the production of local crops for sale. The development of jobs through the agriculture sector is of importance in the Kiribati context. As stated in Section 2.2, income generating opportunities in the outer islands are scarce and, unemployment rates for women and youth are staggering. The increase in production will help to establish new farmers and support farmers to extend their production for increased income. Alongside this increase in supply, it is expected for additional green jobs are created along the value chain. For these products to be sold in the domestic market, there will need to be a push to increase and improve maritime transportation, this will also create new jobs.

In the absence or reliable transportation, there are also opportunities to diversify agriculture products through value addition and food processing. The latter can include food preservation: canning, drying, freezing, fry drying and chemical preservation or new products: banana chips, vinegar, chutneys and sauces, jams. These opportunities can provide income for the overall population, including vulnerable groups such as women, youth and people with disabilities, given the right support to develop these given the constraints these groups currently face. For these linkages to be developed throughout the implementation of the agriculture strategy, it will be crucial to include partnerships within the Kiribati government. These ministries include those working in the health sector, social sector and commerce, Ministry of Health and Medical Services, Ministry of Women, Youth, Sports and Social Affairs, and the Ministry of Commerce, Industry and Cooperatives, respectively.

3. National Policy Framework



This chapter describes how the agriculture strategy is aligned to various existing national policies and strategies. Kiribati's development pathway is framed by three main national documents, the Kiribati 20 Year Vision (KV20), the Kiribati Development Plan (KDP) and the Kiribati Joint Implementation Plan for Climate Change and Disaster Risk Management (KJIP 2019-2028). These documents are guided by country needs and international commitments. The Kiribati national plans were framed in alignment with the Sustainable Development Goals (SDGs) and other international and regional commitments such as the SIDS Accelerated Modalities of Action (SAMOA) Pathway, Paris Agreement Nationally Determined Contributions (NDCs) and the Framework for Resilient Pacific Development. Ministries use these to guide their Sector Policies and Strategies, Ministerial Strategic Plans, and Operations plans which feed into budget preparation.

3.1 Kiribati 20 Year Vision (KV20)

The KV20 is the long-term national development plan for Kiribati focused on the fisheries and tourism sectors as the main vehicles in transforming the economy.

The vision is anchored on four pillars: wealth, peace and security, infrastructure and governance.

The agriculture strategy is aligned with the KV20 pillars relating to wealth, infrastructure and governance and will support the fulfillment of the following strategies within the KV20:

- Increasing overseas and domestic employment opportunities and providing decent employment for all
- Promoting inclusive trade and private sector for sustainable development; and
- Reducing the prevalence of common NCD.
- Implement measures to safeguard and revive traditional skills and knowledge; and the overall outcome of A Secure, Safer and Peaceful Kiribati by promoting food security

3.2 Kiribati Development Plan (KDP)

The KDP is a mid-term plan used to establish government priorities in 4-year intervals. It guides the formulation of policies and programs that allow for the inclusive economic development. The KDP focuses on 6 Key Program Areas (KPA): Human Resource Development, Economic Growth and Poverty Reduction, Health, Environment, Governance, and Infrastructure. The agriculture strategy will support the fulfillment of the following outcomes within the KDP:

KPA 2: Economic Growth and Poverty Reduction

Outcome 1: Increased sustainable economic development and improved standards of living for all Kiribati

KPA 4: Environment

Outcome 2: Promotion of food and nutrition diversity

3.3 Kiribati Joint Implementation Plan for Climate Change & Disaster Risk Management, 2019-2028

The KJIP is Kiribati's National Adaptation Plan (NAP). This integrated adaptation plan featured 104 actions to complement sectoral strategies and national priorities of the government to address climate change impacts, strengthen resilient development, and boost financial and technical coordination and cooperation's among different sectors. This plan highlights the importance of food security considering climate change.

The agriculture strategy will support the fulfillment of the following strategies within the KJIP:

- Strategy 3: Strengthening and greening the private sector, including small to medium-sized enterprises, and
- Strategy 4: Increasing water and food security with integrated and sector-specific approaches and promoting healthy and resilient ecosystems

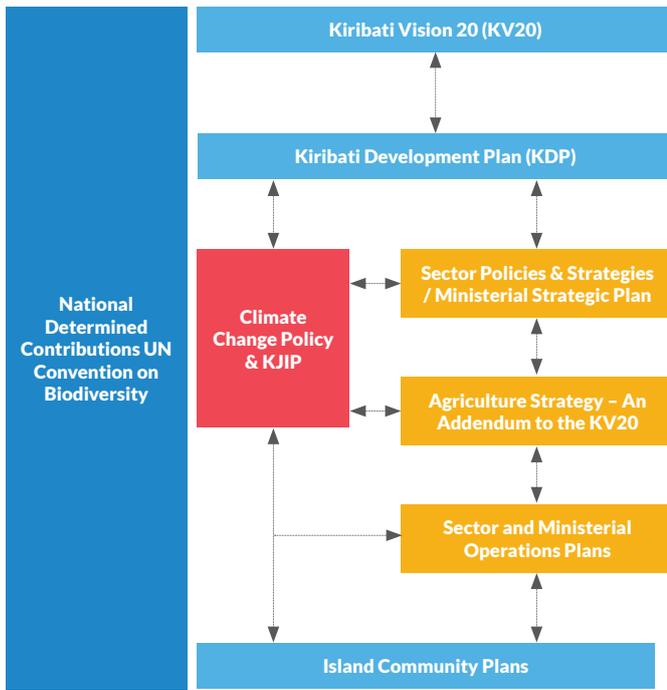


Figure 4: national Policy Framework

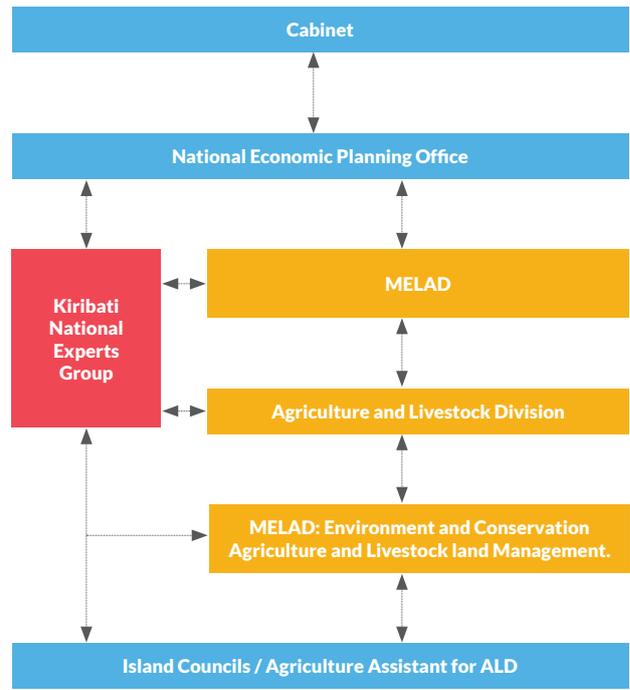


Figure 5: Agriculture policy framework



4. The Agriculture Sector and Key Development Challenges

This chapter presents an overview of the Kiribati agriculture sector and its key development challenges.

4.1 Overview of the Agriculture Sector

The soil in Kiribati is considered amongst the most infertile in the world, being young, shallow and alkaline, limiting conventional agricultural methods. However, Agriculture, along with forestry and fishing, contributed 27% to the GDP of Kiribati and accounted for 59% of total employment in 2017 (ADB, 2019). In 2016, available agricultural land was 42% of total land area compared to 53% in 1964.⁶ The Ministry of Environment, Lands and Agricultural Development is the government ministry responsible for the sector.

The main food crops cultivated by growers both on South Tarawa and outer islands include coconuts, breadfruits, pandanus (sweet varieties), pumpkin, wild fig (te bero), pawpaw, giant swamp taro (bwabwai), taro, sweet potato, cassava to some extent and vegetables like Chinese cabbage, cucumber, eggplant, tomato, spinach, water spinach (kang kong), Chaya, bele, iaroo and iamai.

Copra and coconut crude oil remain the principal agricultural export commodities along with seaweed, and atolls are widely planted with coconut trees (FAO,2011). Copra accounts for about two-third of overall export revenue; and the Kiribati Copra Milling Company purchases this product from local farmer for additional processing and export. Production for copra in 2010 was 3,500 tonnes and had an export value of US\$1.5 million.

Kiribati export copra, coconuts, seaweed and fish to many countries worldwide. In the year 2016 the country exported products to Malaysia (33.8%), Fiji (14.87%) , New Zealand (14.4%) , USA (21.18%), Japan (4.3%) and 12.12% to Philippines, Nauru, Australia, Indonesia, America Samoa, Tuvalu, Marshal Islands, Singapore , Morocco , France, UK...etc (World Bank-WITS, 2016 Export Product Report). Most Kiribati population is involved in subsistence agriculture. The country has developed a sustainable farming system based on the traditional method of te bwabwai pits, which involves an extensive composting technique using pits dug to a depth of between one and eight meters and then filled with compost.

The most common agricultural livestock namely pigs, and chicken are raised largely under a subsistence production system, partly due to the size of the islands. Livestock is the focus of development efforts in the agriculture sector. FAO is operating several livestock projects in the country, including livestock community activities to enhance food security and income generation for all outer island communities. They are also in co-operation with the state to run a sustainable development project for coconut palm. Efforts are also being made to establish breeds of pigs, and poultry suitable for local breeding.

4.2 Key Agriculture Issues and Development Challenges

Agriculture in Kiribati is faced with many development issues and challenges that severely restrict crop and animal production for exports, the domestic market and subsistence. The major issues and development challenges are:

A. Land Tenure system and Land availability

Land tenure system is limiting the productivity and development of agriculture sector. With only 42% of total land available for agriculture, Kiribati has limited availability of land to diversify and boost agricultural production and productivity. However, available agricultural land is not freely accessible because of constraints in the local and traditional land tenure system which is major obstacle to private sector development.

In the Gilbert Islands Group land is unevenly distributed among the people and owned either on an individual or kin basis. Individually owned land, including land which have been purchased, is registered in the name of the individual/s. The atolls in the Phoenix and Line Islands are owned by the Government. Long term residents on Kiritimati atoll have also purchased land of about half an acre per purchase. The Government also leases some land in South Tarawa and traditional landowners are unable to utilise their land for subsistence⁷.

⁶ <https://knoema.com/atlas/Kiribati/topics/Land-Use/Area/Agricultural-land-as-a-share-of-land-area> (accessed 29 November 2019)

B. Soil

Furthermore, available agricultural land will diminish over time as coastal and low-lying land is lost due to increasing erosion and rising sea level. Since Kiribati consists of small low-lying coral atolls, the poor quality of its soil is a major constraint on agricultural production. The soils are shallow, calcareous, alkaline (basic) and coarse textured with low organic matter content, water holding capacity and fertility. While the soils are rich in calcium and magnesium content, nitrogen, phosphorus, potassium and micronutrients deficiencies limit agricultural production (Kiribati National Statistics Office, 2018). However, some places with old guano deposits have elevated nitrogen and phosphorus levels (UNCDP, 2018). Available agricultural land is a critical input factor concerning the success of the KSA, particularly in supporting the development of commercial-scale farms.

C. Water Availability

The country has limited freshwater resources. Groundwater is the main source of water for agriculture, which is exposed to saline water intrusion particularly during droughts. In addition, overuse and a rise in the sea level result in saltwater contamination of groundwater resources. Seasonal rainfall as a source of water has become increasingly variable (CTA, 2019), the northern islands receiving the maximum rainfall, while the southern islands tend to be the driest region⁷.

D. Reliance on Imports

The gap between the country's demand for foods and domestic food production means that food must be imported. The supply of locally produced traditional foods is less than the demand but also expensive in the local market. Low production and the high price of locally produced foods means that consumers have to rely on imported food of low nutritional content, with consequential health implications. Absence of diversified supply in the market causes most people to consume similar food items. The diminishing knowledge of local people about preserving traditional foods has affected the volume of available agriculture production by the citizens of Kiribati (Pacific Climate Change Science Program, 2011).

E. Agricultural Support Services

The sector is dominated by Smallholder farmers producing at subsistence level dominate crop and livestock production in Kiribati (GoK, 2018). Although smallholder farming can make a significant contribution to attaining food security and improving livelihoods, the smallholder sector is impeded by its limited access to agricultural inputs, information, technologies and markets. The distance between the widely scattered islands and existing transport and communication systems limits the capacity of the agriculture sector to adequately provide extension services and training to farmers and staff living in those areas (GoK, 2016). Twenty-six extension workers of which twenty-three in outer island and three from South Tarawa supports the national agriculture development effort (MELAD, 2019). Production is limited to small-scale commercial production of poultry, vegetables and other farm produce for local markets (GoK, 2014). In the absence of a more enabling environment, commercial production and private sector development is limited. Furthermore, agro-processing and value addition remain largely underdeveloped, due to low agricultural production, inadequate infrastructure, technological and policy support.

F. Transportation and Marketing

The lack of reliable transportation to and from the outer islands limits farmers' and traders' access to markets and causes wastage of agriculture produce and thus loss of farmers' incomes (SIDS, 2014). The current regional transportation and Bio-security section of ALD limits the types and amounts of agricultural inputs that arrive in Kiribati – this includes planting materials, livestock breeds as well as other inputs such as organic fertilizers, tools, and livestock feed. Notable limitations are - live pigs for genetic improvement are not allowed to bring in directly by air from the supplying country, and not able to identify sex of eggs (PIFS, 2014).

G. Climate change

Climate variability and climate change - erratic rainfall patterns, frequent droughts, rising temperature and king tides pose substantial challenges for the country's agriculture sector (Pacific Climate Change Science Program, 2011). As extreme climate events are set to become more severe, their adverse impacts on agriculture will further amplify challenges associated with agricultural productivity and food security (GoK, 2014). Over the last eight decades, Kiribati experienced 13 major droughts, 5 major tropical cyclones and 4 extreme tide events, resulting in severe environmental and economic damage (DFAT, 2014). Changes in rain patterns and extreme weather events both cause flooding and drought, also reducing productivity, and increase the

7. <http://www.commonwealthofnations.org/sectors-kiribati/business/agriculture/> (accessed 3 December 2019)

incidence of food-borne diseases. To ensure the sustainability of the agriculture sector, future interventions in this sector will need to address climate change, climate variability and environmental risks in project design. Project stockholders including project designers and managers in agriculture sector are required to develop comprehensive Climate Smart Agricultural (CSA) projects and agricultural systems effectively respond to Kiribati climate change impacts (sea level rise, coastal erosion and inundation of fresh water and by Ocean).

H. Erosion of traditional knowledge

Traditional knowledge for fishing, farming, and care for domestic and wild plants and animals has declined over time. Traditional forms of food preparation and preservation are largely unknown to young people. The result has been a decline in the application of traditional agriculture practices and in the consumption of traditional and local produced foods. Today, most of the atolls are dependent on imported foods which, compared to local produce, are mostly inferior in nutritional quality. This has contributed to a rapid increase in the level of NCDs including diabetes, heart disease, stroke, obesity, dental disease, and cancer (ALD, 2013).

I. Biosecurity threats

As a vulnerable LDC/SIDS, biosecurity is an important consideration in relation to the conservation and protection of flora and fauna in Kiribati. Given that agriculture development will most likely be concentrated on a few viable crops and livestock species, biosecurity threats to those will need to be carefully considered due to the potentially significant harm they can cause to crop and livestock production and thereby to livelihoods. Invasive plant species, diseases and pests can easily find their way into Kiribati in many ways such as trade, tourism, travellers, fishing boats, etc. The revival of agriculture in Kiribati must be supported by effective border biosecurity control and protection

J. Geographic isolation

Kiribati is geographically isolated with low-lying atolls, small land areas dispersed across 3,500,000 square kilometres (1,351,000 square miles) and a high population concentration in the nation's capital, South Tarawa. In this context, the agriculture sector is exposed and vulnerable to the adverse impacts of climate change. It is one of the most environmentally fragile countries in the world. The country has only 34,000 hectares of land for agriculture (WB,2016).

5. Key Strategic Issues



To enable the revival of agriculture production in Kiribati, there are several key strategic issues that needs to be addressed under KAS. These strategic issues are:

A. Radical change in mindset and local diet in favour of local food.

Rapid economic and socio-cultural change in Kiribati over the last fifty years have resulted a high degree of reliance and preference for consumption of imported food leading to a decline in demand for local food and agricultural production. This also directly contributed to the high level of NCDs per capita and other health problems. Reversing this trend will require strong political leadership to create a radical change in mindset and behavior. An intensive national wide education and awareness campaign on nutrition, health and eating local food will be necessary to induce a change in behavior and the local diet. Increased opportunities for local production will need to be matched by an increase in local demand in both the domestic market and household consumption.

B. Political will to lead and support the implementation of the KAS and garner local support and buy in for increased local engagement.

The success of the KAS creates significant livelihood and health benefits for Kiribati and its future generations. Given the current context, its success requires strong political leadership and political will and buy-in from the very top to drive its effective implementation and priority resource allocation, mobilize local engagement but also tracking and ensuring accountability for its results.

C. Identification of influential local champion to promote the implementation and local support for the KAS.

Local champion can be an effective way driving the implementation of national policies such as the KAS that require significant behavior change. Popular national leaders of good standing in society that are well connected at all levels are needed to mobilize all stakeholders and strong local engagement. These champions can be the poster boy or girl of the KSA messaging. Sports personalities, church leaders, youth leaders and community leaders should be considered

D. Mobilization of public sector and private sector investment and resources to support the implementation of KAS.

Capital investment from both public and private sector is crucial to the implementation of the KSA, and support for institutional capacity. Kiribati has high a level of donor support which can be leveraged to secure valued donor funds to complement the government budget. Donor technical support enhance research, innovation knowledge sharing and entrepreneurial skills development but must be driven by a deep understanding of the local context and led locally. The role of the private sector particularly in enabling the marketing value chain will be critical.

E. Development of incentives to effectively induce positive behaviors

The orientation of the KAS is to induce behavioral change at various levels through a range of incentives to engage farmers in farming and agriculture and promote private sector investment. The creation of a conducive investment environment is also crucial to generate great investor confidence, certainty and reduce risks.

F. Gender and social inclusion

The revival of the agriculture sector particularly for household consumption and the domestic market offers opportunities for social inclusion, particularly for gender equality and enhanced livelihoods for women and youth. Tailored projects aimed at increasing the participation of women with the purpose of engaging women in household food production and security income-generating activities through value addition, particularly in fruit and vegetable gardening, access to markets, financial services, capacity building and technology. Allowing women to develop livelihoods close to home, can give more women the impportunity to become financially empowered while still being able to meet family and traditional obligations. Capacity building for women farmers on e.g. soil improvements, composting, pest management, water conservation, crop spacing etc. can increase productivity. Capacity building for conservation techniques, value additions (jams, chips, food

products) and marketing will enhance income diversification and opportunities for off-season income (Cualfiled T. 2018). Similarly, the youth and people with disability can be meaningfully engaged in agriculture.

G. Partnerships

It must be emphasized that successful implementation of the KAS will be dependent on the strength and diversity of partnerships with key stakeholders. Local partnership is crucial to promote social inclusion and improves the ability, opportunity, and dignity of those disadvantaged ones based on their identity. Community Based Organizations (CBOs), Faith Based Organizations (FBOs), Civil Society Organizations (CSOs), local NGOs, International NGOs professional associations and expert group like Kiribati National Expert Group (KNEG) need to work in a coordinated manner to bring collective effort and deliver best result. Other forms of partnerships such as donor funding assistance and in knowledge sharing also helps with rationalizing of resources and scaling up of efforts without the Kiribati Government having to solely bear the resource burden. It is therefore essential that the key stakeholders are identified early and engaged in the development, implementation, and monitoring and evaluation of KAS.

H. Knowledge sharing and learning from other countries.

In the small island states, traditional village pig and poultry production is more important. Kiribati as small island state in South Pacific has a protentional to boost livestock output mainly through improved pig and chicken breeding. Kiribati can share and adopt the experience of other leading livestock producers in the region. Fiji, New Caledonia, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu are the main livestock producing countries in Pacific (FAO,1998), which Kiribati can share the most productive, adaptable and climate resilient pig and chicken breeds both for commercial and household consumption purposes. Its paramount for Kiribati to explore and identify countries which have similar weather and adoptable livestock type through knowledge sharing and learning to enhance agricultural production. It's also crucial for the country to seek and adopt cost-effective and sustainable water, irrigation and soil treatment technologies from countries with proven and practical experience to share water, irrigation and soil treatment and management technologies (middle east countries particularly Israel can be considered).

6. Theory of Change



This chapter presents the KAS Theory of Change (TOC) in Figure 8.

The first step in the development of TOC was the use of the problem tree analysis (Figure 6) tool to study the focal problem of declining agriculture production and local engagement in Kiribati and to identify its related causes and effects. This analysis was guided by the knowledge and insights gained from desk research and consultation across Government and with stakeholders and the community.

Once the problem tree was developed, the second step was transforming it into an objective or solution tree (Figure 7), identifying ways and ideas for solving the causes and addressing the effects. This resulted in a list of objectives and core actions to be adopted. This provided the basis for identifying the optimal pathway for structuring the new Strategy.

The TOC is designed along this chosen optimal pathway. It assumes that if the core outputs and related actions were pursued, it will generate the necessary outcomes necessary to deliver the project impact and benefits leading to increased local engagement and agricultural outputs which will result in improved national and household incomes and livelihoods, improved nutrition and health and living standards for the people of Kiribati.

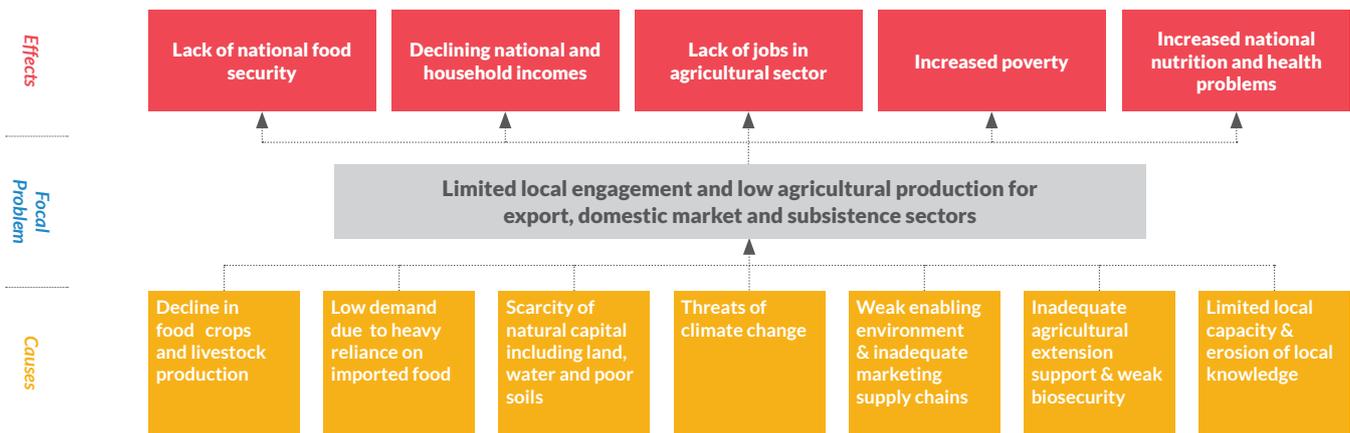


Figure 6: Problem Tree Analysis

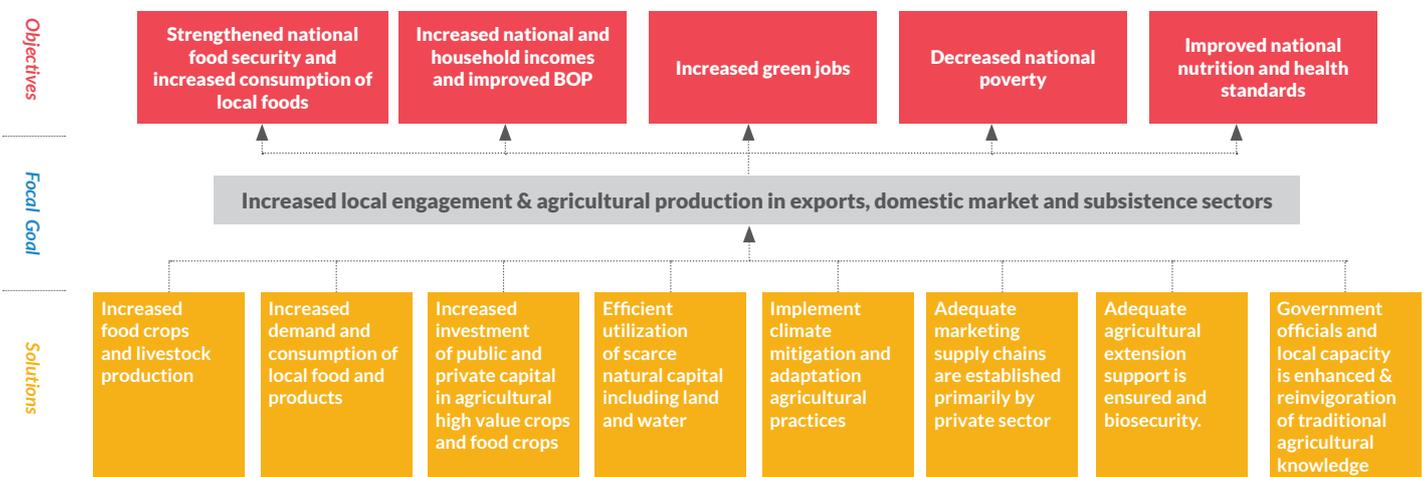


Figure 7: Objectives/Solutions Tree Analysis

KIRIBATI AGRICULTURE STRATEGY THEORY OF CHANGE

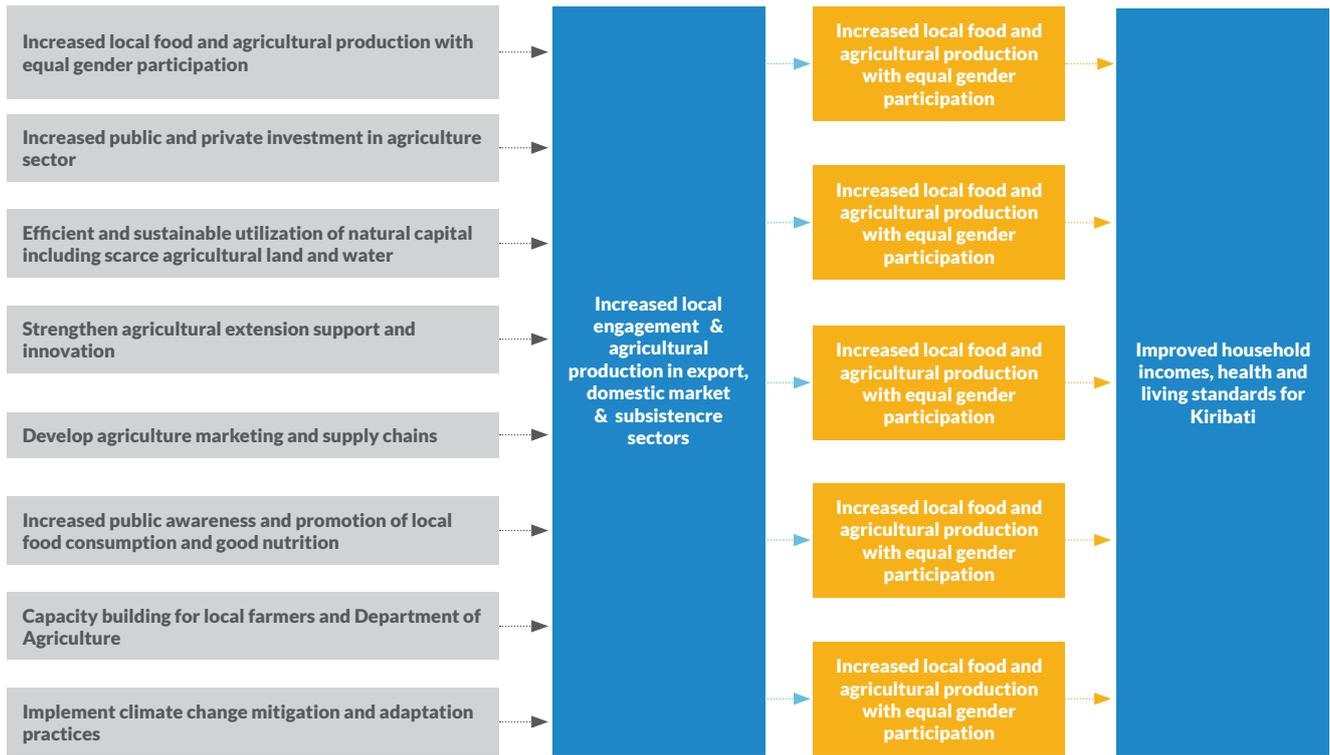


Figure 8: KAS Theory of Change

7. Vision, Mission, Objectives and Outputs



The overarching National Vision of KV20 is to transform Kiribati into a wealthier, healthier and peaceful nation based on accelerated, green growth and strategic investment in our human, natural and cultural capital

Despite the existing challenges and constraints, there is potential to develop and grow the agriculture sector in Kiribati for domestic market and household consumption to contribute further to the achievement of Kiribati's national development goals. This national Agriculture Strategy is closely aligned to the KV20 pillars of wealth, infrastructure and governance.

In order to address the national challenges of low community engagement in the development process and low productivity and production in agriculture, opportunities are presented to increase the involvement of the local community in the sector and to growing a wider range of crops, both for export and in particular for domestic, household consumption. The intention of increasing domestic food production is enhanced food security and improved nutrition and health. An analysis of the food supply in 2005 found that 64% of food consumed in Kiribati that year was imported, indicating vulnerability with respect to food security (ALD, 2016). As discussed above, the vulnerability will be further increased by the impact of climate change.

This new agriculture strategy, to initially cover the ten-year period 2020-2030, will be driven by a new vision and mission.

VISION	MISSION
Household incomes, nutrition, health, food security and living standards in Kiribati are improved through increased domestic agricultural production and productivity.	To increase national and community engagement to raise agricultural production and productivity for household consumption, domestic markets and exports.

OBJECTIVE 1	THE KEY PERFORMANCE INDICATORS
Sustainable atoll crop production systems developed and promoted	<ul style="list-style-type: none"> • Increased adoption of sustainable crop production systems • Increase in crop area and production/output • Increased crop produces sales. • Increased household income for crop farmers (disaggregated by men and women)

OUTPUT 1.1: Crop diversity improved, conserved, and utilized.

Improving crop diversity, especially among traditional crops that are less demanding in terms of production inputs compared to hybrid/imported exotic crops, will result in the production of relatively cheaper food, as well as raising incomes. Selecting varieties that are adapted to atoll conditions and potential climate change impacts of increased temperature, drought, and seawater intrusion will ensure the development of more sustainable production systems, compared to those currently being practiced. ALD will initiate activities to ensure that the genetic diversity of crops is conserved. An integrated agriculture and nutrition effort will be made to develop nutrition sensitive agriculture and food system agricultural production be linked to health, nutrition. Furthermore, agriculture and nutrition integration will be ensured through enhanced food security and mainstreaming nutrition throughout the food system.

OUTPUT 1.2: Soil management technologies appropriate for atoll conditions developed and adopted.

Kiribati soils are calcareous, shallow, alkaline and coarse textured. Any sustainable soil management technologies workable on atoll soils will have to improve the soil's physical, chemical and biological properties. Most rural and urban communities are aware the benefit of composting and practicing at small scale to enrich soil fertility and increase agricultural productivity. ALD is also practicing composting for years in Tanana is ready for scale up and expansion. This means that the efforts will be on improving soil organic matter by use of composting, adaptable cover crops, and any other intervention that will recycle organic matter back to the soil. This will provide opportunities for soil carbon sequestration and further Nitrogen fixation.

OUTPUT 1.3: Agroforestry systems appropriate for atolls developed and adopted.

The Crop Production and Agroforestry Section of ALD will work towards the development and application of agroforestry systems using indigenous trees grown in combination with staple crops and small livestock. The aim being the development and implementation of integrated and holistic food production systems that are both resilient to impacts of climate change and contribute to improved food and nutrition security.

OUTPUT 1.4: Water management technologies appropriate for atolls developed and adopted.

This output is linked to Outputs 1.2 and 1.3. When organic matter levels in soils are improved, the soils will hold more water for plant use. An integrated agroforestry system will also reduce the water required for food production. However, if farmers are to grow cash crops like vegetables (lettuce, cucumber, pumpkins and cabbages), then they must have access to reliable water sources. This will mean that ALD will promote drip irrigation systems, like the bucket irrigation system that was promoted by the Development of Sustainable Agriculture in the Pacific (DSAP) project, to farmers, as well as solar-powered irrigation systems. In addition, the use of the new wicking-based system developed by the Soil Health Project should be promoted as well.

OUTPUT 1.5: Pest and disease problems identified, control methods developed and promoted, and capacity to respond to pest problems strengthened.

There is a need to strengthen the capacity of ALD in the area of biosecurity so that it can manage plant and animal pests and diseases and weeds. It is important that the diagnostic skills of both ALD staff and farmers and their ability to test and apply solutions on-farm are strengthened. Investigation into the potential development of a new pest and disease regime addressing impacts of climate change will be undertaken with capacity support from the Secretariat of the Pacific Community (SPC) and other international agencies such as the Food and Agriculture Organization (FAO) and the Australian Centre for International Agricultural Research (ACIAR). Since Kiribati advocates the ban of inorganic pesticides, it should develop organic food production systems. ALD will seek capacity building support in this area from SPC and FAO.

OBJECTIVE 2

THE KEY PERFORMANCE INDICATORS

Sustainable small-animal livestock production systems developed and promoted.

- Increased adoption of sustainable livestock management systems
- Increase in livestock numbers and production
- National animal waste management strategies developed and adopted
- Increase in household income for livestock farmers (disaggregated by men and women)

OUTPUT 2.1: Appropriate livestock management practices developed and promoted.

ALD will seek support for capacity building in the development and promotion of improved sustainable livestock management practices, including animal health and waste management strategies. Many of the challenges facing ALD are interwoven, and significant benefits can be gained from a greater integration of efforts with other stakeholders, including SPC, International Fund for Agriculture Development (IFAD) and FAO.

OUTPUT 2.2: Livestock genetics diversified, improved, conserved and utilized.

Kiribati has limited choice and insignificant animal stock available to enhance livestock production. Most common are smaller animals such as pigs, poultry, , ducks and the traditional breeds of these animals raised on atolls are few in number and needs further protection to sustain the survival of most breeds The Solomon Islands has the best breed of pigs and the most suitable for formulated feed. The recommended strategy is to improve the local breeds (pig & Chicken) by crossing with others that can adapt to Kiribati conditions, also taking into consideration the potential impacts of climate change.

OUTPUT 2.3: Livestock feeds with local ingredients developed.

The cost of livestock feeds is expensive as the product is demanded at subsistence level, together with transport problem make the cost of livestock production high. There is therefore a need for ALD to seek capacity building, research and development in making livestock feeds purely from local ingredients or producing feeds locally with a combination of local and imported materials.

OUTPUT 2.4: Livestock feeds with local ingredients developed.

The disposal of piggery waste is a challenge and an opportunity in Kiribati, especially along the coastal areas. This activity is linked to Output 1.2. Piggery waste should be used as one of the ingredients in compost used in crop production. ALD should explore spearheading a national campaign on waste management for a cleaner environment and better crop nutrition.

OBJECTIVE 3

THE KEY PERFORMANCE INDICATORS

Sustainable small-animal livestock production systems developed and promoted. Sustainable small-animal livestock production systems developed and promoted..

- Level of public and private investment capital flows into the agriculture sector
- Increase in sale of agricultural outputs in the domestic market

OUTPUT 3.1: Agriculture sector financing and investments mobilized.

Kiribati's prevailing traditional low-input agriculture system requires little credit except for labor and other cash inputs; however, given increasing climate change risks and farming challenges, there will be a demand for new crops, other technologies and farming techniques that will require some level of financial assistance for farmers. Financial institutions including banks and credit providers will be organized to support and make available accessible low-interest agricultural loans to farmers who meet a minimum standard criterion including business, financial and marketing knowledge and skills.

OUTPUT 3.2: Domestic value chains developed.

Typically, smallholder farmers in Kiribati are focus on producing crops for their and their families' own consumption, while those with surplus produce sell for cash in local markets or roadside stalls. There is potential for farmers, men and women, to significantly increase volumes of surplus produce to sell at local markets, South Tarawa and other atolls and thus increase their incomes. This will require the government and private sector to work together to develop efficient and reliable value chains incorporating private sector actors that can source fresh produce directly from farmers, control its safe processing and storage, and sell it in South Tarawa and other major population centers of the country. A small unit needs to be established in the ALD to coordinate and manage the value chain development program in partnership with donors, the private sector and farmers.

OUTPUT 3.3: Agriculture, transport and marketing infrastructure improved.

Agriculture development in a remote and scattered small island country like Kiribati is typically hampered by the lack of quality infrastructure that supports the production of crops and transporting those outputs from farmers to markets to consumers efficiently. A coordinated effort to plan and construct infrastructure through government and donor investments and private sector operations will be sought. Implementation will support agriculture production, quality control, shipping transportation between atolls and markets, storage and the development of local markets.

OBJECTIVE 4

THE KEY PERFORMANCE INDICATORS

Climate change mitigation and adaptation enhanced

- Increased adoption of sustainable livestock management systems
- Increase in livestock numbers and production
- National animal waste management strategies developed and adopted
- Increase in household income for livestock farmers (disaggregated by men and women)

OUTPUT 4.1: Climate change impacts and risks are managed and minimized.

Both in isolation and combined, climate change impacts and natural disasters are disruptive and negatively impact sustainable agricultural production, outputs and livelihoods in Kiribati. It is imperative for agricultural development to focus on integrating environmental protection and sustainability through appropriate climate mitigation and adaptation measures to strengthen climate resilience, such as protection against coastal erosion, adoption of new sustainable agricultural practices, introduction of appropriate technologies, effective use of traditional agricultural knowledge, human and intuitional capacity building efforts and practices help more to mitigate climate change impacts.

OBJECTIVE 5**THE KEY PERFORMANCE INDICATORS**

Improved biosecurity

- Compliance with international standards
- Revision of biosecurity Act 2011
- Increase in domestic and export trade
- Plant protection programme operational (linked to Output 1.5)

OUTPUT 5.1: Capacity to increase domestic and export trade developed and strengthened.

Biosecurity staff will be supported by the Pacific Plant Protection Organization (PPPO), SPC Land Resources Division (LRD) Plant Health Group and FAO to comply with international standards through training in import risk assessment and import specifications concerning market access, updating national pest lists, and issuing phytosanitary and animal health certificates for export commodities and produce. Capacity to carry out commodity pathway analyses will also be strengthened.

OUTPUT 5.2: Quarantine/biosecurity capacity improved.

Efforts will be made to sustain a low pest prevalence while facilitating trade. Border security is the first line of defense against the introduction of invasive alien species, pests and diseases. Biosecurity staff working under ALD staff will be trained in different aspects of quarantine and pest and disease identification and control.

OBJECTIVE 6**THE KEY PERFORMANCE INDICATORS**

National nutrition and health education and awareness-raising about consuming local produce

- Agriculture sector policies are aligned with health sector policies
- Communities are educated about and gain increased awareness of the significance of nutrition, health and consumption of locally produced foods

OUTPUT 6.1: Alignment with the national health sector developmental goals.

The KAS will strengthen, support and more closely align with the Ministry of Health's overall goal to produce and supply the various islands of Kiribati with healthy, fresh and value-added local food and produce through the expansion of agriculture production and commercialization of the sector. The adequate and sustainable supply of fresh local produce will improve people's nutrition and health and help reduce the prevalence of risk factors for NCDs, as well as help reduce morbidity, disability and mortality. It will also support and strengthen initiatives on healthy diets, nutrition education and healthy eating with the availability of fresh local fruits and vegetables.

OUTPUT 6.2: The local community is educated and made aware of the importance of nutrition and a healthy diet by choosing locally produced food.

The national endeavor to increase agricultural production for the domestic market and household consumption must be complemented by an increase in domestic demand for local food. This will require the implementation of an extensive national education, training and awareness program to induce a radical switch in consumer preferences in favor of the healthier consumption of local agricultural produce and food.

OBJECTIVE 7**THE KEY PERFORMANCE INDICATORS**

Capacity building for government officials and stakeholders.

- Skilled and efficient government officials
- Skilled and committed stakeholders including local farmers (men and women)

OUTPUT 7.1: Farming and business skills of farmers improved.

Farming is predominantly for subsistence in Kiribati. In order to increase local community engagement in agriculture, community members will be trained in sustainable farming techniques to grow their own food and produce a surplus for income. The national agriculture extension program will be strengthened and improved to effectively support the implementation of the KAS in providing advice and services on crop selection, land preparation, seed selection/, planting, crop growth, management, harvesting and sales storage and marketing/sales techniques. In order to commercialize operations, people will be trained in farming and business skills with an emphasis on youth and women.

OUTPUT 7.2: Capacity of extension, outreach, and information services strengthened.

Currently, ALD and other departments and stakeholders have limited human resources and few with adequate qualifications to competently and efficiently implement key agriculture sector programs and projects. There are only twenty-six extension workers to support 1326 active farmers; there is insufficient human resource development and a gap in vocational and academic training in agriculture and forestry.

OUTPUT 7.3: Technical skills of agricultural staff improved.

The participatory consultation with stakeholders highlighted the need to upgrade the technical skills of agricultural staff, especially their diagnostic skills. It is envisaged that an improvement in the diagnostic skills of agricultural staff will contribute significantly to effectively addressing challenges to which farmers are exposed. On-farm development of technologies will also be promoted. From the outset, it will be necessary to ensure that farmers are involved in diagnosing a problem and in deciding on solutions, and that they are part of the development, implementation and evaluation of technologies to support their agricultural and forestry activities. Agricultural staff will also understand any gender related and social dynamics that will enable effective capacity building of both men and women farmers.



8. Institutional Set-up and Governance

The Ministry of Environment, Lands and Agriculture Development is the owner of the KAS – An Addendum to the KV20. It consists of 3 Divisions: Environment and Conservation Division (ECD), ALD and Lands Management Division (LMD) and two units, the Policy and Management Unit (PMU) and the Phoenix Area Protected Area (PIPA) Unit.

The implementor of the KAS is the ALD. The division consists of four Sections

I. Biosecurity and Plant Health Section

- Safeguards Kiribati's narrow-based plants and animal genetic resources
- Prevent the spread of introduced/existing plant pests and diseases to other non-infested areas
- Conduct research on appropriate control measures for plant pests and diseases

II. Crop Production and Research Development Section

- Conducts research and provides technical advice on atoll crop production and crop propagation; conservation of local plant species; soil health; and water

III. Information, Training and Extension Section

- Collects, stores and disseminates agricultural information deriving from research from other sections

IV. Livestock Production and Animal Health Section

- Conducts research and provides technical advice on livestock production

The Policy and Management Unit (PMU) will also support the implementation of the KAS and one of its main roles is to ensure that all three divisions carry out their activities and meet their obligations in line with the KDP and KV20, national guidelines, regulations and Acts under the planned budget.

It is proposed that a Steering Committee to be chaired by the Permanent Secretary of the Ministry of Environment, Lands and Agriculture Development will oversee the implementation of the KAS and be accountable for performance and its results. The Steering Committee through its chairperson will be accountable for the KAS results to the Minister for Environment, Lands and Agriculture Development. The Steering Committee membership will consist of the Ministry's Divisional and Section Heads and Senior Officials from other key ministries, partners and stakeholders. Community representatives will also be members of the Steering Committee.

9. Implementation



The most critical step in the success of KAS is its effective and efficient implementation. The ALD in the MELAD will oversee and be responsible for the implementation of the KAS. Strategy implementation in a difficult environment such as Kiribati will be very challenging. The best way to approach it would be to learn from the lessons of the past ASP as well as other Kiribati Government strategy implementation success stories if there are any, and to design an implementation mechanism that will best work under the circumstances.

Several factors will be critical to the success of KAS which are:

- Political will and buy in with strong top down national leadership.
- Local champion to mobilize community and stakeholders support and commitment.
- Adequate resources provided in the local budget and from donors.
- Government and local capacity and training to support the KAS implementation.
- Local community support and buy-in (behavioral change) to engage in agricultural production at all levels and support consumption of local produce.
- Private sector development.
- Donor funding support and technical assistance.
- Public awareness, communication and education (behavioral change).

The KAS Action Plan which will be developed in Phase 2 by MELAD with GGGI's support will guide the Strategy's implementation identifying key milestones, key tasks and activities, and timelines and responsibilities.

10. Monitoring and Evaluation



Effective Monitoring and Evaluation (M&E) are powerful project management tools that will be used by ALD policymakers and decision makers as well as stakeholders to track implementation progress and demonstrate the impacts of the Strategy or a given project, program or policy. The M&E will also generate useful lessons to apply in further improving the implementation of the KAS. The success of the KAS implementation and its achievement of quality results and impacts will depend on the effectiveness of its M&E.

Monitoring should be results-based and move beyond an emphasis on inputs and outputs to a greater focus on outcomes and impacts. The method used will have time and resource implications. For the purpose of the KAS, it should be simple and user friendly and not be an administrative burden. Monitoring will consist of two components as follows:

I. Monitoring of KAS implementation

A monthly and quarterly monitoring system on the implementation performance of KAS will be established. A monthly reporting template will be designed to be filled by implementation section heads every month and submitted to the Head of ALD as the Project Implementation Unit (PIU). At the end of every quarter, the ALD will compile a quarterly progress report (QPR) to be submitted to the KAS Steering Committee for its information and decisions for action. The QPR will cover outputs and outcomes progress and achievements, output delays, problem outputs and resources/funding utilization and actions planned for the next quarter.

II. Monitoring and reporting of results

The results-based reporting of the KAS results will be crucial in order to tell an adequate story of the effects and impacts that interventions are having. It will be done on annual basis at the end of every year over the 10 years from 2020 to 2030.

The reporting will be done against the outputs, outcomes and impact indicators in the Strategy Results Framework (SRF) matrix (refer to Chapter 11). The results matrix is the strategic management tool that will be used to plan, monitor, evaluate and report on the KAS result areas. A reporting questionnaire designed based on the SRF will be completed at the end of every year by the implementing Unit Heads for the respective outputs under their responsibility. The SRF matrix is an important aid which clearly articulates the results at the output and outcome level and the indicators, baselines and targets. These items along with the review of the indicators, assumptions and risks, should serve as guides for reporting on results. The ALD will coordinate this end of year results reporting exercise.

An Annual KAS Results Report will be compiled by ALD and submitted to the Steering Committee and the Minister of Environment, Lands and Agriculture Development to present to the Cabinet. The Results Report will be a measure of the progress in the delivery of the KAS. In writing the results story, the KAS Annual Results Report should:⁸

- describe what was achieved and list the indicators of success;
- compare actual results with expected results and targets;
- quantify achievement whenever possible against a baseline;
- illuminate findings and results and supportive narratives, quotes, testimonials, photos, etc.;
- explain reasons for over or under achievement;
- highlight any unforeseen problems or opportunities that may require new strategies or redesign of the initiative;
- tell the story of how the results were achieved, and highlight any lessons learned;
- recognize the involvement of other partners and stakeholders and assign a degree of attribution, if possible; and
- ensure there is enough relevant and quality data to describe the results from the activities undertaken.

By presenting credible, reliable and balanced information, the KAS will be able to produce an effective and informative results-based report.

8. United Nations Development Group. (2011). Results Based Management Handbook. New York.

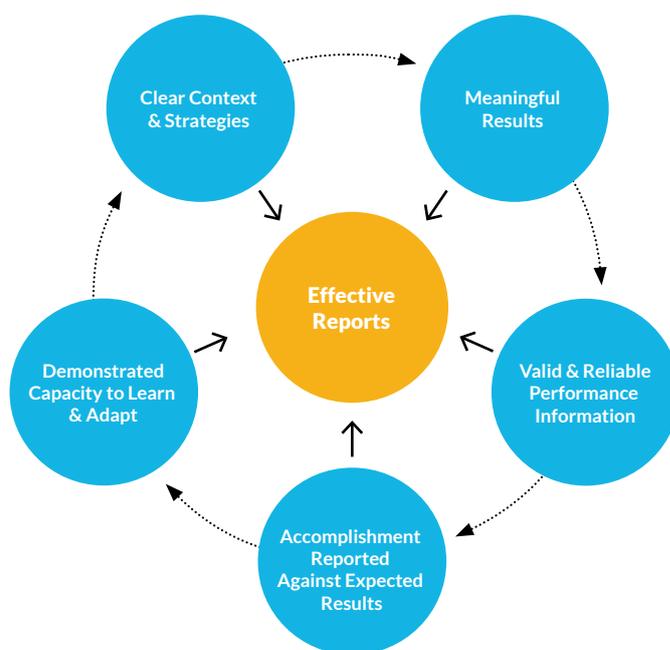


Figure 9: Elements of an effective results-based report⁹

In both the monitoring of project implementation and results, the collection of timely and quality data is crucial as evidence to support the results being reported. The data will be collected through the end of year questionnaire based on the indicators in the SRF. The design of indicators must meet the S.M.A.R.T. criteria of being specific, measurable, achievable, relevant and timebound. A key step will be the cleaning up of the data, its quality assurance and validation prior to the drafting of the Annual Results Report. Capacity building and training will be implemented to develop local and government officials' skills for data collection, analysis and reporting.

Evaluation is equally important to the success of KAS implementation. Evaluation is an assessment, as systematic and impartial as possible, of an activity, project, program, strategy, etc., and focuses on processes and achievements against set goals and objectives. Independent experts will be engaged to evaluate the KAS at mid-point in 2025 and at the end of the Strategy period in 2030. Evaluations will assess results, impacts and sustainability considering the goals and objectives of the KAS in a quantitative and qualitative manner. The evaluation process will include gathering data, interviews and consultations with every relevant Government ministry and department and all key stakeholders. In order to enable efficient M&E, baseline data for each performance indicator will be collected. Performance will be measured against these baseline data and the specific targets set in the SRF. The underlying principle of the evaluation will be to ensure independence and objectivity. The evaluation reports will be made available as public documents through Government (MELAD) website.

9. United Nations Development Group. (2011). Results Based Management Handbook. New York.

11. KAS Results Framework



Narrative	Performance Indicators	Means of Verification	Baseline	Targets	Risks and Assumptions	Responsibility
OUTCOME 1: Sustainable atoll crop production systems developed and promoted.	<ul style="list-style-type: none"> Increased adoption of sustainable crop production systems Increase in crop area and production Increase in crop produce sale. Increased household incomes for crop farmers (disaggregated by gender) 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 	<ul style="list-style-type: none"> 3 No data available No data available No data available 	<ul style="list-style-type: none"> 9 8 idle lands, 4 boarding schools, 25 nurseries 40% 	New crop production system shared and adopted	ALD/IC
Output 1.1: Crop diversity improved, conserved and utilized	<ul style="list-style-type: none"> Adaptable crops selected Number of nurseries and gene banks established Increase in availability of seeds and planning materials 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 	<ul style="list-style-type: none"> 3 22 nurseries 1000 planting materials 	<ul style="list-style-type: none"> 5 110 nurseries 3000 planting materials 	Cross breeding and new hybrids methods enhanced by the government	ALD/IC
Output 1.2: Soil management technologies appropriate for atoll conditions developed and adopted	<ul style="list-style-type: none"> Soil organic matter management technologies generated and promoted 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 	<ul style="list-style-type: none"> 2 	<ul style="list-style-type: none"> 4 	Experience shared from different countries Documentaries/lesson on soil management technology collected	ALD
Output 1.3: Agroforestry systems appropriate for atolls developed and adopted.	<ul style="list-style-type: none"> Agroforestry technologies developed and adopted Crop production technologies including hydroponics developed and promoted 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 	<ul style="list-style-type: none"> 2 1 	<ul style="list-style-type: none"> 4 4 		ALD
Output 1.4: Water management technologies appropriate for atolls supply and irrigation developed and adopted.	<ul style="list-style-type: none"> A drip irrigation system developed and adopted 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 	<ul style="list-style-type: none"> 3 	<ul style="list-style-type: none"> 5 	Projects developed and fund raised to deploy best water technologies	ALD/IC
Output 1.5: Pest and disease problems identified, control methods developed and promoted, and capacity to respond to pest problems strengthened.	<ul style="list-style-type: none"> Number of pests identified Control measures developed and adopted Increased productivity of staples Emergency response plans developed and implemented 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 	<ul style="list-style-type: none"> 6 4 No data available 1 	<ul style="list-style-type: none"> 4 6 4 2 		ALD

<p>OUTCOME 2: Sustainable small-animal livestock systems developed and promoted</p>	<ul style="list-style-type: none"> Increased adoption of sustainable livestock production systems. Increased livestock numbers and production. Increased livestock sales. Increased household income for livestock farmers (disaggregated by gender) Livestock waste management strategy is adopted and implemented. 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 	<ul style="list-style-type: none"> 3 800 swine, 2124 layer \$14000.00 No data available 1 (composting ingredients) 	<ul style="list-style-type: none"> 4 2000 swine, 7000 layer & broiler \$40000.00 \$5,000 income per livestock farmer household 1 (biogas fuel) 	ALD
<p>Output 2.1: Appropriate livestock management practices developed and promoted</p>	<ul style="list-style-type: none"> Improved piggery management practices development and adopted. Improved chicken and duck management practices developed and adopted. 	<ul style="list-style-type: none"> Department reports Project reports Strategy Progress Report 	<ul style="list-style-type: none"> 3 (semi intensive, free range & tethering) 3 (battery cage, deep litter & free range) 	<ul style="list-style-type: none"> 3 (semi-commercial, integration farm) 3 (integration farm, meat producers & semi commercial egg producers) 	ALD
<p>Output 2.2: Livestock genetics diversified and improved, conserved and utilized</p>	<ul style="list-style-type: none"> Improvement in animal breeds. Improved distribution of breeds 	<ul style="list-style-type: none"> Department reports Project reports Strategy Progress Report 	<ul style="list-style-type: none"> 4 (Duroc, Hampshire, Solroc & local) 800 improved breeds distributed 	<ul style="list-style-type: none"> 4 (tulroc, tulace Berkshire & tamworth) 1000 improved breeds 	ALD
<p>Output 2.3: Livestock feeds with local ingredients developed</p>	<ul style="list-style-type: none"> Local ingredients identified and mass produced. Local or part-local ration developed. 	<ul style="list-style-type: none"> Department reports Project reports Strategy Progress Report 	<ul style="list-style-type: none"> No data available No data available 	<ul style="list-style-type: none"> 2 (breadfruit & native fig) 2 (copra meal & maize) 	ALD/IC
<p>Output 2.4: Livestock waste management improve</p>	<ul style="list-style-type: none"> Waste management strategies developed and adopted. 	<ul style="list-style-type: none"> Department reports Project reports Strategy Progress Report 	<ul style="list-style-type: none"> No data available 	<ul style="list-style-type: none"> 1 (biogas fuel) 	ALD/IC
<p>OUTCOME 3: Enabling environment and marketing mechanisms developed</p>	<ul style="list-style-type: none"> Level of public and private investment capital flows into the agriculture sector Increase in sale of agricultural outputs in the domestic market 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 			
<p>Output 3.1: Agriculture sector financing and investments mobilized</p>	<ul style="list-style-type: none"> Growth in public and private sector investments in agriculture 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 	<ul style="list-style-type: none"> No data available 	<ul style="list-style-type: none"> 4 (2 private sectors & 2 agriculture associations) 	

Output 3.2: Domestic marketing value chains developed	<ul style="list-style-type: none"> Growth in number of companies in agricultural and local foods marketing Increase in domestic sales 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 	<ul style="list-style-type: none"> No data available 7.3 metric tons 	<ul style="list-style-type: none"> 4 (2 companies & 2 local market) 28 metric tons 	
Output 3.3: Agriculture, transport, and marketing infrastructure improved	<ul style="list-style-type: none"> Increase in domestic agriculture sales 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 	<ul style="list-style-type: none"> No data available 	<ul style="list-style-type: none"> 80 % infrastructure improved 	ALD
OUTCOME 4: Climate change mitigation and adaptation enhanced	<ul style="list-style-type: none"> Reduction in crop and livestock losses Implementation of appropriate agriculture related climate mitigation and adaptation measures Revival and use of traditional local agriculture knowledge and practices Knowledge and capacity for climate resilience strengthened (disaggregated by gender) 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 			ECD/MISE/MIA/OB
Output 4.1: Climate change impacts and risks are managed and minimized	<ul style="list-style-type: none"> Number of mitigation and adaptation measures implemented. 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 			KNEG
OUTCOME 5: Improved biosecurity	<ul style="list-style-type: none"> Compliance with international standards Enactment of biosecurity laws Increase in domestic and export trade Plant protection program operational 	<ul style="list-style-type: none"> Department reports Project reports Focus surveys Strategy progress report 	<ul style="list-style-type: none"> 1 0 No data available 3 	<ul style="list-style-type: none"> 1 1 1 4 	ALD
Output 5.1: Capacity to increase domestic and export trade developed and strengthened.	<ul style="list-style-type: none"> Increase in domestic marketing of agricultural products Common pathways established for 2 local products 	<ul style="list-style-type: none"> Domestic market reports Common pathway report Strategy progress report 	<ul style="list-style-type: none"> 2 (VCO & CSS) No data available 	<ul style="list-style-type: none"> 8 (any agricultural products) 2 	ALD
Output 5.2: Quarantine/biosecurity capacity improved	<ul style="list-style-type: none"> Number of pests intercepted Biosecurity laws enacted and implemented 	<ul style="list-style-type: none"> Department report Press Release Gazetted bills Strategy progress report 	<ul style="list-style-type: none"> No data available 1 	<ul style="list-style-type: none"> 4 species 4 	ALD

<p>OUTCOME 6: National nutrition and health education on eating local foods promoted</p>	<ul style="list-style-type: none"> • Agriculture sector policies are aligned with Health sector policies • Local communities are educated and aware of good nutrition, health, and buying local foods 	<ul style="list-style-type: none"> • Department reports • Project reports • Focus surveys • Strategy progress report 	<ul style="list-style-type: none"> • Department reports • Project reports • Focus surveys • Strategy progress report 	<ul style="list-style-type: none"> • 3 (NCD, CTA & KOIFAWP programs) 	<ul style="list-style-type: none"> • 4 activities implemented 	
<p>Output 6.1: Alignment with the national health sector development goals</p>	<ul style="list-style-type: none"> • Alignment activities between KAS and Health Sector goals is implemented 	<ul style="list-style-type: none"> • Department reports • Project reports • Focus surveys • Strategy progress report 	<ul style="list-style-type: none"> • 10 trainings & awareness completed 	<ul style="list-style-type: none"> • 40 (trainings & awareness conducted) 	ALD	
<p>Output 6.2: The local community is educated and aware of good nutrition and healthy diet from choosing locally made food compared to imports</p>	<ul style="list-style-type: none"> • Number of health and diet education and awareness of eating local foods completed. 	<ul style="list-style-type: none"> • Department reports • Project reports • Focus surveys • Strategy progress report 	<ul style="list-style-type: none"> • 1481 farmers trained • No data available 	<ul style="list-style-type: none"> • 2000 farmers • 80% (existing farmers) 	ALD	
<p>OUTCOME 7: Capacity building for government officials and stakeholders</p>	<ul style="list-style-type: none"> • Efficient agriculture staff • Skilled stakeholders and farmers 	<ul style="list-style-type: none"> • Department reports • Project reports • Focus surveys • Strategy progress report 	<ul style="list-style-type: none"> • 6 posters, 5 video clips, 1000 pamphlets & 26 radio programs) • 7 training attended • 4 females & 3 males • No data available 	<ul style="list-style-type: none"> • 15 technical courses • 15 staff trained • 90% staff 	ALD	
<p>Output 7.1: Farming, business, financial and marketing skills of farmers improved</p>	<ul style="list-style-type: none"> • Number of farmers trained (disaggregated by gender) • Number of farmers efficiently applying skills (disaggregated by gender) 	<ul style="list-style-type: none"> • Department reports • Strategy progress reports • Focus surveys 	<ul style="list-style-type: none"> • Extension outreach information and innovative methods adopted 	<ul style="list-style-type: none"> • Number of technical training skills courses conducted • Number of staff trained (disaggregated by gender) • Number of staffs efficiently applying skills in implementing KAS 	ALD	
<p>Output 7.2: Capacity of extension, outreach and information services strengthened</p>	<ul style="list-style-type: none"> • Extension outreach information and innovative methods adopted 	<ul style="list-style-type: none"> • Department reports • Strategy progress reports 	<ul style="list-style-type: none"> • 20 posters, 8 video clips, 4000 pamphlets & 48 radio programs 	<ul style="list-style-type: none"> • 15 technical courses 	ALD	
<p>Output 7.3: Technical skills of agriculture staff improved</p>	<ul style="list-style-type: none"> • Number of technical training skills courses conducted • Number of staff trained (disaggregated by gender) • Number of staffs efficiently applying skills in implementing KAS 	<ul style="list-style-type: none"> • Department reports • Strategy progress reports 	<ul style="list-style-type: none"> • 15 technical courses 	<ul style="list-style-type: none"> • 15 staff trained 	ALD	



12. List of Strategic Agriculture Projects

The chapter presents an initial list of agriculture projects which have been identified in consultation with MELAD to drive the implementation of the KAS. The fact that Kiribati is a small country, and its projects are therefore typically small, does not lessen the need for careful planning and screening of projects and activities. These projects each need a developed concept note with costings and implementation plans for their appraisal will proper cost-benefit analysis, prioritization and approval for funding and implementation. This is likely to be done during the development of the KAS Action Plan in Phase 2. The approval of each project concept note will be followed by the development of full project proposals and feasibility studies. Once approved, the projects should be managed and monitored diligently during implementation.

#	Name of Agriculture projects
1	Tarawa produce market
2	Solar refrigeration for outer islands
3	Solar dryers for outer islands - extension of shelf life
4	Fruit and vegetable processing
5	Seed banks
6	Health and quality standards for sale of food and produce
7	Composting
8	Basic business and financial literacy training for unemployed youth and women
9	Sea grape harvesting and packaging
10	VCO production
11	Production of livestock feed
12	Food and nutrition dietary guidelines linked to food produced in the outer islands
13	Basic hydroponics
14	Agribusiness fund
15	Regional agriculture test/demonstration farms
16	Agriculture business center (courses, advise, partnership with commerce).
17	How to treat your agriculture production as a business
18	Community awareness and education on nutrition, health and eating local foods
19	Agriculture value chain development
20	Livestock production and integration of livestock into traditional farming system



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