Cold Chain in Cambodia

Emerging Markets Program Assessment

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WFLO

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LIST OF ABBREVIATIONS

3PL	Third Party Logistics
APHIS	Animal and Plant Health Inspection Service
CA	Controlled Atmosphere
CEO	Chief Executive Office
CFS	Container Freight Station
CO	Consumer-oriented
CR	Cambodian Riel
EMP	Emerging Markets Program
FAS	Foreign Agricultural Service
FOB	Free on Board
FTA	Free Trade Agreement
GBI	Global Broad-based Initiative
GCCA	Global Cold Chain Alliance
GDP	Gross Domestic Product
GE	Genetically Engineered
GOC	Government of Cambodia
GST	Goods and Service Tax
IARW	International Association of Refrigerated Warehouses
ICD	Inland Container Depots
IIAR	International Institute of Ammonia Refrigeration
ISO	International Organization for Standardization
KM	Kilometer
LCL	Less than Container Load
KWH	Kilowatt Hour
(M)MT	(Million) Metric Tons
MY	Market Year
PC	Phytosanitary Certificate
PLC	Programmable Logic Controller
PPP	Public Private Partnership
PRW	Public Refrigerated Warehouse
SOPs	Standard Operating Procedures
SPS	Sanitary and Phytosanitary Standards
SWOT	Strengths, Weaknesses, Opportunities and Threats
US	United States
USDA	United States Department of Agriculture
VMU	Vehicle Mounted Units
WFLO	World Food Logistics Organization
WMS	Warehouse Management System

EXECUTIVE SUMMARY

The World Food Logistics Organization (WFLO), the technical assistance, training and education arm of the Global Cold Chain Alliance (GCCA), was allocated a grant under the Foreign Agricultural Service's (FAS) Emerging Markets Program (EMP) Agreement #2019-15 to assess Cambodia's cold chain infrastructure, to identify the characteristics, constraints, and gaps in the existing cold chain system that are unique to Cambodia in Phnom Penh and surrounding region.

The assessment took place in December 2019 with in-country travel from December 1-13. The team studied the movement of imported fruit, primarily apples, inland from ports to the ultimate consumer and from points of domestic production. Key observations, conclusions, opportunities, and recommendations are summarized in the table below. The concrete recommendations are centered on resource development and training.

The cold chain in Cambodia is broken at most stages, but especially during distribution. The first breaks for imports tend to occur upon arrival at warehouses. There is no association for cold chain providers, and the industry is fragmented. While there is little knowledge about cold chain, there is a lot of interest in learning.

Observations	Conclusions & Opportunities	Recommendations
Food & Agricultural Market		
The vast majority (up to 90%) of food is purchased by consumers from the traditional open air markets but there is growth in modern supermarkets, convenience stores, and quick serve restaurants. Cambodia produces bananas and mangoes and would like to export greater volumes to existing and new markets in Asia and elsewhere.	Mid to upper income consumers, tourists, and expatriates are demanding more safe, upscale, and imported processed food products. Countries importing Cambodian produced fruit demand that strict quality and food safety standards are followed.	Training and education on the importance of adopting science and risk-based food safety policies, laws, and regulations would be well received by government and consumers alike, and would facilitate improvement in the quality of perishable food products in both the traditional and modern retail sectors as well as facilitate exports of Cambodia produced bananas and mangoes.
Most imported food enters the country via Thailand (by road) and Vietnam (by road and the Phnom Penh river port).	Due to limited demand for high volumes of imported food, most perishable products will continue to be transshipped through Thailand and Vietnam, so it is important for U.S. suppliers to identify and work with importers/distributors in those countries who service Cambodia via Less than Container Loads (LCLs) and small trucks.	Identify importers and distributors in Vietnam, Thailand and Singapore that service Cambodia and share their informaiton more widely with Cambodia buyers (distributors, retailers, and end-users) of perishable products. Enocurage buyers to explore how they can source containers of multiple products and/or share containers with other buyers.
U.S. sourced products have a strong reputation for quality and	The demand for high quality and safe food will continue to grow	Target modern supermarkets, hotels, restaurants, and their

safety, however, high prices constrain purchases, but local meat, poultry and dairy production is limited so reliance on imports is critical.	so there will be increased opportunities to supply a greater volume of temperature controlled products.	distributors/suppliers to train them on proper handling, storage and transportation of meat, poultry, and dairy products.
Postharvest		
Postharvest handling practices are not widely known or understood	Farmers would benefit from low-cost interventions to remove field heat, followed by enhanced packaging support.	It is out of the scope for this project, but donors should continue and expand support for on-farm postharvest handling best practices.
Processing		
There is very little food processing in Cambodia.	There is potential for food processing to grow as the government focuses on diversification.	Training in this area should be a future donor focus. At present this nascent sector may benefit from food safety courses which should be including in the training delivered for Phase 2.
Transport		
Cold storage capacity at the ports is very limited as is knowledge of storage and handling practices. Congestion reduces port efficiency.	Opportunities exist to enhance efficiencies in handling of products. Large scale investment is required, but short-term solutions could ameliorate storage issues if there was interest in this type of solution.	Targeted training on handling of perishable products, especially bananas and mangoes, should be developed and delivered. The government should support infrastructure improvements to roads and surrounding areas to reduce congestion.
There is a shortage of refrigerated trucks and a preference for purchasing second-hand trucks instead of new. Driver and maintenace capacity are low.	Several companies requested information or connections to import second-hand refrigerated trucks.	As companies explore options to increase the number of reefers existing in-country, training in refrigerated transport should be provided. GCCA should explore solutions for maintenance capacity.
Cold Storage Design Build and Construction		
Design tends to focus on basic box within a box.	Current design choice results in mutiple inefficiencies.	Deliver targeted training on designing for operations. Provide consultations for companies seeking to invest in facility upgrades.
Cold Storage Warehouse Operations		
Very little 3PL presence in Cambodia and little sophistication in terms of warehouse practices.	Cambodian warehouse workers would benefit from cold chain training as no opportunities for such training exist in country.	GCCA should develop basic handling best practices training for Cambodians.
Retail/Last Mile		
Organized retail is increasing, but the vast majority of customers are not yet	Quality is inconsistent as it not chilled in final distribution.	Invite retailers to training on product handling and importance of training and food safety.

demanding high quality products so there is acceptance of lower quality.		
Government Regulations		
Support exists within the government to enhance cold chain, but there is little focus on policies outside of food safety.	Government would benefit from training on cold chain and an understanding of how government food safety policies and standards can provide enabling environment while also enforcing necessary laws.	GCCA should provide targeted interventions to government officials – training and/or focused information through the Cold Chain Connections to improve understanding of international best practices and Codex food safety standards

INTRODUCTION

OBJECTIVES

The World Food Logistics Organization (WFLO), the technical assistance, training and education arm of the Global Cold Chain Alliance (GCCA), was allocated a grant under the Foreign Agricultural Service's (FAS) Emerging Markets Program (EMP) Agreement #2019-15 to conduct a cold chain assessment and follow-on technical assistance activities in Cambodia. This baseline assessment examines the existing cold chain practices in Cambodia, with specific focus on identifying gaps and constraints as temperature-controlled products arrive at ports and are then distributed for retail. This study focused on Phnom Penh and Sihanoukville and targeted fresh fruit, frozen potatoes, and meat and poultry as the key commodities. Upon approval of the assessment, WFLO will return to Cambodia and the region for additional technical training and strategy workshops.

METHODOLOGY

The assessment was conducted in three phases:

- Literature Review. Led by the WFLO home office, this included research on all available public information for the food and agriculture industry focused on temperature-controlled food and the development of cold chain systems in Cambodia.
- In-country Assessment. The team visited retailers, importers, distribution/logistics centers, wholesalers and wholesale markets, government officials, cold storage owners, logistics providers, shipping companies and cargo/freight services in New Delhi and Mumbai involved with temperature-control enterprises.
- Analysis and Evaluation. The team compared existing practices to international standards and market requirements for temperature-controlled food products to identify the specific needs for strengthening the cold chain in Cambodia. The team utilized a Strategic Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis for this assessment.

ASSESSMENT TEAM & QUALIFICATIONS

The assessment team consisted of:

Kent Sisson is a retired USDA Foreign Agricultural Specialist with a background in the marketing of agricultural products. For 37 years, Mr. Sisson has participated in USDA programs designed to increase US exports of agricultural products, maintaining close contact with a variety of cooperator groups, including those supporting this assessment. He has conducted similar assessments in Pakistan, China, Indonesia, the Philippines, and Angola and served as the Marketing Specialist.

Manuel Kabrera-Cabana. Manuel has worked for over 30 years in the perishable logistics sector and previously with the banking industry on project and export financing. Manuel is General Manager & Director of Friopuerto Investment, Cold Storage Division. He holds various Board positions in national and international industry organizations and is Vice Chair of the International Association of Refrigerated Warehouses (IARW) within the Global Cold Chain Alliance (GCCA).

Jason Troendle is the Director for Market Intelligence and Research at the Global Cold Chain Alliance (GCCA), and serves to help capture and share market intelligence dedicated to solving our members business challenges. Jason leads GCCA's efforts on surveying, analysis and reporting of market data including industry benchmarking, growth and key trends. He also assists with inquiries from members, stakeholders and the public along with completing custom research projects.

Timothy (Tim) Nguyen is Senior Vice President of ESI Constructors, a design build firm offering services to the food process, beverage, grocery, foodservice, and public refrigerated warehouse industries. With more than 30 years in food distribution and process experience, Tim's educational and design background includes refrigeration and mechanical engineering studies of industrial ammonia systems as applied to food systems applications. His project portfolio include food distribution and processing centers ranging from 20,000 square feet additions to 595,895 square feet facilities (1,850 to 55,360 square meters).

The team was supported in-country by **Bunhourng Tan** of **EMC Consulting** with additional technical support and guidance from GCCA's Senior Director of International Projects, **Amanda Brondy** and from GCCA's Vice President of International Programs, **Richard Tracy**.

ASSESSMENT ROADMAP

The premise of this study is that a lack of sufficient cold chain capacity hinders the export of US temperature-controlled products. In other words, lack of sufficient cold chain is a barrier to the trade of US perishable products. For this reason, this report contains a market assessment and a cold chain assessment. The market assessment provides the specific information listed in the FAS Assessment Guidance including food and rural business systems, sources of competition, historical value and volume trade data, and trade barriers. The cold chain trade barrier is assessed in its own section.

The market and cold chain assessments are followed by the Strategic SWOT Analysis, market opportunities, and recommendations.

GENERAL ECONOMIC OVERVIEW

SUMMARY[1]

At 27.1 billion current US dollars, Cambodia was the 105th largest economy in the world in 2019 based on World Bank Gross Domestic Product (GDP) data. Over the past two decades, Cambodia has undergone a significant transition, reaching lower middle-income status in 2015 and aspiring to attain upper middle-income status by 2030. Driven by garment exports and tourism, Cambodia's economy has sustained an average growth rate of 8% between 1998 and 2018, making it one of the fastest-growing economies in the world. While easing slightly, growth remained strong, estimated to have reached 7.1% in 2019, after the better-than-expected growth rate of 7.5% in 2018.

Cambodia's economy depends heavily on agriculture. Nevertheless, in recent years the importance of manufacturing has been growing due to establishment of export oriented textile and shoe factories.

[1] Source: World Bank, World Bank Overview - Cambodia – April 17, 2020

Cambodia is also taking advantage of the fast developing tourism sector. More importantly, oil deposits found beneath Cambodia's territorial waters and the prospective exploration of mineral resources (bauxite, gold, iron and gems) will likely reshape Cambodia's economy. According to the CIA World Factbook, services were the biggest sector in the economy and accounted for an estimated 42 percent of total GDP. The industry sector accounted for 33 percent of GDP, and agriculture has the lowest share at just over 25 percent.

The global shock triggered by the COVID-19 pandemic has significantly impacted Cambodia's economy in 2020 at a time when Cambodia also faces the partial suspension of preferential access to the EU market under the "Everything But Arms" initiative. The outbreak caused sharp deceleration in most of Cambodia's main engines of growth in the first quarter of 2020, including weakened tourism and construction activity. Growth is projected to slow sharply to 2.5 percent in 2020 under the baseline scenario. The COVID-19 outbreak and slow recovery in global economic activity alongside prolonged financial market turmoil pose risks to Cambodia's growth outlook.

Poverty continues to fall in Cambodia. According to official estimates, the poverty rate in 2014 was 13.5% compared to 47.8% in 2007. About 90% of the poor live in the countryside. While Cambodia achieved in 2009 the Millennium Development Goal (MDG) of halving poverty, the vast majority of families who escaped poverty did so by a small margin. Around 4.5 million people remain near-poor, vulnerable to falling back into poverty when exposed to economic and other external shocks. Health and education, especially quality, remain important challenges and development priorities.

Cambodia continues to have a serious infrastructure gap and would benefit from greater connectivity and investments in rural and urban infrastructure. Further diversification of the economy will require fostering entrepreneurship, expanding the use of technology and building new skills to address emerging labor market needs. Accountable and responsive public institutions will also be critical to meeting the evolving needs of citizens and the private sector. Quality of human capital will be of utmost importance to achieve Cambodia's ambitious goal of reaching middle-income status by 2030.

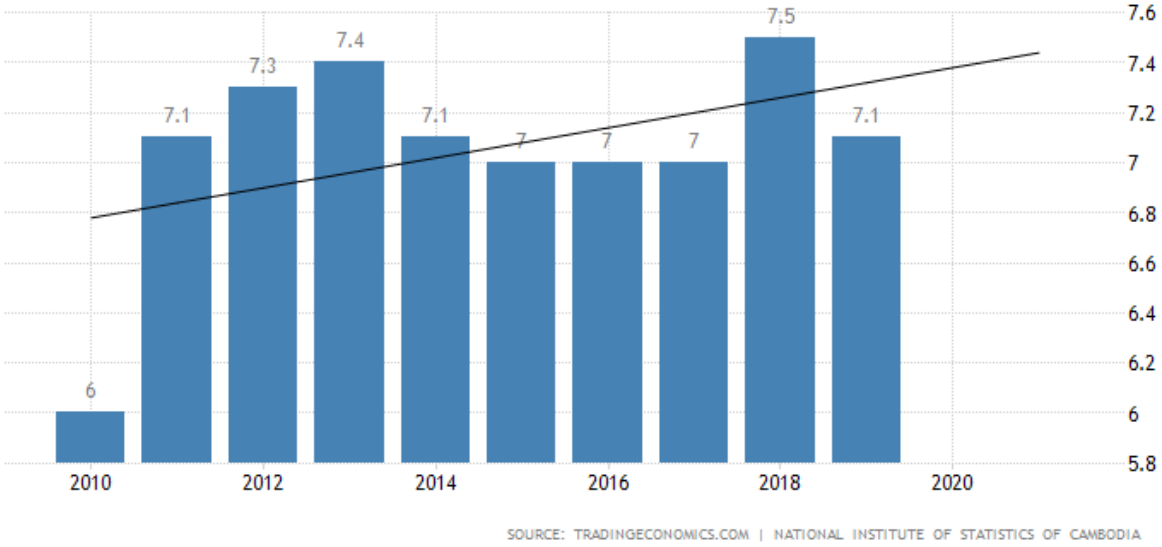
The World Bank's Ease of Doing Business 2020 report ranked Cambodia 144 out of 190 countries. It is classified as lower-middle income, which, in 2020 places it in the company of Cote Ivoire, Egypt, Ghana, India, Indonesia, Kenya, Morocco, Nigeria, Pakistan, and the Philippines.

Cambodia's economy is very open to foreign investment, but the bulk of that investment originates from China, especially in the last five years. Cambodia has not historically attracted significant investment for several reasons: the country's small market size, corruption, a limited supply of skilled labor, inadequate infrastructure (including high energy costs), and a lack of transparency in some government approval processes. China has eagerly stepped up to fill many of Cambodia's investment needs, highlighting China's desire for influence in Cambodia, and Southeast Asia more broadly. Moreover, Chinese businesses, many of which are state-owned enterprises, may not assess the challenges in Cambodia's business environment in the same manner as US businesses. A frequently-cited downside risk to Cambodia's economy is its reliance on China: a slowdown in China would very likely cause Cambodia's growth to also slow.[2]

The following graphs and tables provide a recent overview of the macroeconomic situation in Cambodia.

[2] The source for this paragraph is the US Department of Commerce, Export.gov Market Overview

Figure 1: Cambodia GDP Annual Economic Growth



Source: Tradingeconomics.com, ***Cambodia GDP Growth Rate*** as reported by the National Institute of Statistics of Cambodia

CAMBODIA GDP ANNUAL GROWTH RATE[3]

The gross domestic product (GDP) in Cambodia expanded 7.10 percent in 2019 from the previous year. GDP annual growth rate in Cambodia averaged 8 percent from 1998 until 2018, reaching an all-time high of 13.30 percent in 2005 and a record low of 0.10 percent in 2009. GDP Annual Growth Rate in Cambodia is expected to reach -2.00 percent by the end of 2020, according to Trading Economics (TE) global macro models and analyst's expectations. In the long-term, the Cambodia GDP Annual Growth Rate is projected to trend around 6.00 percent in 2021 and 6.50 percent in 2022, according to TE econometric models.

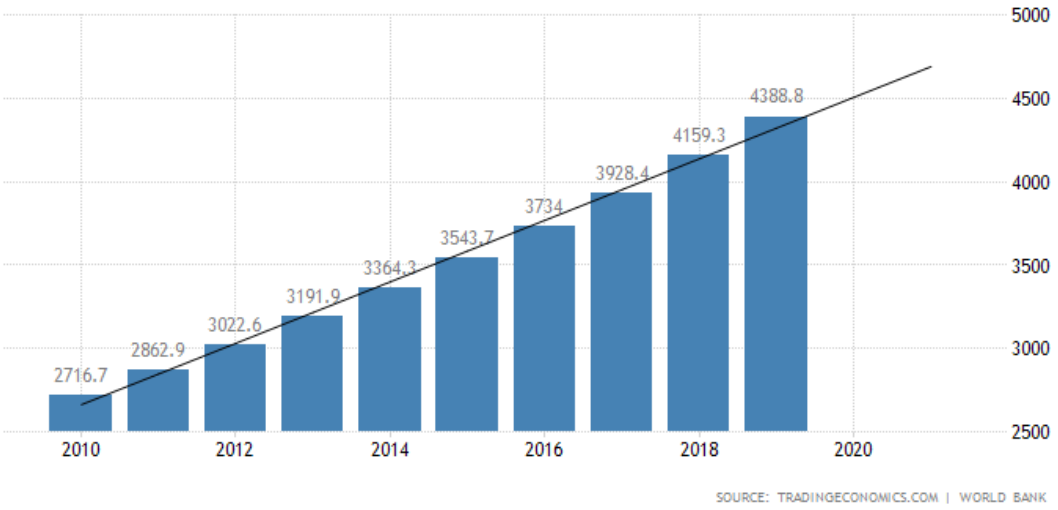
CAMBODIA GDP ANNUAL PER CAPITA GDP ON A PPP BASIS

The Gross Domestic Product (GDP) per capita in Cambodia was last recorded at 4,388.80 US dollars in 2019, when adjusted by purchasing power parity (PPP) which is equivalent to 25 percent of the world's average.

GDP per capita PPP in Cambodia has grown steadily over the past 10 years from the low of 2,717 USD in 2010 to the 2019 high of 4,389 USD, reflecting an increase of 62%.

[3] Trading Economics, Trading Economics Cambodia GDP

Figure 2: Annual Per Capita GDP (PPP basis)



Source: Tradingeconomics.com, *Cambodia Per Capita GDP (PPP)* as reported by the World Bank

Within Southeast Asia, Cambodia ranks at the bottom in terms of GDP on PPP basis according to IMF 2019 data.

Table 1: Southeast Asian Population and GDP Data by Country

Rank	Country	Population in million	GDP Nominal Millions of USD	GDP Nominal per capita USD	GDP (PPP) millions of USD	GDP (PPP) per capita USD
1	Singapore	5.670	362,818	63,987	585,055	103,181
2	Brunei	0.447	12,455	27,871	35,920	80,383
3	Malaysia	32.801	365,303	11,136	1,078,537	32,880
4	Thailand	67.913	529,177	7,791	1,383,022	20,364
5	Indonesia	266.998	1,111,713	4,163	3,737,484	13,998
—	ASEAN	654.306	3,111,768	4,755	9,106,637	13,918
6	Philippines	108.307	356,814	3,294	1,025,758	9,470
7	Laos	7.163	19,127	2,670	58,091	8,109
8	Vietnam	95.494	261,637	2,739	770,227	8,065
9	Myanmar	53.019	65,994	1,244	355,609	6,707
10	Cambodia	16.494	26,730	1,620	76,934	4,664

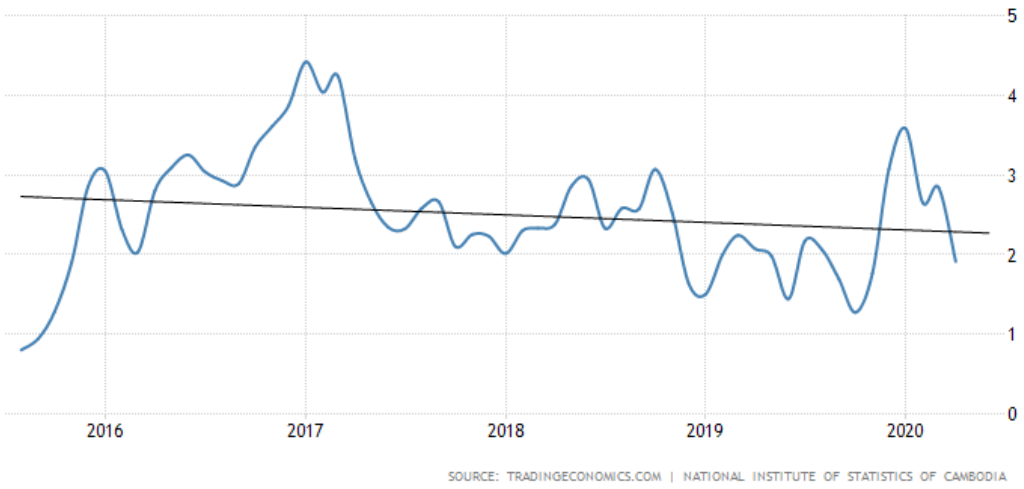
Source: International Monetary Fund, 2019

CAMBODIA INFLATION RATE

The inflation rate in Cambodia was recorded at 1.91 percent in April 2020. It averaged 4.70 percent from 1995 until 2020, reaching an all-time high of 35.57 percent in May of 2008 and a record low of -5.69 percent

in May of 2009. In the long-term, the rate is projected to trend around 3.00 percent in 2021, according to TE econometric models.

Figure 3: Cambodia Inflation Rate



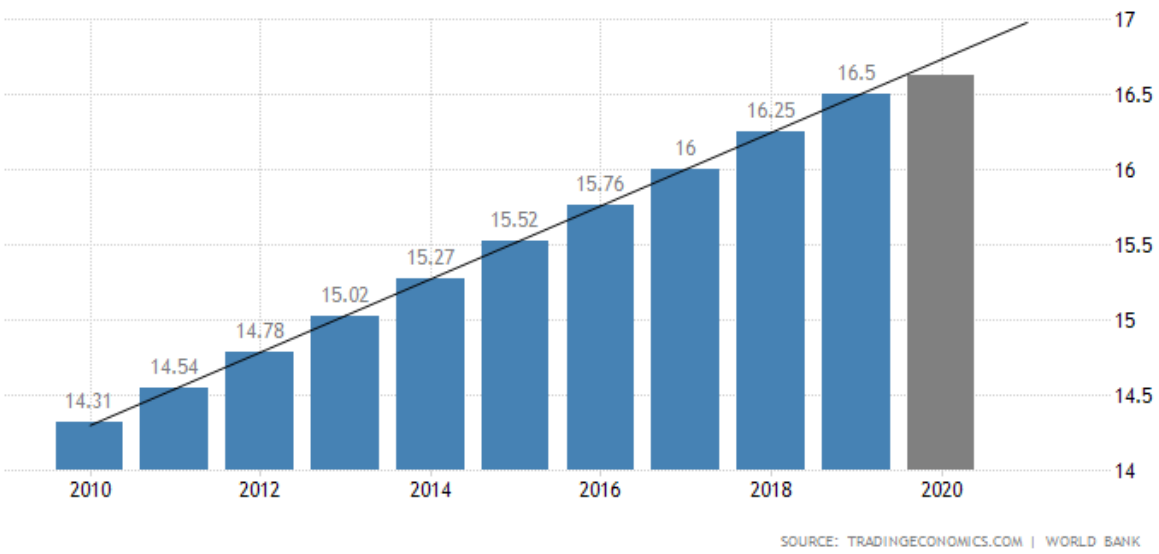
Source: Tradingeconomics.com, *Cambodia Inflation Rate* as reported by the National Institute of Statistics of Cambodia

In Cambodia, the most important components of the Consumer Price Index (CPI) are: food and non-alcoholic beverages (44.8 percent), housing, water electricity, gas and other fuels (17.1 percent), transport (12.2 percent), restaurants (5.9 percent) and health (5.1 percent). Other items include: clothing and footwear (3 percent); recreation and culture (2.9 percent); furnishings and household maintenance (2.7 percent). The index also takes into account: miscellaneous goods and services (2.3 percent), alcoholic beverages, tobacco and narcotics (1.6 percent), education (1.2 percent), and communication (1.1 percent).

POPULATION

The total population in Cambodia was estimated at 16.5 million people in 2019, according to the World Bank, compared to 5.7 million in 1960. The population is expected to reach 16.75 million by the end of 2020. TE projects the population to reach 17.00 million in 2021 and 17.25 million in 2022. Approximately one-quarter of the population reside in urban locations with more than 2 million inhabitants in Phnom Penh which has seen a proliferation of bars and restaurants in recent years.

Figure 4: Population Growth

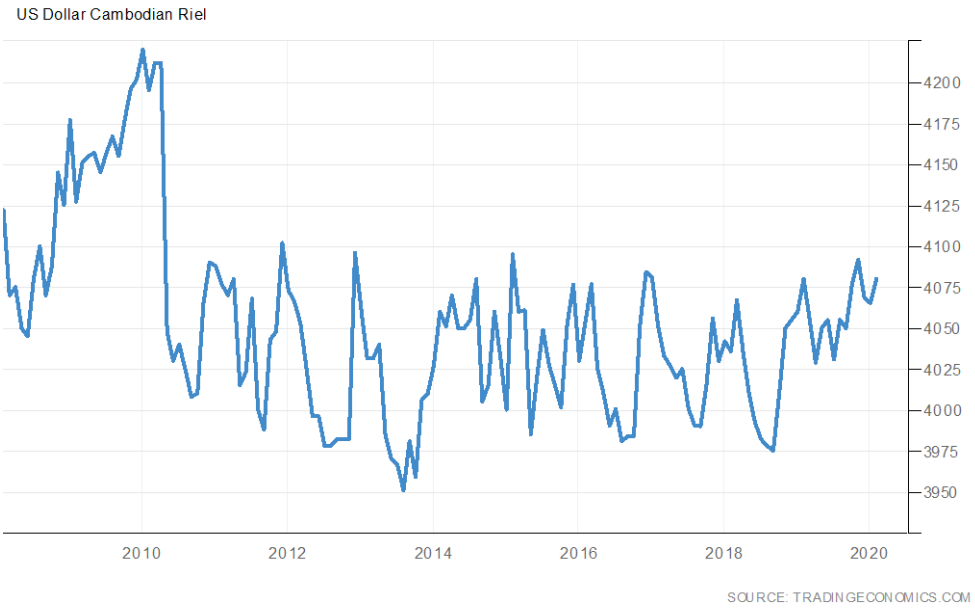


Source: Tradingeconomics.com, *Cambodia Population*, as reported by the World Bank

EXCHANGE RATE

Historically, the Cambodian Riel (KHR) reached an all-time high of 4269 in July of 2010. Since then, it has vacillated between a low of about 3950 in 2013 to about 4100.

Figure 5: Exchange Rate Between Dollar and Cambodian Riel

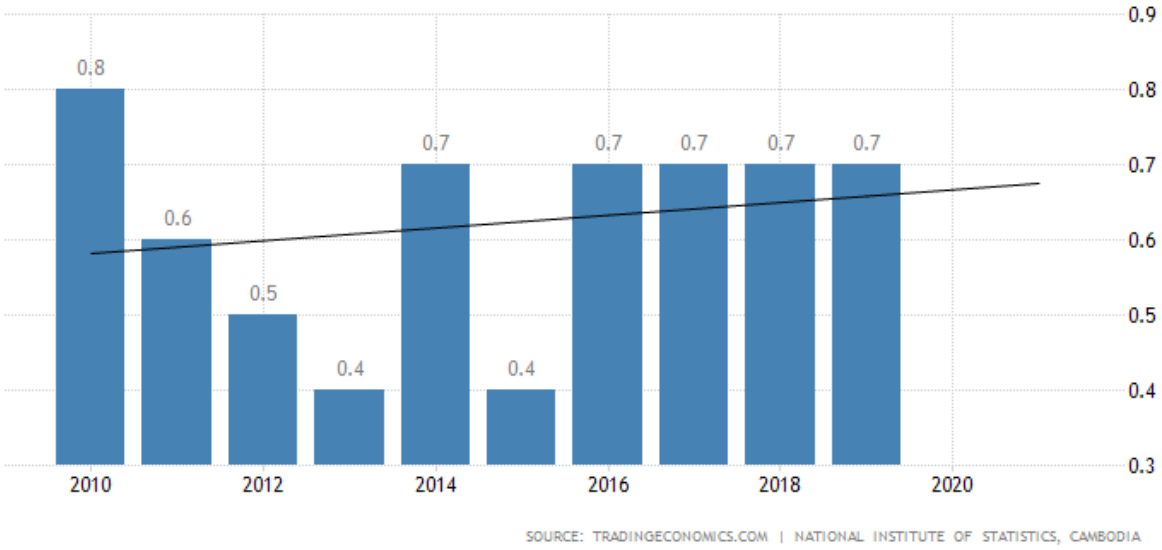


Source: Tradingeconomics.com, *US Dollar Cambodian Riel Exchange Rate*

UNEMPLOYMENT RATE

The unemployment rate in Cambodia remained unchanged at 0.70 percent in 2019 compared to 2018. It averaged 0.87 percent from 1994 until 2019, reaching an all-time high of 1.3 percent in 2003 and a record low of 0.40 percent in 2013.

Figure 6: Cambodia Unemployment Rate



Source: Tradingeconomics.com, *Trading Economics Cambodia Unemployment Rate* as reported by the National Institute of Statistics, Cambodia

WORKFORCE

The World Economic Forum's Global Human Capital Report 2017 gave Cambodia the poorest score in ASEAN for educating and training its citizens to develop a competitive workforce and put their skills to productive use. Cambodia ranked 92nd out of 130 countries in terms of human capital development.

INVESTING

Cambodia ranks very low in terms of the ease of doing business there and the ranking has been going down over the past few years. Within Southeast Asia it is the lowest ranked by far. Furthermore, for three of the five categories important for investing in cold storage, it ranks near the bottom in the world for Starting a Business, Dealing with Construction Permits, and Enforcing Contracts.

Table 2: Ease of Doing Business World Bank Rankings for Cambodia with Comparisons (Among 190 World Economies)

Category	Thai	Viet	Indo	Philip	Cambodia	United States	Sing
Ease of Doing Business	21	70	73	95	144	6	2
Starting a Business	47	115	140	171	187	55	4
Dealing with Construction Permits	34	25	110	85	178	24	5
Getting Electricity	6	27	33	32	146	64	19
Registering Property	67	64	106	120	129	39	21
Getting Credit	48	25	48	132	25	4	37
Protecting Minority Investors	3	97	37	72	128	36	3
Paying Taxes	68	109	81	95	138	25	7
Trading Across Borders	62	104	116	113	118	39	47
Enforcing Contracts	37	68	139	152	182	17	1
Resolving Insolvency	24	122	38	65	82	2	27

Source: The World Bank, ***Ease of Doing Business Rankings***, 2020.

According to the World Bank, Cambodia is one of the most open countries to foreign investment in the East Asia and the Pacific region. The country has allowed foreign investment and ownership in most industries, with a few exceptions in port and airport operation, and the electricity transmission industry.

FOOD & AGRICULTURE MARKET ASSESSMENT

This section summarizes the food and agriculture production, distribution and consumption, trade, and competition in Cambodia with emphasis on the temperature-controlled products of greatest interest to the US for this study namely, poultry, beef, pork, dairy products, frozen potato products, fresh fruit and seafood.

PRODUCTION OF FOOD AND AGRICULTURE PRODUCTS

Cambodia is blessed with an abundance of natural resources including land and water, favorable climatic conditions and geographic position, which represent potential comparative advantages for increased agricultural production and livelihood improvements. Nearly 80 percent of Cambodians live in rural areas, and 65 percent rely on agriculture, fisheries, and forestry for their livelihoods. One-fifth of Cambodians are food deprived, which means they eat less than the minimum daily requirement of calories.[4]

According to the CIA World Factbook, agriculture accounted for 25 percent of Cambodia's GDP, and employed about 49 percent or 4.3 million of the total labor force, estimated at 8.9 million people in 2017. Crop production contributes about 54 per cent to the ag sector GDP, with fisheries accounting for 25 per cent, livestock for 15 per cent and forestry and logging for about 6 per cent.[5] Rice made up half of

[4] USAID, Cambodia Agriculture and Food Security
[5] Food and Agriculture Organization (FAO) of the United Nations, FAO Cambodia at a Glance

Cambodia's agricultural GDP and Cambodia is one of the top 10 rice exporters in the world – exporting 620,000 tons in 2019.

Other major agriculture exports include rubber, cassava, corn, pepper, fresh mango, and raw palm oil. Only 70% of Cambodia's vegetable and fruit demand is produced locally; the rest is imported, mainly from Thailand, Vietnam, and other Southeast Asian countries. Fish is the main source of protein in people's diet and marine fisheries and freshwater fishing in lakes and waterways, in particular the Tonle Sap and the Mekong, contribute substantially to incomes, jobs and food security. The country's aquaculture industry demand for soybean protein is projected to reach 100,000 metric tons per year by 2030.

The livestock sector is underdeveloped with small animals such as pigs, ducks and chickens raised mainly for household consumption.

DISTRIBUTION AND CONSUMPTION OF FOOD

Although the vast majority of food is sold in traditional markets, the situation is changing as more supermarkets, convenience stores, quick service restaurants, and other modern outlets are opening. There is limited food manufacturing in Cambodia, contributing to the impressive variety of imported processed foods from the U.S. and other sources.

The market of US food products is still small and under development. The primary buyers of US foods are expatriates and high income Cambodians, but Cambodians, in general, highly regard food products for their quality and safety. However, for most Cambodians, US food products are too expensive. Even middle and upper income Cambodians, while American products are generally viewed as higher quality, will opt for cheaper priced products from China or Thailand. In Phnom Penh, where government and industry are centered, prices are higher and branded products are more popular.

Food costs in Cambodia are higher than the surrounding countries as many products are imported. Temperature control could almost double the price of products. For example, the price of 1 kg of lettuce in the wet market of $0.80 while in supermarket it is $1.50.

Cambodians dispense a sizeable portion of their income on food items. More than half of total expenditures are for food, mostly basic food items like rice, salt, sugar, meat, vegetable oil, and sauces. The average household spends very little on high-value processed food products. The two staple foods in Cambodia are rice and fish. These foods are supplemented by maize, root crops (cassava and sweet potatoes), mung beans and groundnuts. A wide variety of fruits and vegetables are produced in Cambodia. Some pickling of fruit and vegetables occurs, but fruit and vegetable processing is little developed. There is almost no food canning, and very limited frozen food production in the country. Some bread is consumed in urban areas. Almost all dairy products are imported or reconstituted in the country.

However, eating habits are changing in urban areas due to (1) increasing incomes, (2) growing awareness and concern about nutrition, quality, hygiene and food safety, (3) attraction to Western lifestyle, (4) modern advertising and promotions. With half of the population under the age of 25 with an increasing number considered tech-savvy and worldly, Cambodian consumers are avid users of social media platforms and have gained an increasing awareness of the world outside of Cambodia which shapes their preferences for

how they want to live. In 2016, Cambodian incomes moved into the World Bank's Middle Income bracket, passing $1,045 GNI per capita. The middle-class society is arriving. [6]

Consumer trends point to a favorable shift in consumer demand for temperature controlled food as incomes increase alongside the awareness of the importance of safe, quality food. Reports from stakeholders varied on the measure. Some reported that there seems to be a stronger willingness to pay for products that have been temperature controlled, especially coming from the younger generation who reportedly favor American brands. However, others indicated that they were not seeing a huge demand yet noting a lack of consumer awareness of product temperature sensitivities. Price and availability remain the major determinant in sales rather than quality and service. The strong cultural preference for warm meat, which is considered fresher than frozen meat, was also mentioned. This is a common sentiment across many cultures, although it may be impacted further by Covid-19.

The main attraction of foreign products is their perceived superior quality, reliability, and status. Products from developed countries, such as the US and Japan, are perceived as having the highest quality and status. Food Export Midwest and Northeast reported in their Cambodia country profile that among the best prospects for US products in the retail and food service sectors are beef, pork, processed meat products, dairy products, frozen potatoes, snacks, fresh fruit, and dried fruits and nuts.

Some importers in Cambodia specialize in servicing the hotel, restaurant and institution (HRI) trade and have the appropriate frozen and chilled storage and distribution infrastructure. Most of the modern food retailers, such as DFI Lucky and Thai Huot, also service the HRI trade through their retail stores or wholesale operations.

Retail Sector[7]

Although traditional markets still dominate the retail sector—it is estimated that about 90 percent of the food products move through this system—rising disposable incomes, the large expat NGO work force, and strong tourism industry have contributed to a growth of Western-style restaurants, shopping malls, mini-marts, convenience stores and supermarkets. Phnom Penh, Siem Reap, and Sihanoukville are the major locations of modern retailers, with new supermarkets and shopping malls sprawling in these cities.

According to Euromonitor, retail sales in the packaged food market in Cambodia had been estimated to reach US$441.1 million in 2016. That represents a growth rate of over 55.5% or US$157.3 million since 2012. The forecast for growth in this market is also promising. By the year 2021, the retail sales in the packaged food market in Cambodia is expected to reach US$632 million, a growth rate of 33.5% or US$158.8 million. High growth categories in the forecast include ready meals, breakfast cereals, ice cream and frozen desserts, sweet biscuits snack bars and fruit snacks, savory snacks and baked goods.

Euromonitor has Cambodia also identified as one of the "20 Markets of the Future" that will offer the most opportunities for consumer goods companies. Young and growing population, growing middle class, and investments to infrastructure as well as improved business climate is anticipated to foster sales of consumer

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[6] Source http://www.ukabc.org.uk/wp-content/uploads/2017/04/FMCG-in-Cambodia-Executive-Summary.pdf

[7] This information was taken from the Food Export Midwest and Northeast Country profile which can be viewed on line at: Food Export Country Profile for Cambodia and FAS GAIN Report, KH5001, 10/20/2015, Cambodia Exporter Guide.

goods. Packaged food and alcoholic drinks are expected to remain the largest categories over the forecast period.

FAS reports that Lucky Markets is the leading retail chain in Cambodia, with 10 supermarket outlets, along with fast food operations (Lucky Burger) and in-store bakeries. Lucky imports some products directly from the US, such as frozen potato products, and others in consolidated shipments from Singapore. Dairy Farm International (DFI), of Hong Kong, recently acquired Lucky Markets and operates in Cambodia under the name DFI Lucky Private Limited. Japanese retailer AEON opened a large mall and hypermarket in 2014 and was able to attract 15 million visitors in the first year. AEON imports many of their food products from Japan, Thailand and Singapore, but the hypermarket also carries some US brands.

Other food retailers that offer a variety of imported products include: Bayon Markets, Thai Huot Supermarkets, Veggy's and Super Duper. Most modern retail outlets are located in Phnom Penh, but there is an increasing presence in Siem Reap, including Angkor Market, Lucky Market, Thai Huot Market, and Asia Market. Modern retailers in Phnom Penh often import from foreign suppliers, while smaller supermarkets in Siem Reap position themselves as distributors and source their products from the importers based in Phnom Penh. Retailers, such as DFI Lucky and Thai Huot, also supply the food service trade through their retail stores or wholesale operations.

Food Service: Hotels[8]

Tourist arrival data from the Ministry of Tourism projected an increase from 2018's 6.2 million total recorded arrivals. Between January to September 2019, there were 4.8 million international tourist arrivals in Cambodia, this figure is 10% higher compared to the same period in 2018. For comparison purposes, the table below shows tourist arrivals for all ASEAN countries in 2019.

Table 3: Tourist Arrivals in ASEAN in 2019 (Millions)

Country	Tourist Arrivals
Thailand	39.8
Malaysia	20.1
Vietnam	18.0
Singapore	15.9
Indonesia	13.6
Philippines	8.0
Cambodia	6.7
Myanmar	4.3
Laos	3.4
Brunei	0.2
TOTAL	130.0

Source: Good News from Southeast Asia, Southeast Asia Tourist Arrivals

This year-over-year increase has not been lost on Cambodia's hotel sector. Hotel investments have increased to accommodate the growing demand – projected by the government to reach 15 million tourists

[8] Khmer Times, on-line article, Cambodia's Hotel Industry Trend Predicts Big Rise, January 1, 2020

by 2030. Hotels in Cambodia can mainly be found in Phnom Penh, Siem Reap, and Sihanoukville. Data from the Ministry of Tourism shows Phnom Penh has surpassed Siem Reap in tourist arrivals by air.

Knight Frank, a real estate consulting firm, recorded 83 hotels with more than 50 rooms operating in Phnom Penh. The recent additions to these came in between January 2018 to June 2019, with six hotels having a total of 773 rooms. This brought the total rooms available at 11,120. This growth is largely fueled by Chinese tourists arriving in Phnom Penh and has resulted in high-class hotels popping up to meet their demand for luxury accommodations. Knight Frank estimates that considering the shift in the tourist market, the supply of hotels post-2019 will be skewed towards the high-end at 40 percent, followed by the mid-tier at 38 percent, and economy-budget at 22 percent. However, those estimates were pre-COVID-19.

Siem Reap (tourist location including Angkor Wat) is dominated by mid-tier boutique hotels to accommodate a market with more modest tastes. But this is also starting to see shifts as more Chinese tourists arrive. Knight Frank has noted a total of 85 hotels (more than 50 keys) with a total of 11,848 rooms available. Boutique hotels are not included in this count.

The hotel market's competition in Siem Reap is notably more competitive than in Phnom Penh. According to Knight Frank, 4 new hotels are opening in the future with a total of 740 rooms. The same report estimates that the recorded supply of hotels post-2019 will also be skewed to the high-end at 58 percent and mid-tier at 42 percent.

Sihanoukville is a relatively new entry into Cambodia's hotel industry. Boutique hotels have operated in the province for years, but the city only got itself on the map with the surge of Chinese investments mainly starting in 2015. Sihanoukville is comparatively more modest than Phnom Penh, primarily due to it being a beach-and-resort destination. As of June 2019, Knight Frank reports that there were 46 hotels operating in Sihanoukville with a total of 5,238 rooms. The report estimates that the future supply of hotels in the city will mainly be mid-tier at 46 percent, high-end at 32 percent, and economy-budget at 22 percent. Sihanoukville is set to surpass Phnom Penh in terms of total hotel rooms around 2021 at over 13,000 available hotel rooms, signifying hoteliers' confidence in the province's tourism prospects.

Food Service: Restaurants[9]

Cambodia's growing urban middle class, supplemented by a significant expatriate community, increasingly frequents restaurant franchises. A few local "mom and pop" eateries emulating US-style fast food restaurants are popular and busy, such as doughnut and hamburger establishments. In 2005, Thailand's The Pizza Company opened the first international-standard pizza business in Cambodia, and the company has done well. In 2008, Swensen's and KFC opened their first outlets, and both are expanding throughout the country. Dairy Queen and Burger King have also entered the Cambodian market. The Hard Rock Cafe opened a franchise in Siem Reap in 2014 and in Phnom Penh in December 2017. In 2015, Domino's Pizza and Starbucks coffee opened franchises in Phnom Penh. Krispy Kreme Doughnut launched its first shop in Phnom Penh in May 2016. Carls' Jr and Cold Stone Creamery opened outlets in Phnom Penh in 2016. Franchises of Circle K and ChemDry cleaning service entered Cambodian market in 2018. Other foreign food and restaurant franchises present in Cambodia are from Singapore, Taiwan, Korea, Thailand and Australia.

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[9] Source: Export.gov US Dept of Commerce, https://www.export.gov/apex/article2?id=Cambodia-fast-food-and-beverage-franchises

Food Manufacturing

The food manufacturing industry in Cambodia is still in its infancy and relatively small. There are a limited number of multinational players, such as Pepsi, Coca Cola, Liwayway, and a local food processing sector that is in its early stages.

Food manufacturing faces several constraints and weaknesses, including a shortage of the following: capital; processing facilities; food processing technology and skills; market analysis and marketing information; and sanitation and hygiene knowledge. Additional challenges include poor infrastructure, an unreliable supply of raw materials, low levels of competitiveness of locally-produced products due to high operating costs, and a relatively small domestic market.

FOOD DISTRIBUTION TRENDS AND INFRASTRUCTURE[10]

Food Distribution Trends

Cambodia's healthy tourism industry and the growing bakery, quick service restaurant, and retail sectors offer the best opportunities for US exporters of high-value foods and beverages. Consumers of US products are likely to be young and higher income Cambodians, expatriates, and tourists. There is a surprisingly wide range of US food products available in Cambodian supermarkets and growing food service offerings. Although the vast majority of food is sold in traditional markets, the situation is changing as more supermarkets, convenience stores, quick service restaurants, and other modern outlets are opening. There is limited food manufacturing in Cambodia, contributing to the impressive variety of imported processed foods from the US and other sources.

Food Distribution Infrastructure

The food distribution infrastructure from the production (domestic) areas and ports (imported) to the final consumer faces many challenges. Much of this discussion is discussed in greater detail in the storage, transportation, and handling sections of this report. Thus, only the main points are highlighted here.

The World Economic Forum (WEF) Global Competitiveness Report (2019) ranked the quality of overall infrastructure of Cambodia 106th out of 142 countries. The ranking has worsened since 2013 when it was ranked 82. Road connectivity and electricity access are among the most notable deficits.

There are two major water ports for importing goods into Cambodia: Sihanoukville Port (Gulf of Siam) is the main deep sea seaport and Phnom Penh Port (assessable from the South China Sea and Mekong River via Vietnam – 330 km from the mouth of the Mekong in Vietnam). However, many if not most food imports are brought in via Vietnam through the Phom Penh port and by road and from Thailand by road. Phnom Penh International Airport is the major airport.

The major seaport in Sihanoukville is located 230 kilometers (143 miles) from Phnom Penh (PP) by road. Due the poor road conditions, the trip from Sihanoukville to PP by truck takes 7 to 8 hours. A new road is being built which should be ready in 2023. It will be shorter at 191 km and is estimated to cut the truck travel time to 4 to 5 hours.

[10] Source: FAS GAIN Report, KH5001, 10/20/2015, Cambodia Exporter Guide

TRADE

Cambodians, in general, highly regard US food products for their quality and safety, and US food brands are popular among younger Cambodians. However, the Cambodian market remains small compared to neighboring markets and US products are typically more expensive than Asian imports, due to high shipping costs and import duties.

Due to the relatively small size of the market, there are a limited number of importers. These include supermarket operators as well as food service distributors. There are growing direct shipments from the US, but many US food products enter the country via Singapore or other ASEAN markets.

PERISHABLE GOODS - EXPORTS

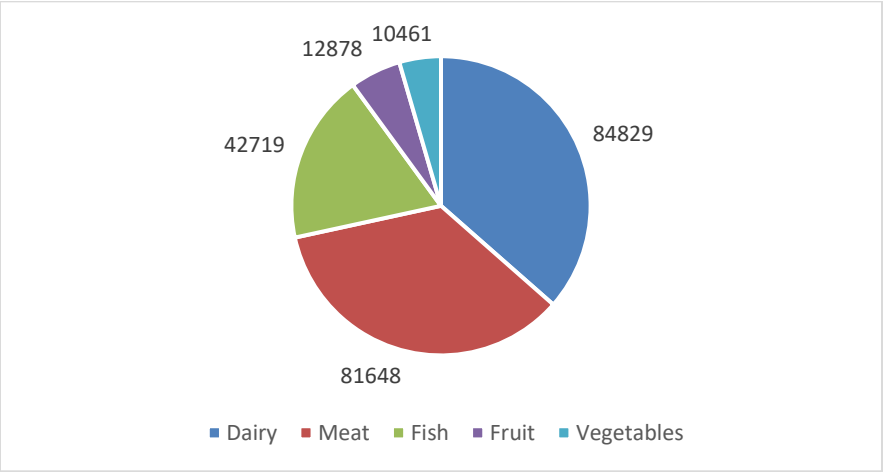
Of perishable products, Cambodia exports mainly fruits and vegetables and some fish products. Vegetable exports are largely dominated by roots and tubers with little exports in other vegetable categories. Fish products from 2014-2018 did experience growth in value but not in volume. However, outside of their main fish product, fresh or chilled fish, other fish products decreased from 2017 to 2018 or only very modestly grew. The main markets are Thailand and Vietnam with almost 96 percent of Cambodia's fruit exported to Vietnam. Cambodia's vegetable exports are split between Vietnam and Thailand, with 51 percent exported to Vietnam and 47 percent to Thailand. Cambodia's fish products almost entirely go to Thailand.

There may be future opportunities for exporting mango in the future. Ten MT per hour of fresh mangoes being cleaned and packaged at one facility for export. Bananas are also exported to other Asian countries. Cross border trade is important for Cambodia between Vietnam and Thailand, although according to one stakeholder confirmed that no one really knows what is being transported cross-country.

PERISHABLE GOODS - IMPORTS

Most food imports taxed at 35 percent. Cambodia's largest perishable imports are dairy and meat products. Dairy imports have grown by value overall and in each sub-category each year, but meat products has a higher CAGR between 2014 and 2018. The third largest import category is fish. Most dairy products come from Thailand while 70 percent of Cambodia's imported meat is from Japan and around 7 percent from Thailand and the United States. Thailand and Vietnam dominate fish imports, with Thailand fish imports making up 65 percent and Vietnam fish imports making up 25 percent. While fruit and vegetables are a smaller portion of Cambodian imports, the United States and Singapore are the main exporters of fruit to Cambodia and Thailand and China are the main exporters of vegetables.

Figure 7: 2018 Imports by Value (thousands USD)



Source: International Trade Centre Data

Cambodia's Agricultural and Related Products Trade with the World

Cambodian imports of most food and agriculture products are sourced from its neighboring Southeast Asian countries, namely Thailand, Vietnam, Indonesia, Malaysia and Singapore. Most of the imports from Singapore are transshipments from other countries. China is also a significant supplier. Major agriculture import items include cotton, beverages, tobacco, hides and skins, and animal feed ingredients.

Major exported agricultural related products include rice, cassava, and forest products. For consumer oriented products, Cambodia exports bananas, mangoes and cashews.

Cambodia's Agricultural and Related Products Trade with the United States

ASEAN in general is an important market for US ag and related product exports. However, Cambodia has not been a significant buyer. For 2019, Cambodia ranked as only the 94th largest market for total exports of food and agricultural products.

Table 4: Agricultural and Related Product Exports: World and ASEAN (Value in US$ 1000)

January - December Values in Thousands of US Dollars							
Partner	2015	2016	2017	2018	2019	Jan - May 2019	Jan - May 2020
World Total	150,603,539	152,329,718	157,719,379	159,347,105	153,974,811	63,999,715	62,093,576
Southeast Asia	10,870,442	11,971,718	12,605,312	15,208,245	14,355,331	6,153,915	6,032,340
Vietnam (#6)	2,596,287	3,020,790	2,940,680	4,446,504	3,970,244	1,790,217	1,700,993
Philippines (#10)	2,477,305	2,697,744	2,711,376	3,116,283	3,022,151	1,261,895	1,254,133
Indonesia (#11)	2,258,967	2,753,573	2,960,585	3,177,205	2,932,095	1,293,908	1,290,721
Thailand (#17)	1,818,358	1,678,817	1,959,460	2,238,789	1,942,844	779,289	746,022
Malaysia (#27)	879,949	839,664	966,153	1,111,893	1,187,185	512,306	479,330
Singapore (#30)	753,667	841,710	917,395	920,506	1,047,667	417,642	442,423
Burma	39,501	82,918	70,938	126,975	174,824	65,419	87,871
Cambodia (#94)	40,458	49,713	70,933	62,904	69,734	29,564	26,696
Brunei	4,817	5,803	6,509	4,871	5,441	2,472	2,150
Laos	1,133	986	1,283	2,315	3,146	1,203	2,001

Source: Census Bureau Trade Data, Product Group: BICO-HS6

US exports of agricultural products to Cambodia were only US$69 million in 2019. However, official export statistics undervalue the amount of US goods imported into Cambodia. Due to the relatively small size of the market, only a few supermarkets and a limited number of importers are in a position to import directly from the US. Most retailers and importers choose to source US and other imported products from Thailand, Malaysia, Vietnam and Singapore. By importing from these markets, the supermarkets and importers are able to bring in a wider range of products, via smaller quantities than full container loads.

Major US Exports of Agricultural and Related Products to Cambodia

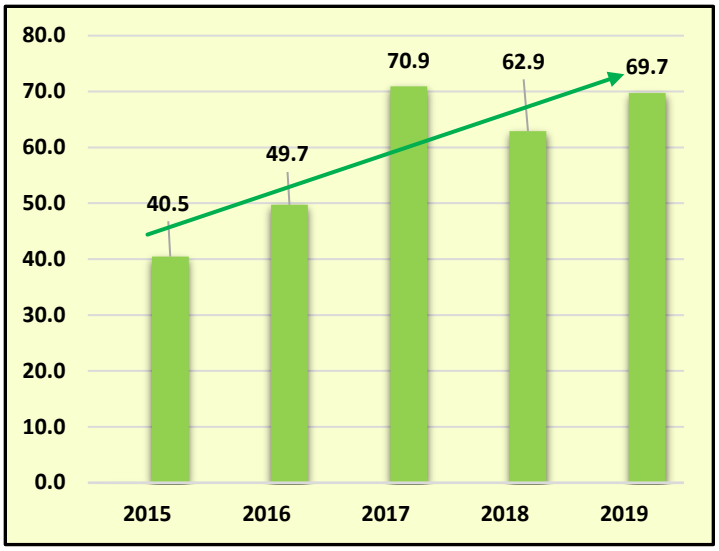
The leading category has been feed for poultry and aquaculture including soybean meal and distillers' grains. However, US exports of consumer-oriented (CO) products have been growing rapidly since at least 2015 reaching a high of US$29 million in 2019, representing 42 percent of total US agriculture related products to the country. The major CO export products were food ingredients and beverages followed closely by beef, then fresh fruit and dairy products. Beef replaced fresh fruit as the top temperature controlled product export to Cambodia in 2016 and in 2019, US beef exports to Cambodia were 3.5 times the value of those exports in 2015.

Figure 8: US Exports of Agricultural and Related Products to Cambodia by Product (US$ 1,000)

	2015	2016	2017	2018	2019
Agricultural & Related Products Total	**40,458**	**49,713**	**70,933**	**62,904**	**69,734**
Intermediate Agricultural Total	24,851	33,914	47,574	33,942	32,620
Consumer Oriented Agricultural Total	**11,590**	**14,049**	**19,555**	**23,761**	**29,026**
Food Preps. & Misc. Bev	2,692	3,929	6,169	6,626	8,139
Beef & Beef Products	2,086	2,863	3,464	5,188	7,370
Fresh Fruit	2,338	2,352	2,658	2,687	4,107
Dairy Products	674	737	874	1,574	2,465
Non-Alcoholic Bev. (ex. juices, coffee, tea)	429	1,111	1,678	2,628	2,003
Processed Vegetables	1,089	1,218	1,447	1,495	1,582
Condiments & Sauces	239	161	538	477	708
Wine & Beer	584	519	607	511	701
Chocolate & Cocoa Products	228	325	257	481	440
Tea	165	155	142	823	407
Tree Nuts	304	162	99	313	302
Snack Foods NESOI	130	141	145	229	158
Coffee, Roasted and Extracts	77	117	114	40	154
Processed Fruit	292	136	194	223	122
Poultry Meat & Prods. (ex. eggs)	49	46	960	122	119
Meat Products NESOI	3	0	49	0	89
Fruit & Vegetable Juices	33	75	151	31	79
Pork & Pork Products	30	0	0	195	70
Fresh Vegetables	11	0	6	0	10
Spices	0	0	3	9	0
Dog & Cat Food	0	0	0	89	0
Nursery Products & Cut Flowers	139	0	0	20	0
Agricultural Related Product Total	733	1,223	2,198	2,462	6,802
Forest Products	114	210	1,603	2,393	6,204
Distilled Spirits	527	935	503	0	452
Fish Products	93	78	92	69	146
Bulk Agricultural Total	3,283	527	1,606	2,738	1,286

Source: Census Bureau Trade Data, Product Group: BICO-HS6

Figure 9: Trend of US Exports of Agricultural and Related Products to Cambodia (US$ Million)



Source: Census Bureau Trade Data, Product Group: BICO-HS6

Major US Imports of Agricultural and Related Products from Cambodia

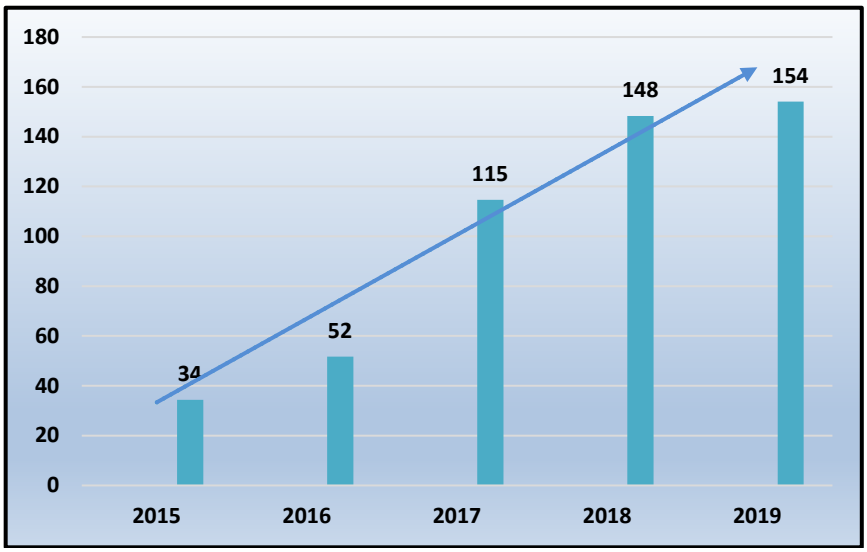
US imports of Cambodian food and agriculture related products have grown dramatically over the past five years from only US$34 million in 2015 to over US$154 million in 2019, four and a half times the value in 2015 (see table below). Forest products ($136 million) have been the bulk of US purchases each year accounting for 88 percent of total imports in 2019. Pet food has been the second largest import item.

Figure 10: US Imports of Agricultural and Related Products from Cambodia by Product (US$ 1,000)

	2015	2016	2017	2018	2019
Product	Value	Value	Value	Value	Value
Agricultural & Related Products Total	34,319	51,658	114,702	148,342	154,102
Agricultural Related Product Total	11,991	29,361	93,383	126,439	136,120
Forest Products	11,991	29,361	93,383	126,423	136,120
Fish Products	0	0	0	16	0
Consumer Oriented Agricultural Total	20,092	20,425	17,628	19,994	14,326
Dog & Cat Food	19,919	19,275	17,245	18,826	12,939
Food Preps. & Misc. Bev	97	332	311	418	539
Snack Foods NESOI	0	0	0	0	386
Processed Vegetables	0	0	0	599	250
Spices	35	109	8	56	119
Fresh Fruit	0	190	0	70	68
Wine & Beer	0	0	25	25	25
Dairy Products	0	10	6	0	0
Processed Fruit	0	510	34	0	0
Nursery Products & Cut Flowers	41	0	0	0	0
Bulk Agricultural Total	2,137	1,224	1,754	1,354	2,284
Intermediate Agricultural Total	99	648	1,937	555	1,372

Source: Census Bureau Trade Data, Product Group: BICO-HS6

Figure 11: Trend of Imports of Agricultural and Related Products from Cambodia (US$ Million)



Source: Census Bureau Trade Data, Product Group: BICO-HS6

SOURCES OF COMPETITION

Domestic

There is not much domestic commercial production of meat, poultry, dairy, and seafood so there is little competition with those products imported from the US other than some freshwater fish. Domestic rice is the primary cereal consumed and fish is the main source of protein in the people's diet. The country's aquaculture industry is a large user of imported soybean meal for which the demand is projected to reach 100,000 metric tons per year by 2030.

International

High quality US fruit, vegetable, and meat products face stiff competition from Thai, Vietnamese, Chinese, New Zealand and Australian products that are cheap and commonly available in the market. Some European products are also available. Due to ASEAN Free Trade Agreements with China, New Zealand, Australia, the EU, and other countries, the US is at a disadvantage due to the import duties it must pay that the Free Trade Agreement (FTA) countries are exempt from. Cambodia also just completed negotiations with China for a bilateral FTA that was signed on August 12, 2020.

COLD CHAIN ASSESSMENT

The assessment team met with 39 cold chain stakeholders including:

- Large commercial farmers and export producers
- Processing facilities
- Capital equipment suppliers/maintenance companies
- Companies with refrigerated transportation fleet
- Logistics providers
- Ports/Entry points
- Distributors/retails
- Government
- Local legal counsel & tax attorneys
- Development partners
- Local financing institutions/DFI
- Associations
- Pharma Companies
- Holding company
- Advisors
- Food safety and testing
- Hotels & Restaurants
- Real Estate Research

The report below is based on these interviews, observations, and the literature review. It is broken down into the different cold chain links with sections on postharvest, processing, transport, design/build, warehousing, final point of sale, and government regulations.

POSTHARVEST

Agricultural Practices. Postharvest handling tactics are relatively basic, as farmers lack the time, land, or capital to invest in new technology. On-farm cold storage is extremely limited.

Postharvest Losses[11]. Postharvest losses of fruits and vegetables in Cambodia are reported to be higher than 20 to 25 percent for fruits and somewhere between 17 percent for vegetables as reported in one study[12] to as much as 30 percent.

Packaging. Products are usually packed in plastic bags, bamboo baskets, sacks or crudely tied up using branches or plastic strips. Suppliers for collectors and wholesalers commonly use sacks and bamboo baskets while on the retail side, plastic bags are used.

Pre-Cooling. On-farm precooling at harvest is not common.

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[11] https://horticulture.ucdavis.edu/project/strengthening-local-expertise-postharvest-practices-cambodia-and-vietnam
[12]https://www.researchgate.net/publication/232724421_Quantifying_postharvest_loss_in_vegetables_along_the_supply_chain_in_Vietnam_Cambodia_and_Laos

Farmer Incomes. In spite of positive trends for economic growth, farmer incomes were not projected to rise. One stakeholder commented that he sees Cambodia at the same level as China about 7 to10 years ago.

Off-Farm Transport. Most aggregators and retailers are responsible for transporting purchased vegetables which is typically done using motorbike, car, rented vehicles, or public transport. Farmers may walk their products to nearby markets.

PROCESSING

Food Processing. There is very limited food processing in-country. Some reported it as limited to non-existent, but research indicated that it could be growing. In August of 2019, the first-ever food and agricultural processing business matching forum was held, aiming to boost "the rapidly growing sector."[13]

Future Growth. The Cambodian government is aiming for agribusiness to make up 30 per cent of the country's GDP by 2025, up from 24 per cent in 2013. In an attempt to wean the country off its reliance on cheap garment production, exports of processed food are expected to make up 12 per cent of total exports by 2025.[14] Some of this will involve products for ambient storage such as rice, but the Cambodian Association of Food Science and Technology (CAFST) anticipate high growth categories to include dairy products, baby food and prepared meals for children and convenience and grab and go.[15]

TRANSPORT

This assessment details shipping and trucking, but does not provide details on railways or air cargo which was reported to be nearly nonexistent in the country and/or not used for temperature controlled transport. Rail tends to be for heavy cargo such as rice, while the importance of air did not factor into the discussions on perishable products.[16]

Refrigerated Shipping

Existing Ports. The three main international ports in Cambodia are: Sihanoukville on the Gulf of Siam, Phnom Penh on the Mekong river, and the provincial port of Koh Kong. The team visited Sihanoukville and Phnom Penh.

Cost. Sending a container by train costs about $200 to $250 USD.

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[13] https://www.khmertimeskh.com/50634710/food-processing-forum-kicks-off/

[14] http://www.fareasternagriculture.com/crops/processing-a-storage/cambodia-to-focus-on-food-processing-and-exports

[15] https://www.foodnavigator-asia.com/Article/2018/05/23/Food-and-beverage-in-Cambodia-Soaring-demand-offering-huge-potential-for-overseas-brands

[16]The Phnom Penh Airport is undergoing renovation with three Chinese-owned enterprises selected to build the new airport. https://thailand-construction.com/cambodia-airport-investments-new-phnom-penh-international-airport-cost-estimated-at-1-5-billion/

Sihanoukville Autonomous Port (PAS)

Size. Constructed in 1956, the port occupies 54 Hectares (ha) or 540,000 m2. Of the three port gates, one has four lanes in use for full containers; one is for picking up empty containers; and the third is for passengers/cruise ships.

Management. PAS is operated by a government agency and state corporation, dependent upon Ministry of Public Works & Transportation. There are 10 shipping lines that have contracts for weekly service. When visited, much of port area was used to store empty containers. An increase in fees for empty containers was expected to reduce this.

Capacity. Operationally, the port is limited by berth capacity and crane movements. PAS can handle two vessels of up to 1,500 TEU at one time, but on average, ships come and go with a load of about 600 TEUs. PAS reports productivity of 25 containers per hour although others reported it was closer to 20 containers per hour. Most imports are garment industry materials.

Turnaround Times. The Port services an average of two vessels per day with an average of 24 hours turn around. For trucks, there is an average of 30 minutes to a one-hour turn around inside the port.

Cold Storage. Currently, there is no cold storage at or near to PAS, but they have plug-ins for more than 50 containers and land reserved for cold storage (13,000 m2 space). The port has no bulk handling capacity. According to one stakeholder, the reefer traffic is still small, limiting the need for cold storage services. The majority of reefer exports from Cambodia move out of the Ving Tau Port near Ho Chi Minh City in Vietnam where a new Terminal will be built.

Equipment. PAS has four container cranes for loading/unloading containers on two berths. There is a radiation detector station.

Product Distribution. Generally, reefers that enter the Port move up to Phnom Penh and then are distributed throughout the country. It takes seven to eight hours to truck materials to Phnom Penh, although in 2023, the 230 km road #4 is being replaced by a 191 km road which is anticipated to reduce the time to four to five hours.

Surrounding Infrastructure. The road infrastructure is far worse than in Phnom Penh. PAS faces both trucking congestion and port vessel congestion. PAS is connected to other smaller seaports in the country by barges.

Special Economic Zone There is a Special Economic Zone just outside the Port of 64 Ha. (640,000 m2) for factories and a container area of 103,000 m2 with capacity for 8,400 TEUs. At the time of the visit, three Chinese-owned factors were in operations. In general, Chinese interests control most hotels, restaurants, and food shops in the area, and it was reported that they are pursuing control of port operations.

Inspection. Quarantine inspection is done by CAMCONTROL.

Future Growth Plans. Extensive plans exist for further development. PAS intends to expand the area and depth by 2023, leading to a projected annual throughput of 1,200,000 TEU. A pre-gate truck waiting area about 30 kms from the port will also be built to prevent congestion. A deep water port extending 14.5 meters deep for 5,000 to 6,000 TEU vessels is planned. Phase 1 includes a 350 meter berth (2019/23) with three

cranes and an area of 17.5 Ha (175,000 m2) connected to Special Zone. The final project is for 1.2 million TEU capacity.

Challenges. The biggest challenges for the port include the need to improve port infrastructure and roads and the lack of technical knowledge of port operations which could improve efficiency It is the most expensive port in all of Asia.

Phnom Penh Autonomous Port (PPAP)

Size. PPAP is Cambodia's second largest container hub after PAS on 5.5 hectares with capacity of 500,000 TEUs per year.

Management. Estate-owned enterprise with 20 percent traded on Cambodia Stock Exchange. It is dependent on Ministry of Commerce. Five shipping lines operate at PPAP, and there is no Roll On-Roll Off (RO-RO) activity.

Capacity. Barge capacity is 200 TEUs. PPAP's actual volume is 20 to 30 40-foot reefers per week. As reefer imports are limited there is an imbalance of reefer availability and PPAP is trying to work with other shipping lines. One shipping company has offered higher costs to operate with reefers at PPAP.

Turnaround Times. PPAP is selling services at no profit to gain volume. They are matching costs with higher transit times.

Cold Storage. The port has limited existing reefer capacity. CMA-CGM gives preference to Vietnam to export on their vessels as there is not always space for all reefers, and there is no reefer maintenance personnel at PPAP from the shipping lines. PPAP has 64 plugs for reefers. Cold storage could be a new business for the Port and there are projects to be built by third parties at the Port premises.

Equipment. Equipment includes eight stacker cranes and four container cranes for barges.

Product Distribution. PPAP specializes in containerized cargo. Export volumes were expected to double to 40 reefers/week as of July 2020 (pre-Covid) although almost all was dry cargo. The sailing time from PPAP to Ho Chi Minh is five days versus a trucking time of two days. It takes 12 days to connect PPAP to Ho Chi Ming City by barge.

Surrounding Infrastructure. The area floods during the wet season. There are farms nearby and a water reservoir. Four national highway routes and three rail lines converge in Phnom Penh, linking it with other parts of Cambodia.

Inspection. Pre-trip inspections (PTI) are not performed PPAP.

Future Growth Plans. There is possible construction of cold storage by a third party, but there is no cold storage capacity at PPAP presently.

Challenges. There is no technical knowledge on reefer refrigeration units.

Banana Exports. The Port is currently trying to diversify services by exporting bananas by barge. Otherwise, this is done by truck. For several months, PPAP has acted as agent, dispatcher and service provider from farm to Ho Chi Minh Port for transshipment to China in reefers. Empty reefers are delivered

to four banana farms with limited cold storage facilities. They are stuffing two reefers per day, then returning to PPAP for transshipment to barges destined for Ho Chi Minh Port then for Shanghai, Dalián and Tianjin.

Refrigerated Trucking

Refrigerated Transportation. Chilled & frozen distribution is not yet much developed. As with other areas of the cold chain, there emerges differentiation in the types and sophistication of services offered. There is some capacity to distribute higher end products with trucks that are properly precooled. Growth for refrigerated trucking is estimated to be 20-30%.

Cost. The cost to send product by refrigerated truck is approximately $210USD. The average salary for a truck driver is between $250 and $350 USD per month.

Road Network. There is a lack of high-quality, paved roads, but there are plans underway to improve the road network. Specifically, Road N-4 and new expressway will facilitate connectivity from Sihanoukville to Phnom Penh by 2023 that should reduce driving time to four hours. Currently, it takes two days from Phnom Penh port to get to Ho Chi Minh City. The bad road infrastructure combined with truck size distribution limitations makes it difficult to transport more than 1.5 tons without problems.

Truck Types. The refrigerated trucks that are in-country are mostly second-hand from South Korea (Hyundai & Kia). There is interest in importing second-hand or used reefer trucks into Cambodia, which is similar to how the refrigerated trucking industry got its start in the Philippines. A new truck from Korea is $45-$50k landed while a secondhand truck is $15k landed. Making it more expensive is a 110% taxation on new trucks compounded by high interest rates of 15% to buy new trucks.

Refrigerated Trucking Capacity. Cambodia faces a shortage of refrigerated trucks (reefers). A total of 40 reefer units were reported to the team during the interviews, although the actual number is likely higher. Capacity of refrigerated trucks is mostly 1.5 and 2.5 ton trucks, and most of these were reported to be chilled vehicles without the capacity for frozen. Temperature fluctuations during transport was common.

Refrigerated Transport Training. It is difficult to find high-quality and consistent drivers. Even those companies with refrigerated assets did not have managers who had received proper training on refrigerated trucking best practices.

Fragmentation of Trucking Sector. The biggest challenge holding refrigerated trucking companies back is the lack economies of scale; customers only have small amounts, and the frequency is inconsistent. The lack of aggregation is a concern.

Maintenance. There is also a shortage of mechanics to help work on the trucks and most importantly the reefer units on the trucks. Drivers are not accustomed to using refrigerated products. Mechanics are typically from Thailand. Vietnam also has mechanics, but mechanics from Japan and Thailand were preferred.

Traffic Concerns. Most trucks distribute in the morning and after 3.00 PM, and trucks with more than 2.5 tons of distribution is limited to these hours.

Secondary Distribution. Most of the secondary distribution, especially for fruit and vegetable products occurs via a bike transport delivery service with plastic bags. Foam boxes are also utilized. Some tuk tuks are converted to use for last mile delivery.

Cross-Border. Overland trucks that enter the country are inspected on a random basis. There is no real control over the land border trade. They simply pay to get their product into the country. Some transport companies are reported to be owned by government officials.

Challenges. There is a critical need for education on the handling, loading, and unloading of product from refrigerated warehouse facilities to retailers and for refrigeration maintenance for vehicles. There remain low compliance to standards and there are not enough drivers for food distribution. The vehicle tariff for new trucks is 63 percent and 150 to 200 percent for used trucks.

COLD STORAGE DESIGN/BUILD & CONSTRUCTION

Design. The lack of professional and governmental code requirements leads to variation in design and construction. The most common designs followed the box-in-box' concept common for designers not familiar with cold storage facilities. This concept includes an outer building shell without insulation or a vapor barrier. The interior walls and ceiling are lined with some kind of insulation component to create a vapor barrier. Facilities lack temperature controlled staging areas.

Materials. 95 percent of all materials are imported. The larger facilities utilized design or best practice technology from countries such as Japan, China, or Vietnam.

Maintenance. It is not easy to find skilled technicians. They need more qualified technicians in the country to maintain and repair compressors and related equipment. A maintenance program requires on-going training and investment to mechanically and electrically proficient technicians.

Structural. It is common to see chambers in two stories with one elevator to move products. One of the disadvantages of the 'box-in-box' design approach is the reduced clear height in the cold storage rooms. Whether there is racking, or product is floor stacked, lower ceilings reduce available space. Interior columns are concrete pilasters and not tube steel or I-beams. This reduces aisle space and pathways for forklift maneuvering.

Walls. Insulation is sprayed foam on the walls. This creates a food safety and cleanliness issue. The spray foam is brittle and breaks down over time creating air and floor sanitation issues. The spray foam does not have a vapor barrier which eliminates a cleanable surface.

Floors. Concrete floors were minimal thickness' which will result in wear and cracking. The floors do not have a wearing surface or finished surface for protection and cleanability. The result is a chalking effect which does not meet good food safety practices. Joints in the floor are often not caulked which also is a sanitation issue. In high traffic areas, armored joints with steel plates would be the best design approach.

Roofs. Conventional to the 'box-in-box' design approach, the roof was without cold storage insulation. The built up roof tended to utilize metal corrugated deck, ply sheet, and some kind of asphalt covering. While these roofs are acceptable, they are prone to leaks. Even though the insulation and vapor barrier is below the roof line as the ceiling to the cold storage box, continuous water and vapor leaks in the roof will cause damage to the insulated ceiling below over time.

Refrigeration. Refrigerant technology is 134a, 404a for the -20 to -25 degree Celsius range. Most cold stores are very small rooms with chillers. Equipment is expensive and much of the observed equipment was

in bad condition. The condensing units are located on the roof or ground, and the evaporator units were hung inside the roofs below the ceiling. It was reported that ammonia refrigerant is not widely available in Cambodia although one facility had a central ammonia system. Water supply and water quality is problematic which makes air cooled condensing the best approach. It is not very efficient as this creates additional power requirements for air and fan horsepower.

Doors. Doors are primarily manual and insulated. The insulation is most likely urethane or polystyrene with galvanized steel covering. The doors are adequate in construction, but installation and maintenance are critical in a cold storage facility, and they were not adequately protected from forklift or pallet jack damage. The seals were not properly set or were knocked off their tracks which resulted in air infiltration. No high speed roll up doors were evident.

Lighting. Lighting used an older technology with high pressure sodium fixtures. Some fluorescent lighting was seen in the newer facilities; however, no LED with motion sensors were evident.

Fire Prevention. No fire sprinkler systems were evident in the older facilities. Since product racking was not prevalent or very high, in-rack sprinklers were not an issue. Box-in-box design allows for dry pendant heads to be installed in the ceiling with overhead piping above the ceiling; therefore, a conventional wet sprinkler system was utilized.

Racking. Of those operating, almost no warehouses included racking. Where it existed, there were some chambers with stackable cages for frozen meat and some drive-in racks for fruit pallets.

Dock Equipment. Docks are typically not enclosed or only partially enclosed. They are usually too small and not refrigerated. No dock levelers were observed.

Electricity. Power shortages are frequent, even at ports. Electricity is expensive, costing $.20 to $0.35 per kilowatt hour. Even at the highest price, it is considered unreliable by many, some reporting an average of three cuts per day, some lasting four hours per day, especially during hot weather. One interviewee anticipated it would be 10 years before the electrical problems were fixed. Power in Cambodia is from coal, solar, black oil, hydro and purchase from neighboring countries. All 50 hertz in Cambodia which is different than the standard 60 hertz.

Solar. In spite of the high cost of electricity, there is little or no interest in solar due as the investment cost is approximately $800,000 for 1 megawatt installation. In terms of ROI, this is approximately 8 years. The solar panels that are available are usually imported from China; they are not produced in Cambodia. The Government dissuades from investing in solar energy due to high costs. At the time of the interviews, there were no incentives or subsidies, and it was reported that amortization of the required investments were far too long.

Chinese Influence. Given its proximity, the interests and influence of China are relevant to Cambodia. According to some interviewees, these interests are currently focused on controlling the road infrastructure and real estate sectors. When it comes to influence, Chinese products are most easily accessible. Chinese equipment is available at much lower prices, but the quality and service are not very high. Therefore, the lifetime of the equipment is much shorter.

WAREHOUSING

Cold Storage Services. Limited services are provided in Phnom Penh but mostly as distributors of specific brands which are commercialized by themselves.

Private Warehousing. Most importers and distributors have their own small facilities. In some cases, the frozen warehouse may consist of reefer containers that store 18 to 20 pallets each. One fruit and vegetable distributor utilized a modular cold storage unit with what appeared to be a Coldbot in order to sustain temperatures of 8 to 11 degrees Celsius.

Demand. The peak season for temperature controlled logistics is October to April. During this time, containers may be used for excess storage capacity. The lack of cold storage capacity has some potential clients looking to build their own facilities. At least one stakeholder stated they are looking to build their own cold storage but would avoid this if a provider was available.

Logistic Service Providers. There are few third party logistics providers (3PLs), which only started to emerge recently. Customers include the largest retail chains and HORECA (hotels, restaurants and catering) in Cambodia. A capacity list is provided in Annex B.

Labor. Cold storage experience is in short supply. One company reported that they would send their employees to Thailand for training. Labor was reported to be cheap and readily available although skilled labor was more difficult to find. Labor costs are reported to be about $300 USD per month. Working conditions are usually poor with little protective clothing.

Land. Land is difficult to come by and cannot be owned by a foreign company, JV or land holding company. It costs about $40-$80 per square meter in the economic zones for a 50-year lease, but most of these economic zones are empty. It took one operator 2.5 years was to get the right permits, permissions, and documents from the government in the special economic zone south of the city.

Future Growth. Sihanoukville maybe a potential location for cold storage to service the sea freight importation especially if it becomes a tourist destination which would help in reducing traffic volume and decongestion in the Phnom Penh area.

GOVERNMENT REGULATIONS

Relevant Ministries. According to interviewees, each Ministry acts differently regarding food safety & protection. There are opportunities for training in this area to bring those working within food industries up to international standards. Ministries relevant to cold chain in Cambodia include the Ministry of Commerce, the Ministry of Agriculture Forestry and Fisheries, the Ministry of Labour and Vocational Training, and the Ministry of Public Works and Transport. The Council for the Development of Cambodia (CDC) also serves to promote food safety and protection by monitoring and increasing business activity.

Cold Chain Promotion. In spite of the lack of guidance on cold chain, government support was reported to be high with the Department of Agriculture Forestry and Fisheries expressing strong interest in cold chain development.

Food Safety. Per the USDA, Cambodia has been drafting a food safety law. The draft went through the government regulatory process over the past three years with the assistance of the U.N.'s Food and Agriculture Organization (FAO) and was returned by the Council of Ministers for revision. The Ministry of Commerce and other line ministries are working on updating the draft with respect to responsibilities of the relevant ministries and agencies. The revised draft law is expected to be completed by the end of January 2018, and will be re-submitted to the Council of Ministers for review, and the National Assembly later for approval.

Food Standards. Cambodia has a Law on the Management of Quality and Safety of Products and Services which covers aspects such as labeling for consumer protection and the right of inspectors to inspect all products. However, it is of little importance as there is a lack of enforcement leaving little reason for companies to comply.

Enforcement. Quality standards are not imposed. Some business will operate below sanitary standards due to cost and customers do not complain. Almost no regulations, no sanitary controls, no enforcements and no requirements or specifications at any level including code compliance for design/build.

Duties and Taxes. One stakeholder reported that they anticipate an increase in customs duties and corporate income taxes, which were at 20 percent at the time of the assessment to reduce dependency on bilateral donors.

FINAL POINT OF SALE

Reviews were mixed on the state of the cold chain at the final point of sale. Some food service providers reported it was very good or adequate, although it was acknowledged, that although the current system works for the hotel on the frozen and chill side, the largest challenge is with the fresh produce since it is not chilled in transport to the hotel. Consistency and availability are also issues.

SWOT ANALYSIS

Strengths • One of Asia's fastest growing economies. • Low inflation rate. • Unemployment rate below 1% over the past 10 years. • Familiarity with US products and established importers of US goods. • US food and beverage products have a strong reputation for quality and safety. • Western products are common in modern supermarkets. • Trend in total and consumer-oriented US ag and related product exports is rising, albeit from a low base. • Local meat and poultry production is limited so not much domestic competition for US imports	***Weaknesses*** • Small economy with a relatively small population. • Low per capita income on a PPP basis. • Ranks 144 out of 190 countries for doing business. • Market for US food and ag products remains small • Importers are usually not in a position to buy container loads of products direct from the US. • Limited infrastructure and distribution for perishable products. • Relatively high cost of electricity. • Shortage of labor. • Shortage of refrigerated trucking. • Limited number of importers and distributors. • ASEAN has free trade agreements with Australia, New Zealand, Japan, Korea, China and most recently it signed its own FTA with China in 2020. • Most consumers continue to shop at traditional markets that do not carry many imported products. • Shortage of technicians for maintaining and repairing cold storage/transport equipment.
Opportunities • Moderate and growing number of tourists, Western style fast food chains, and modern food retail chains, bakeries, restaurants, and hotels. • A large number of NGO-employed expatriates create a market for Western imported products. • Strong Chinese investment in infrastructure (e.g., roads and ports) and other sectors is also expanding the number of Chinese tourists demanding moderate to up-scale hotels. • Potential for exporting mangoes to Philippines and Malaysia for drying and to China for fresh.	***Threats*** • Slowdown in economic growth due to COVID-19 • Drop in Chinese Casino and on-line gambling in Cambodia has reduced Chinese tourist visits and jobs in the on-line gambling call centers.

Market Opportunities

There are limited market opportunities for large growth in US exports of temperature controlled products to Cambodia in the short-term (2020-2023). For comparison purposes it's useful to look at how US food and agricultural exports (in particular, the consumer oriented product category that includes all temperature controlled products) have grown over the past 20 years in other ASEAN nations. Unfortunately, there is not one single country in the region that compares well with Cambodia in terms of

population and nominal GDP; two of the main drivers of increased consumption of high value, temperature controlled products.

Since we conducted cold chain assessments of Cambodia and Vietnam within a few months of each other, it is relatively easy to compare and contrast the opportunities between those two markets. Vietnam is already a huge and important market for US food and agriculture products ranking sixth in the world reaching a record high of nearly US$ 4.5 billion in calendar 2018. In that year US ag exports to Vietnam were over a billion dollars greater than exports to both Indonesia and the Philippines (the next two largest markets in ASEAN) which were the 10th and 11th largest US ag export markets, respectively, in the world. Cambodia ranked number 95 in 2018.

Comparing US export trade data for the 10 ASEAN countries, it is clear that Cambodia is at least 15 years behind all but Burma, Brunei and Laos in terms of becoming a billion dollar market for US food and agricultural goods. The biggest and most insurmountable constraint is its relatively small population of only 16.5 million people. Only Brunei (0.5 million) and Laos (7.2 million) have a smaller population base. For that reason alone, Cambodia will not reach the one billion dollar benchmark for US ag exports anytime soon. For example, in comparison to Vietnam, its population (95.5 million) is six times larger than Cambodia (16.5 million). Other liming factors for comparison include (for 2019):

- **GDP per capita on a Purchasing Power Parity (PPP) basis**: Vietnam (US$ 8,065) is 73% greater than Cambodia (US$ 4,664)
- **Nominal GDP:** Vietnam GDP (US$ 262.6 billion) is 10-times larger than Cambodia (US$26.7 billion)
- **Ease of Doing Business:** With a ranking of 144 - lowest by far in ASEAN - doing business in Cambodia is very problematic — virtually double of the rankings for Vietnam (70) and Indonesia (73) and nearly at the bottom of the list of 190 counties in the world for starting a business (187), enforcing contracts, and dealing with construction permits (178)

But there are some niche mid to longer-term (2023-2030) opportunities that should develop in line with greater economic growth and per capita incomes, growth in tourism and modern hotels, and growth in international quick service and family-style restaurants. The greatest growth and opportunities for exports of US temperature controlled products are ranked and shown in the table below. **With greater investment in the country's cold chain infrastructure coupled with the handling, operations and management training and education recommendations provided in this assessment, the estimated value of US exports should exceed the 2025 estimates.**

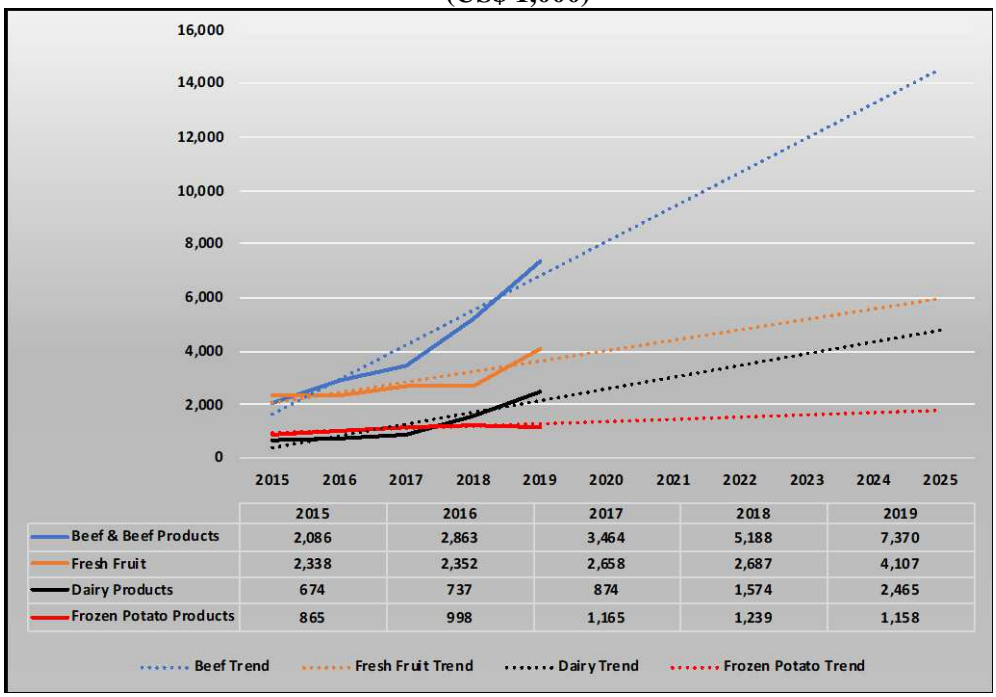
Table 5: Ranking of Best US Ag Export Opportunities and Estimated Value in 2025 (US$ 1,000)

Product	2019 Value	2025 Value *	% Increase
Beef and Beef Products	7,370	14,500	97%
Fresh Fruit	4,107	6,000	44%
Dairy products	2,621	4,800	86%
Frozen potato products	1,158	1,900	64%
TOTAL	**15,256**	**27,200**	**78%**

* Trendline Estimate

The following graphs show the value of the above US exports to Cambodia from 2015 to 2019 and our growth estimates based on a linear trend line for 2025.

Figure 12: Selected US Actual and Estimated Agricultural Exports to Cambodia (US$ 1,000)



	2015	2016	2017	2018	2019
Beef & Beef Products	2,086	2,863	3,464	5,188	7,370
Fresh Fruit	2,338	2,352	2,658	2,687	4,107
Dairy Products	674	737	874	1,574	2,465
Frozen Potato Products	865	998	1,165	1,239	1,158

RECOMMENDATIONS FOR PHASE TWO

TRAINING

Basic training is required at all levels, and where possible, it should be in the local language. GCCA can provide general cold chain operational knowledge on handling, transport, and storage practices.

One stakeholder is very interested in training for cold chain operations and offered WFLO to train his trainers at the world bridge facility training center in Phnom Penh. Specific requests for training emerged:

- Training for banana exporters .
- Cost analysis for 2nd hand cargo-worthy reefer trucks (1 to 5 tons) from the USA versus brand new reefer trucks.
- Operation & maintenance of reefer machines.
- Targeted training to the suppliers that deliver the food from the airport to their facilities, and to the hotel.

Observationally, Cambodians could benefit from training targeted to commodity storage, food safety, and best practices for warehouse operations.

If approved and provided travel is allowed once more post-Covid, Phase Two will include a mix of remote and in-person training opportunities. Currently, it is envisaged that approximately eight to ten modules will be developed and customized for market. These will be delivered and recorded in English, but will be translated through dubbing or subtitles. An in-person study tour to a regional country like the Philippines will provide multiple site visits.

CONSULTATIONS

Once travel is allowed, companies will benefit from specific consultations. Participants will be invited to sign up and identify the area they are need specific services, but it is anticipated that design/build expertise will be an area of focus. Decision makers who are investing in facilities need to be more knowledgeable about proper design and construction when they are negotiating.

ASSOCIATION DEVELOPMENT

Competitors are not accustomed to working together. There is a space for GCCA to bring together stakeholders to demonstrate the value of resolving common challenges. GCCA will hold Cold Chain Connections to afford networking opportunities with each other and with GCCA leadership to understand the value of working together.

POLICY

It was suggested that GCCA should review the food safety draft law and offer recommendations. GCCA will offer to do this through the appropriate channels and will follow-up if the offer is accepted.

Annex A: Meeting Schedule and Contacts

Meeting Date	Sector	Org_Name	Name	Title / Position
Monday, December 2, 2019	Dairy	**Moo Moo Farm**	Kenny Matthews	Co-Founder /CEO
Monday, December 2, 2019	Grocery importers / distributors	**Auskhmer**	Vincent	Food Sales Director
Tuesday, December 3, 2019	Cold Storage Provider	**Nippon Express**	Mr.Ishikawa	
Tuesday, December 3, 2019	Logistics Agents / Shipping	**Pandora Logistics**	Nhiev Kol	Owner
Tuesday, December 3, 2019	Horticulture - Other	**Consultant in commercial veg sector**	Parth Borkotoky	
Tuesday, December 3, 2019	Hotels	**Sunway**	Thiang Yang Hian	GM
Wednesday, December 4, 2019	Consumer goods	**Unilever**	Long Vanndeth	In charge of ice-cream
Wednesday, December 4, 2019		**US Embassy**	David Sequeira	Economic Department
Wednesday, December 4, 2019	Equipment suppliers	**Lotus Green**	Hong LeangY	Managing Director
Wednesday, December 4, 2019	Government	**USAID**	Sequeira, David R Laura Cizmo	Economic Department
Wednesday, December 4, 2019	Restaurant Groups	**Park Café**	Sengly Heng	General Manager
Thursday, December 5, 2019	Logistics Agents / Shipping	**Damco**	Gruemmer, Tobias / Civardi, Marco	Head of Operations / Area CEO
Thursday, December 5, 2019	Equipment suppliers	**Comin Asia**	Michael Freeman	Vice President Contracting of Comin Khemere
Thursday, December 5, 2019	Consulting engineers	**Redfurnesse**	Mr Paul Redfurn	Managing Director
Thursday, December 5, 2019	Cold Storage Provider	**Hun Ty Co.Ltd**	Mrs. Sophy	Owner
Thursday, December 5, 2019	Logistics Agents / Shipping	**Kerry Worldbridge Logistics**	Dickson Pang	Manager of Logistics and Express
Friday, December 6, 2019	Others	**Chip Mong Group**	Singh Chanchal	BD Manager

Friday, December 6, 2019	Mini-Mart Grocery	**CALTEX (subsidary of Chevron, US Oil Co.)**	Daniel Hwang	Country Manager
Friday, December 6, 2019	Agriculture	**Genearal Directorate of Agriculture (GDA) - MAFF**	Ker Monthivuth	
Friday, December 6, 2019	Government	**CAMCONTROL Directorate-General- Ministry of Commerce (MoC)**	Mak Pichrith	Directorate-General
Friday, December 6, 2019	Cold Storage Provider	**Chll Logistics**	Sonic Duran	BD Manager
Friday, December 6, 2019	Others	**CBRE**	Hodge, James	Director
Saturday, December 7, 2019	Sea port	**Sihanoukville Autonomous Port (PAS)**	Thay Rithy	Deputy Director General
Monday, December 9, 2019	Equipment suppliers	**Rieckermann**	Billy Dalle-Grave	Managing Director
Monday, December 9, 2019	Seafood/Aquaculture	**USDA - Commercialization of Aquaculture for Sustainable Trade (CAST)**	Jim Hersey	Chief of Party
Monday, December 9, 2019	Restaurant Groups	**CBM Corporation Co., Ltd**	KOUCH Sokly (Managing Director)	CEO
Monday, December 9, 2019	Others	**Agriculture Cosultant**	Metta Hem	
Monday, December 9, 2019	River port	**Phnom Penh Autonomous Port (PPAP)**	Phanin Hei	Deputy Director General
Tuesday, December 10, 2019	Horticulture - Other	**Plant and Foods**	Declan Graham	Business Manager, Team Leader (food safety)
Tuesday, December 10, 2019	Beverage	**UNT Wholesale**	Mr. Quentin Peng khim / Van Sitheoun	Operation Managmer
Wednesday, December 11, 2019	Grocery importers / distributors	**LSH**	Mr. Ng Chor Yee	Owner
Wednesday, December 11, 2019	Logistics Agents / Shipping	**OOCL**	Chhay Sophatey	CEO
Wednesday, December 11, 2019	Cold Storage Provider	**Konoike Asia**	Mr. Heng	Sales manager Warehouse manager
Wednesday, December 11, 2019	Consumer goods	**P&G - Goodhill**	Oon Kiat Teoh /Frankie Yee S.K	Director / Country Manager

Wednesday, December 11, 2019	Barging services	**Global Logistics service (GLS)**	Phuoc Nguyen	General Manager
Wednesday, December 11, 2019	Others	**Infunde**	Peter Schultz	Sr. VP
Thursday, December 12, 2019	Hotels	**Rosewood**	Mr. Michael James Parker	Managing Director
Thursday, December 12, 2019	Others	**Royal Group**	Rami Sharaf & David Pearson	Sr.VP Executive Assistant to the Chairman & Special Projects Director
Email	Supermarket Grocery	**Super Duper**	Kirk McManus	Founder, CEO

Annex B: Facilities, Current and Planned

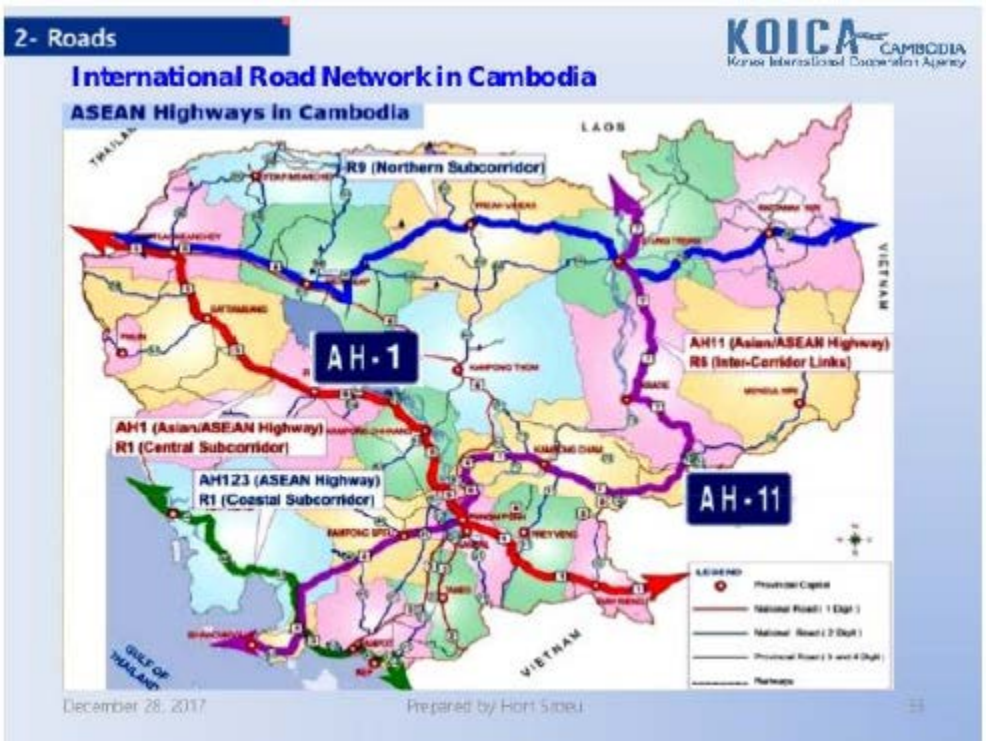
Facility	Location	Square Meters (M2)	Pallet Positions or Other Info
Airport	Phnom Penh	6000 square meters	2 000 pallet positions, 20% frozen/80% chilled
Hunty Co., Ltd.	Phnom Penh	7,200 m2 (2,400 m2 for chilled in 6 chambers on 2nd floor and 4,800 m2 for frozen in 4 chambers on 1st floor and 2 on the second floor	12,000 tons of product
UNT (Distributor)	Phnom Penh	600 m2 total. 5 Frozen rooms (100 sqm each); 1 Chilled room (100 sqm) which also serves as their ante room for picking and delivery preparation.	65,000 m2 plot with 2 warehouses. Phase 1 built in 2010 for dry cargo only with 8,250 m2 and Phase 2 for dry, chilled and frozen built in 2015 with 8,500 m2.
LSH (Private importer/wholesale distributor)	Phnom Penh	Frozen 1061 sqm (3 small chambers) and chilled 572 sqm (2 small chambers) totaling 1,600 m2 (35% chilled & 65% frozen).	All with racking system.
Konoike	Phnom Penh	Frozen and chilled 1500 sq meter. (660 is dry).	Total storage is about 2-3000 sq meters. They have a 4 pallet high racking system.
Yusen Logistics (not visited)	Phnom Penh	25 sqm chilled, 13 sqm frozen	Primarily pharma
Facility (Planned)	**Location**	**Square Meters (M2)**	**Pallet Positions or Other Info**
Planned at airport	Phnom Penh	6,000 square meters	New facility in special economic zone to replace airport facility, with 15% chilled
LSH	Phnom Penh		Planning for a 3rd location of warehouse as 3PL. This is for Chilled, Frozen & Dry storage.
Nippon Express Cambodia	Phnom Penh	Total facility size - 6,915 m2 ✓ Refrigerated Area - 4,711 m2 ✓ Fixed Temp – 2,011 m2 ✓ Offices – 588 m2	150 pallet positions
RGC	Phnom Penh		RGC has a SEZ (Special Ec. Zone) licensed plot of land 6 kms. east from S'ville next to a power plant and with feasibility studies done and water source. Parcel over 80,000 m2

Annex C: Maps of Cambodia

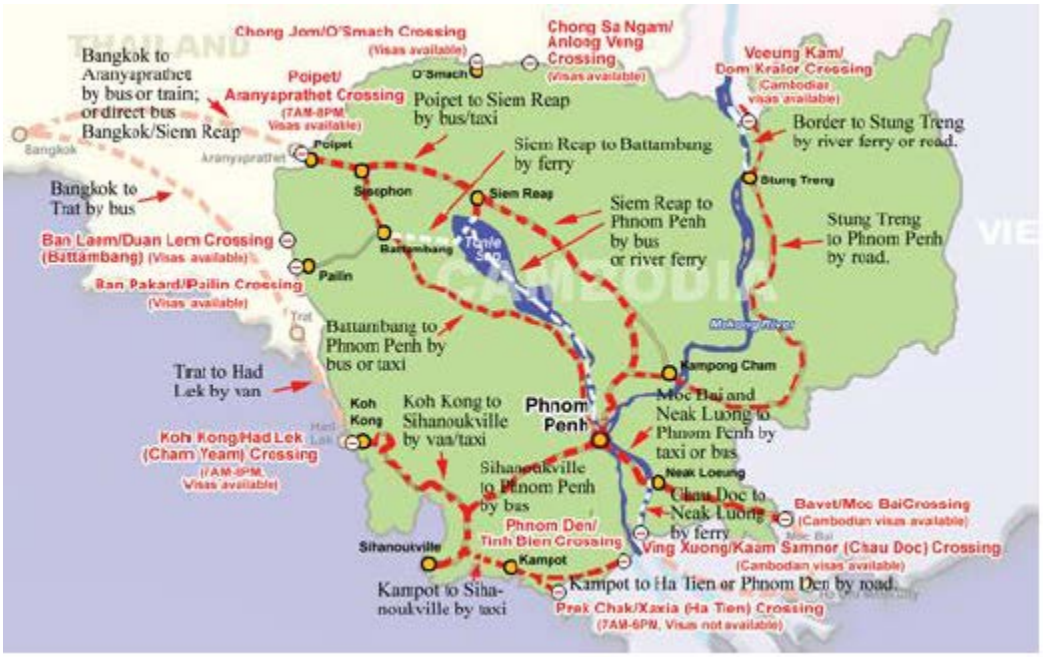
BORDER CROSSINGS, SEAPORTS AND AIRPORTS

MAJOR ROAD, WATER, AND RAILWAYS

INTERNATIONAL ROAD NETWORK



RAILWAY NETWORK



Annex D: US Ag Exports to Cambodia