EXCESS BAGGAGE

REDUCING PLASTIC BAG WASTE IN MAJOR CITIES OF CAMBODIA

DESIGN OF PRODUCT AND SERVICE ALTERNATIVES TO PLASTIC BAGS

CAMBODIA'S PLASTIC BAG ECOSYSTEM AND USAGE

SUMMARY OF RESEARCH REPORT

Fondazione ACRA, Italy

Phnom Penh Capital Department of Environment

Royal University of Phnom Penh

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switchasia PROGRAMME

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The project is implemented in Cambodia by Fondazione ACRA, the Phnom Penh Capital Department of Environment and the Royal University of Phnom Penh, in cooperation with the Ministry of Environment, the National Council for Sustainable Development, the National Commitee for Clean City Assessment and local authorities.

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QUICKSAND

Quicksand is a strategic innovation consultancy headquartered in India, and working in emerging markets. For more information on their work, please visit **www.quicksand.co.in**

For further information on the European Union, its activities in Cambodia and the SWITCH-Asia program, please visit
www.ec.europa.eu
www.eeas.europa.eu/delegations/cambodia
www.switch-asia.eu

For further information on the implementing partners, please visit :
www.acra.it
www.rupp.edu.kh
www.moe.gov.kh

For further information on the project and to have access to additional resources please visit **www.excessbaggage-cambodia.org**

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1. INTRODUCTION

CAMBODIA'S PLASTIC BAG PROBLEM

The use of plastic bags is deep rooted in the lives of Cambodians. Plastic bags offer a convenience that manifests itself in a number of unique ways - on the streets, at the markets and at homes. The bags no longer represent just a simple packaging film, but a sign of the kingdom's rapidly transitioning society – culturally and economically.

They also represent a growing problem. The non-biodegradability of plastic as a material and increasing evidence of other adverse impacts on the environment, have led to bans and taxes in countries across the globe in an effort to control it's use. Cambodia's affluent neighbors are amongst the worst offenders in terms of oceanic plastic pollution, and the nation seems to be on a similar trajectory. Plastic bags are an evident component of litter in Cambodia. Choked water and sewage systems, littered streets and fast filling landfills all point to the evolving problem at hand.

It is in this context that ACRA envisioned an overarching approach to reduce the negative impact of plastic bags in major cities of Cambodia. The project is funded by the EU (www.ec.europa.eu) within the framework of the Switch Asia Programme (www.switch-asia.eu) and is implemented by Fondazione ACRA, the Phnom Penh Capital Department of Environment (DoEPP) and the Royal University of Phnom Penh (RUPP).

REDUCING PLASTIC BAG WASTE IN MAJOR CITIES OF CAMBODIA

The project is structured with three major streams of focus.

1. BEHAVIOR CHANGE
Developing and implementing behavioral change interventions focused on plastic bag usage in Cambodia.
Cambodia based behavior change experts, 17 Triggers has been contracted as the lead agency for this line of intervention.

2. DESIGN OF ALTERNATIVES
Developing product-service alternatives to plastic bags in Cambodia.
Indian design firm, Quicksand is responsible for this effort. A Human Centered Design / Design Thinking methodology is at the heart of Quicksand's approach.

3. POLICY FORMULATION
Developing guidelines for future policy on plastic bag usage in Cambodia.
The Ministry of Environment, Cambodia (MoE), the Phnom Penh Capital Department of Environment (DoEPP), the Royal University of Phnom Penh, and ACRA are collaborating on this effort.

HUMAN-CENTERED DESIGN (HCD)

The experiences of countries tackling the plastic bag problem demonstrate that any solution identified to reduce the use of plastic bags must be designed with a profound understanding of local behaviors, attitudes, desires, needs and motivations.

HCD as a methodology helps bring sharp focus on the complexity of problems that go beyond the obvious. In the case of plastic bags in Cambodia, an HCD approach helps mine human interactions and experiences to arrive at insights that guide solution development.

Core to the HCD approach is the belief that people are at the heart of innovation and change - they are producers, sellers, consumers, users, managers, enforcers and other actors - all working together to make a system work. Any future state will depend on how these actors view and adopt change.

DESIGN OF ALTERNATIVES

The design of alternatives stream of the project aims to prioritize the most environmentally damaging and wasteful occasions of plastic bag use, and develop sustainable solutions.

Any product-service alternative would need to be viable, visible, accessible and affordable so that it can challenge the established conveniences of plastic bags.

It is hypothesized in the project approach that alternatives could be one or a combination of material, product, service or system based solutions.

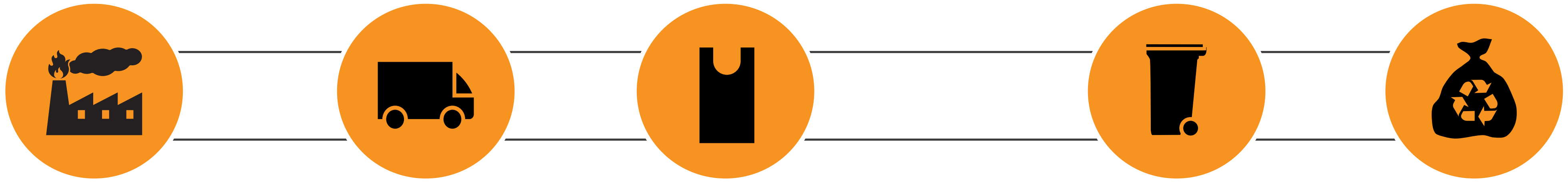
As we approach alternatives, it would be appropriate to consider the challenge at hand. Plastic carrier bags, since they were first introduced in the 1970s, have gone on to become an icon of modern consumption culture and one of the most successful industrial products of all time. It's success has much to do with it's simple and functional interface, and the scale of the Petroleum (which is the raw material for plastic) industry. Displacing plastic, simply put - has not been and will not be easy.

FOCUS OF THIS REPORT
- Codify the different uses of plastic bags in a way that can be framed as 'cases' for design of alternatives.
- Map systems, users and actors, user attitudes and behaviors relevant to plastic bag use.
- Map the different types of bags available locally and understand their usage and contribution to waste.
- Define impact from plastic bag usage and identify criteria that can help prioritize cases for design.
- Identify potential themes for interventions for the prioritized set of plastic bag uses.

The broader research report and media can be accessed on the project website - **www.excessbaggage-cambodia.org**

2. ENVIRONMENTAL IMPACT

THE PLASTIC BAG LIFECYCLE



PETROLEUM & PLASTIC BAG PRODUCTION

Plastic bags are derived from Petroleum products. It is estimated that plastic production accounts for the use of about 4% of the overall global Petroleum output.

Large and small scale manufacturers are part of a global industry that is linked by sophisticated supply chains.

The scale and scope of the plastic industry are substantial and plastic bags are only one of the many products manufactured.

PLASTIC BAG TRANSPORT & SUPPLY

Upon production, plastic bags are distributed to businesses through a well structured and mature supply chain.

All types and sizes of businesses use plastic bags and supply chains reach corners that very few products otherwise have been able to penetrate so successfully.

PLASTIC BAG USAGE

The primary buyers and users of plastic bags are businesses.

In either back-end or front-end processes, plastic bags find diverse use across a range of industries. While there are no definite numbers, it is estimated that anywhere between 500 Billion - 1 Trillion bags are used globally each year.

Individual consumers are typical end receivers of plastic bags from businesses and their eventual end users and disposers.

PLASTIC BAG DISPOSAL

Plastic bags are a part of household, commercial and municipal waste. It is estimated that globally, all types of plastics contribute 10-20% of municipal waste.

Plastic bags are however a substantial component of the visible waste problem. The tendency of bags to be discarded immediately after a single use is one of the most disturbing aspects of the problem at hand.

PLASTIC BAG RECYCLING

A small portion (usually less than 10% globally) of overall plastic waste is segregated and recycled.

This segregated waste is processed and used as raw material for further production of plastic bags and other materials.

The recycling industry has it's limitations and designing for recycling does not always mean that products end up being recycled.

THE LIFECYCLE & IMPACT

The impact of plastic bag use goes beyond just the consumption of resources. Considerations include:

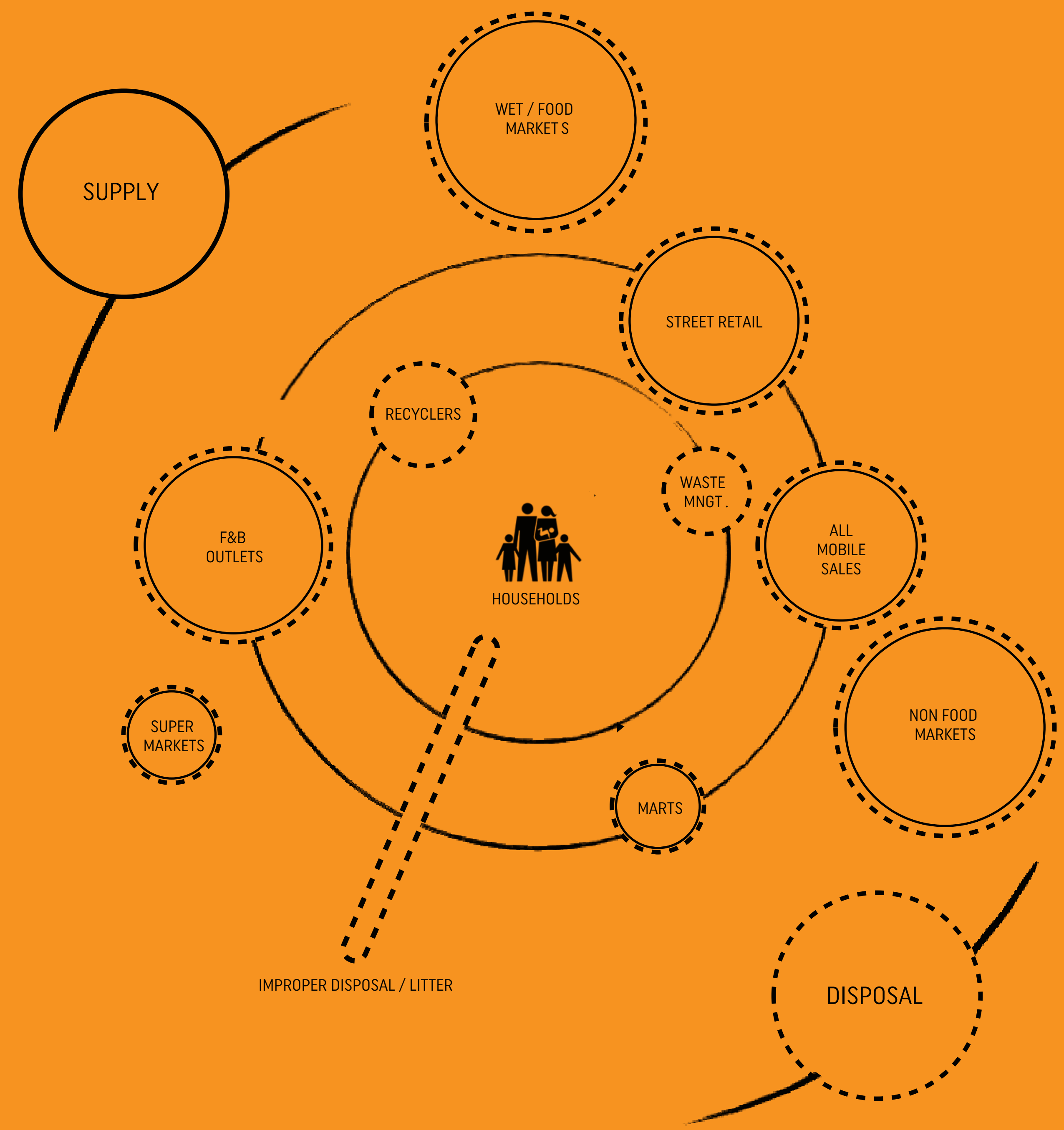
Emissions
The production of raw materials and finished plastic bags, transportation and in some instances, their disposal (burning) contributes to emissions of green house and other toxic gases.

Natural resource consumption
Plastic bags are made from Petroleum which is a non-renewable resource and it's consumption and the consumption of other resources like water, electricity and fuel at other points in the lifecycle can be considered as wasteful activities in the larger context.

Industrial discharges
The production and recycling of plastic bags involves industrial discharges with potentially damaging consequences for the environment and on human health.

Toxic leaching
Plastic bags in use or at disposal could be leaching toxic materials into natural ecosystems. These toxic materials may also have adverse human health impact.

Visible waste and litter
Plastic bags contribute to litter on the streets, in water bodies and oceans leading to consequences such as negative public perception, soil pollution, blockage of drains, flooding, degradation of marine ecosystems, and impact on animal and marine lifeforms etc.



CAMBODIA'S PLASTIC BAG ECOSYSTEM

3. THE PLASTIC BAG ECOSYSTEM

The lifecycle of plastic bags can be represented in the real world as an ecosystem of actors and interactions. The ecosystem approach attempts to map both systemic and behavioral factors to enable a better understanding of plastic use and waste. Following are factors to consider for the plastic bag ecosystem in Cambodia:

There is minimal production of plastic bags within Cambodia.
While measuring impact with a lifecycle approach requires end to end estimations, the absence of manufacturing (of plastic bags) in Cambodia limits the local impact that may be considered from production. Most plastic bags used in the country are imported from Thailand and Vietnam.

In addition, there is the added challenge with available data on trade and other commercial activity. There is an acknowledged part of the economy that is undocumented and thus far there have been limited studies focused on plastic bags in Cambodia.

Retail activity generates the maximum plastic bag use and waste.
Businesses, and particularly the retail sector use the largest amount of bags. The bags serve both their primary function of a carry bag and a range of value added functions. Retail activity could be both consumer and wholesale.

There are multiple retail formats and each one has a unique contribution towards plastic bag use and waste.
The different retail formats fit into the lives of Cambodian households in unique ways.

There are distinct purchase needs, attitudes and rituals associated with each retail format - both at the retailer and consumer end. The nature and scale of use of plastic bags have a strong correlation with the retail formats at which they are used.

Retail nodes function as use systems that have elements of both supply and disposal of plastic bags.
The supply of plastic bags is made possible through retail formats where these bags are also used and disposed. Retail formats represent micro-ecosystems for plastic bags. Their contribution to waste generation is considered under the purview of commercial solid waste. The component of commercial waste in the overall solid waste collected is much smaller in scale when compared to households.

Disposal systems have both a formal and informal component. Litter is a visible problem of the disposal end of things.
In the cities, waste collection is managed by professional private sector enterprises who offer services to households and businesses on a monthly fee basis. Working alongside is the informal sector which largely focuses on collection of recyclable waste. Plastic bags are collected through both these systems (though recycling is rare) and also are a major component of the litter or uncollected waste problem that in part inspired this project.

*** The size of the different nodes on the ecosystem map represent their relative scale to the overall retail space in Cambodia.**

4. RESEARCH TAKEAWAYS

RESEARCH APPROACH

The core focus of research within Quicksand's work stream has been to understand behaviors, attitudes, desires, needs and motivations as relevant to plastic bag use.

Research Target Groups
The research focused on four critical actors that are part of the plastic bag ecosystem in the three major target cities (Phnom Penh, Siem Reap, and Sihanoukville). These actors were:

- Retailers & Suppliers
- Consumers & End Users
- Suppliers & Producers
- Waste Managers & Recyclers

Additional Research
Additionally, research included discussions with experts and representatives from a diverse set of areas. Some of the themes explored included:

- Environmental impact from plastic
- Human health impact from plastic
- Plastics as a material and industry
- Alternate materials on the horizon
- The retail industry in general and in Cambodia
- Cambodia's economic indicators and activity
- Trends and cultures relevant to Cambodia
- Policy and governance structures in Cambodia
- Role of community in the country

Research Takeaways
The prominent findings from the user research immersions have been highlighted as takeaways in this report. These takeaways are to be leveraged to identify themes for ideation and as guidance for prototyping activities.

In addition to user research
One of the core goals of the research phase was to also identify the portfolio of bags currently available in the local economy and define how their use may be impacting the environment. The findings have been summarized in the section on bag typology later in this report.

Synthesizing findings, an evaluation framework has been proposed to prioritize those uses of plastic bags that create the highest negative impact. Also, outlined are some potential platforms and themes that could shape interventions.





IN-DEPTH INTERVIEWS, USER JOURNEYS, AND FIELD IMMERSIONS
The research approach adopted interviews and immersions as the two primary tools of learning.

4. RESEARCH TAKEAWAYS

4.1. RETAILERS & MARKET ACTORS

The retail landscape in Cambodia is dominated by micro-enterprises. Their presence is one of the reasons why Cambodia is credited with the lowest unemployment rate in the world (0.3% as per the CIA World Factbook 2015). The high density of economic activity, especially in the services sector (contributes 27% to the GDP, agriculture is at 55%), contributes to intense competition amongst businesses in the market place, including the retail sector. It is a factor that greatly strengthens customers' purchasing power.

As a critical half of the equation explaining the wide use of plastic bags in the country - the other half being consumers - an understanding of the diverse retail industry and it's largely unorganized nature is essential in order to design an intervention that is inclusive and sustainable.

RESEARCH TAKEAWAYS

Based on the research undertaken, some prominent takeaways for us to consider are:

The engine of the economy are it's micro-enterprises. Cambodia is self employed in a world leading manner.
Micro-enterprises (1-10 employees) make up for a bulk of businesses (close to 90% as per the Cambodian official statistics) in the country. Further, most of these micro-enterprises happen to be in the retail sector.

The unorganized and highly dispersed nature of the industry presents a huge challenge for interventions that aim to impact at scale. On the other hand, the ingrained entrepreneurial fiber in society is a valuable asset to build on.

Women are at the front and center of retail businesses.
Most small businesses are in the retail industry and are lead by women. It is a result of a unique mix of socio-culture norms (noted even by Chinese records of the Angkor Khmer empire in the 11th-12th century), and a legacy from the post conflict years where single women took to businesses in order to rebuild their lives. In the current economy, the high participation (upwards of 60% by some estimates) of women in retail presents an interesting platform for interventions to be based on.

A wide spectrum of retail formats and approaches cater to both traditional and evolving customer needs.
Cambodia's retail landscape has a rich diversity of types and formats. A number of businesses are run from home fronts. In addition, there are small and large format stores at the local markets, and also a number of different kinds of mobile business formats. Each of these cater to different customer needs - offering unique conveniences and choices that correspond to evolving lifestyles, different socio-economic backgrounds, changing demographics, and individual needs and preferences.

In a highly crowded and homogeneous marketplace, retailers hail the power of customer service and agility as differentiators.
The enormous scale of the small scale retail sector gives rise to a highly competitive marketplace. Retailers realize that their customers have choice and thus approach their businesses with an evolved sense of customer service. Loyal customers are quite often appreciated through gestures likes giveaways and trials at no extra cost. The generous use of plastic bags as packaging is also part of a larger customer orientation.

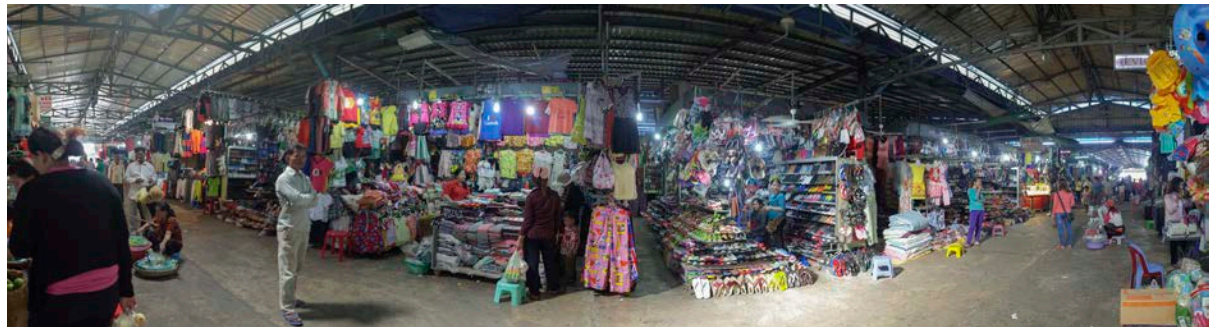
The packaging gap between branded/modern retail and unbranded/unorganized retail is continuously challenged.
One may expect a large gap in packaging experiences offered by modern retail and the unorganized sector, especially in emerging markets. In Cambodia however, small scale retailers offer a rich contrast to that view.

There is a deep rooted understanding of the need to package better in order to sell more. In food for example, small beverage sellers have overwhelmingly adopted plastic and paper glasses in recent years (a shift away from plastic bags as containers). The attempt is to offer a similar experience to the one offered by branded cafes. Food as a more personal and involved purchase category (also high influence of tourists) is especially absorbing of trends from the modern retail sector.

A retail (product) transaction without a plastic bag involved has probably never happened.
The use of plastic bags for retail transactions is visible across all formats and at all levels of scale. It is also interestingly visible regardless of the quantity or value of purchases made. An overwhelming majority of retailers do not debate a customer's requirement for plastic bags. Irrespective of the kind of purchase (bulk or individual), a transaction is incomplete if a new plastic bag has not been handed over to a customer at some point. It is a strong pointer to the ingrained place of plastic bags in Cambodian life and the level of expectations that customers have become accustomed to.

4. RESEARCH TAKEAWAYS

4.1. RETAILERS & MARKET ACTORS

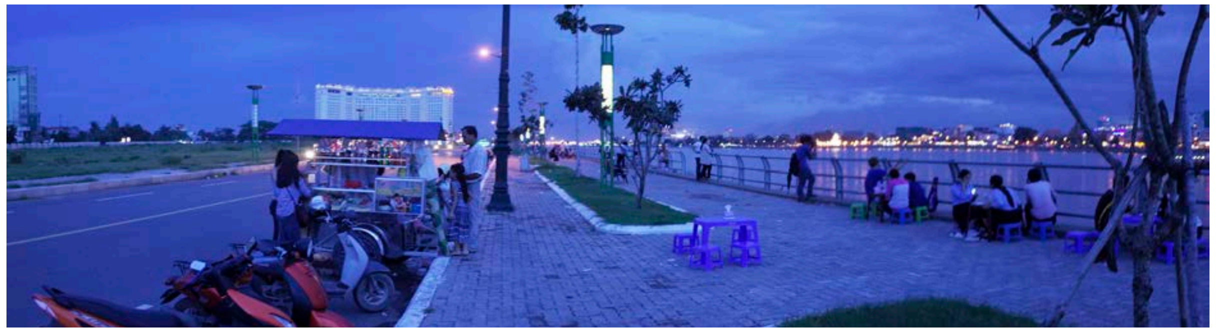


LOCAL MARKETS - WET (FOOD) & LIFESTYLE (NON FOOD)

The traditional local markets are the nerve centers of economic activity. Planned and professionally managed, these markets offer their services at multiple levels – neighborhoods, districts, towns and cities. The markets cater to both consumer and wholesale needs. Food and lifestyle items are part of a wide portfolio of products sold at these markets. Also, consumers belonging to all socio economic backgrounds shop at these markets.

STREET RETAIL - CHAB HOUYS (MOM & POP STORES)

Chab Houys (Mom & Pop Stores) are the most ubiquitous street retail format with many households operating stores from their home fronts. Street retail stores dealing with other products (beyond the profile of a general retail store like a Chab Houy) are also highly visible throughout the country.

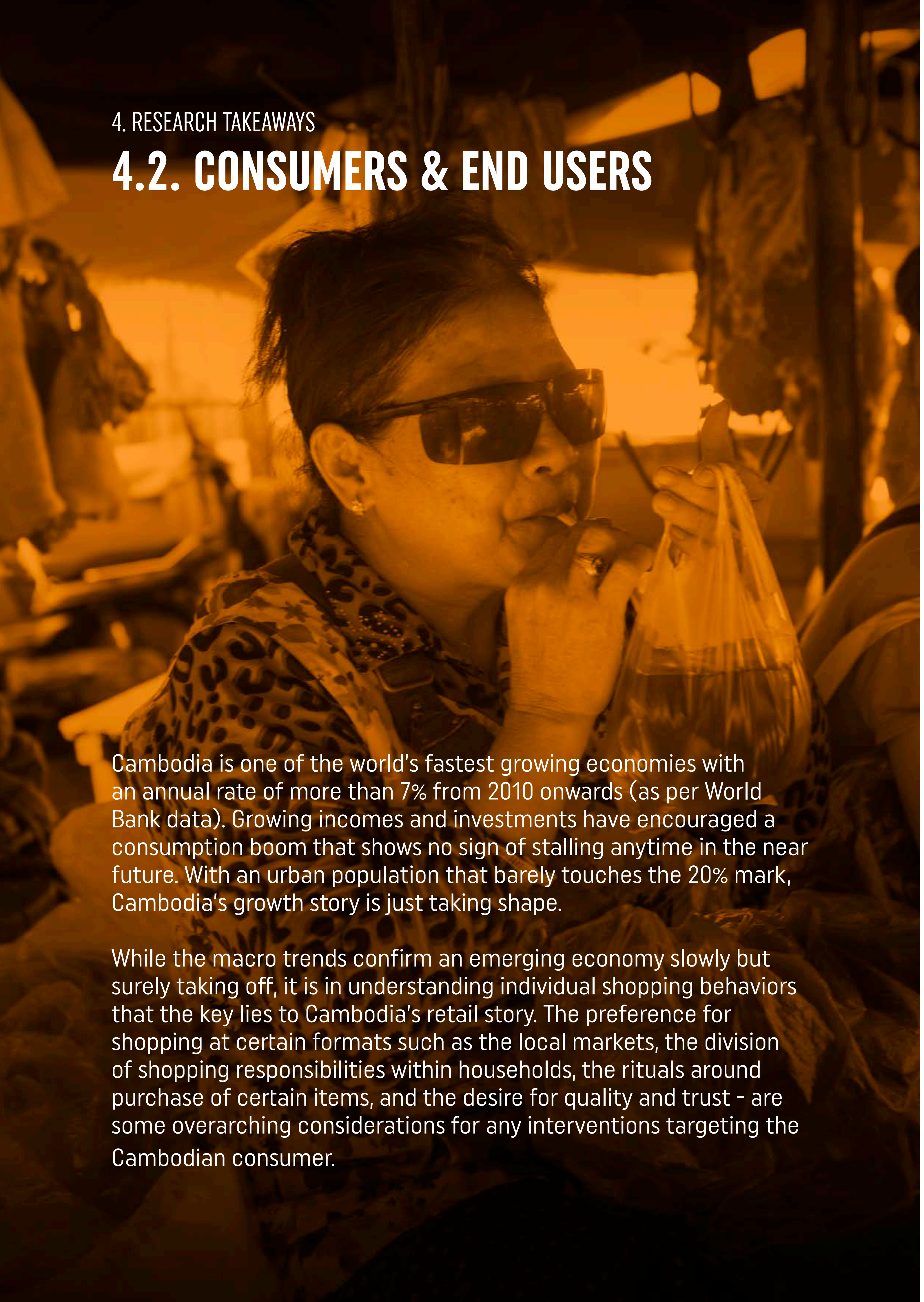


FOOD & BEVERAGE RETAIL

Food is a rich component of Cambodia's culture. Traditional restaurants, cafes and stalls are large in number and highly visible. Eating out of home on a frequent basis is common across socio economic backgrounds. Also, mobile retail carts are very popular in the country. Phnom Penh especially has one of the great street food cultures amongst Asian cities.

MODERN RETAIL

Modern retail stores are growing in number but still cater to only a small section of society, usually the affluent local population, international tourists and the resident expat workforce. International brands and chains are making their first forays into Cambodia.



4. RESEARCH TAKEAWAYS

4.2. CONSUMERS & END USERS

Cambodia is one of the world's fastest growing economies with an annual rate of more than 7% from 2010 onwards (as per World Bank data). Growing incomes and investments have encouraged a consumption boom that shows no sign of stalling anytime in the near future. With an urban population that barely touches the 20% mark, Cambodia's growth story is just taking shape.

While the macro trends confirm an emerging economy slowly but surely taking off, it is in understanding individual shopping behaviors that the key lies to Cambodia's retail story. The preference for shopping at certain formats such as the local markets, the division of shopping responsibilities within households, the rituals around purchase of certain items, and the desire for quality and trust - are some overarching considerations for any interventions targeting the Cambodian consumer.

RESEARCH TAKEAWAYS

Based on the research undertaken, some prominent takeaways for us to consider are:

Regardless of socio-economic backgrounds, consumers shop at local markets more often than any other format.
Local markets play a central role in the Cambodian economy. There are a number of these markets spread across the country, and the concentration of retailers provides consumers with great choice. The markets are also conveniently located within the cities and the different markets between them cater to all types of consumer profiles. Markets serve the needs of shopping across categories - perishables, food, lifestyle, durables etc.

Price sensitivity is high and value seeking behaviors are strongly entrenched.
Cambodia is a low income country and consumer prices (due to a limited manufacturing industry) are relatively high compared to the average income. The national savings rate is estimated to be only about 9% (CIA World Factbook 2015) which places Cambodia in the bottom half of the global economy.

Retail prices are rarely standardized and it is not uncommon for consumer goods (like a milk carton) to have significantly differing prices (could be as high as 10-30%) across marts in the same locality.

This is true at the local markets and at street level as well. Prices and quality differ from store to store. The ability to win bargains and perceive quality has evolved as a valuable consumer attribute in Cambodia.

Packaging is a crucial influencer. Appearances matter - product or people.
There is a strong aspirational quotient to today's Cambodia. Packaging is not just a value add but a core feature of a purchase. Retailers recognize that packaging helps them differentiate and engage their customers.

Consumers often express the desire to buy brands and be seen with these brands (and appreciated within their social groups). Brands are equated with individuals having taken the next step forward.

With regards to plastic bags, there are occasions when customers demand black bags for small purchases made at the end of the month. They do so because they wish not to be seen as being poor or struggling for cash by society.

Branding's potential to communicate, differentiate and build trust is at an early stage of realization.
Brands as a whole are equated with quality. The youth and upwardly mobile are today increasingly looking to engage more with brands at all levels.

Global brands in the electronics and automotive space inspire a great deal of aspiration. International brands also have a strong presence in the FMCG sector, and to some extent in the fast food space, but have not yet made a big impact in lifestyle retail.

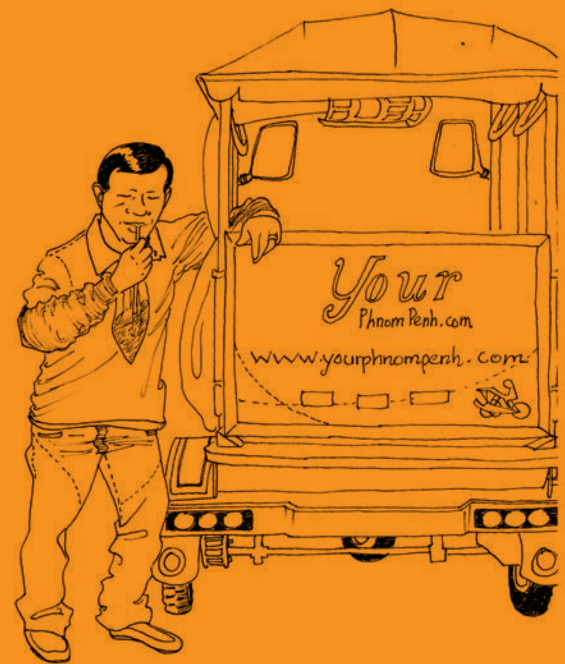
Local brands are currently limited in presence and mostly in the packaged food and beverage sector.

Consumers assume that the price of the plastic bag is already adjusted in the price of the purchase.
As of today, consumers do not hesitate from asking for extra plastic bags for their purchases from retailers. Retailers do not question that request either.

The per bag cost of plastic bags is so low that refusal is almost always taken as a serious lack of courtesy on part of the retailer. Consumers believe that the retailer is and should be including the bag's cost in the price for the product they are purchasing.

4.2. CONSUMERS & END USERS

Women - Home makers and business owners
Women are both home makers and business owners in Cambodia. An independent voice within households, women play an influential role in decision making. Women are widely respected for their understanding of both commercial and cultural practices.

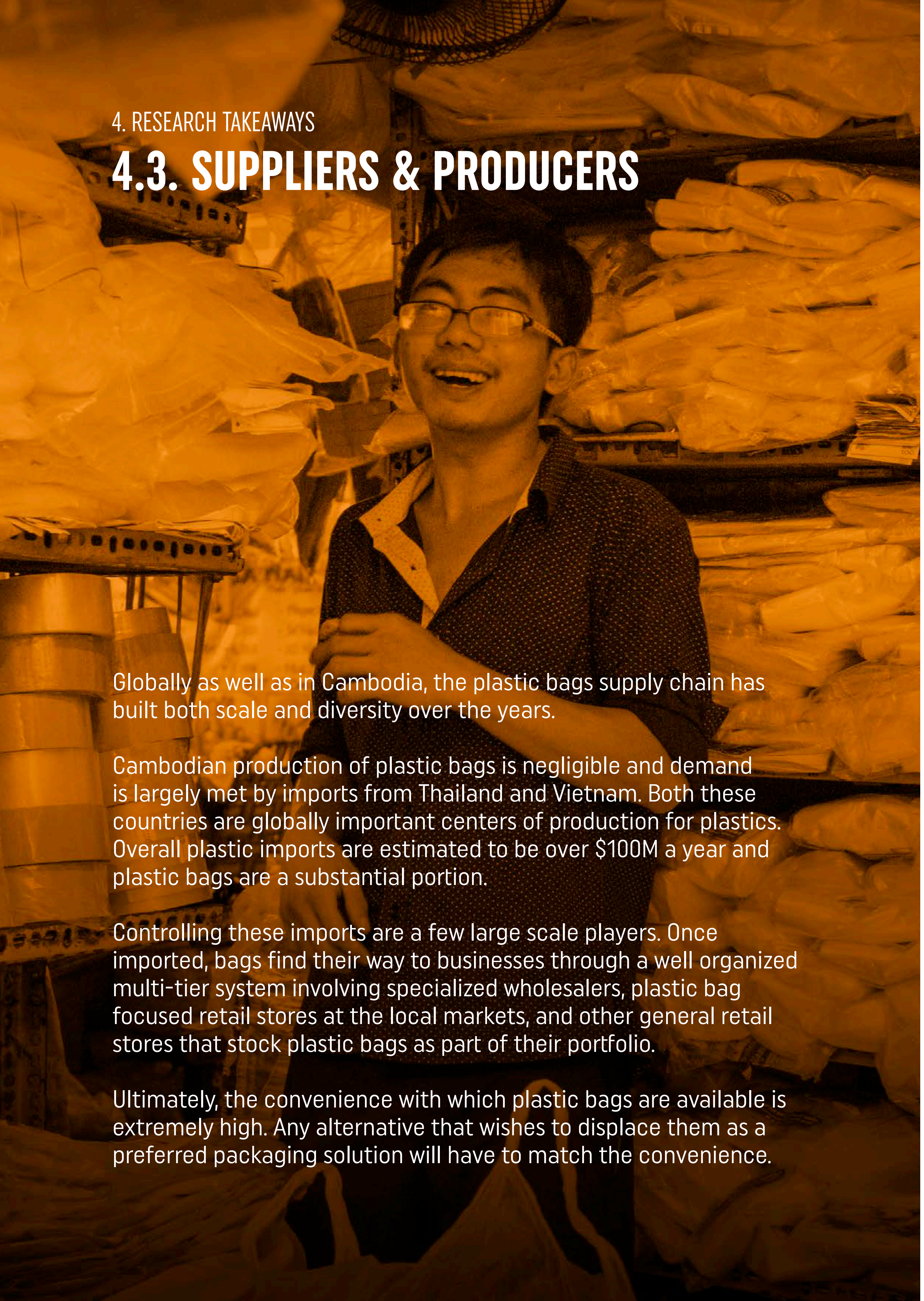


Children - The voice of the future
Parents are investing in education and exposure to international languages and media like never before. Schools have been a focus for the government and great hope is associated with children taking the country forward.

The Workforce - Mobile and value seeking
As an emerging market, Cambodia has a sizable low income population. People from the provinces often come to the big cities - looking to support families back home. They play an important role in making the economy tick.

The Youth - Aspiring and career oriented
Cambodia has a large youth population that is exposed to international media, the Internet, tourist and expat cultures, and modern retail brands. Aspirations are rapidly increasing. A growing number are also in professional jobs and English speaking unlike the previous generations.

Men - The reluctant shoppers
The men control politics and big businesses. They are also the lead voice at homes when it comes to big ticket investments. On the other hand, shopping is something that most men avoid. Modern retail has encouraged more men shoppers than was the case at traditional retail formats.



4. RESEARCH TAKEAWAYS

4.3. SUPPLIERS & PRODUCERS

Globally as well as in Cambodia, the plastic bags supply chain has built both scale and diversity over the years.

Cambodian production of plastic bags is negligible and demand is largely met by imports from Thailand and Vietnam. Both these countries are globally important centers of production for plastics. Overall plastic imports are estimated to be over $100M a year and plastic bags are a substantial portion.

Controlling these imports are a few large scale players. Once imported, bags find their way to businesses through a well organized multi-tier system involving specialized wholesalers, plastic bag focused retail stores at the local markets, and other general retail stores that stock plastic bags as part of their portfolio.

Ultimately, the convenience with which plastic bags are available is extremely high. Any alternative that wishes to displace them as a preferred packaging solution will have to match the convenience.

RESEARCH TAKEAWAYS

Based on the research undertaken, some prominent takeaways for us to consider are:

In the absence of industry standards, a vibrant local vocabulary with reference to plastic bags has emerged over time.
The consumer information and pricing standards in Cambodia are yet to mature. In the case of plastic bags, while there are branded options available, a significant number of unbranded bags are sold in the market.

The branded bags have limited product specifications (limited to size and country of manufacture) and the unbranded bags have no such specifications at all. In the absence of information (material, additives etc.), users have developed their own vocabulary to identify bags - for example glossy bags are known as No.1 and rough textured bags are known as No.2. The trend however is towards a preference for some form of branded packaging in the category.

The available plastic bag portfolio is highly expansive and caters to a number of diverse and specialized customer and business needs.
There are three broad categories of plastic bags available in Cambodia - transparent, translucent (colored) and opaque (colored). Within each of these three categories, there are a number of variations with regards to price, size, thickness, colors, textures, prints, and shapes available for sale. The portfolio is extremely wide and users have the choice to pick exactly the kind of bags that suit their packaging and cost requirements.

Trends from neighboring countries and from modern retail quickly find adoption on Cambodia's streets.
The proximity of Thailand and Vietnam strongly influences consumer culture in Cambodia. Imports are also easily accessible from these countries. In addition, a number of Chinese, Taiwanese and Japanese businesses operate in the market. The large number of expats and tourists also influence business attitudes, especially in the food & beverage sector.

These influences are reflected in even the most modest of businesses. The high intensity of competition, and a young and growing consumer base are some contributing factors that accelerate adoption of trends. Suppliers of plastic bags understand this pulse and are always on the look out for products they feel are 'trendy' enough to be introduced in the country.

The best, most expensive plastic bags are the only kind not easily available in Cambodia.
The most expensive bags ($4/Kg and above) are not available easily even at the largest, most prominent suppliers in Cambodia. Retailers who use these bags have to source them on their own from Thailand or China/Hong Kong and depend on family and friends based in these countries to source the products. Cambodian suppliers tend to focus on fast moving, mass oriented product types and do not cater to all the niches that might exist.

Plastic bags are traded by weight (kilograms) and not in numbers.
Plastic bags (even the branded and prepackaged varieties) are sold by weight rather by numbers. The numbers in a Kilogram (Kg) of plastic bags vary based on the size and thickness of the bags themselves. In the case of smaller bags, a single Kg could hold over 500 individual bags.

The perceived (and real) cost per bag is often so low that the attention paid by retailers to the count of bags used is minimal. The concept of potential overuse and the accrued cost as a result of the unconscious use of bags is an abstract concept that is often lost on businesses.

4. RESEARCH TAKEAWAYS

4.3. SUPPLIERS & PRODUCERS

LARGE SCALE WHOLESALERS & IMPORTERS RULE THE MARKETPLACE
Packaging and plastics are a big money spinner in Cambodia. Supplies are controlled by a few prominent and well established players who have been in the business for many years and understand the pulse of their customers.

4. RESEARCH TAKEAWAYS

4.4. WASTE MANAGERS & RECYCLERS

IMPACT FROM WASTE
Evidence of how plastic bags and waste are shaping public spaces in the absence of effective waste collection.

FORMAL & INFORMAL COLLECTION
The local waste collection systems are a combination of professional and informal players.

4.4. WASTE MANAGERS & RECYCLERS

Formal waste management in Cambodia is limited to its largest cities. The role played by these systems is currently geared towards collection and disposal of waste at designated landfills. Government policy has tended to favor private participation in the area.

Government officials, civil society and citizens have raised concerns over the arrangement not being able to consistently deliver expected level of services. There is an acute shortage of public trash bins - an aspect that amplifies the problem of litter. Also, infrequent or nonexistent collection is often reported by households in peri-urban and low income neighborhoods. Waste collection companies have in turn highlighted infrastructural bottlenecks (for example - traffic, no roads), low pricing power, and human resource challenges as some of the aspects that limit their effectiveness.

As of today, there is little focus on segregation and recycling in the current formal set up. That component of waste management is lead by local recycling agents known as ‘Etchays’. The Etchay network is spread across most urban centers. Segregated waste is however shipped to Vietnam and not recycled inside the country. Plastic bags are currently a negligible fraction of the recycled waste.

RESEARCH TAKEAWAYS

Based on the research undertaken, some prominent takeaways for us to consider are:

If there is a value attached to waste, people will find ways to segregate or re-use.
Households, especially those belonging to low and middle income levels often segregate recyclable waste such as Aluminum (beverage) cans, hard plastic items, metal etc. These are collected by recycling agents known as “Etchays”. The effort involved in segregating the waste is compensated by a fair price. For instance, while 40 cans fetch about half a dollar from recyclers, a Kg of plastic bags (which could be 100s of small bags) fetches only about 10-15 cents. The effort required to segregate and collect plastic bags is substantially higher while the incentive is much less appealing.

Plastic bags that are large in size and better in quality are often reused as trash bags or for storage. But since a majority of the bags used are small in size, soiled after use, and quite thin, they are discarded without much thought.

The local recycling system (Etchays) is more accessible to most people than any waste management system.
The Etchays or recycling agents are visible on the streets across the three cities. In the capital, there are a large number of such agents and they are seen doing their rounds through the day (and night). They are regulars in certain areas and are familiar with households and commercial enterprises in those locations.

On the other side, formal waste collectors operate late nights and there is little interaction with households or even commercial enterprises. In low and middle income colonies, it is the Etchays who typically access streets that formal waste collectors avoid because of their current dependence on large trucks.

Low income and peri-urban households have lesser likelihood of systems reaching them, and have to be self reliant in terms of managing their waste.
Low income and peri-urban households in cities like Phnom Penh are located either on the outskirts that are not regularly serviced by waste collectors or organized in a manner making it difficult for waste trucks to make their way inside these localities.

In Siem Reap and Sihanoukville also the focus of collection is often limited to main streets with high densities and tourist visibility. As a result of infrequent collection, these households prefer to burn, bury or throw away trash in open spaces. The lack of access to a functioning system forces these households to be self reliant.

Awareness of a problem does not necessarily translate to desired action.
There is rising awareness on all fronts of the negative impact of plastic bags on the environment. This may be because of the public messaging that the Ministry of Environment (MoE) has been supporting in this regard.

However, while awareness is high, there is little to suggest that it is supported by understanding and action on part of citizens - consumers or retailers. Continued over use of bags, burning trash, littering etc. - in these situations, awareness of potential environmental damage has not lead to visible change in behaviors.

The overarching nature of messaging and the lack of systems that can support positive actions may be contributing to this gap.

5. THE USE OF PLASTIC BAGS

PRIORITIZATION OF USES FOR THE DESIGN OF ALTERNATIVES

As highlighted in the introduction, uses of plastic bags need to be prioritized for targeting by alternatives. The first level of our prioritization of uses considers the following criteria:

Significant volume of use
Uses that generate a significant number of new plastic bags on a regular basis need to be prioritized for intervention.

Contribution to waste generation
The plastic bags from a use should be frequently disposed by users and thus be a regular source of waste generated.

Need based uses Vs. Value added uses
The uses that are critical to businesses or have a core need are to be prioritized over others where users have found individual expression (like hanging bags for storage).

Users are as well defined as the use
Uses in which the users can be consistently identified (type of retailer or profile of a customer) are to prioritized over those uses in which a definite user is difficult to predict (like using plastic bags as gloves).

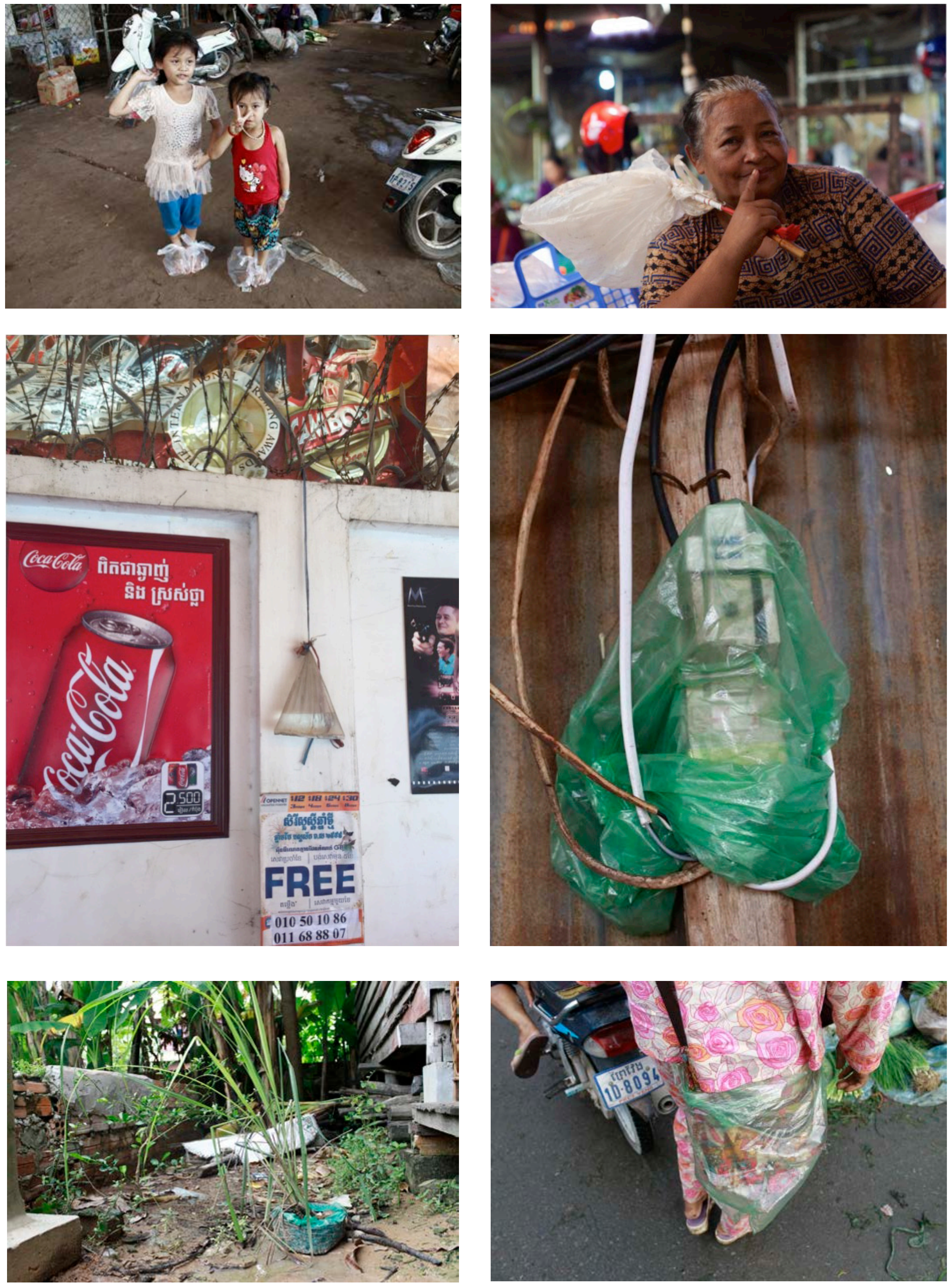
RETAIL TRANSACTIONS ARE THE BIGGEST CONTRIBUTORS TO WASTE

Transactions are the fulcrum of any economy and our findings suggest that retail transactions in Cambodia do not usually take place without plastic bags being involved.

The use of plastic bags in transactions has the following characteristics:

- A certain kind of product being purchased/ transacted.
- A retail format where the purchase takes place.
- A set of identifiable behaviors and rituals (use and waste) displayed by actors during the course of the transaction.
- The use of a certain type of plastic bag in the transaction.

Beyond transactions
Plastic bags find a multitude of uses beyond transactions. They may include uses such as:
- Plastic bags as cooking tools, personal protection (as gloves, head gear, rain cover, shoes etc.), general protection (fly swatter, insect repellent etc.), storage (shelves, containers, pots etc.) etc.



THE SEEMINGLY ENDLESS USES
Plastic bags are not just a packaging medium but a way of life here in Cambodia.

6. BAGS IN TRANSACTIONS

While it is recognized that transactions use the most plastic, it is important for design to understand the characteristics of these transactions and the use of plastic bags in them in a deeper manner.

The use of a certain type of plastic bag is dependent on the kind of product being transacted.
To understand how plastic bags are used in the context of businesses, it is important to consider the different types of retail purchases. Each type of purchase has a unique need for packaging and a typical type of business operation associated with it. Each type of purchase also has certain shopping behaviors, attitudes and rituals linked to it. The broad types of purchases that may be considered are:

- **Consumer purchases** - Fresh food, groceries, consumables, and durables
- **Food & beverages**
- **Wholesale** - Wet & dry items

The location of a transaction helps identify users and the journey of use.
The locations and retail formats at which transactions take place are relevant to identify and understand associated users, rituals, and systems. The formats that may be considered in Cambodia's context include:

- **Local Markets** - Food & non food
- **Street Retail** - Mom & Pop stores (Chab Houys), consumables, durables, and food & beverage
- **Mobile Retail** - Food & non food carts
- **Modern Retail** - Malls, supermarkets and marts

In the context of pre, point of and post transaction, plastic bags offer a number of important functional and experiential benefits.
The plastic bag is a versatile media. It is used in an incredibly diverse number of ways. Designing for a set of it's functions creates the risk of being either too broad or too concentrated in focus. However, mapping functions and associated behaviors, in the context of the transaction journey is fundamental to approaching any alternative solution.

The three basic stages of a transaction where plastic bags play an important role are:

- **Pre Transaction**
- **Point of Transaction**
- **Post Transaction**

Some illustrative usage behaviors associated with these three stages have been highlighted in the following pages. For different types of transactions, behaviors can and do differ.

6.1. PRE TRANSACTION USAGE BEHAVIORS

Preparation for sale
Retailers often prepare for sales by pre packaging their wares in plastic bags.

Storage and space creation
For smaller stores, plastic bags are an invaluable tool to store and arrange goods before the sale.

Units for sale
In wholesale trade especially, plastic bags are used as volumetric and weight units.

Sorting and selection
Consumers often use plastic bags as a tool to sort and select goods that they'd like to purchase.

A portfolio of choices
Retailers use a portfolio of different sized bags based on how consumers tend to purchase.

Professional packaging
Plastic bag or film packaging allows retailers to project a more professional outlook to business.

Merchandising and display
Retailers use plastic bags and pouches to display their goods in an aesthetic manner.

Protection and organization
Retailers use plastic bags to package goods that could be damaged by the elements.

Mixing and processing
Retailers use plastic as part of their preparation process, especially with food items.

6.2. POINT OF TRANSACTION USAGE BEHAVIORS

Agility of operations
Plastic bags serve to enhance agility which is a valued asset for retail businesses.

Cost optimization for retailers
Retailers often maintain a portfolio of bags which are an efficient spread of their resources.

Muscle memory for users
Using plastic bags has become second nature to retailers and it's very much a part of their trade.

Packaging for wet materials
Plastic bags are amongst the most convenient options available for wet materials.

Packaging for everything
Plastic bags are used to pack all purchases irrespective of how small they might be.

Packaging as units
Plastic bags are used to pack purchases as individual units for the convenience of consumers.

Privacy of purchases
For certain purchases, consumers appreciate the privacy offered by colored plastic bags.

Health and organization
Plastic bags offer a hygienic and well organized option to interact with their purchases.

Knotting and sealing of bags
Retailers often knot bags to seal or strengthen them for the convenience of the consumer.

6.3. POST TRANSACTION USAGE BEHAVIORS

An aid to mobility
Plastic bags are a boon for consumers on the move and in the context of impulse purchases.

Ergonomics of carrying
The handles on the plastic bags are a feature that substantially increase the ease of carrying.

Part of experiences
Plastic bags are part of consumption experiences that go beyond it's functional benefits.

Tendency to litter
Bags tend to be thrown away immediately after use as there is very little value attached to them.

Protection from the elements
Plastic bags allow purchases to be protected from the elements - insects and weather included.

A communication channel
The bags are often printed to serve as a communication channel for brands when in use.

Presence of alternatives
There are alternatives such as baskets that are often used to consolidate different purchases.

Need for strength
Plastic bags often need to carry substantial weight over distances and therefore need to be strong.

New purchase experience
The plastic bags are part of the satisfaction that consumers derive from their purchases.

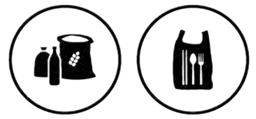
7.1. TRANSPARENT BAGS

HIGH TRANSPARENCY | With and wthout handles. These are glossy and smooth - the clearest of the colorless bags.
These bags are used for both dry and wet food items. With handles, these bags are often used for beverages. In non food retail especially these pouches help contain and display the items before sale.

MEDIUM TRANSPARENCY | Smooth and glossy finish plastic bags.
These bags are the default bags for most types of food and beverage packaging. Also, they are used by a number of vendors (who choose not to use the colored translucent bags) in the food and non-food markets.

LOW TRANSPARENCY | Plain finish with cloudiness and typically found with roller marks.
Used primarily in the bigger sizes, these bags are important part of logistics and supply chain for both food and non food.

PRINTED AND TRANSPARENT | Transparent bags with prints - usually glossy.
These bags could be used as carriers for beverages, non food retail and some modern retail.

	HIGH TRANSPARENCY	MEDIUM TRANSPARENCY	LOW TRANSPARENCY	PRINTED AND TRANSPARENT
TYPICAL USES				
SCALE OF USE	**HIGH**	**VERY HIGH**	**MEDIUM**	**LOW**
COMPOSITION	Virgin LDPE, with coating	Virgin LDPE, with coating	Virgin LDPE, with coating	Virgin LDPE, with colorant and coating
KNOWN PRODUCTION	Thailand & Vietnam	Thailand & Vietnam	Thailand & Vietnam	Thailand & Vietnam
PERCEIVED QUALITY	HIGH	HIGH	HIGH	HIGH
COST / KG	USD 2 - 4	USD 2 - 3	USD 2 - 4	USD 2 - 5
MOST COMMON SIZE	 **0.5 - 3 KG**	 **0.5 - 3 KG**	 **3 KG & ABOVE**	 **0.5 - 3 KG**
CURRENT RECYCLING	Some recycling agents may pick transparent bags. Prefer dry, large and thick bags.			

7. BAG TYPOLOGY

7.2. COLORED & TRANSLUCENT BAGS

HIGH TRANSLUCENCY | Smooth and glossy finished plastic bags.
These bags are amongst the cheapest available, and find use in a wide number of transactions including shopping at the local markets for both food and non food items and purchases at street stores.

MEDIUM TRANSLUCENCY | Plain finish with fuller colors and typically found with roller marks.
Used primarily in the bigger sizes, these bags are an important part of logistics and supply chain for both food and non food items.

LOW TRANSLUCENCY | Rough texture with waxy feel and duller colors.
Common before, these bags are much less likely to be seen now. The perceived quality of these bags was poor and they are rapidly losing favor in the market

	HIGH TRANSLUCENCY	MEDIUM TRANSLUCENCY	LOW TRANSLUCENCY
TYPICAL USES			
SCALE OF USE	**VERY HIGH**	**MEDIUM**	**LOW**
COMPOSITION	VIRGIN LDPE, with colorants and coatings	VIRGIN LDPE, with colorants and coatings	RECYCLED LDPE, with colorants and coatings
KNOWN PRODUCTION	Thailand & Vietnam	Thailand & Vietnam	Thailand & Vietnam
PERCEIVED QUALITY	LOW TO MEDIUM	MEDIUM TO HIGH	LOW
COST / KG	USD 1.5 - 2.5	USD 2 - 2.5	USD 1.5 - 2
MOST COMMON SIZE	**0.5 - 3 KG**	**5 KG & ABOVE**	**5 KG & ABOVE**

CURRENT RECYCLING These bags are very poor in strength, and hence tatter easily. As they are difficlut to recover they are usually not picked by recycling agents.

7.3. COLORED & OPAQUE BAGS

WHITE BAGS | Comes in textures of smooth, glossy or rough.
The default bag for marts and super marts. White bags are also visible in non food retail in markets.

FULL COLORED BAGS | Comes in textures of smooth, glossy or rough.
These bags are used at non food retail stores for carrying clothes, jewellery, cosmetics etc.

PRINTED BAGS | Rough texture with waxy feel and duller colors.
These bags are used at non food retail stores for carrying clothes, jewellery, cosmetics etc.

BLACK BAGS | Comes in textures of smooth, glossy or rough.
These bags are most commonly used as garbage liners. However, they are also used to carry some types of sea food, and in some cases for groceries and non food retail. Black bags are also seen in the supply chain for non food items.

	WHITE BAGS	FULL COLORED BAGS	PRINTED BAGS	BLACK BAGS
TYPICAL USES				
SCALE OF USE	HIGH	MEDIUM	HIGH	MEDIUM
COMPOSITION	Virgin & Recycled LDPE & HDPE, with colorants and coatings	Virgin & Recycled LDPE & HDPE, with colorants and coatings	Virgin & Recycled LDPE & HDPE (much lesser) with colorants and coatings	Virgin & Recycled LDPE & HDPE, with colorants and coatings
KNOWN PRODUCTION	Thailand & Vietnam	Thailand & Vietnam	Thailand & Vietnam	Thailand, Cambodia & Vietnam
PERCEIVED QUALITY	MEDIUM TO HIGH	HIGH	HIGH	LOW TO MEDIUM
COST / KG	USD 2 - 3	USD 2 - 3	USD 2 - 5	USD 1 - 2.5
MOST COMMON SIZE	1 - 3 KG	0.5 - 3 KG; 3 KG & ABOVE	0.5 - 3 KG	3 KG & ABOVE
CURRENT RECYCLING	These bags are not picked by recycling agents.			

8. FOCUS AREAS OF BAG USE

Based on the research and preliminary prioritization of uses, six potential 'Focus Areas' have been identified for the design of alternatives. These areas represent certain types of purchases, particular locations for the purchases, a certain profile of users, associated rituals, and a certain typology of bags. Importantly, the focus areas represent substantial opportunities to tackle bags at scale.

1. BUYING PERISHABLES AT THE LOCAL WET MARKETS
Use of plastic bags by households for the purchase of fresh food ingredients like vegetables, meats, fruits, spices and other groceries (perishables) from local wet markets.

2. FOOD & BEVERAGE CONSUMPTION ON THE GO (TAKEAWAYS)
Use of plastic bags for purchase, transport and consumption of cooked or readily edible food items (like fruits) by mobile customers.

3. PURCHASES AT NEIGHBORHOOD CHAB HOUYS
Use of plastic bags by households for purchases from Chab Houys (Mom & Pop Stores) located at the street or neighborhood level.

4. LIFESTYLE PURCHASES AT LOCAL MARKETS
Use of plastic bags by individuals for purchase of non food items such as clothes, cosmetics, footwear etc. at local markets.

5. SHOPPING AT MODERN RETAIL FORMATS
Use of plastic bags by individuals and households for purchases at modern retail formats such as marts, supermarkets and malls.

6. SUPPLY CHAIN FOR FRESH FOOD MARKETS
Use of plastic bags to transport perishables from farm to local markets, and from local markets to retail businesses.

8. FOCUS AREAS OF BAG USE | FOCUS AREA ONE

BUYING PERISHABLES AT THE WET MARKETS

ABOUT | The use of plastic bags by households for the purchase of fresh food ingredients like vegetables, meats, fruits, spices and other groceries (perishables) from local wet markets.

This focus area is important to consider because it is relevant for a majority of Cambodian households and generates a significant amount of new plastic bag use on a frequent basis.

- Local markets are a preferred destination for perishables shopping. There are only a handful of vegetable/meat stores at street level.
- The need for fresh ingredients (vegetables/ meat etc) is widely expressed as being critical to Cambodian cuisine.
- Refrigeration is not very common as electricity rates remain high.
- Shopping takes place almost as a ritual and multiple times in a week and usually at a particular time of the day.
- A trip to the market brings in an average of 5-6 different small to medium sized plastic bags into the household most of which are usually immediately thrown away.

Range of Plastic Usage: 5 - 50 Kg/Store/Month

TYPOLOGY OF BAGS USED

ALL BAG CATEGORIES SMALL SIZES

The majority of Cambodian households buy perishables such as vegetables and meats on a daily basis. This means that the quantities they buy tend to be small and thus an overwhelming number of small bags are used. Groceries and dry foods are also by and large carried in these bags.

TRANSPARENT POUCHES SMALL SIZES

Cambodian cuisine is rich in sauces and spices. Pouches are the default choice for packaging these food items. Processed items like pickles, grated fresh spices, coconut milk etc. are also packaged in these bags.

ALL BAG CATEGORIES LARGE SIZES

Large bags may be used to consolidate smaller purchases into a single bag. However, by itself, buying large quantities at one go is not a commonly observed behavior at a household level (unless it is a large family).

PRIMARY CONSUMERS

The local markets are preferred destinations for older members in households. Women are considered as the go to folk when it comes to knowing and navigating the local markets.

The women or elders are the custodians of the kitchen. Organic food (specially meat) is a high priority and requires a detailed eye and understanding of quality and cost. Women and elders are the most informed about current rates and costs of different things.

Women start their days early by first going to the markets to shop for the kitchen and then proceeding to manage their own businesses (in a high number of cases). Dual working households are a key aspect of the Cambodian life.

Men are rarely seen shopping at the wet markets.

8. FOCUS AREAS OF BAG USE | FOCUS AREA TWO

FOOD & BEVERAGE CONSUMPTION ON THE GO

ABOUT | The use of plastic bags for purchase, transport and consumption of cooked or readily edible food items (fruits) by mobile customers.

This focus area is important to consider because there are a lot of food items that are served directly in plastic bags and also because eating out of home is common across households. Purchases here contribute to the overall litter problem.

Range of Plastic Usage: 5 - 50 Kg/Store/Month

- Double income households and working women mean that people are always on the move and days start early and end late. There is usually no time to cook more than a meal at home.
- Food and beverages continue to be served directly in plastic bags for consumption.
- School and college students also often eat one or two meals out of home in the current situation.
- Food occupies a central role in Khmer lives, and the influence of multiple cultures - local, south east Asian and western, has inspired a range of street food and restaurant formats.
- A significant portion of retailers are mobile and rely on plastic bags as a way to serve customers.
- Food businesses are attractive ventures for many first time entrepreneurs.

TYPOLOGY OF BAGS USED

TRANSPARENT BAGS SMALL SIZES

Small transparent bags are the most commonly used food packaging. Bags are often used as primary containers and wrappers for food items such as beverages, fruits, soups, sauces, sandwiches etc, and as carrier bags for beverages and food packaged in Styrofoam containers or in smaller bags.

TRANSPARENT POUCHES SMALL SIZES

Transparent pouches are used to pack wet food items such as sauces, curries and soups. These food items form a regular part of Cambodian diet. The transparent bags are generally considered safe enough to carry hot foods by retailers and consumers currently.

COLORED TRANSLUCENT BAGS ALL SIZES

Colored translucent bags are primarily used as carriers for food packaged in transparent bags or in other packaging solutions like Styrofoam containers. Beverage handles are also often made with this kind of plastic. It is rare to find food being served directly in these bags.

PRIMARY CONSUMERS

Food consumption out of home can be associated with a number of consumer archetypes that have their own unique rituals and expectations from these purchases.

A significant number of Cambodians have breakfast out of home. Households with working women are more likely to have take-away food, specially during breakfast time.

A majority of office goers, school and college students eat lunch at restaurants and food stalls close to their institutions.

There are many different types of snack and beverage vendors that serve the needs in between meals. Many are mobile.

Mobile consumers on two wheelers often buy and consume beverages on the move. The mobile workforce is also a significant consumer of food on the streets.

Leisure often revolves around food - evenings are vibrant and families often prepackage food for picnics and tourist visits.

8. FOCUS AREAS OF BAG USE | FOCUS AREA THREE

PURCHASES AT NEIGHBORHOOD CHAB HOUYS

ABOUT | The use of plastic bags by households for purchases from Chab Houys (Mom & Pop Stores) located at the street or neighborhood level.

This focus area is important to consider because the overall volume of retail activity at this format is high and a lot of plastic is used that may not be reused again. The impulse nature of purchases also means that many plastic bags from here land up as litter.

- Many house fronts have been converted to retail shops. Chab Houys are the most common street retail format in Cambodia and are easily accessible by those who may not be able to shop at the local markets.
- Even though the distances between the point of use and point of sale is usually low, there is a lot of plastic that is used for small sized purchases.
- Majority of the purchases at these stores is impulse in nature.
- Men and youngsters are highly likely to be purchasing at these stores.
- The stores have a wide portfolio of products that they sell and plastic bags are the norm.

Range of Plastic Usage: 5 - 50 Kg/Store/Month

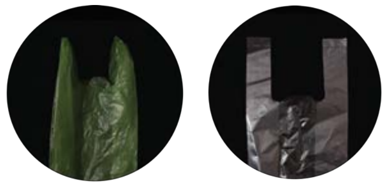
TYPOLOGY OF BAGS USED

ALL BAG CATEGORIES SMALL BAGS

Shopping on the streets and in neighborhoods is largely impulse based. People buy small quantities and thus sizes of bags used are small. In an attempt to optimize costs retailers use a mix of colored and transparent bags. Black bags are common too - used by those buying really small quantities (to avoid notice).

TRANSPARENT POUCHES ALL SIZES

Transparent pouches are used to prepackaged items like sugar and rice and also for display of items.



ALL BAG CATEGORIES LARGE BAGS

Large bags are not commonly used by street shoppers as quantities of purchase are small. These kind of bags could be used to carry beverages or ice, or to consolidate multiple purchases that would then require some sort of weight carrying from the bag.

PRIMARY CONSUMERS

The Chab Houys offer a convenience and ease of reach that is difficult to find a match for in the local retail space.

Lower income households, migrant workers (living on construction sites) and students are most likely to be shopping regularly at street side Chab Houys for home essentials, beverages and snacks.

Men, young adults and children - consumer profiles unlikely to visit the local markets regularly are frequent customers at Chab Houys, specially for small impulsive purchases.

Traveling consumer profiles like tuk tuk drivers are also likely to purchase more often from a Chab Houy although the purchases may be distributed.

8. FOCUS AREAS OF BAG USE | FOCUS AREA FOUR

LIFESTYLE PURCHASES AT LOCAL MARKETS

ABOUT | The use of plastic bags by individuals for purchase of non food items such as clothes, cosmetics, footwear etc. at local markets.

This focus area is important to consider because it is relevant for a lot of young Cambodians, uses some of the best quality bags in traditional retail formats, has wide scale because of the local markets, and generates a significant amount of plastic bag use as a whole.

Range of Plastic Usage: 2 - 10 Kg/Store/Month

- Outside of food and household purchases that are more functional and under the remit of the older generation, shopping for lifestyle goods specially clothing, accessories and footwear makes up for a major portion of a young individual's retail spending in Cambodia.
- The influences of international fashion and trends are highly visible in this context.
- All local markets have a lifestyle section and also there are dedicated markets.
- The best quality (and aesthetic) plastic bags are used in this area.
- This retail behavior is more aspirational, individualistic and packaging constraints are not that applicable here.

TYPOLOGY OF BAGS USED

PRINTED OPAQUE BAGS
ALL SIZES

Small and large printed bags are used by retailers to package their products in an effort to appeal to trendy and design conscious consumers. The margins in these products are also likely to be higher and thus more expensive bags can be bought by retailers.

TRANSPARENT POUCHES
ALL SIZES

Transparent pouches are a common packaging, display and storage option for items such as clothes, jewelery, shoes etc. Transparent bags are also used as carriers by many retailers.

ALL BAG CATEGORIES
LARGE BAGS

Retailers also use translucent or opaque bags quite commonly. These bags are cheaper than printed bags and might be used to package larger goods (backpacks, home furnishings or even clothes) by cost conscious businesses.

PRIMARY CONSUMERS

Lifestyle purchases are growing with rising incomes in an essentially young and aspirational country.

Women are more likely to shop frequently for clothes and accessories at local markets than men.

The fact that younger Cambodians are choosing careers over following the traditional business route means that they have to dress the part as well. Students and young professionals thus shop frequently at local markets, and are highly engaged with brand cultures and market rates.

Currently, an overwhelming majority of consumers continue to shop at local markets rather than the extremely nascent branded modern retail stores. Even the lowest income households, could end up shopping for some form of clothing (for themselves or kids) at least 2-3 times a month. The tendency is to buy cheap and buy often - follow fashion and trends as much as possible.

8. FOCUS AREAS OF BAG USE | FOCUS AREA FIVE

SHOPPING AT MODERN RETAIL FORMATS

ABOUT | The use of plastic bags by individuals and households for purchases at modern retail formats such as marts, supermarkets and malls.

This focus area is important to consider because it is relevant for the new age aspirational Cambodian household and signifies an important trend to map, even as the current scale of volume is relatively small.

Range of Plastic Usage: 15 - 300 Kg/Store/Month

- Busy working lifestyles and increasing purchasing power means that a new generation of Cambodians are beginning to seek and access modern retail experiences.
- Even though the overall consumption at this retail format is low, it is highly aspirational and is only bound to grow in the coming years.
- International brands and businesses are making their presence felt through modern retail. Fashion and trends are highly visible and set benchmarks in terms of desired experience.
- Interestingly, men are more likely to want to shop at modern retail stores and malls than they are to at shop at local traditional markets.

TYPOLOGY OF BAGS USED

WHITE BAGS
ALL SIZES

The white opaque bags are the default type used by modern retail stores like marts and supermarkets. The use of large bags is limited as most shopping at marts is at the neighborhood level and purchase sizes tend to be small. Supermarts use larger bags in much higher quantities.

TRANSPARENT POUCHES
ALL SIZES

Transparent bags and films are used in modern retail for display and pre-packaging of food items and other goods before sale. Also transparent bags (on rollers) are used to choose, sort, weigh and pack vegetables and meats in at these stores.

OPAQUE PRINTED BAGS
ALL SIZES

Printed bags are common for the higher end stores in malls. These bags are usually printed with brand logos and other marketing oriented messaging. The bags are also usually thick and of better quality than most bags available in the open market.

PRIMARY CONSUMERS

Modern retail stores set consumer expectations that then get translated in other traditional retail formats.

Affluent families are more likely have frequent interaction with modern retail than low income families. Amongst local consumers - younger people, especially working individuals are more likely to shop at modern retail stores.

Men from mid income households are more likely to shop at modern retail formats than at local markets.

Parents with young children prefer shopping for food and personal care supplies at modern retail stores.

In tourist centric places, specially in the towns of Siem Reap and Sihanoukville, or the backpacker districts of Phnom Penh, small marts and all night convenience stores are fairly common. Most purchases at these stores are consumables like beverages, snacks, toiletries, and other personal care items etc.

8. FOCUS AREAS OF BAG USE | FOCUS AREA SIX

SUPPLY CHAIN FOR FRESH FOOD MARKETS

ABOUT | Use of plastic bags to transport perishables from farm to local markets, and from local markets to retail businesses.

This focus area is important to consider because it is relevant for the whole Cambodian economy. It generates a significant amount of plastic bag use in a manner that is testament to the shortfall in infrastructure and systems.

Range of Plastic Usage: 50 - 150 Kg/Store/Month

- Close to 70% of the country's fresh food demand is imported from Vietnam on a daily basis and in plastic bags that are not reused.
- There is a gap in professional logistics systems and plastic bags fill that gap very well currently.
- The use is a sign of how endemic plastic bags really have become in the system.
- Phnom Penh is the epicenter of the produce trade from provinces and other countries. The supply to and from the city to other cities and provinces through out the country, runs into hundreds of tonnes on a daily basis.
- The wholesale trade is controlled by a few individuals and change could be advocated at a systems and infrastructure level.

TYPOLOGY OF BAGS USED

TRANSPARENT BAGS LARGE SIZES

5, 10 & 20 Kg bags are commonly used to transport fresh produce. These bags are perceived to have higher strength but are also more expensive than the other bags. These bags are usually preferred for high density and more expensive items.

TRANSLUCENT BAGS LARGE SIZES

Large colored translucent bags were the default carriers before the transparent bags became common. These bags are preferred for voluminous-low density and low margin items.

PRIMARY ACTORS

Plastic bags involved in a logistics function at scale, as they are in this case, are both surprising and a testament to frugal business attitudes.

A majority of producers, exporters/importers and traders of perishables are likely to use plastic bags for packaging.

Restaurant owners buy items for their kitchens at the wholesale markets. Smaller vendors and smaller neighborhood stores are also highly likely to shop at these markets.

Porters and transporters (like tuk tuk drivers) play an important role in making the supply lines work.

9. PRIORITIZATION OF FOCUS AREAS FOR INTERVENTION

9.1. CRITERIA ONE: ENVIRONMENTAL IMPACT

SCALE OF USE

The scale of use of plastic bags is a basic indicator of negative impact. The greater the volume (as well as higher the frequency) of bags consumed, the more we need to focus on a particular use.

Understanding the metric
The demand for plastic bags in Cambodia is steadily increasing as the economy moves forward. Waste management systems are to a large extent nascent and the growing volumes of waste are a cause of deep concern for the government and citizens.

First introduced in the 1970s, plastic bags (grocery sacks as they were known) are made from Polyethylene polymers that are derived from Petroleum. Life cycle analyses for plastic bags indicate that the use of natural resources (close to 4% of global Petroleum is diverted towards plastics) and the resultant emissions from production are considerable. Also, the impact of waste generated after use is a genuine area for concern. As volumes grow, the negative impacts of plastic bags grow exponentially – a lot of those being just understood in the broader debate on climate change.

In the Cambodian context, the local plastic manufacturing industry is minimal and the country depends primarily on imports from Thailand and Vietnam. The negative impacts from production are therefore limited in the current scenario.

Impact from disposal however is a local problem and the reduction of the volume of waste being generated is the prime consideration for the purpose of taking the project forward.

NATURE OF DISPOSAL

Improper disposal (littering, dumping into water bodies, burning) of plastic bags contributes to their negative environmental impact. Greater the tendency of bags of being improperly disposed, the more we need to focus on a particular use for intervention.

Understanding the metric
It has been proven through multiple research studies that most landfills (even in developed economies) are not designed to effectively degrade waste, and even the leakage of effluents into ground water is quite common at these sites.

Globally, it has been observed that in addition to waste deposited at landfills, a significant portion of waste remains uncollected by formal waste management systems. This waste ends up as litter on the ground, and in water bodies creating serious environmental and health impacts. Over 200 species of marine life have been found to have ingested plastics in some form. Global attention has also been drawn to the massive 'Garbage Patches' at sea. The burning of trash is a common practice in developing countries and results in emissions of green house gases as well as toxins (like Dioxins) into the air.

Cambodia has a large peri-urban and rural population without any access to formal waste management systems. Also current systems in its cities do not effectively cover all households. Basic infrastructure requirements like trash bins are absent from most streets and public spaces. This creates a situation where the containment of impact is at limited and evident with it's public presence.

RECYCLABILITY & REUSE

Recyclability & Reuse of plastic bags contribute to reducing the overall volume of new bags used.

Understanding the metric
Globally, less than 10% of plastic bags find their way into the recycling stream. Further, most recyclers are weary of recycling plastic bags because of the scale of effort involved in collection and relatively low pay offs. Plastic bags are difficult to manage at the centers (recyclers complain of the mess the bags create) and to clean for further processing. They often end up jamming machinery at recycling factories and cause far more damage than is acceptable for industry. Variations in additives and colors create further process complications. It is understood that dedicated bag recycling centers are the way forward even in developed countries.

Within Cambodia, the recycling agents are referred to as 'Etchays'. While there is a wide network of these agents and collection of a number of items (such as Aluminum cans and PET bottles) is made possible, it is rare for plastic bags to be collected. Bags do however get reclaimed at landfills, but even there, it is the largest and thickest bags that are preferred. The volume of this collection is minuscule compared to overall consumption. Vietnam (where a vibrant recycling industry thrives) is the biggest buyer of Cambodian waste.

The reuse and up-cycling of plastic bags remains limited at both a global and local level. Reuse is often only about bags being used as trash liners. The seemingly endless supply of bags discourages any compelling motive for extended reuse.

TOXICITY

Plastic bags are made from chemical compounds that are damaging to the environment. The likelihood of potentially harmful constituents being used should help us prioritize a particular use.

Understanding the metric
Polyethylene (PE) is the base polymer used in the manufacture of plastic bags in its two forms - High Density (HDPE) and Low Density (LDPE). While PE is considered inert, additives used to impart properties to plastic bags may be toxic in nature.

Common additives (multiple exist - no declarations as of today in Cambodia) used include Plasticizers for fluidity and strength, Colorants and Inks for color, Antioxidants and Stabilizers to protect against thermal decomposition during manufacture. Research highlights that commonly used plasticizers disrupt endocrine functionality in living organisms. Also, the use of heavy metals like Cadmium and Lead in colorants can be potentially carcinogenic. In recent years, studies have concluded that plastic debris in marine conditions not only adsorbs high concentrations of contaminants, but also find it's way into the food chain via ingestion by animals. Researchers are considering the case for plastics being considered a Persistent Organic Pollutant (POPs) like the well known DDT. Ironically, bags that have recycled material also tend to have higher concentrations of additives - required to maintain properties that make bags desirable in the first place.

In addition to the dangers posed by the choice of materials used, the burning of trash (and plastic bags) contributes significantly to overall concerns.

9.1. ENVIRONMENTAL IMPACT

EXTREMELY HIGH VOLUMES OF USE Considering the fact that all Cambodian households shop for fresh produce on a highly frequent basis (a minimum of 3-4 times a week) and every shopping trip involves 5-6 bags, the scale of use is extremely high in this case.	**DISPOSAL IS MOSTLY AT HOMES** Disposal of the bags is most likely to take place at home. Low income households are however major consumers and many do not have access to formal waste collection. Bags are thus quite likely to be burnt or end up as litter.	**SMALL, SOILED AND COLORED BAGS MAKE RECYCLING AND REUSE DIFFICULT** Bags used in this use category are likely to be small, colored, low strength, and soiled after first use. These factors contribute to a high percentage of immediate disposals after the first use of these bags.	**CHEAP COLORED BAGS ARE ALARMING** A significant number bags used are colored, cheap and untested in terms of quality. Many are of the unbranded type. These bags are likely to have additives and colorants that could leach at the time of use or after disposal.
EXTREMELY HIGH VOLUMES OF USE There is both rich diversity and large scale in food retail. These factors are indicators of a large scale of consumption and also plastic bags. Bags are used both as carrier bags and interestingly even as vessels/ immediate skins by many retailers.	**THE BIGGEST CONTRIBUTOR TO LITTER** The very nature of consumption on the move means that the likelihood of disposal on the streets is very high. It's not just the bags that are the problem, but other food packaging (like Styrofoam) as well. Styrofoam is growing menace.	**DIFFICULT TO RECLAIM SMALL AND SOILED BAGS FROM LITTER** Collection of bags from this area is complicated because they tend to be small and often soiled. They also tend to be disposed in public spaces from where their collection is highly effort intensive.	**LESSER CHEMICALS BUT OUT IN THE OPEN** The bags may not contribute to pollution in terms of toxic leaching by way of colorants. But since they are not safely disposed, the chances of it getting into water bodies, and being accidentally consumed by animals are quite high.
HIGH VOLUMES BUT DIFFICULT TO CODIFY The ubiquitous nature of the format, the various conveniences it provides, and the range of products sold lead to very high volumes of transactions (mostly small and impulse), that are difficult to codify.	**IMPROPER DISPOSAL IS QUITE PROBABLE** Disposal of bags from this area has high probability of being on the streets. This is because a significant number of customers may be on the move. Also, low income consumers may not always have access to formal waste collection.	**RECYCLING IS UNLIKELY AND REUSE OF BAGS IS LIMITED** Bags used are likely to be small, colored, and low strength. These factors limit the reuse of these bags and also lower the chances of them being collected for recycling in the current scenario.	**CHEAP COLORED BAGS THAT COULD BE IMPROPERLY DISPOSED** Colored bags have additives that could potentially leach and cause land, water and air pollution. Bags from the area also land up on the streets and in water bodies as a result of improper disposal.
LESS FREQUENT BUT LARGE AS A WHOLE While shopping for lifestyle at local markets is not as frequent an activity for individuals - as an aggregate the volume is substantial. Youthful population, a local garment industry, and accessible imports gives rise to a vibrant market place.	**LONG USE LIVES AND MOSTLY CONTROLLED DISPOSAL** The disposal of bags used in this category is most likely to happen at homes. Most of these bags are reused to some degree. The bags are amongst the best quality available and tend to have longer lives.	**BETTER QUALITY ENCOURAGES REUSE** Most of the bags used in this category are of a high quality and there is a certain aspirational association with them. The likelihood of re-use is quite high. Some of these bags might be made from partially recycled material.	**RECYCLED BAGS COULD BE A WORRY** Colorants and additives could potentially leach. Also, while the use of recycled bags is commendable, these bags could be potentially even more polluting because of additives used to strengthen the material in the recycling process.
LOW VOLUMES BUT GROWING RAPIDLY Although expanding, shopping at modern retail stores remains an activity favored by the more affluent end of households. It is also a more occasional activity and limited to a few types of products.	**DISPOSAL IS LARGELY UNDER CHECK** Disposal of most bags is likely to take place at home or at the retail location itself. Also, the stores and their customers are likely to have access to formal waste management services. Bags are of better quality and tend to be used longer as well.	**QUALITY BAGS TEND TO BE REUSED** Bags tend to be reused though for longer periods of time as there is an aspirational association and the quality of bags is usually good. Some bags tend to be made of recycled material and are less likely to be picked again for recycling.	**COLORANTS & RECYCLED BAGS COULD BE POTENTIALLY DAMAGING** The use of colorants and a number of bags having recycled plastic content (and thus added plasticizers) could be a potential cause of concern in terms of toxic discharges.
EXTREMELY HIGH VOLUMES OF USE A majority of the country's food supplies are transported in plastic bags everyday. The number of large bags involved means that in terms of weight, the plastic used in this area is substantial.	**SOME LITTER, BUT MOSTLY CONTROLLED** The disposal of these bags happens at markets and at business locations. The bags contribute to the litter associated with these locations. However, most of these locations do have access to formal waste management services.	**REUSE IS SURPRISINGLY LOW** Bags used are large in size and of higher quality, which should increase the likelihood of reuse. However, most of these bags are disposed off after first use. Some large bags do however get separated at landfills for recycling.	**EXTREMELY HIGH VOLUMES OF USE** A significant number bags used are colored. Also, mostly unbranded, these bags are likely to have additives and colorants that could leach at the time of use or after disposal.

9. PRIORITIZATION OF FOCUS AREAS FOR INTERVENTION

9.2. CRITERIA TWO: POTENTIAL LEVERS FOR CHANGE

INFLUENCE & CONTROL

Existing policies, networks, systems and business models could be leveraged as starting points for creating sustainable change. If a system exists that could potentially create or support change, we should consider it a positive aspect for the relevant area.

Understanding the metric
In recent years, environment has been the subject of much debate within Cambodia. Plastic bags are part of the concern and the government and other agencies have been focusing on how it's wide use is damaging the country. It is a platform to build on.

From a manufacturing control perspective, the limited domestic industry is a substantial challenge. However, import controls and incentives could be evaluated as potential instruments. Supply of bags is dominated by a few importers who may have substantial influence and may need to be brought on board to create any substantial change.

Enforcement at micro-enterprises has proven difficult. It is estimated that over 80% of all businesses are outside the tax network. The local markets however are organized and controlled with retailers bound by contract/fee arrangements (rent, security, and waste). Tourist attractions, public places and institutions like schools and universities could also be potentially identified as controlled ecosystems of use and mirror the markets.

Retailers may also have independent relationships with non government organizations, cooperatives, financial inclusion agencies etc. that could be explored as potential engagement channels.

COST FOR BUSINESSES

Lowering the cost of packaging or growing revenues in alternate ways for businesses could encourage change. If plastic bags are a sizable or crucial expense for retailers in a particular area, it is a potential opportunity for an alternative solution.

Understanding the metric
Business in Cambodia and especially the retail industry, is dominated by micro-enterprises. Most of these small businesses work on tight margins and often purchase goods on credit options extended by suppliers./wholesalers.

The costs to business, such as rent and electricity (about 20 cents a unit) are high relative to incomes. The availability and costs of committed human resources is a challenge for organizations. Since most Cambodians belong to low and middle income households, price sensitivity is expectedly high in the context of everyday transactions. Raising prices for retailers runs the real risk of loss of customers.

Plastic bags are a steady and now factored in cost for retail businesses and retailers ration and optimize use while trying to address customer expectations. The cost of plastic per transaction (assuming single use) remains unmatched by any material alternative currently available or on the horizon. However, cost in comparison to profits could be substantial for most small businesses (profits could be as low as $1 a day).

Initial estimates suggest that retailers in the fresh produce and food sectors spend anywhere from $5 to $100 (or more) a month on bags. The usage is difficult to predict as there are multiple dependencies - size of store, products sold, location, quality of bags etc.

HUMAN HEALTH IMPACT

Plastic bags include chemical compounds that have proven to be damaging to human health. If plastic bags used in a particular area have a potential impact on human health, the fact could be used to engage users in bringing about change.

Understanding the metric
Over the last two decades, the impact of plastics on health impact has been the subject of much interest.

Research into compounds that make up plastic bags has highlighted that additives such as Plasticizers (used to impart flexibility and strength to plastic bags) can potentially disrupt Endocrine functioning in humans (hormonal damage). Colorants used could include rare metal extracts (Cadmium, Lead etc.) and be potentially carcinogenic. These additives leach into food and fresh produce carried in plastic bags. Plastics are also known to enter the food chain through animals. As micro-plastics and as marine debris, plastics adsorb pollutants and function like Persistent Organic Pollutants (POPs) - substances like DDT. Burning plastics post-use contributes to emissions by way of dioxins which are also proven carcinogens.

Interestingly, Cambodians are extremely sensitive about the presence of chemicals in the fresh produce they purchase. However, at the same time, the use of chemicals as taste enhancers and preservatives is wide spread. The concern on one end and the apathy on the other, are factors that need to be better understood. The long term nature of health impact from plastic, and it's prolific use by modern retail compromises the effectiveness of a health focused messaging strategy used to drive change.

EXISTING ALTERNATIVES

The use of alternatives to plastic bags in a particular case could serve as inspiration for interventions that may be considered. Alternatives provide an opportunity to interpret both needs and behaviors. Existing alternatives in an area are a positive sign.

Understanding the metric
Plastics are one of those materials that have made modern life possible. They have addressed human consumption needs in unparalleled ways. The scale of the plastic industry has brought costs to a level that is difficult to beat. Further, in Cambodia's case, limited local manufacturing means that the available material library (and thus the ease of identifying an obvious alternative) is limited at best .

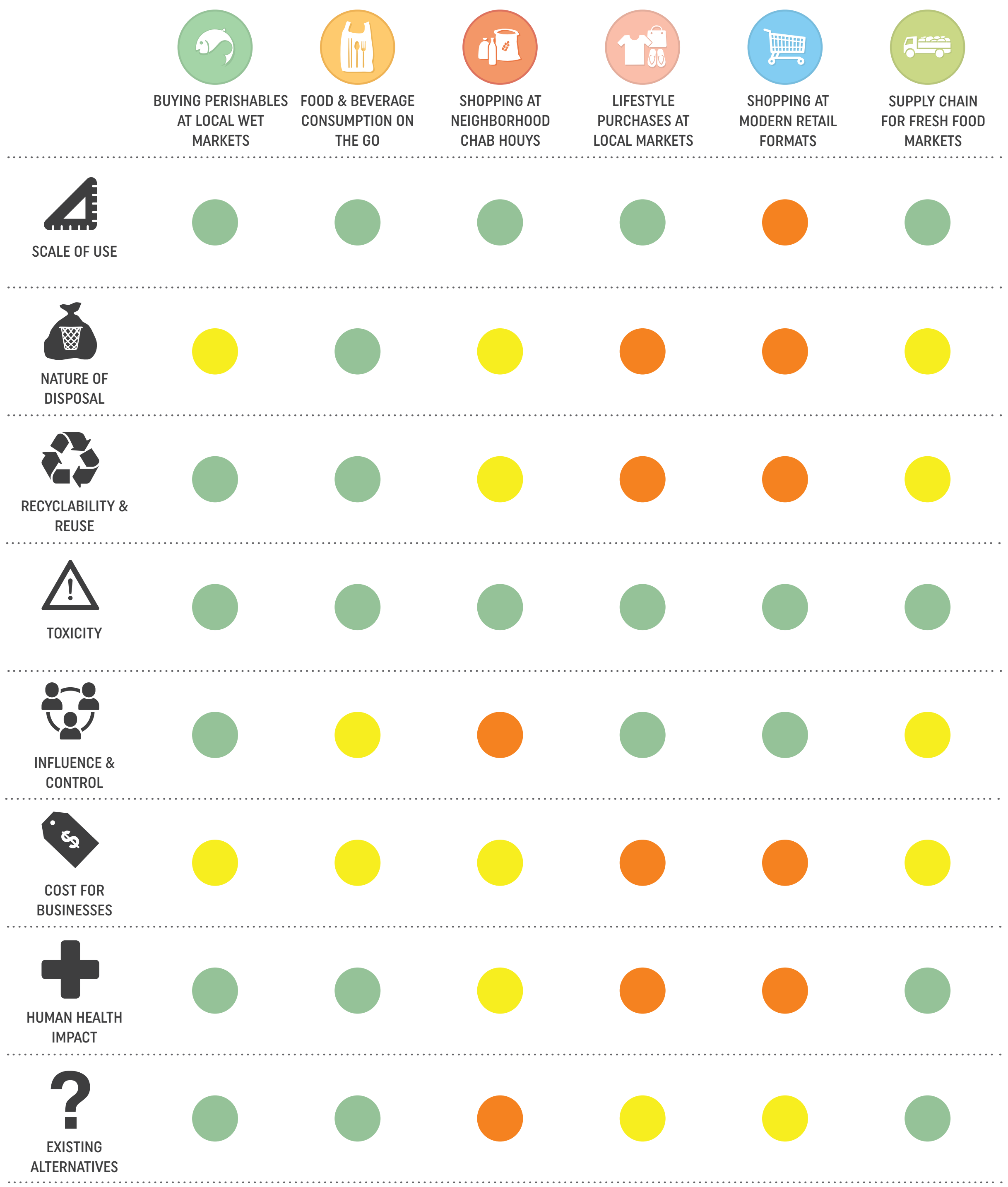
Understandably, interest is expressed in going back to the good old days. Traditional alternatives like leaves and cane are however rarely used in the modern economy. Prices of these alternatives have risen dramatically in the past few years and availability is a consistent challenge. The scale to which consumption has grown means that any effort to reintroduce traditional alternatives has a high probability of remaining relatively niche. There is a sense of nostalgia and a compelling environmental and health story associated with tradition, however, there is also wide agreement amongst retailers and consumers alike that there is no going back on the consumption and conveniences of today.

The use of alternatives like shopping baskets in the case of perishables shopping, or the shift towards better quality plastic packaging in food are aspects to study further. Widespread use of Styrofoam though is of deep concern because of it's non recyclability.

9.2. POTENTIAL LEVERS FOR CHANGE

LOCAL MARKETS - PROFESSIONAL BODIES Each city has a number of local markets. These markets are administered by managements - either public or private. Systems for fee collection and communication exist to reach out to retailers and consumers.	**BAGS ARE AN APPRECIABLE EXPENSE** Retailers in this category are amongst some of the highest users of plastic bags. Bags are likely to be a regular and appreciable business expense. The cost of plastic bags per transaction however remains extremely low.	**CONTACT WITH FOOD ITEMS IS A PROBLEM** This area involves the purchase of food items that have a direct impact on health. Leaching of additives could lead to Endocrine disruption. Colored bags could have Lead or Cadmium that pose serious health hazards for human beings.	**SOME SHOPPERS DO CARRY THEIR OWN BASKETS TODAY** Alternatives like plastic/cane baskets are used by some shoppers. Also, traditional alternatives like Lotus and Banana leaves are still visible. For storage and sorting, crates and baskets are used (inconsistent).
NEED TO MARK OUT AND CONTROL ZONES Food retailers are widely spread out and on the whole are difficult to target. In some locations such as markets, schools, public spaces and tourist areas, a certain degree of control could be potentially exercised.	**BAGS ARE THE CHEAPEST OPTION** Retailers could be using a large amount of plastic bags. Bags are likely to be a regular and appreciable business expenditure for retailers in this area. They are however the cheapest packaging option available and help customer service in a big way.	**ALARMING RISKS ON THE HEALTH FRONT** Food items packed directly in plastic bags are a cause of concern. Additionally, packing hot food in plastic bags is even more alarming as an accepted behavior. Additives and colorants could both have serious impacts in this case.	**SOME ALTERNATIVES MAY BE EVEN WORSE** Retailers use plastic boxes and glasses that may be considered as relatively better than bags as they may be reused or recycled. Styrofoam boxes are fairly common, but are also worse off as they neither recyclable nor biodegradable.
DISPERSED AND DIVERSE The Chab Houys are widely dispersed and independent businesses. A majority of them are operated from residential shop houses. The portfolios of these stores are also highly diverse and all these factors make control quite complicated.	**COST PER TRANSACTION IS VERY LOW** Larger Chab Houys may use a substantial amount of plastic bags. The cost of plastic as a cumulative expense could be significant for these businesses, even as the cost per transaction remains low. They tend to use a lot of cheap colored bags.	**LIMITED IMPACT ON HUMAN HEALTH** Transparent plastic pouches, used to pack dry food items are widely considered to be food grade. Most other items sold here are prepackaged consumer goods and the contact of food with plastic bags as such is minimal.	**NO REAL ALTERNATIVE IN USE TODAY** No real alternatives are used by consumers currently. Since purchases are usually small and impulse based, the probability of carrying an alternative is low. However, neighborhood shopping should place the onus on consumers.
MARKETS - MECHANISMS IN PLACE The factors that make the local markets attractive in this regard for the first focus area, are also relevant in this regard. Shopping however is not as regular and the diffusion of users has to be considered more deeply before investing in the area.	**CHOOSE THE MOST EXPENSIVE BAGS** Relative to the scale of business, the cost of plastic bags may not be a significant expense for retailers. Retailers actually buy some of the most expensive bags available. Aesthetics and customer service are extremely valuable to these retailers.	**NO IMMEDIATE IMPACT ON HEALTH** There is little impact on health that can be associated with the use of plastic bags used to pack clothes, shoes, electronics, personal care items etc.	**PAPER AND CLOTH ARE NOT VERY POPULAR** There are no real alternatives used consistently by either retailers or consumers as of today. Cloth and paper bags are in use to a limited degree. If anything, retailers tend to invest in more expensive and better quality plastic bags.
RETAIL CHAINS OFFER AN OPPORTUNITY Modern retail stores are often part of a chain. That means the level of control that could potentially be exercised is high. The government has previously targeted modern retail for it's programs, so there is a precedence for future engagements.	**BAGS ARE A MARKETING MEDIUM** Shopping at modern retail is largely aspirational. The quality of the bags and prints, are thus an important part of the packaging experience. In many ways, the bags serve as an inexpensive marketing medium for the retailers from this area.	**USE HERE SETS EXPECTATIONS FOR THE INFORMAL/UNORGANIZED SECTOR** Some food does come in direct contact with plastic (for example vegetables and meats). However, most products sold are prepackaged. The use of plastic packaging here sets the tone for everyone else.	**ECO BAGS HAVEN'T REALLY MADE A DENT** A small fraction of consumers (mostly expats) carry their own bags. The Eco Bags (an earlier government initiative) haven't made much impact. Paper and cloth bags are also rare and only used by boutiques and other high end retailers.
CONCENTRATED AND COMPLEX The supply chain trade is controlled by a handful of prominent businessmen and traders. This could either be considered an opportunity or a daunting challenge as moving the needle with powerful interests may have it's own complications.	**SHORT TERM OVER LONG TERM** The scale of use on an everyday basis means that the cost of plastic bags as an expenditure is substantial for businesses involved. However, these businesses seem to be resisting long term investments for short term expenditure.	**USE AT THE BACK END MAKES IT DIFFICULT TO COMMUNICATE IMPACT** The colored bags could be considered for intervention. Also, considering bags do come in contact with food items for long periods, the health impact from this use cannot be taken lightly.	**SURPRISING THAT PLASTIC BAGS ARE USED** Alternatives such as crates, sacks and cardboard boxes are in limited use. The produce coming from China arrives in Thermacol boxes. Packaging essentially depends on the established norm in the countries that export to Cambodia.

9.3. SUMMARY OF EVALUATION



- STRONG CASE FOR INTERVENTION
- POTENTIAL CASE FOR INTERVENTION
- WEAK CASE FOR INTERVENTION

10. FOCUS GOING FORWARD

SUMMARY

There are two top 'Focus Areas' of interest based on the evaluation criteria. These focus areas are explained further and next steps listed below:

BUYING PERISHABLES AT THE LOCAL WET MARKETS
Use of plastic bags by households for the purchase of fresh food ingredients like vegetables, meats, fruits, spices and other groceries (perishables) from local wet markets.

FOOD & BEVERAGE CONSUMPTION ON THE GO (TAKEAWAYS)
Use of plastic bags for purchase, transport and consumption of cooked or readily edible food items (like fruits) by mobile customers.

WAY FORWARD

BUYING PERISHABLES AT THE LOCAL WET MARKETS

Summary
The use of plastic bags at the scale at which they are used in this category is worrisome, and needs to be checked. Also, the bags used are in most cases small, colored and often soiled which in turn makes them unlikely to be either reused or recycled.

The markets provide a large captive audience to target and are therefore attractive in terms of the ability to drive change and awareness. This is however a largely unexplored territory since regulating small vendors has been assumed to be difficult.

The target for intervention would be mostly older women who are regular shoppers and business owners. The downside however is the exclusion of a younger population that does not necessarily identify with the markets. The rituals around shopping regularly are of particular interest. The case for reduction in use is strong as many bags are used primarily for segregation which may not be a critical aspect of shopping.

Themes for exploration

- Encourage retailers to start asking - "Do consumers really need the bags?"
- Colored bags are abundant at the wet markets and are the most questionable in terms of quality. Markets provide a single window to attempt banning the extensive use of colored bags.
- A market policy, backed by the market authorities, with simultaneous provision of alternatives such as bio-plastics could be considered. If markets source at scale, prices of such alternatives could be made more competitive.
- Participation of corporates and other sponsors could be a potential source of support and be mutually beneficial (advertising for corporates and subsidizing costs for businesses) in the case of markets.
- Bags picked up by consumers at markets, in particular the large sized bags, are often used as trash liners at home and hence there is an inherent behavior of reuse. Any attempt to replace plastic bags should take into account what is an otherwise favorable user behavior.
- European countries that have experimented with bio and compostable bags have experienced significant push back from both retailers and customers - lessons from these experiments should be kept in mind.
- A complex system that involves multiple actors and stakeholders would be tough to implement. One would have to account for the time that the government machinery would need to process, appreciate and support any attempt in this direction. Evangelizing the need to target this area, especially amongst policy makers, should be an integral part of the design strategy.

FOOD & BEVERAGE CONSUMPTION ON THE GO

Summary
The number of bags from this particular area landing up as litter is a serious aspect of concern. Specifically, it's impact on the perception of Cambodia as a tourist destination and as a rapidly modernizing economy in the Indo-China region.

Ancillary food packaging material such as Styrofoam boxes are equally of concern as they are mostly non biodegradable and also end up as litter. Minimization of litter from the streets is high on the government's priority list as recent ordinances and decrees in the area suggest.

The large number of food joints and the deep cultural significance of food in Cambodian society make this an extremely important case to consider. The number of bags being used and thus the scale of the problem is high and demands focus from policy makers.

Health is also a criteria that is particularly relevant for this case since ready to eat food is in direct contact with plastics and likely to pose more severe problems than other areas of bag use.

Themes for exploration

- To start with, one could target simpler food packaging solutions for those vendors that do not need to use plastic bags as serving vessels.
- Part of the solution would have to focus on the aspect of trash collection and disposal.
- Branding and advertising could be leveraged to engage the youth around this idea since they are one of the most important target groups.
- It will be important to identify 'Early Adopters' who could champion initial ideas.
- There is a need to create platforms and networks to be able to reach out to different vendors together so that interventions can be executed at scale.
- Food safe packaging is a challenge for design and the choice of alternatives cannot be compromised in that aspect.

10.1. OTHER FOCUS AREAS

POTENTIAL INTERVENTIONS

In addition to the two areas being taken forward, interventions could be explored for the other four focus areas that were discussed in this report.

PURCHASES AT NEIGHBORHOOD CHAB HOUYS

Themes for intervention

- Campaigning at the street retail level with relevant messaging for consumers to start evaluating the need for plastic bags.
- Identifying colored bags as a cause for concern and possible future ban at Chab Houys.
- Partnering Sangkats (district governments) and municipal authorities to enforce the littering decree and other relevant laws.
- Potentially expanding a reuse bag system (if practical) from the markets to Chab Houys.
- If bio-alternatives are explored, there should be support systems to ensure they get to Chab Houys.
- Empowering retailers to start asking the question of their customers - "Do you need a plastic bag?"

LIFESTYLE PURCHASES AT LOCAL MARKETS

Themes for intervention

- Extending systems and solutions identified for the wet markets to the non food side of retail.
- Subsidizing available alternatives such as paper or available varieties of cloth bags could be a way forward. This could be done in addition to possibly banning plastic bags as carriers in life style retail - prominent tourist attractions like Central Market & Russian Market could be a starting point.
- If bio-alternatives are explored, there should be support systems to ensure they get to these markets at the scale at which they can be viable.

SHOPPING AT MODERN RETAIL FORMATS

Themes for intervention

- Enforcing a "No Free Bag" policy at these stores.
- Ensuring the availability of eco bags that are cheap and attractive to consumers.
- Engaging modern retail brands and malls to minimize the number of bags being used at these locations for single use only.
- Campaigning at these stores with relevant messaging for consumers to start evaluating the need for plastic bags.
- Engaging students and the youth to start saying no to plastic bags as the right thing to do.
- Enforcing a ban on plastic bags at international / branded fast food and lifestyle stores.

SUPPLY CHAIN FOR FRESH FOOD MARKETS

Themes for intervention

- Engaging prominent wholesalers and agents to identify alternate systems.
- Investing in logistics and cold storage facilities that may reduce the overall plastic footprint of the supply chain.
- Establishing collection mechanisms for plastic bags used across markets.
- Subsidizing and financing investments in alternate logistics solutions.

APPENDIX

REFERENCES & READINGS

LIFECYCLE OF PLASTIC BAGS

- American Chemistry Council - Lifecycle of a Plastic Product – www.plastics.amercianchemistry.com
- Reason Foundation – How Green Is that Grocery Bag Ban? - Lifecycle Assessment Comparisons for Plastic Bags

ENVIRONMENTAL IMPACT OF PLASTIC

- Jenna R. Jambeck – Plastic waste inputs from land into the ocean (2015)
- Marchus Eriksen – Plastic Pollution In The World's Oceans (2014)
- Chelsea M. Rochman – Long-Term Field Measurement of Sorption of Organic Contaminants to Five Types of Plastic Pellets: Implications for Plastic Marine Debris (2013)
- United Nations Environment Programme (UNEP) - Marine Litter: A Global Challenge (2009)
- Richard C. Thompson - Plastics, the environment and human health: current consensus and future trends (2009)
- www.plasticisrubbish.com

HUMAN HEALTH IMPACT OF PLASTIC BAGS

- www.endocrinedisruption.org
- National Institute of Health Sciences (USA) – Endocrine Disruptors – www.niehs.nih.gov/health/topics/agents/endocrine/
- Chun Z. Yang – Most Plastic Products Release Estrogenic Chemicals: A Potential Health Problem That Can Be Solved (2011)

RECYCLING PLASTIC BAGS

- Heng, N. – Recycling and Reuse of Household Plastics (2008)
- International Solid Waste Association – Global recycling markets: plastic waste (2014)
- Chicago Tribune – Plastic Bags a Headache for Recyclers

CAMBODIA'S SOLID WASTE MANAGEMENT

- Asia Foundation, Cambodia - Solid Waste Generation and Life Span with Credible Growth Forecasts Waste Generation, Volume and Composition (2015)
- Danh Serey – Ministry of Environment, Cambodia – Solid Waste Management in Cambodia (2014)
- Yim Mongtoeun - Current status of commercial solid waste generation, composition and management in Phnom Penh city, Cambodia (2014)

THE CAMBODIAN ECONOMY

- National Institute of Statistics, Ministry of Planning, Cambodia – Cambodia Socio-Economic Survey 2012
- Harvard – The Atlas of Economic Complexity, Cambodia (2013)
- Italian Trade Agency - Plastics and Rubber Machinery Market Survey of Cambodia
- Sharit Bhowmik - Street Vendors in the Global Urban Economy (2010)
- Brookings Institute – Economic history of industrialization in Cambodia
- www.vietrade.gov.vn
- CIA World Factbook 2015

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