

**KITRO: TECHNOLOGY SOLUTIONS TO REDUCE FOOD WASTE IN ASIA-
PACIFIC HOSPITALITY AND RESTAURANTS**

Carlos Martin-Rios*
Ecole hôtelière de Lausanne
HES-SO // University of Applied Sciences and Arts Western Switzerland
Route de Cojonnex 18
1000 Lausanne 25. Switzerland
carlos.martin-rios@ehl.ch

Laura Zizka
Ecole hôtelière de Lausanne
HES-SO // University of Applied Sciences and Arts Western Switzerland
Route de Cojonnex 18
1000 Lausanne 25. Switzerland
laura.zizka@ehl.ch

Peter Varga
Ecole hôtelière de Lausanne
HES-SO // University of Applied Sciences and Arts Western Switzerland
Route de Cojonnex 18
1000 Lausanne 25. Switzerland
peter.varga@ehl.ch

Susana Pasamar
Universidad Pablo de Olavide
Departamento de Dirección de Empresas y Marketing
41013 Sevilla, Spain
spasrey@upo.es

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* Corresponding author

ABSTRACT

This teaching case addresses sustainable hospitality in Asia-Pacific, specifically practices to reduce food waste. Hospitality and foodservice firms often require a third party to manage the introduction of sustainable practices. KITRO is a Swiss start-up developing waste management systems. In this notional case, KITRO plans to enter the Asia-Pacific market to expand their business. The teaching case offers opportunities to address the growing importance of sustainability and the steps towards introducing sustainable practices in Asia. The KITRO case can be used in undergraduate and postgraduate courses in the subjects of sustainability, innovation, strategy, sustainable entrepreneurship or hospitality operations management.

KEYWORDS: Food waste management; Hospitality; Food and Beverage; Restaurant; Asia Pacific; Sustainability; Environment; Innovation; Technology; Best practices

TEACHING OBJECTIVES

After working on this case, students will be able to:

1. Identify the importance of sustainability and sustainable food management.
2. Develop critical thinking about how to effectively address the managerial challenges of sustainability in hospitality, with a focus on food waste.
3. Adopt a critical perspective on the introduction of sustainability technology in hotel and restaurant management systems.
4. Examine the challenges that companies face in their expansion to Asia-Pacific in different areas such as sustainability, regulations and consumer preferences.
5. Critically discuss different food waste practices in Asian countries and regions.

CONTEXT

KITRO is a Swiss start-up that focuses on finding innovative solutions to manage food waste tailored to the hospitality and restaurant industry. Since effective food management is a global challenge and a key component in the sustainability agenda, the case highlights how food waste can be considered an inclusive opportunity to enhance not only environmental, but also social and economic benefits for hotels and restaurants.

The teaching case creates a fictional scenario to explore the essential challenge that KITRO faces in its expansion in Asia-Pacific: The current social and managerial environment toward sustainability. The study elucidates the different perceptions food waste triggers in various countries and regions. Besides KITRO's plans, the case offers contextual information about food wastage justifying the importance of adopting sustainable practices in Asia-Pacific. It also provides basic background information about KITRO's foundation, the founders' vision and their plans to expand in the Asia-Pacific market. To create this hypothetical business situation,

the case makes use of real facts, primary documents (e.g. interviews with the founders), and secondary sources (e.g. existing sustainability reporting and data).

This case is relevant for a variety of courses in sustainability and CSR, innovation, strategic management and entrepreneurship included in the Hospitality Management Concentration and the Restaurant, Food and Beverage (FB) Management Concentration. With this teaching case, students address applicable topics such as the implementation of food waste practices, the development of sustainable strategies, and the establishment of collaborations with start-ups to introduce sustainable practices in hotel and FB operations.

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Sustainability and food waste in Asia-Pacific

In recent years, food loss and waste has become an issue of great public interest, including the United Nation's 17 Sustainable Development Goals (SDGs) (Appendix A). One of them sets the target of halving food waste by 2030 "at the retail and consumer levels and reduce food losses along the production and supply chains "(Appendix B)¹. As a result, there has been a renewed attempt to drastically reduce food waste as part of efforts to eliminate hunger. Likewise, the UN World Tourism Organization in its commitment to sustainable tourism for development has listed five priority targets:

- sustainable economic growth
- increased employment and poverty reduction

¹ The food supply chain goes all the way from harvesting to the end consumer. Food loss occurs during the initial phases of the food supply chain: Production and harvest, storage, processing and packaging, and transportation and distribution systems. Food waste and discards take place along the latest phases of the supply chain. It is mostly due to storage and sale in wholesale and retails and manipulation and consumption in hotels, restaurants, caterings and households.

- resource efficiency, environmental protection and climate change
- cultural values, diversity and heritage
- mutual understanding, peace and security

Despite being the region with the largest share of food waste, the Asian hospitality and FB industry is becoming more mindful of global issues and is reacting to sustainable practices². Yet, the amount of food waste at every step of the food supply chain that ends up in landfills is still staggering (Appendix C). According to recent studies, about 5 million tons of food are wasted each year in Australia, 6.2 million tons in Japan, 18 million in China, and 63 million tons in the U.S. alone, with some 40% of that volume coming from consumer-facing businesses, including hotels³. Managers, employees and companies for the most part remain uninformed about what they discard, including their food waste.

The hotel industry in the region is more aware of the matter and is positioned to step to the next phase of sustainability by finding solutions via innovation and new technology⁴. The hotel industry is poised to move into a next phase of sustainability, where technology, innovative programs and management solutions to address climate change become more widespread across the region's portfolio and pipeline. Yet, next generation best practices such as measurement of food waste for prevention and recycling are still nascent in the region.

Only a small number of hotels are actively engaged in sustainability practices, including food waste minimization and management. For example, according to the National Environment Agency (NEA), hotels in Singapore with more than 200 rooms have a recycling rate of just 7.7 per cent in 2018. According to NEA, only "the top performers typically segregated common recyclables such as carton boxes, plastic packaging, and newspapers, and operated food waste digesters."

² For general overviews of trends and management approaches to tourism in Asia Pacific, see Chon (2019), Park et al. (2019).

³ FAO (2018), <http://www.fao.org/save-food>

⁴ Ricaurte & Jagarajan (2019), <https://horwathhtl.co.nz/publication/asia-pacific-sustainability-data-trends-2019/>

About KITRO⁵

KITRO is a technological start-up, building sustainability tech that automatically manages and monitors food waste for the hotel and food and beverage industry. The company was founded in 2017 in Switzerland by two graduates from a Swiss hotel school, Anastasia Hofmann and Naomi Mackenzie. These young entrepreneurs put together a young dynamic team dedicated to disrupting and bringing value to the Swiss hospitality and foodservice industry. Switzerland has proved to be a receptive country in linking the start-up to sustainability, building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation.

Before KITRO was launched, existing solutions to the wastage problem were manual, time intensive and inconsistent. For instance, hotel and kitchen management had to rely on their staff to type in or write down what they threw away, which led to inconsistent and often erroneous results. It was also not a long-term solution. According to the founders, this avoidable food waste has detrimental impacts on the environment. Reducing avoidable food waste would prevent unnecessary greenhouse gas emissions and help mitigate climate change.

Working in partnership with Swiss engineering universities, KITRO devised a technological novelty to assess food wastage in hotel and restaurant kitchens. The device fits below and above existing trash cans in the kitchen and automatically measures and tracks the amount of food tossed into the bin. The technology uses cameras and artificial intelligence to evaluate discarded food, then analyzes and attaches a cost to the food that was wasted (Appendix D). After a thorough analysis of the data by KITRO, kitchen management receives reports of their company's food waste – showing them where they can cut costs for maximum impact.

⁵ More resources about Kitro can be found here: <https://www.kitro.com> ; <https://www.youtube.com/watch?v=EB8I7qP-WMI> ; <https://www.youtube.com/watch?v=JN2Wp1F5XIY>

According to the founders, Anastasia and Naomi *“We provide personalized analytics dashboards that empower users to make informed decisions and optimize work practices to reduce food waste, food cost and their environmental impact.”* Their goal is to help management and employees in the hospitality industry understand how much they throw away in order for them to reduce it, but also to have a system that can consistently and accurately measure food waste. KITRO technology offers a positive payback within the first year—a rate of return of between 200% and 1000%.

The business model is aimed at hotels and restaurants where professional managers run their kitchens with a greater focus on quality and cost than waste practices. Current customers include a small but growing percentage of hotel chains, independent and chained restaurants, large retailers, public institutions and private firms with canteens (universities, hospitals, factories). According to the co-founders, their goal is:

“To get data on food waste and to create benchmarks that help. Because right now, users don’t know where they stand, and they also don’t know what the norm is so if we tell them ‘you lose 300g per guest’ they don’t know if it’s a lot or not. Now, they want to turn into this data company and analyze that data to be able to say ‘this is the norm for our segment’, ‘here is what we can improve’”.

A second step would be to incentivize long-term measurements which could be used for management and communication purposes, externally and internally.

All along the early pitching and funding stage, KITRO realized that institutional stakeholders were strongly supportive of their concept. KITRO won several national and international prizes; they received outstanding press coverage, and people showed their empathy toward the concept in every industry and academic event related to sustainability they took part in. Investors made it clear - there was market for their company. Unique business opportunities were identified in the final stage of the supply chain. According to the founders:

“We focused on a huge chunk of the food waste that really is lost upstream at the hotel and FB level because behavior toward food has changed in the past years and we are just not valuing food anymore as we probably should”.

When talking about business opportunities in hospitality and restaurants, Anastasia and Naomi are quite optimistic:

“For us, it’s a no-brainer to measure your food waste, because first of all you get these detailed insights into what is in your bin and you close the circle because you know what you purchase. You know what you sell but not what you throw away. If you have these numbers, you have an additional performance indicator you can monitor and communicate to your staff and start measuring performance based on your food waste. And so, we think this is really a big opportunity, not only from a cost-saving perspective but also from a marketing perspective. It gives you a good story you can share with your customers as well that you are now focusing on food waste reduction and you make kind of a game out of it and try to hit your target.”

What the two co-founders could not envisage during those times was that it was going to be a bumpy road: Hospitality firms appreciate the technology but hesitate to invest. In other words, upper echelons in hospitality firms consider sustainable practices are important but many companies are not actively managing sustainability. Some of the challenges KITRO faced as a start-up in food waste were linked to the fact that food waste management is an area that has not been widely considered by the hospitality and restaurant companies so far.

To overcome the initial resistance to change and to stand out among the few other competing companies, they marketed their business proposition and their technology around the principles of sustainability, sustainable management and operations, and sustainable lifestyle. KITRO’s innovative idea makes this field morally, but also financially, attractive for the companies (restaurants, hotels, caterings, schools...) to employ their services. However,

there is always the potential for ‘greenwashing’, i.e. presenting green initiatives as more important to a company’s strategy than it is. In the hospitality industry, this is often seen in the ‘re-use your towel’ scheme. While the initiative is a good one, per se, it has existed for many decades. Trying to profit from this action today and acting as if it were especially sustainable could be construed as ‘greenwashing’, particularly if no other subsequent sustainability actions is put into place.

Moreover, part of KITRO’s initial success is due to broad changes in consumer behavior. There is a lifestyle component tied to food waste beyond its social, economic and environmental consequences. Nowadays, food has also a cultural component, many people think of food to nourish mind, body and spirit for longevity, vitality and joy. A sustainable lifestyle places greater demands on quality products and richer diets. There is a growing concern about where food comes from, whether it is organic (i.e., grown using less chemicals and pesticides), if it is locally sourced, and how the ‘war on waste’ is fought all the way from packaging to cooking and consumption.

Thus, while this topic of food waste seems to be so evident, there is still the question of addressing customer expectations and making food waste a ‘simple’ task to do for managers and employees. Getting them to do it, however, is where the challenge remains. Despite growing pressures toward sustainable and eco-friendly practices, often the main challenge that hotel and FB managers perceive concerning sustainable practices is linked to cost. Hotels and restaurants are labor-intensive, cost-oriented activities. They benefit from lower margin profits than other industries. As such, cost control is a key managerial priority for these companies. They frequently decide not to invest in innovative solutions because they are unsure about the impact on their Profit and Loss (PL) statement. Also, they lack appropriate information on the different solutions available. In principle, companies invest only if it is financially interesting and there is clear evidence of a positive impact on PL. Despite the fast rate of return it provides

and due to its strategic positioning and innovative offering, KITRO's services are better suited for companies with medium- and long-term strategies. There seems to be a lack of those companies in the hospitality and FB industry at the moment. Additionally, sustainable initiatives like the one offered by KITRO often need human capital as well. Kitchens regularly face difficulties in attracting young, talented people who are willing to challenge traditional procurement, cooking and service practices.

Anastasia and Naomi are mulling over the idea of expanding beyond Switzerland. The problem of market immaturity presents a series of challenges for their expansion. According to the founders, there is potential for a start-up like KITRO in the European marketplace. Countries like Denmark have made a huge effort to reduce their food waste with considerable success, and recent legislation in France is also supporting this kind of efforts. The level of environmental management maturity is less obvious in other markets like Asia-Pacific. Moreover, cultural differences regarding food wastage should be considered before expanding across borders. For instance, in some Asian or Middle East countries, leaving a plate full can be interpreted as a good sign, offering huge buffets during Ramadan is perceived as a sign of hospitality, and most cultures in India believe that to leave a glass or a plate completely empty brings bad luck. Nevertheless, food waste is becoming part of the mainstream media coverage and is drawing increasing awareness and interest about the importance of general waste reduction by companies and customers. The founders consider that the time has come for KITRO to expand its international presence:

“We are looking to expand next year into Asia-Pacific. We already have requests from Europe (Germany, Austria and France). Expansion outside European countries will be next. We are screening distributors in several countries to sign distribution partnerships as well. Particularly in Asian countries because these are the fastest growing markets.”

Challenges ahead: The future of KITRO in Asia-Pacific

This morning Anastasia and Naomi will sit down and discuss their expansion plans in their monthly management meeting. An internal Executive Report with findings and recommendations on food waste sits on their desks. The report includes three fact sheets: one with best practices in food waste, another with main takeaways on food waste in Asia-Pacific, and a third one with specific data on specific countries (Appendix E). This Executive Report will serve as a roadmap for KITRO in their expansion to the Asia-Pacific market.

To date, KITRO has started off well and is slowly moving forward, but, like all start-ups, the company needs to carefully assess its options before expanding to new markets. The founders need advice to address these issues by examining how to get management from major hospitality and restaurant brands to buy into KITRO. Three challenges facing KITRO expanding into Asia-Pacific are:

- **Understanding the characteristics of each country:** What are the different legal systems, unique business culture and management practices across Asia-Pacific countries?
- **Acquiring adequate knowledge of how local businesses approach sustainability:** What management lessons can KITRO learn if they set up in a specific Asia-Pacific country?
- **The various regulatory frameworks for different countries:** What are the unique characteristics of each country/region that must be considered regarding sustainable lifestyle, food and food waste?

Teaching Note

The increasing awareness of food waste in Asia-Pacific may be an opportunity for companies such as KITRO. Sustainability has become a central concept on hospitality, FB and foodservice that necessitates new technologies and practices tailored to Asia-Pacific. Class

discussions can be guided by the UN 17 SDGs, which entwine economic, social and environmental targets of sustainable development (Appendix A). KITRO, like other start-ups, represents a business opportunity resulting from environmental urgency which links to sustainability issues. Yet, there is industry/managerial/cultural resistance to changes driven by sustainability. Therefore, this case addresses two types of challenges:

- a. Industry level of maturity regarding sustainability issues: KITRO can be used to illustrate the relevance of sustainable management in hotel and FB operations, and the challenges it has to face because of the low involvement of companies with sustainability, the resistance to invest on sustainability tech and to collaborate with third-party companies, like KITRO (Appendix E)
- b. Cultural and institutional level: KITRO proposes an operational tool to introduce into professional kitchens to measure food waste and to encourage discussion about how to reduce this waste for the future. It is vital to consider consumer preferences and social norms about sustainability, food waste and other related sustainability issues in Asia. KITRO has linked itself primarily to SDG 12.3, i.e. food wastage, but could indeed introduce other SDGs as the company expands. This is not only a management process but also a cultural question, driven by environmental-sustainable priorities for which students need to acknowledge the differences among countries, and the drivers and barriers that may explain the success or failure of the expansion of this Swiss start-up in Asia-Pacific.

Teaching Questions/Assignments

The following assignments have been divided into three categories: General questions, managerial questions and local culture questions.

General questions amenable to Bachelor courses such as CSR and business ethics, Sustainability; Strategy; Cross-cultural management; Practical arts (Kitchen, Food preparation).

1. How much food is currently being wasted on your campus? How do you measure it?
Is it possible to reduce this amount?
2. What initiatives have been implemented on your campus to address food waste?
What would be the likely level of acceptance of a technology such as KITRO to reduce food waste on your campus?
3. What are the main drivers and barriers of reducing consumer food waste in restaurants? Are customers aware of the relevance of this food waste? Do consumers demand actions to reduce food waste?
4. How many hotels and restaurants in your country/region/city are likely measure food waste? How many have food waste management systems in place? Compare your results with the data offered in the case from Western countries. Discuss how your country could adapt and/or learn from what is being practiced in other parts of the world.

Example of assignment: Conduct primary research to investigate how much food is currently being wasted on your campus and the main sources of this waste. Prepare a short business report to present your findings.

Managerial questions for Bachelor and Graduate courses such as: Sustainability, Strategy, Innovation, Operations, Entrepreneurship.

1. What are the challenges linked to launching a sustainability-oriented start-up in Asia-Pacific (specify which Asian market/region/country)? How are these challenges fundamentally different from those faced by KITRO in Europe?

2. How should Asia-Pacific companies address the challenge of embedding sustainability in their initiatives and practices? What type of resistance and constraints would they be likely to find in tackling food waste in their companies?
3. What are the main sustainable practices and innovations that hotels or restaurants can introduce to solve food waste?

Example of assignment: Investigate existing sustainability tech start-ups like KITRO to establish best practices when introducing their sustainability initiatives for hotels and restaurants. Students can be required to elaborate based on a critical assessment of the current awareness of sustainability in their region, the possible drivers to manage food waste in different areas in Asia-Pacific and their knowledge of relationships between hotels, foodservice firms and start-ups to develop a timeline for expansion for KITRO in their country. Prepare a report or presentation to share findings.

Local culture questions: Graduate courses: CSR and Business Ethics, Sustainability and Sustainable Management; International Business; Hotel operations; FB Management.

1. What are the main perceptions in your country of origin in relation to food waste? Discuss if the benefits of tackling food waste outweigh the costs (consider short- and long-term objectives, different strategies, the role of customers, legislation...)
2. List the main economic, social, environmental and cultural opportunities and challenges of implementing food waste initiatives in hotels and restaurants in your country of origin.

Examples of assignment: 1) Prepare a business plan for KITRO to enter a specific market in your country. Define which market and consider the specificities of this market when trying to implement a food waste initiative: Average company size, employee qualification, customer base, barriers and opportunities regarding specific legislation, culture, food waste awareness, possible competitors, etc. 2) Prepare a summary of the sustainability-related activities listed in

the annual memories of the main hotel chains in your country. Based on that analysis, list down the hotels that are more likely to introduce innovations to reduce food waste.

LINKS TO THEORY

The first part of the teaching case revolves around KITRO, a start-up that helps to address environmental problems related to food waste through the development of innovative technological solutions. The Swiss company chooses to strive for a triple bottom line (social, economic and environmental goals), aiming to generate revenue and profits for stakeholders while also working to increase the social impact and mitigate the food waste challenge (Adams et al., 2016). The second section of this case is linked to the increasing interest in sustainable practices in the Asian hotel and restaurant industry, including the intensifying institutional and economic forces linked to climate change, SDGs, and sustainable tourism and consumerism (Raub & Martin-Rios, 2019).

The teaching case relates to sustainability, small firms and entrepreneurship (Martin-Rios & Erhardt, 2017) and culture (Erhardt et al., 2016) subjects, including the relevance of “green start-ups” that seek to leverage technology to deliver environmentally friendly services; or the additional challenges of establishing contractual relationships with traditional companies less prone to invest in sustainability principles and practices.

The case also addresses important concepts amenable to Asia-Pacific, including the importance of their legal systems, business culture and management practices across countries, the role that the various local business approaches to sustainability plays in the implementation of new technologies and practices, or the characteristics of the regulatory frameworks for each country regarding sustainable food and food waste. These topics are the central concept discussed within hospitality textbooks in sustainability, food tourism or entrepreneurship (Chon, 2019; Enz, 2010; Hall & Gössling, 2016).

Food waste has become a global issue and a major challenge for foodservice companies (FAO, 2013, Gössling et al., 2011). According to FAO, “food waste refers to the decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers.” (Appendix B). As it is strongly linked to the Triple Bottom Line agenda (Elkington, 1999), the European Parliament Council has proposed a framework called ‘The Waste Hierarchy’ (Papargyropoulou et al., 2014) (Appendix F). This framework considers five levels of food waste management: Prevention, reuse, recycle, recovery and disposal. Although this framework can be very effective once established, there are other parameters that should be considered in this domain. On the individual level, for example, the Attitude-Behavior Gap theory explains the fact that individuals are often concerned about their impacts on the environment, however they struggle to convert their intentions into real actions (Bray et al., 2011). This gap has important managerial consequences, as shown in the difficulties faced by KITRO in selling their technology to hotels and restaurants. Research shows that interest in innovation to minimize food waste is limited among food providers (Martin-Rios & Ciobanu, 2019; Martin-Rios et al., 2018).

CONCLUSION

This teaching case provides students with opportunities to learn about food waste as an important indicator of sustainability and allows students to reap the benefits of exploring the management-related opportunities and challenges that hotels and restaurants face in adopting sustainability practices. Students can review the launch and growth of a “green start-up” delivering sustainable tech solutions. That way, they learn that KITRO’s start-up experience, so far, shows how sustainable innovations face various challenges in today’s Asian hospitality and restaurant industry. Though companies admit the necessity to innovate traditional food-waste management practices to more sustainable ones, in many Asia-Pacific regions food waste innovations are still perceived as extra costs with immediate impacts in their financial results.

Adding to this, students will observe firsthand that national, cultural and legal differences in food waste management are also major issues to cope with.

SOLVING THE CASE

We offer several ways to debrief this teaching case based on time and debriefing topics. Instructors may consider teaching this differently should they have different time availability.

- a. For those who have little time (under 30 minutes): Use the data from the case, point out the importance of developing specific food waste practices and management systems in each establishment (teaching objectives 1 and 2), show the difficulty of implementing these changes successfully without institutional support and establishing partnerships with third parties like KITRO (teaching objectives 3 and 4), and summarize the importance of technology. Fit in between standard operation procedures (SOP) and strategy (metrics) to reduce food waste, the several levels of engagement in food waste by adopting the 3 R's of food waste: Reduce, reuse and recycle (Appendix F), and the role of culture and cultural norms in food waste behaviors. Instructors can ask students to share their individual or group responses to the teaching case with a view to engaging a debate on lessons learned (teaching objective 5).
- b. For those who have more time (30-60 minutes): After reviewing results and explaining the relationship between food waste and UN 17 SDGs (Appendix A) across levels, students reveal examples of success/failure in their city/region/country. They can discuss the likelihood of these local food waste practices (teaching objectives 3 and 5), and how third companies like KITRO can take part (teaching objective 4). Instructors can bring up 1-2 questions from "Teaching Questions/Assignments" and allow 5-10 minutes for that discussion.

- c. For those who want to devote a whole class to debrief (60-90 minutes): Link the teaching case with sustainability and management issues, including aspects of food loss/waste (Appendix B), and cultural and geographic differences of food waste (Appendix C, E) (“Teaching Questions/Assignments”). Instructors can challenge students to demonstrate high-order thinking skills (including reasoning, analyzing, synthesizing, experimentation and evaluation) and bring up a high-order question, for example, “What elements (business plan, strategy and operations) would you need to consider if you intend to launch your own waste management start-up for hotels and restaurants in your country?” and allow about 20-30 minutes for that discussion.

Moreover, instructors can approach this debrief by focusing on different content in the teaching case. Some possibilities include:

- (1) Courses in sustainability and CSR: Appendix A, B, C, E and teaching objectives 1 and 2;
- (2) Courses in innovation and strategy: Appendix D and teaching objectives 3 and 4;
- (3) Courses in Restaurant and FB Management Concentration: questions related to operational excellence, Appendix E, F and teaching objectives 1 and 5;
- (4) Social and sustainable entrepreneurship courses: Appendix D, E and teaching objective 4.

In every case, the teaching case provides real statistics on the outcomes and challenges of implementing food waste and how these challenges are being addressed (“Challenges ahead: The future of KITRO in Asia-Pacific”). Class discussion could revolve around how the Asia-Pacific region could adapt and/or learn from existing best practices. It is important to establish awareness in students of what is being or not being practiced in other parts of the world.

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Appendix A

UN 17 Sustainable Development Goals



Source: UN (2017): <https://www.un.org/sustainabledevelopment/>

Appendix B

Food loss and waste

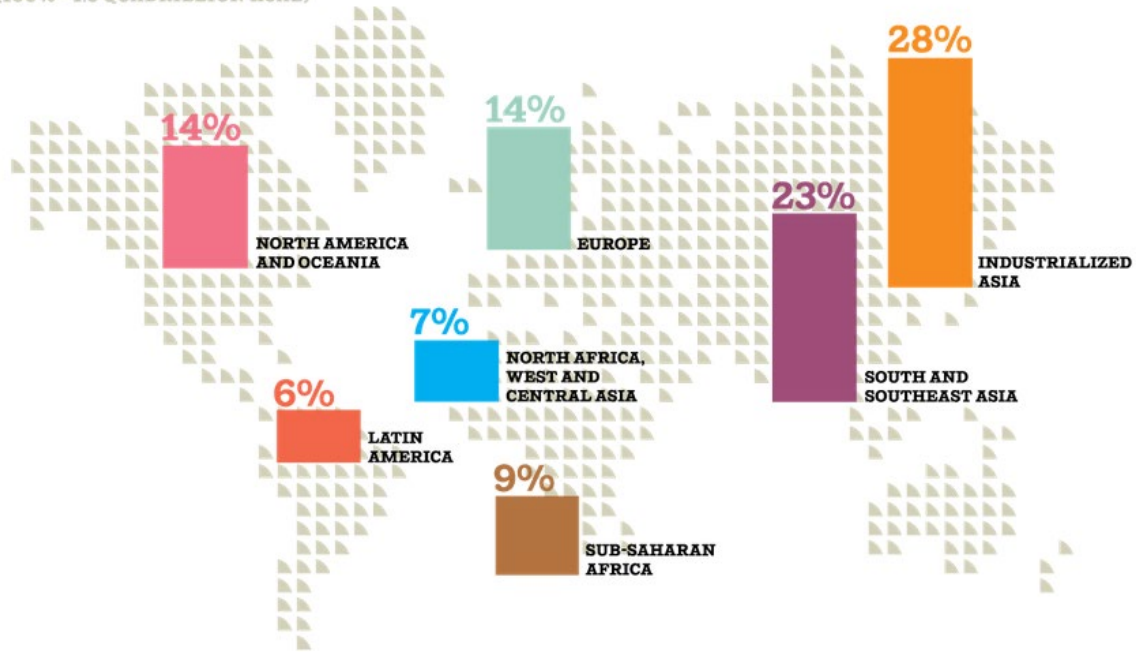


Source: FAO (2018) <http://www.fao.org/platform-food-loss-waste/en/>

Appendix C

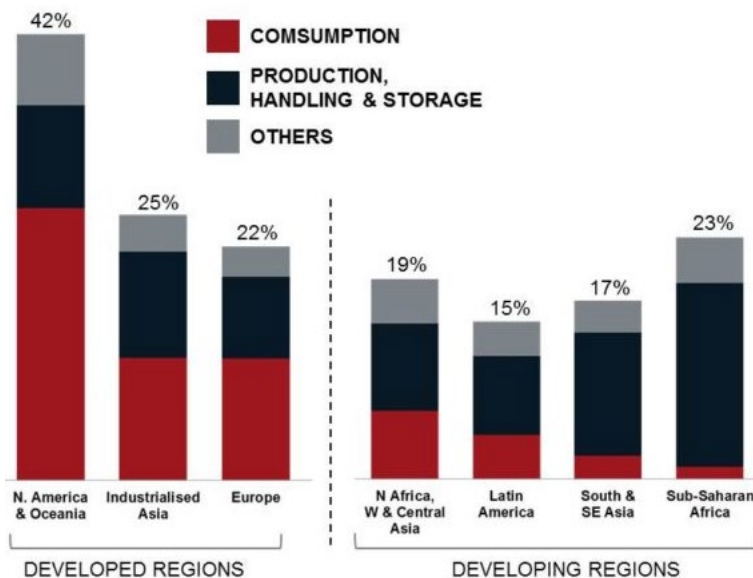
Total share of global food waste and annual food waste by region

TOTAL SHARE OF GLOBAL FOOD LOSS AND WASTE, 2009
(100% = 1.5 QUADRILLION KCAL)



SOURCE: WORLD RESOURCES INSTITUTE, UNEF, REDUCING FOOD LOSS AND WASTE, JUNE 2013

Source: World Resources Institute (2013) https://pdf.wri.org/reducing_food_loss_and_waste.pdf



Source: UNFCCC (2013) WRI report "Creating a sustainable food future"

Appendix D

KITRO's food waste technology



Source: KITRO (2019) <https://www.kitro.ch>

Appendix E

Executive Report

Fact sheet 1: Best practices in food waste	
Macro-level factors	<ul style="list-style-type: none"> - Country income: Low-income countries produce the most food waste during farming, storage and distribution. High-income countries are the biggest producers of food waste in retails, commercial food service and household - Academic research (engineering, environmental studies, chemistry and food science, management)
Cultural factors	<ul style="list-style-type: none"> - In cultures with higher wasteful customs, food is seen as a commodity (disposable). In places with lower proportion of waste, food has cultural, social, symbolic and heritage significance. - Country-level initiatives (e.g. on February 5th, Italy celebrates its National Day against Food Waste) - Apps and online services increase awareness about the cultural dimensions of food and waste⁶
Legislative factors	<ul style="list-style-type: none"> - UN 17 SDGs (Appendix A) - EU revised Waste Framework Directive (2018), Communication on Circular Economy (2015) - Japan Basic Act on Establishing a Sound Material-Cycle Society to promote the 3Rs, “reduce” “recycle” and “reuse” (2000)
Industry factors	<ul style="list-style-type: none"> - Courses and workshops for students in Hotel and Gastronomic Schools - Guidelines and training by industry Associations (e.g. Nordic Hospitality Waste Group)⁷
Company factors	<ul style="list-style-type: none"> - All-encompassing management approach to prevention of avoidable food waste yields higher results than reusing, sorting, recycling and disposal measures - Collaboration with third-party companies to set up the company’s management strategy to prevent food waste
Operational factors	<ul style="list-style-type: none"> - Measurement allows fixed targets for waste reduction - Stockage, storage and kitchen routines need to be adapted - Menu planning: Fruits and vegetables are the most wasted edible products, followed by meat and dairy

Fact sheet 2: Food waste in South and East Asia and the Pacific
<ul style="list-style-type: none"> - Asia produces over 50% of global food waste
<ul style="list-style-type: none"> - China, Japan and South Korea combine to make up 28% of the world’s wasted food

⁶ TooGoodToGo App: <https://toogoodtogo.co.uk/en-gb/about-us>

⁷ Norden (2014): <http://www.diva-portal.org/smash/get/diva2:701203/FULLTEXT01.pdf>

- In Australia, food wastage costs the government \$20b annually (Australia Department of Environment and Energy, 2017) ⁸
- South and Southeast Asia together generate 25% of the planet's food waste
- China generates close to 20 million tons of food waste, with restaurants alone being responsible for 19% of it. The amount of food wasted in China alone could feed 100 million people ⁹
- South Pacific islands are a popular tourist destination with growing demand for sustainable travel, conservation measures and eco-friendly hospitality practices
- 45.35 million tons of fruit and vegetables are wasted annually in India costing the country INR\$440 billion (FASAR, 2014)
- The main industrialized urban areas in the region account for the largest share of wastage
- Since 2009, food waste in Singapore has risen by 40% ¹⁰
- Apart from Japan's Food Loss Act, most countries have not adopted legislation to reduce household food waste. Mindsets need to change, and some pressure exerted on the industry from governments and customers
- In 2019 PATA, Pacific Asia Travel Association, has launched the BUFFET Initiative 'Building an Understanding for Food Excess in Tourism' a food waste campaign for the Asia Pacific region ¹¹
- According to media, leading hotels in Asia prefer to donate unsold edible food to curb food wastage rather than introduce innovative but costly food inventory and food cost calculations
- In restaurants across most countries in Asia, the issue of food waste has not emerged yet as a major economic, social and environmental problem
- In Southeast Asia, there was a 133% increase in the number of food and drink launches with takeaway claims in 2016 compared to 2012 ¹²
- 'All you can eat' buffets, canteens, banquets and similar high food plate waste alternatives are still popular among Asian consumers, particularly in China
- A competitor Singaporean startup called Lumitics (previously known as Good for Food) offers a "smart dustbin" called Insight to help local foodservices to track the type of food waste capture the weight and type of food thrown away
- Another potential competitor is LightBlue Environmental Consulting. Servicing Thailand and neighboring countries, LightBlue offers auditing and consulting services to minimize food wastage

⁸ https://fial.com.au/Attachment?Action=Download&Attachment_id=211

⁹ Source: Food Navigator (2017), <https://www.foodnavigator-asia.com/Article/2017/11/16/China-wastes-enough-food-to-feed-100-million-people>

¹⁰ Source: National Environment Agency (2017), Food waste reduction outreach program in Singapore

¹¹ Source: PATA (2019), <https://www.pata.org/pata-launches-food-waste-campaign-building-understanding-food-excess-tourism/#sthash.JO5qwIBg.dpuf>

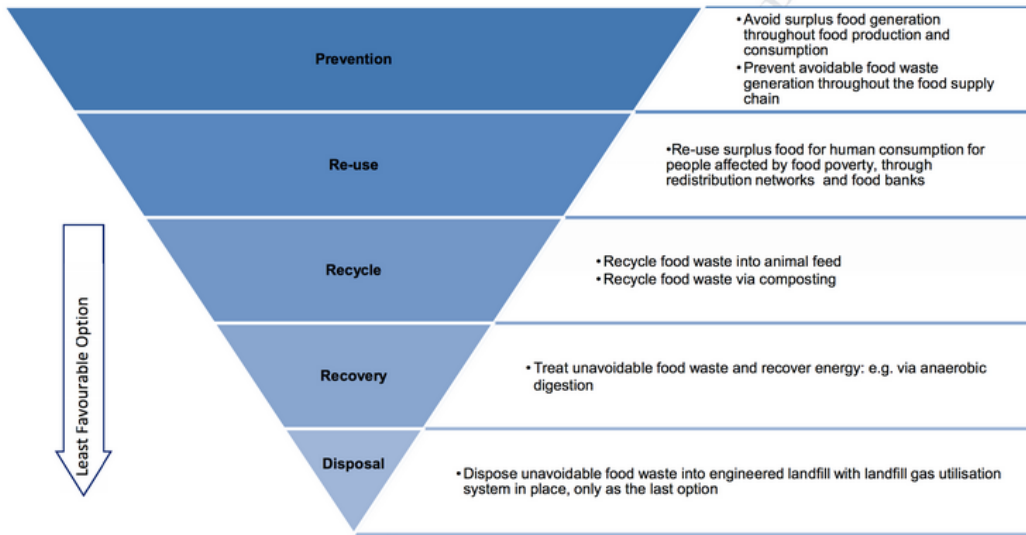
¹² Source: <https://foodindustry.asia/a-look-at-food-and-drink-trends-in-southeast-as>

Fact Sheet 3: Potential business opportunities		
Waste management and food waste snapshot in hotels by country		
Country (sample size)	% waste and recycling tracking	% Food waste composting
Australia (N=141)	55%	25%
China (N=1043)	49%	35%
Hong Kong (N=37)	53%	25%
India (N=169)	69%	51%
Indonesia (N=44)	48%	23%
Japan (N=92)	61%	33%
Korea (N=34)	79%	63%
Malaysia (N=99)	42%	22%
Maldives (N=14)	79%	29%
Philippines (N=19)	82%	47%
Singapore (N=76)	78%	26%
Thailand (N=191)	72%	49%
Vietnam (N=44)	59%	29%

Source: Horwath HTL (2019) Asia Pacific sustainability trends.

Appendix F

Food waste hierarchy



Source: Papargyropoulou et al. (2014); European Union (2009), Directive of the European parliament and of the council on waste. Retrieved from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0098>