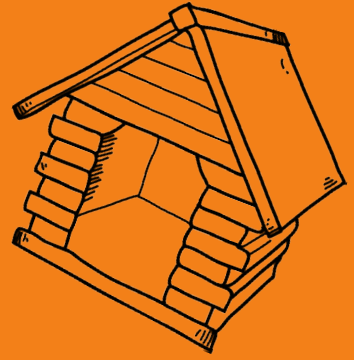


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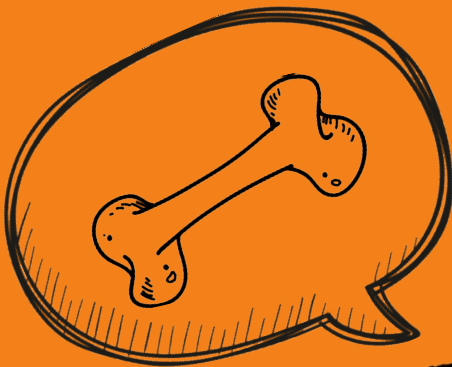
K9



Entrepreneurship

Sustainability

Nicole Huang
Paper Code: 119208
School of Art and Design
AUT University
Donna Cleveland



Woof!

BARK!

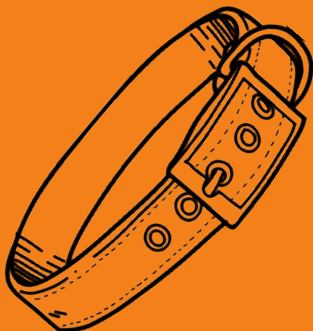


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Environmental Sustainability for **NEW K9 ENTREPRENEURSHIP.**



2.0 ABSTRACT

////////////////////////////////////

This paper focuses on dog food delivery services for the new K9 business model. The K9 Care business aims to be an environmentally responsible and sustainable business in the care for dog/s well-being. The K9 food delivery services will be using fresh organic ingredients for dog meals placed in environmentally sustainable packaging. The project highlights the practice of environmental sustainability and how it can be implemented in the K9 food delivery services. The key element in the development and making of this paper to use information and data on how to optimize canine's health to create solutions that not only deliver the best product and care for the canine but in the process have the least negative impact or no negative impact on the environment.

3.0 INTRODUCTION

////////////////////////////////////

Dog ownership is increasing worldwide because of two major trends emerging in the market. One is the “Humanization”, where dog owners treat their dogs as part of their family. There is a strong feeling of responsibility by pet owners to provide love and care for their dogs almost like raising their own children. They nurture their dogs like their own children. The pet owners make sure that their dogs are well provided in terms of food, shelter, medical care and other necessities. They desire their dogs to be healthy and well provided. The increasing number of dog owners and their deep concern for their pets have led even lobbying and enactment of legislation that obliged pet owners to “ensure the physical, health, and behavioral needs of the animal are met” (Animal Welfare Act 1999 No 142 (as at 25 August 2016), Public Act 4 Definition of physical, health, and behavioural needs – New Zealand Legislation, n.d., p. xx) The second emerging trend is “Premiumization.” People desire for what they consider the best and they are willing to pay a premium. With “Humanization”, dog owners treating their dogs like their children, and because of “Premiumization” pet owners pampering their pets with the best available in the market, this create a great market opportunity.

These trends have created vast opportunities in terms of demand for different products and services that will satisfy pet owners desire to give the best care for their dogs. Today, the pet care business is highly competitive. To succeed in the market it is necessary for the K9 brand to identify and establish its own market niche. The K9 brand realizing that in the consumer market is a trend towards green business and also there is growing number of people seeking new and innovative products. As such, the K9 brand seeks to establish itself as a provider of premium goods and services that are not only innovative but environmental friendly. The target market are mostly dog owners who are single professionals, empty nesters, and couples without children belonging to middle-high.

According to APPA, it is estimated pet owners will be spending 60.28 Billion USD in 2015 and expected to increase to 62.75 Billion USD in terms food, medicine, vet care, live animal purchases and different services provided. (American Pet Products Association, n.d.). It is a growing market that presents a lot of opportunities.

Based on the statistics (See Figure 3.0), the highest consumption demand is in the food category. This is expected, as food is a necessity. There are different brands and varieties of dog food available in the market. However the production and delivery of these commercial dog foods are causing a lot of harm to the environment.

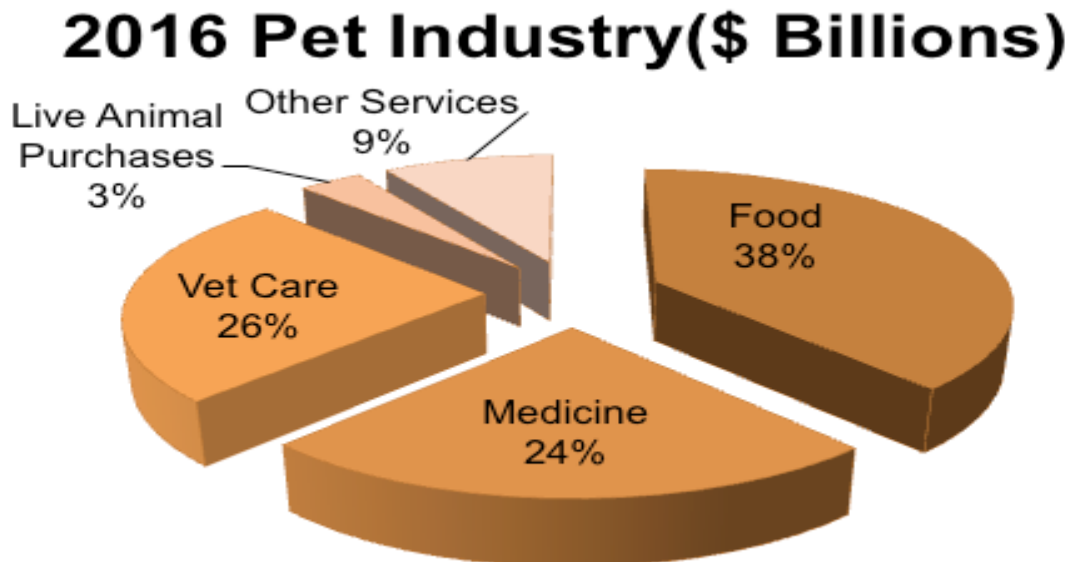


Fig. 3.0 Expenditures for Pet Consumers
(American Pet Products Association, n.d.)

WHY ENVIRONMENT SUSTAINABILITY?

Environmental sustainability is necessary to ensure that measures are being taken to help discover ways to protect our environment. As such, today there is worldwide campaign to find renewable energy and reduce carbon emission in industries. Because of the ill effects of pollution, we realize there is a need for balance use of our ecosystem and find ways to protect our natural resources. Studies have shown increase in number of carbon paw print left by pet dog/s. To establish itself as green and innovative, for this project, the K9 food delivery services will implement good environmental friendly standards.

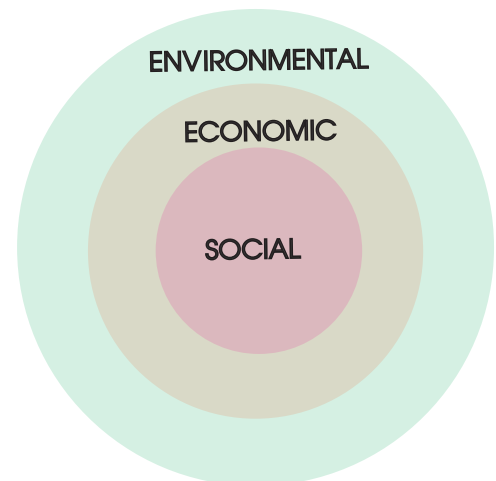


Fig. 3.1 Environmental Sustainability
(Cleveland, 2016)

WHAT IS CARBON PAW PRINT?

Carbon paw print is the measurement of greenhouse gas emissions caused directly or indirectly, by pet dogs, pet-related business operations like production of pet products, the provision of a service for caring of pets and delivery of these product and services. Included in the business operations, is the production of pet food and packaging containment. (See Figure 3.2)

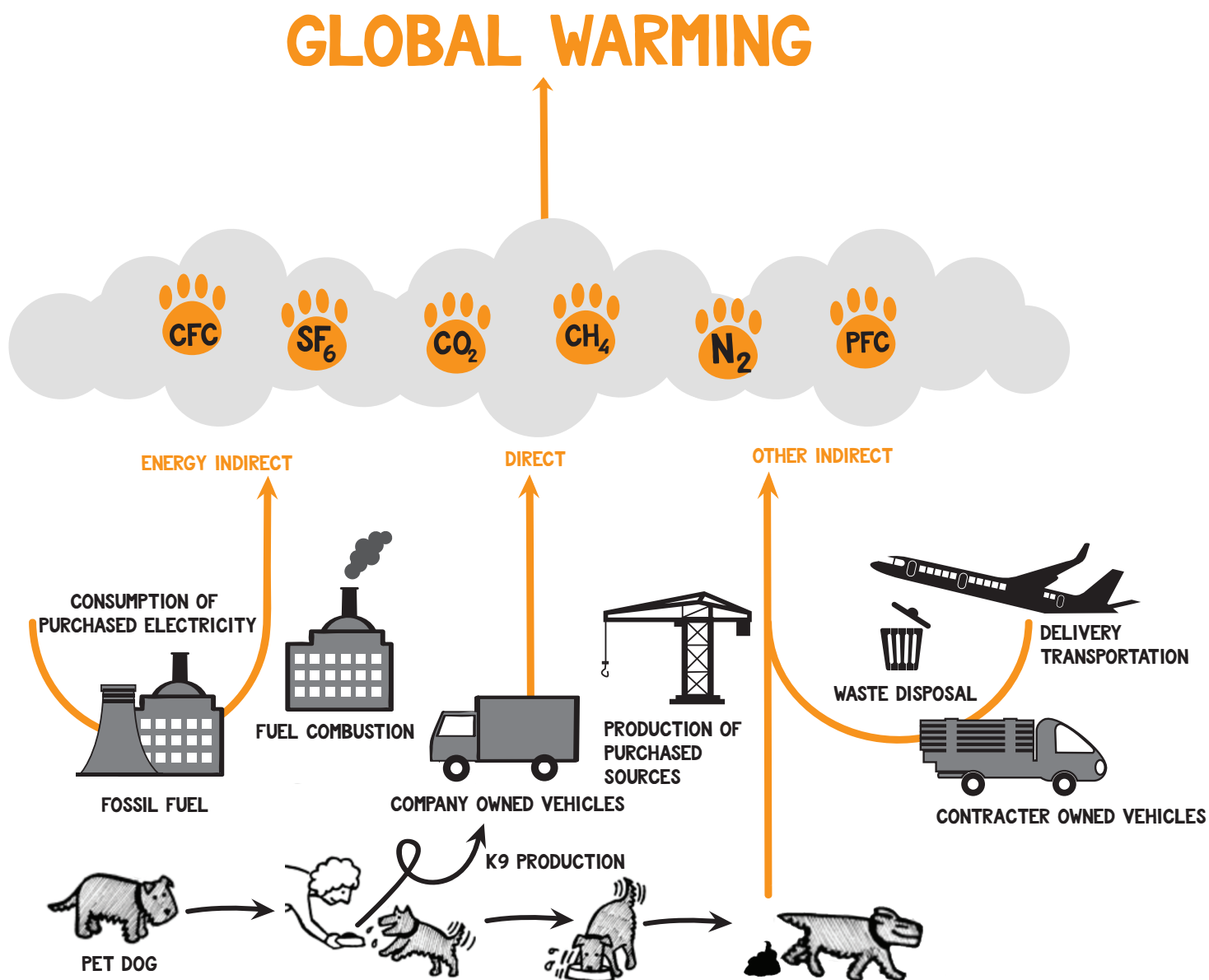


Fig. 3.2 Carbon Paw Print (Wilhem, 2013)

With the continuous growth in demand for products and services, sadly this has resulted in a corresponding increase in carbon emission. These toxins emitted are:(See Figure 3.3)(Wilhem, 2013)

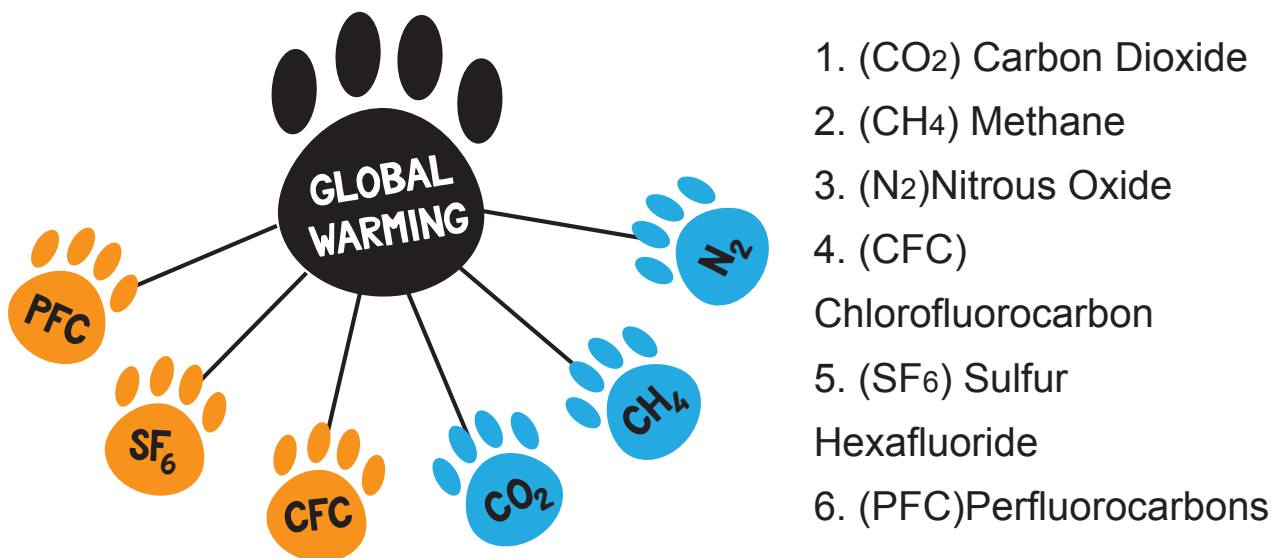


Fig. 3.3 Carbon Emissions
(Wilhem, 2013)

Dog owners should be aware of these carbon emission left by their furry companion and how to reduce dog's carbon paw print. Some of these are:(Newcomb, 2014)

1. Using biodegradable dog feces bags.
2. Using non-toxic products for dogs such as organic shampoos, flea spray and many more.
3. Feeding natural organic dog food.
4. Purchasing high-priced durable dog toys that last longer than cheaper versions
5. Reuse and used recycled dog accessories such as dog beds, leashes and collars
6. Neuter pet dog/s to avoid diseases and overpopulation of pets.

4.0. PET FOOD DELIVERY



A. CARBON PAW PRINT CASE STUDIES

4.1. PROCESSED DOG FOOD:

According to New Scientist Magazine, an average medium size dog leaves a carbon emission that is more than a 4.6 litre SUV motor vehicle. An average dog needs to be fed 300grams/ day and to produce that amount of food will require 0.48 hectares of land. Unlike an SUV it only requires 0.41 hectares of land to produce enough energy to build and to drive the vehicle for 10,000 Km/ year.(See Figure 4.1.1) (Ravilious, 2009). There is a significant negative ecological impact in the present dog food production.

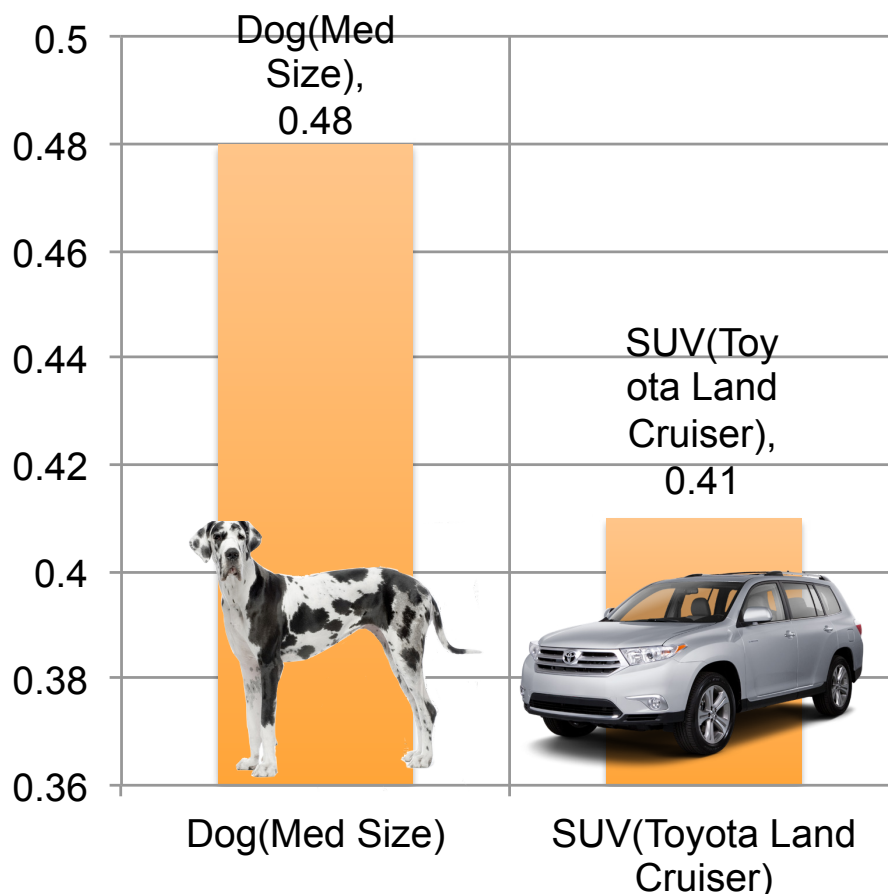


Fig. 4.1.1 Carbon Emission between Great Dane VS SUV, (Ravilious, 2009)

In the article, the carbon footprint consumed by one dog is about “360 pounds and 210 pounds of cereals” (Schwartz, 2014). To meet the increasing market demand, the production of dog food has increase, and there is deep concern over the increasing greenhouse emission from the production.



Fig. 4.1.2 Dog Food Production
(Mackle Pet Foods Manufacturing and Production Processes,2016)

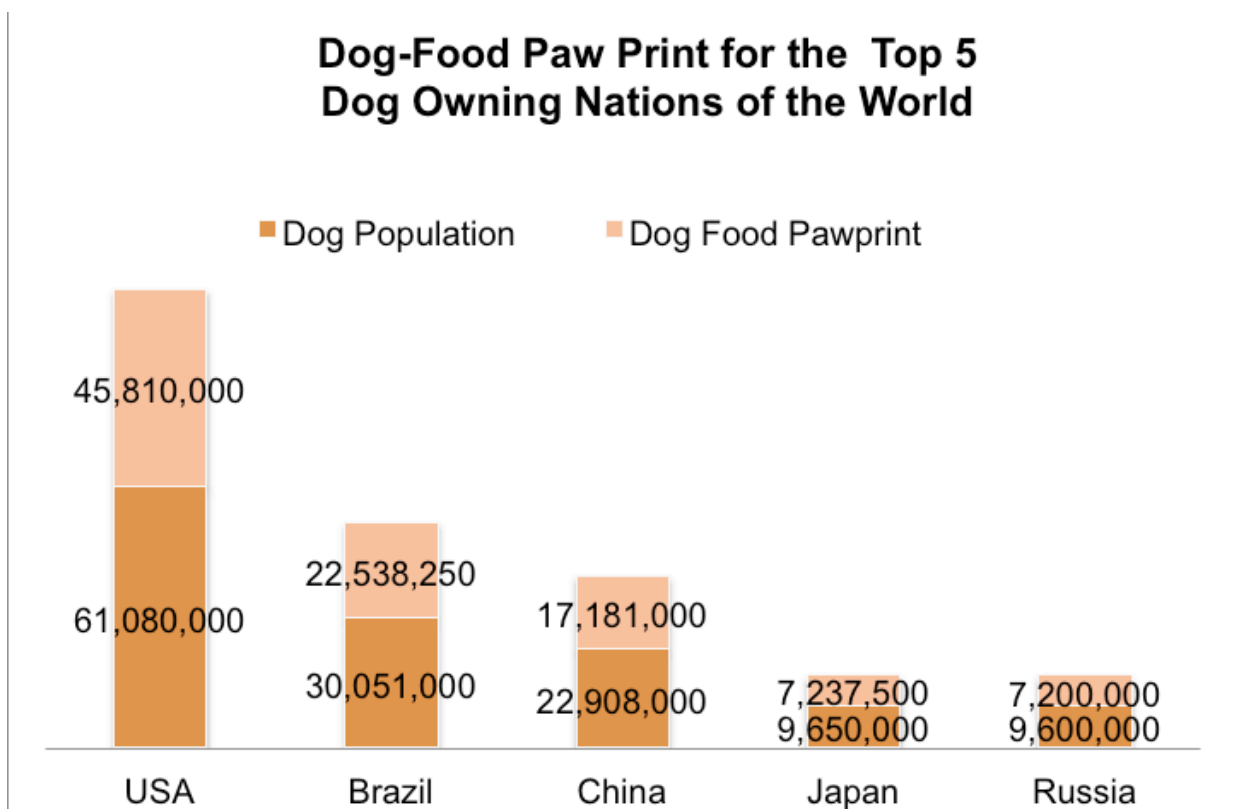


Fig. 4.1.3 Top 5 Countries with Carbon Paw Print,
(Vale, B., & Vale, R., 2009)

Shown in the chart (See Figure 4.1.3), the top five dog owning nations with their carbon paw print caused by their dog population and production of dog food.

4.2. COWSPIRACY

The documentary film, “Cowspiracy” (Andersen, 2014) tells the effects of the use of livestock and how it changes our planet. It takes into consideration the meat being processed for humans as well as canines. As shown below (See Figure 4.2.1) are the ill effects brought about by continuous usage of livestock:

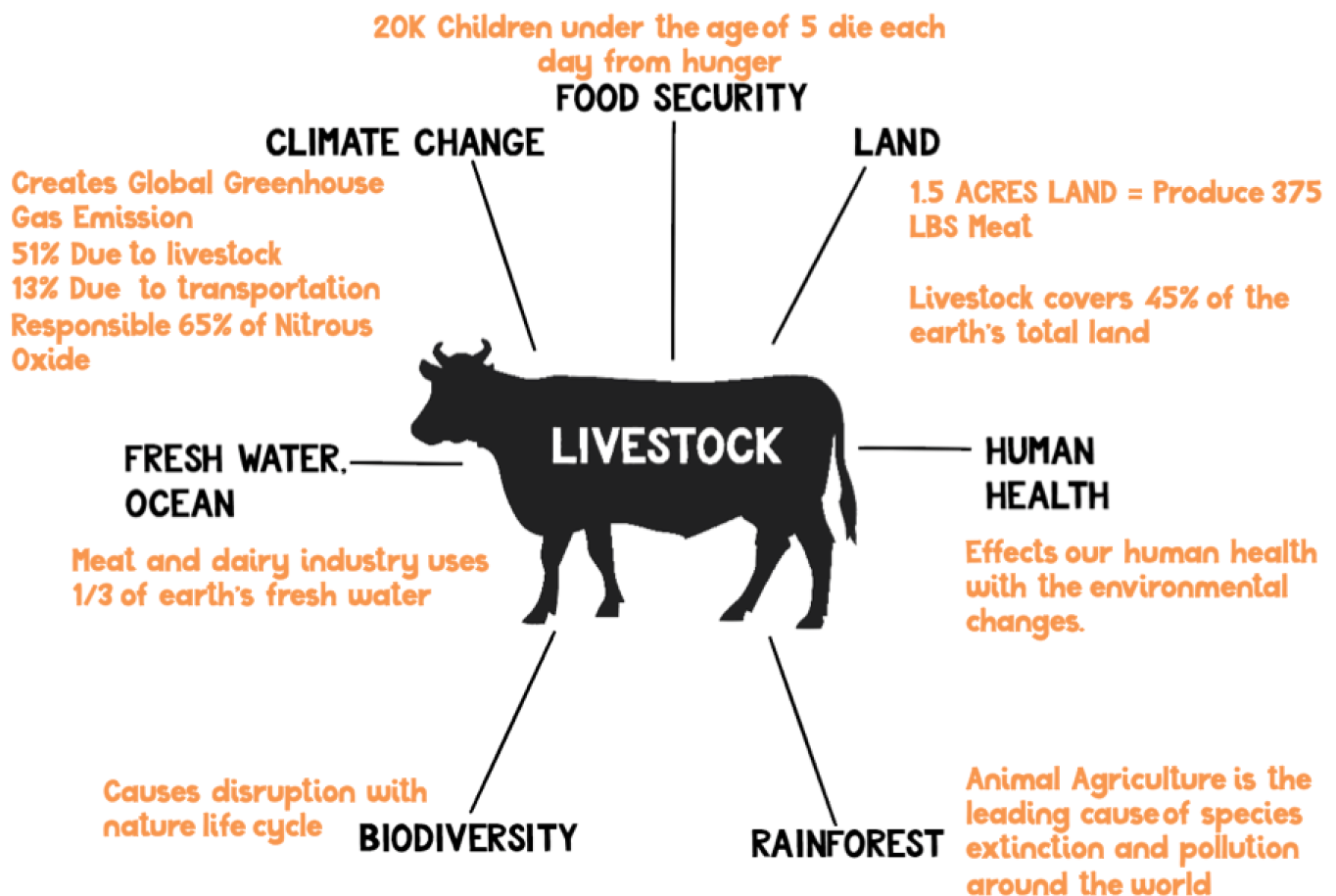


Fig. 4.2.1. Effects of Livestock Production
(Andersen, 2014)

The recommendation of these case studies suggested all humans including dogs should go under vegan diet in order to have sustainable environment.

4.3. FOOD WASTE

Food gives energy to both humans and canines. Because of the amount of that is being consumed everyday, a lot of energy is required to manufacture, produce, pack and distribute the food. Considering the amount of greenhouse emission due to food production, there is concern on how all of this will affect the existing economy and society. This is compounded by waste attributed to kitchen waste and waste during packaging. To address this, the K9 brand propose to use 100% organic ingredients to reduce negative ecological footprint and from the process of manufacturing and from the waste.



Fig. 4.3 Food Waste
(Waas,M., 2016)

4.4. PACKAGING

Commercial dog food packaging “represents the outer surface of what would be found in the retail environment.” (Boylston, 2009). The primary usage is to provide information to consumers, brand name, information on servings and nutritional facts on a particular brand. Sad to say there ,seem to be a lack of concern that most packaging being use for consumable goods are increasng the landfill waste, creating a huge environmental problem. The prevailing industry system operates by extracting natural resources heavily and show little practice to give back to mother nature. K9 Meal pack seeks to address issue through use of materials that can be reuse or recycle.



Fig. 4.4 Dog Food Packaging
(Hearthstone Wellness Blog, n.d.)

4.5 COMPETITOR ANALYSIS

To develop a sustainable K9 a careful analysis of competitor's existing practices was required. There was a need to obtain and understand the practices of the companies existing in the market. One of the key experts interviewed for this project was current dog groomer named Nico Villaroman, who shares his insight regarding the pet business.

Here are some interesting facts:

Nico Villaroman,
Filipino Pet Groomer,
Pet Stock, Auckland, New Zealand:



1. Animates and PetStock (pet stores) merchandise different types of dog food such as dry, semi-moist, moist and frozen.
2. They do not provide pet delivery services.
3. Grooming facilities uses a lot of electricity to groom dogs
4. The companies use non-organic products and treatments for dogs
5. Dog hairs are disposed as waste.

(N.Villaroman, personal communication, August 29, 2016)



Fig. 4.5 Competitors Observation Photos
(Huang, N, 2016)

B. SUSTAINABLE BUSINESS

4.6 ENVIRONMENTAL CHANGE

4.6.1 DESIGN THINKING ADAPTATION

Through the implementation of design thinking approach, the Human-K9 centricity seeks to create a sustainable business model that maximizes profit and create positive impact to the community and the environment. The first-five year plan of the business is to create K9 dog food delivery services and dog care grooming that balances sustainable environmental practices and delivery of market driven products and services, thus creating a more holistic experience for the pet owners and their pet dogs.

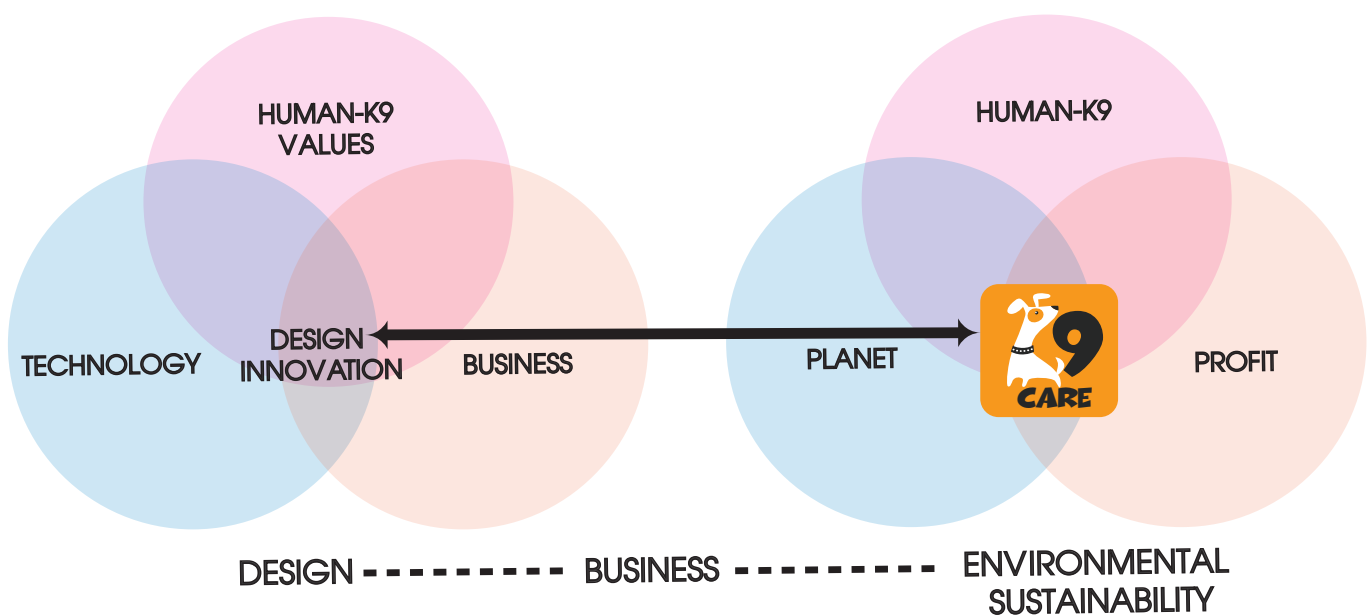


Fig. 4.6.1 Design Thinking + Sustainable Business Model
(Cleveland, 2016)

4.6.2 LIFE CYCLE ASSESSMENT

Much care was taken in studying the life cycle of dog's meal to ensure the products and services introduced create positive impact, is a great improvement over what is existing in the market and is sustainable. This is a sample analysis of the development process for K9 food and packaging:

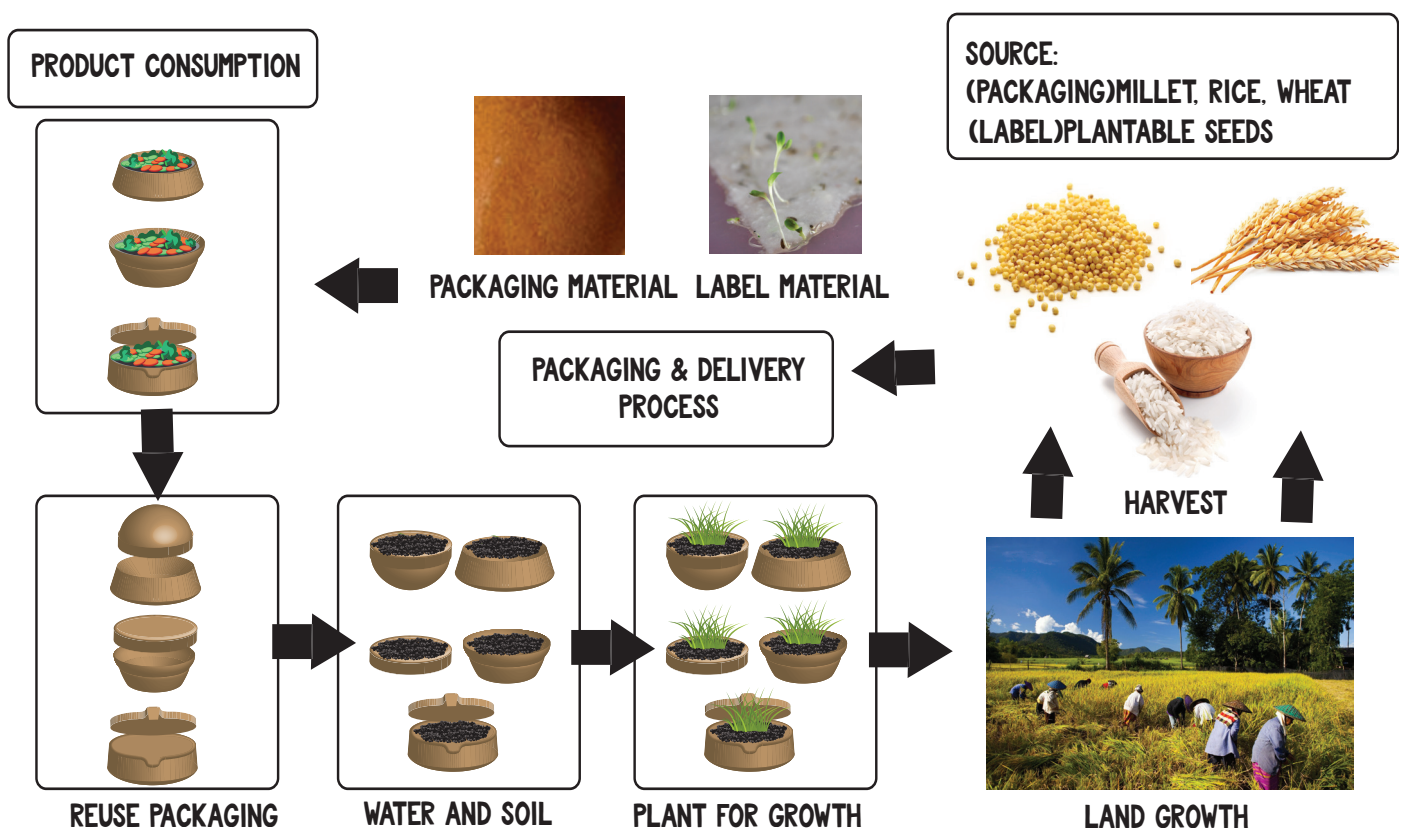


Fig. 4.6.2 Life Cycle Analysis of K9 Meal Pack
(Huang, N, 2016)

In this diagram, the creation of packaging starts with cultivation of ingredients to mold into desired packaging. Here natural organic meals are placed into the packaging and delivered to target customer. The packaging can be reused to a certain extent and be decomposed to give new life and nutrients for planting.

It shows continuous stewardship, non-toxic, locally source and functions the 4R's (Renew, Reuse, Recycle and Reduce) to be eco-friendly.

4.6.3 CRADLE TO CRADLE

The cradle to cradle is cyclical process of “continuous quality, and integrity” (W. McDonough & M. Braungart, 2002) to achieve waste free results.

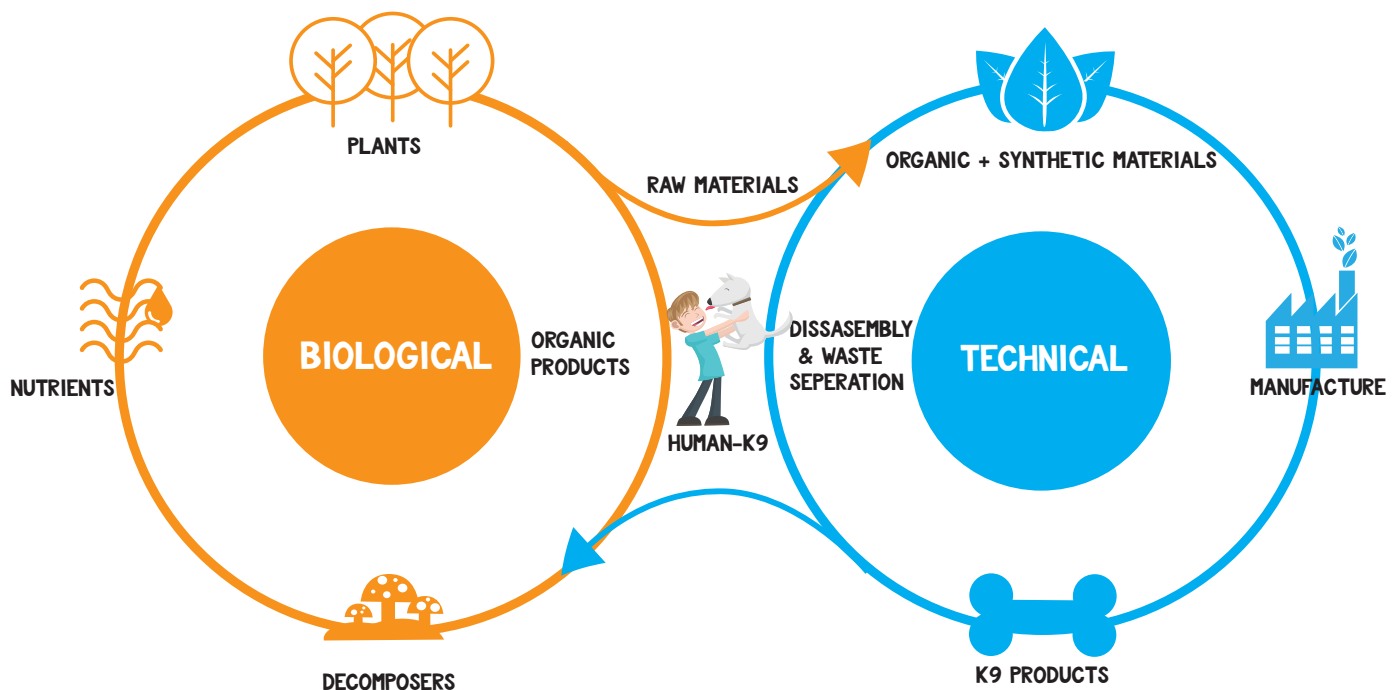


Fig. 4.6.3 Cradle to Cradle
(Biological and Technical Cycle, n.d.)

By adopting the Cradle to Cradle approach, the K9 brand adopted as its standard, the design and development of products and services for canine care with minimize wastage of natural resources. It aims to discontinue the practice to do linear process of “cradle to grave” (W. McDonough & M. Braungart, 2002) when producing unique goods for the market.

4.7. CANINE FOOD CONSUMPTION

4.7.1 NATURAL ORGANIC VS COMMERCIAL FOOD

NATURAL ORGANIC FOOD	COMMERCIAL FOOD
Every ingredient is controlled and selected by expert opinion	Ingredients are chemically formulated which contains preservatives.
All ingredients are fresh.	Ingredients aren't fresh and contain fillers.

Fig. 4.7 Natural Organic VS Commercial Dog Food
(Your Hollistic Dog Care Guide, n.d)

It is important to differentiate natural organic food from standard commercial food. There are advantages in the use of natural organic raw materials rather than then the present practice using a mix of inorganic and organic raw materials in producing dog food. Organic food presents less risk for the canine pets and at the same time can provide a more optimum nutrition for the dogs. History has shown that standard commercial dog food can at times put your pets at risk.This was the case with Purina Beneful Dog Food.(See Figure 4.7.1)



Fig. 4.7.1 Purina Beneful
(CBS News, 2015)

CASE STUDY: PURINA BENEFUL

Recently, Dog owners filed cases against Purina Beneful, one of the leading manufacturer of Dog food today. The lawsuit against Purina Beneful Dog Food alleges that dogs died or got sick from eating their dog food. It was claimed that Beneful used a hidden toxic ingredient called Propylene Glycol, a chemical used in automobile freeze. (CBS News, 2015). This is the risk when you use inorganic raw materials in the manufacturing.

4.7.2 REDUCE FOOD WASTE

In order to reduce food waste, the K9 Care brand solution is to ensure that appropriate dietary amount be fed to the canine. The quantity of food for each individual dog is adjusted based on their weight.

	DAILY CALORIE INTAKE	
WEIGHT	PUPPIES	ADULT DOGS
5 pounds/ 2 kg	500	250
10 pounds/ 4.5 kg	850	450
20 pounds/ 9 kg	1400	700
30 pounds/ 13.5 kg	1800	900
40 pounds/ 18 kg	2300	1200
50 pounds/ 22.5 kg	2700	1400
60 pounds/ 27 kg	3200	1600
70 pounds/ 31.5 kg	3600	1500
80 pounds/ 36 kg	-	1800
90 pounds/ 40.5 kg	-	2100

Fig. 4.7.2 Dog's Daily Fuel Requirement
(S. Stall & D. Brunner, 2004)

4.7.3 DOG'S DIET

It is recommended by experts, that the calorie intake of a canine needs to include three important ingredients in their diet.

CARBOHYDRATES	PROTEINS	FATS
<p>Cruciferous vegetables</p> <ul style="list-style-type: none"> • Broccoli, Cauliflower, Brussels sprouts, Cabbage and Bok Choy <p>Fresh, whole fruits</p> <ul style="list-style-type: none"> • Apples, Bananas, Berries (no strawberries), Watermelon, Cantaloupe • Avoid grapes and raisins <p>Gluten-free grains</p> <ul style="list-style-type: none"> • Millet, Quinoa, Sorghum and Gluten-free oats <p>Green leafy vegetables</p> <ul style="list-style-type: none"> • Kale and Collard greens <p>Legumes</p> <ul style="list-style-type: none"> • Kidney beans, Black-eyed peas, Garbanzo beans, Lentils, Lima beans and Peas 	<p>Dairy products made from goat or sheep (organic and raw)</p> <p>Eggs (Free-range and organic)</p> <p>Fish low in mercury</p> <ul style="list-style-type: none"> • Sardines • Wild Salmon • Avoid Tuna, King Mackerel, Tilefish, Shark and Swordfish <p>Muscle meat and organ meat which are grass fed and naturally raised</p> <ul style="list-style-type: none"> • Bison • Buffalo • Duck • Goat • Pork • Rabbit • Turkey • Venison 	<p>Oils</p> <ul style="list-style-type: none"> • Fish oil • Coconut oil • Hemp oil • Borage oil • Olive oil • Primrose oil • Pumpkin seed oil • Sunflower oil <p>Chicken or lamb fat(as long the dog is not sensitive to both fats)</p> <p>Meat (Based on protein section)</p>

Fig. 4.7.3 Dog's Diet(Dodds, W.J., & Laverdure,D, 2015)

These key three ingredients should be cultivated and be 100% organic. In order to maximize dog's health, K9 meals will rely on nutritional assessment from nutritional experts.

According to W. Jean Dodds, DVM and Diana Laverdure the secret formula to healthier dogs is feeding the right organic food. The optimum feed can be customize base on the genetic make-up of the dog. dog owners have the luxury to spend for their dogs, It is best to consult key experts to determine food mix which improves the dogs' immune system and reduce irregular behaviors. To this, it is necessary to determine the dog's genome and how it affects the dogs' health. At the same time understand, what kind of food contributes to a better, healthier dog. Through the process of DNA testing, experts can easily recommend the optimum feed mix for specific breed of dog. (Dodds, W.J., & Laverdure,D, 2015)



4.8. PACKAGING

4.8.1. CASE STUDY: EDIBLE CUTLERY

Have you heard the saying “My dog ate my homework”? Literally the idea can be achievable through the implementation of edible packaging. In recent findings, Narayan Peesapaty, founder of Edible Cutlery, have created utensils that can be eaten and are soluble in water. It uses organic ingredients such as millets, wheat and rice to shape and form these cutleries. These key ingredients can be molded into different forms of packaging or food containers. Estimated shelf life of these environmental friendly products is span of three years. (National Geographic,2016)The founder has even created different flavors. Some of these flavored cutleries are suitable to be used and can be eaten by dogs.It is certified gluten free, vegan, organic, non trans fat, dairy free, no preservatives, fair trade, and kosher.



Fig. 4.8.1 Edible Cutlery
(National Geographic, 2016)

The Edible Cutlery uses as main ingredient something called Sorghum. Studies shows that the farming of the crop minimizes the used of energy and water. In comparison to cutlery made of plastic (polypropylene) or corn based material , this would have the least carbon emissions. Shown in the chart (See Figure 4.8.2) are the usage of amount of energy, water, solid waste and carbon emission for all three materials.

Manufacturing One Pound of the Material	Energy Used (kwh)	Water Used (gals)	Solid Waste (lbs)	Carbon Emissions (lbs)
PP (Polypropylene)	9.34	5.12	0.029	1.67
Corn PLA	5.37	8.29	0.042	1.30
Sorghum	0.18	1.15	n/a	0.19

Fig. 4.8.2 How Efficient Are Our Edible Spoon?(Munir, S, 2016)

Given these facts, the design of the cutlery is sustainable based on the Life Cycle Assessment of the packaging:(See Figure 4.8.3)

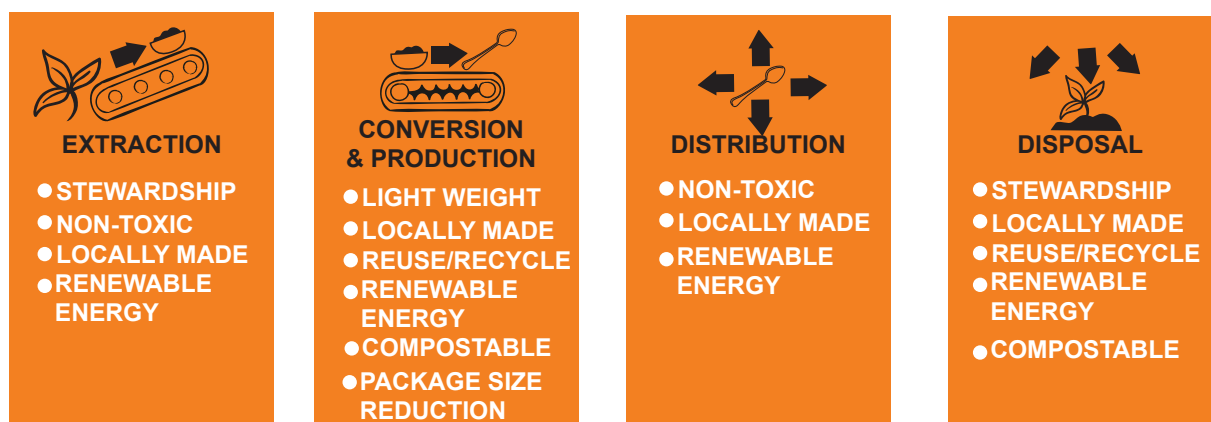


Fig. 4.8.3 The Packaging Lifestyle(Boylston, 2009)

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The Edible Cutlery LCA packaging have the following positive factors:(Boylston, 2009)

1. Stewardship: It entrust responsibility to care for the environment by using natural resources properly without any harm
2. Non-Toxic: It doesn't use chemical toxins to produce the end product or result.
3. Locally Made: It is source within the area of cultivation and network.
4. Renewable Energy: It replenishes energy from natural resources to enhance safe induction of end product or result
5. Light Weight: It is constructed to reduce the usage of materials, manufacturing process and ecological footprint to enhance the state of environmental impact.
6. Compostable: It can regenerate biodegradable products the soil by giving back nutrients to living organisms.
7. Package size reduction: The size reduction creates distribution and transportation advantages. It is easier to process and reduce ecological footprint.

5.0. CONCEPT SKETCHES



5.1. Organic Natural Food

The use of organic ingredients are key component of K9 Food delivery service. The meal is base on recommendations from nutritionist and are customized for particular breeds. Selected ingredients will be use to produce healthy meals by in-house chef/nutritionist and be placed in sustainable packaging.

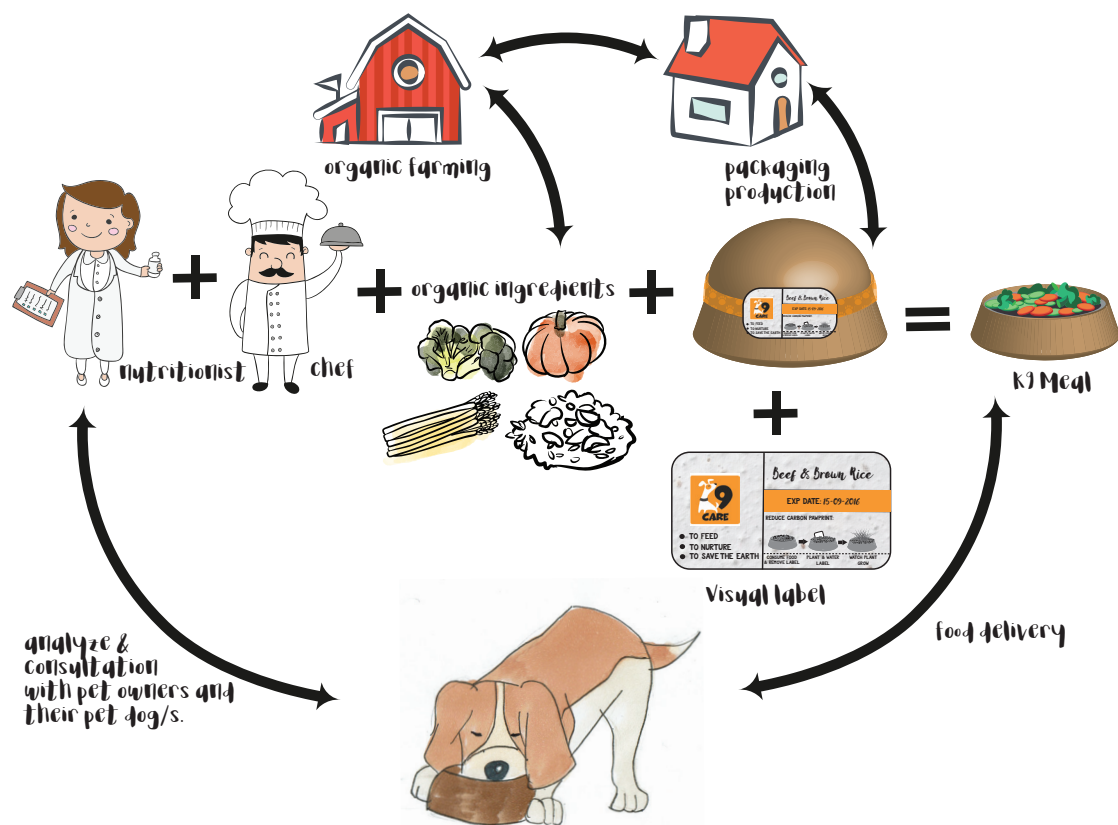


Fig 5.1 K9 Food Delivery Experience
(Huang, N.,2016)

5.2 SUSTAINABLE PACKAGING

In order to have sustainable packaging, there are four categories to remember:

EFFECTIVE	EFFICIENT
Functional to deliver homemade meals for canines	Material uses recyclable materials
CYCLIC	SAFE
Renewable and be compostable	Material is non-toxic using edible natural ingredients

Fig 5.2 Sustainable Packaging Criteria
(Aashish Shama, V. and Nautiyal, H, 2016)

Initial idea of packaging:

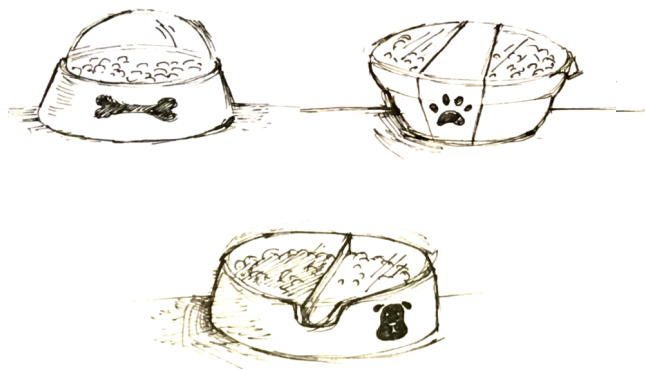


Fig 5.2.1
Sustainable Packaging
Sketch
(Huang, N, 2016)

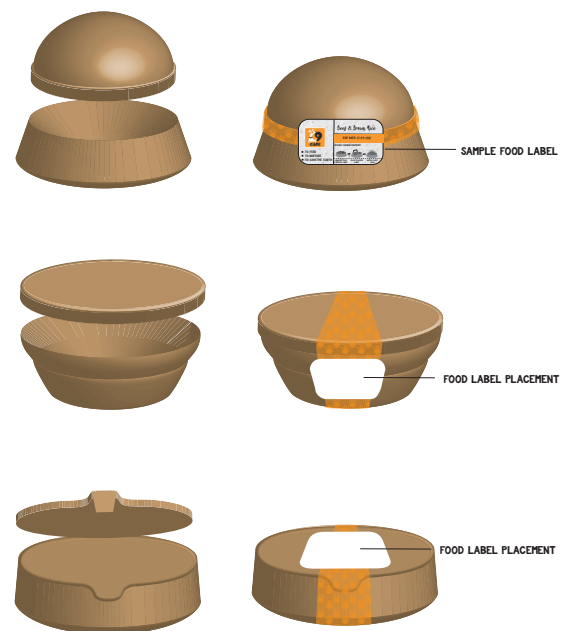


Fig 5.2.2
Sustainable Packaging 3D
Model
(Huang, N, 2016)

The propose K9 packaging is to adopt edible cutlery materials to create an edible, recyclable and compostable packaging that will preserve the taste and freshness of the K9 Meal. Outer packaging and label will use plantable paper. Included in the label will be K9's promotion on its products being eco-friendly.

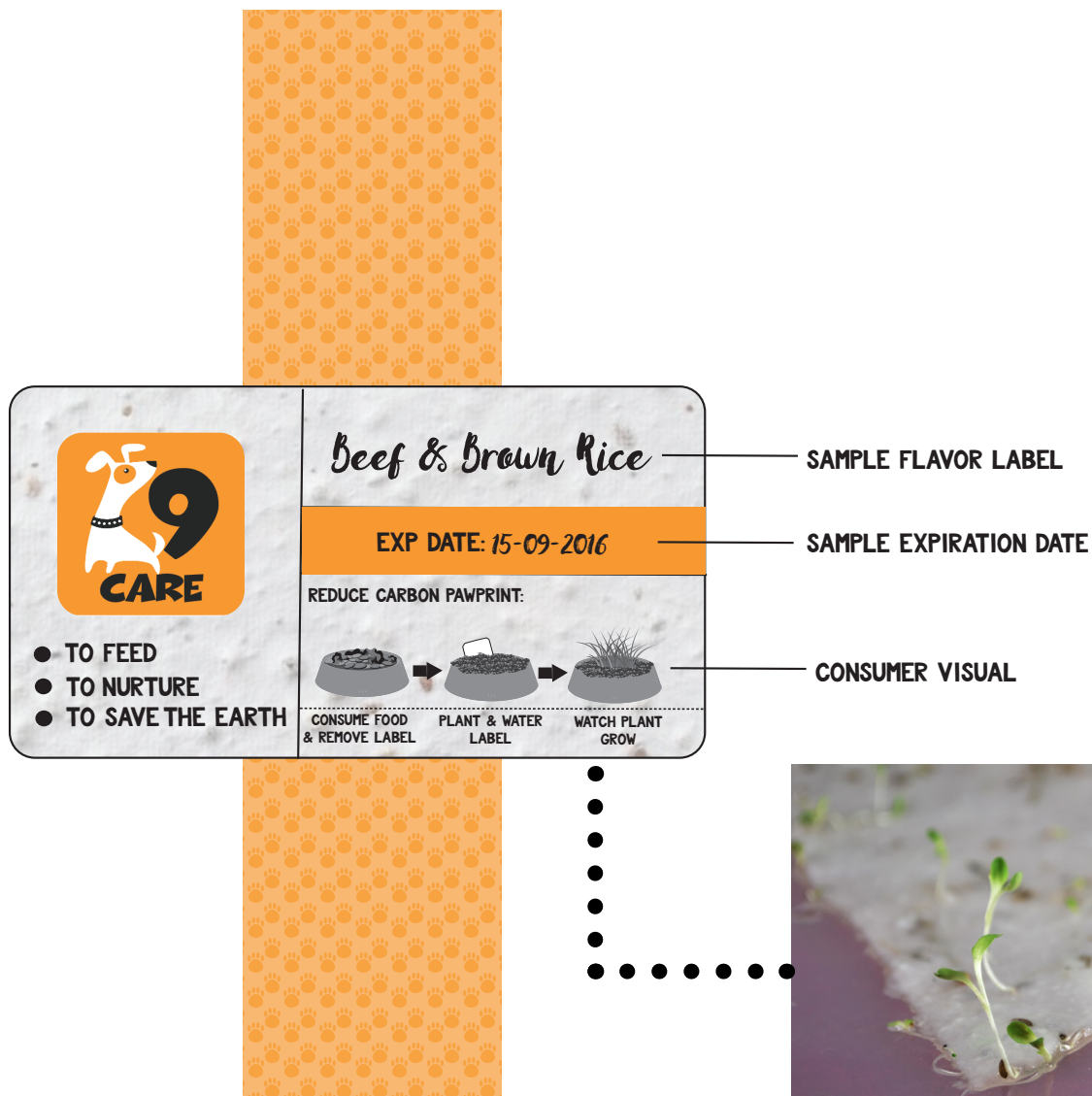


Fig 5.2.3
Sustainable Packaging
Label and Prints
(Huang, N, 2016)

Fig 5.2.4
Plantable Paper
(Of the Earth,n.d)

5.3 FUTURE ENVIRONMENTAL PRACTICE

In the future, not only pet delivery food services will also be sustainable but mobile grooming as well. In bathing dogs, the business will provide hybrid mobile equipped with organic dog products, filtered water and practice use of recycle bottles.

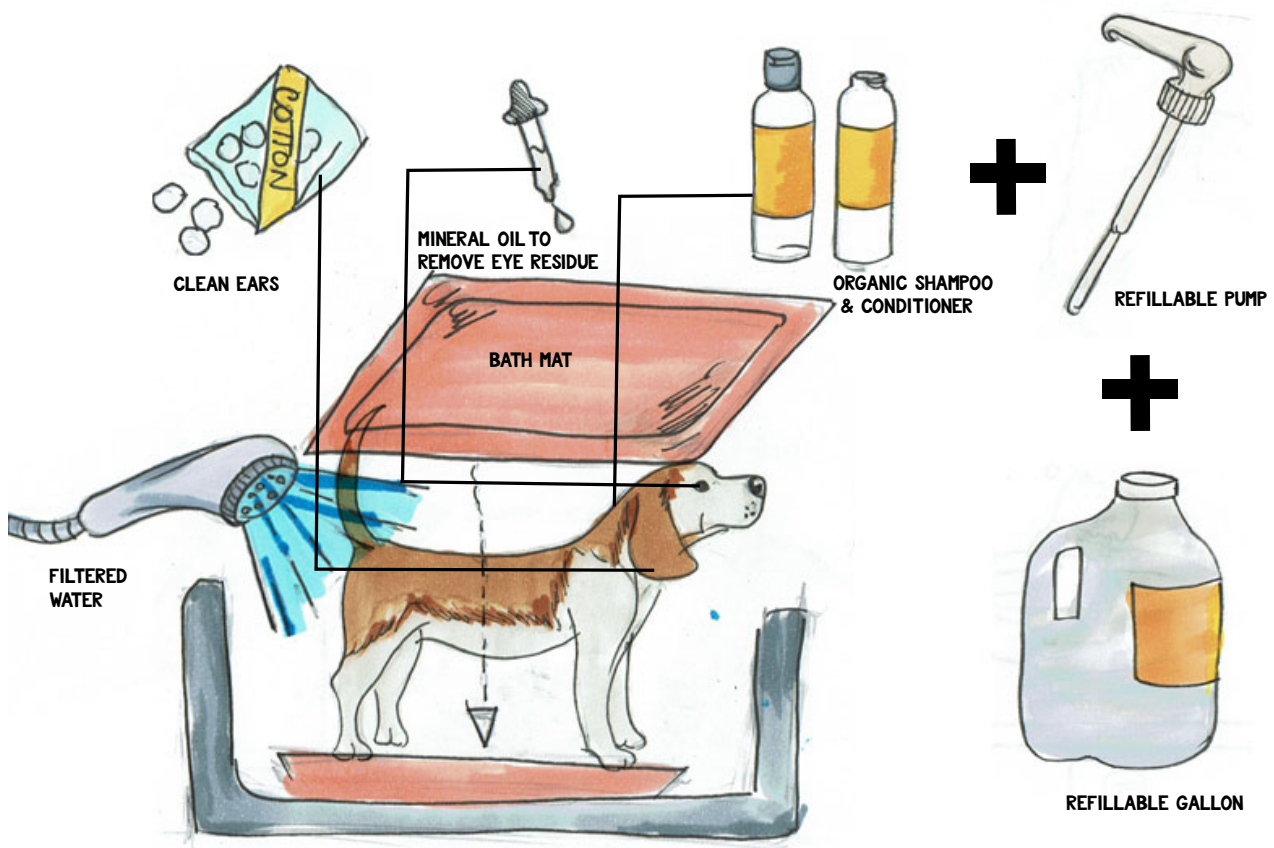


Fig 5.3 Dog Bathing
(Huang, N., 2016)

On dog brushing and cutting services, to create a more positive environmental impact, dog hair from the cuttings, an organic matter, should be taken to compost facilities to convert them into fertilizers for growing crops. The plan is to donate proceeds from sale of compose to organizations promoting healthier lifestyle, dog welfare, and environment protection.

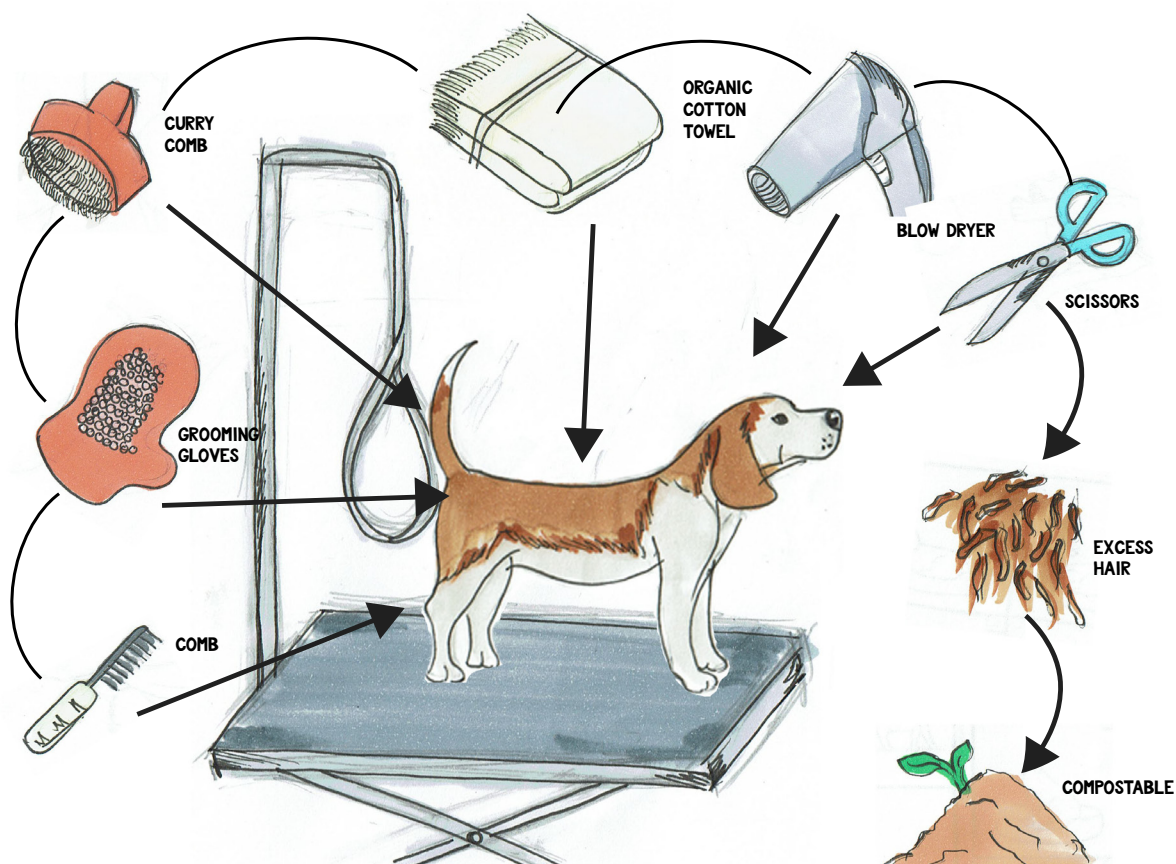


Fig 5.3.1 Dog Brushing and Cutting
(Huang, N., 2016)



Not only does the business practice environmental sustainability it can be a vehicle to create partnerships that can contribute to the K9 brand image.



Fig 5.3.2 Profit Diagram

6.0 CONCLUSION

6.0 CONCLUSION

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The K9 business gives importance to the practice of environmental sustainability. It aims to practices such as Cradle to Cradle Approach and Life Cycle Assessment to develop the right kind of K9 care products and services that is sustainable. It is only through emphasis on designing totally environmentally friendly products that the K9 will attain sustainability. This means not only the materials going into the product and services but also the packaging and waste management. The use of organic raw materials in the manufacturing of the dog food, the use of organic packaging, and the recycling of dog hair were developed based on this standard. The K9 brand seeks to develop environmentally friendly products and services that delivers a holistic experience to pet owners.

Since dog ownership is increasing worldwide, there is a growing opportunity to open new business in the industry. There is an opportunity to offer products and services that enhances the health and well being of dogs. The two market trends, Humanization and Premiumization, together with the world trend towards protecting the environment presents an opportunity for the K9 brand to create and eco-friendly business, that produces only natural and organic food, placed in environmentally friendly edible packaging, and delivered promptly to a growing market. There are numerous products and services that can be developed. The continuous use of the “Cradle to Cradle” approach to “analyze materials, processed use in the development of new methods and materials for minimizing environmental impact” (Lockwood,2009) will ensure that K9 products and services continues to be environmentally sustainable.

Based on research and the used of design thinking, the demand to become green business can be achievable. Presently there is significant amount of carbon emission created in the pet caring industry. There is a need to find a solution to this problem. It must be a solution that benefits both humans and pet dogs alike. The K9 food delivery services, and canine care services like dog grooming are projects which will address the existing problem. It is able to impact and optimize a healthier lifestyle to consumers.

There are many other opportunities for development of such products. Through iteration process and stress on products which projects market empathy, more environmental friendly products and services can be develop. Products that will also meet the demands of the growing market.

By establishing for itself the highest standard for its products and services in terms of environmental impact, K9 will create a brand image that will help it develop and sustain into the future. (See Figure 6.0)

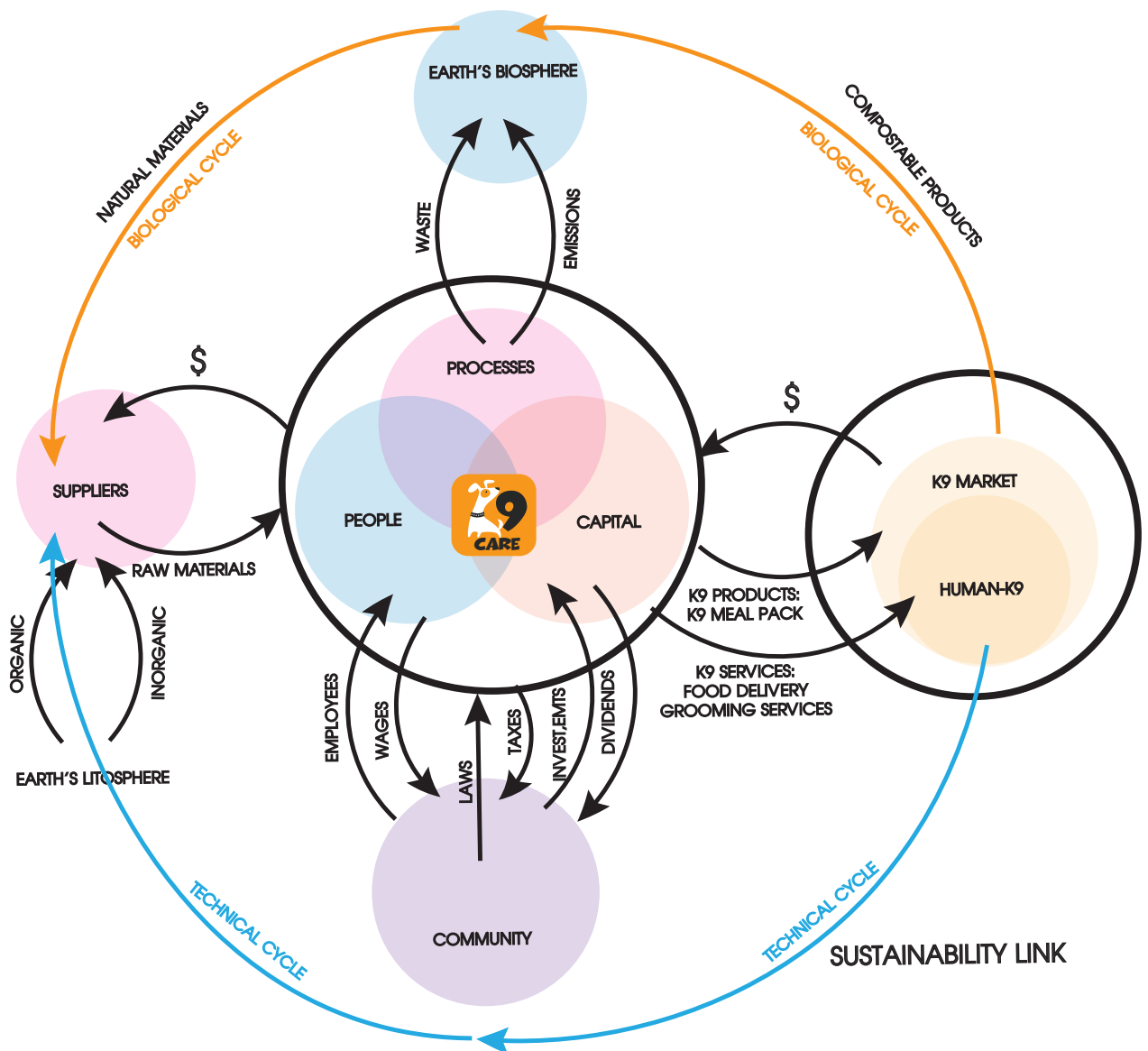


Fig 6.0 Interface Sustainability
(Interface Global,n.d.)

7.0. BIBLIOGRAPHY

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