

## Shifting Roles and Development of Agriculture in Hong Kong

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### Research Article

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#### ABSTRACT

In recent decades, agriculture is never to serve for food subsistence and food security functions in Hong Kong. It plays more important roles in leading healthy or green lifestyle, promoting green leisure or even for urban development such as Northeast New Territories, thus it has drawn increasing research and policy attention in the past 15 years. This study presents an overview of the shifting roles and development of local agriculture in Hong Kong from a historical and developmental perspective. Based on an extensive literature review of published papers, magazines and newspaper articles within the past 15 years, this study has identified the nine themes and several focal issues. These themes include food subsistence, food security, land grab, organic food, green lifestyle, green leisure, green activism, green modernism, agroecology. The results show that the functions of agriculture have been changing and new trends of agriculture development in Hong Kong speak to its great potential of serving for other functions. Findings of this study also suggest that the development of agriculture is not a linear process while the role of agriculture is changing greatly in different social and economic contexts. The identification of the nine themes regarding the development and shifting roles of agriculture can inform the formulation of policy and practice strategies for further fostering a more balanced, modernized and sustainable development of local agriculture in Hong Kong.

### INTRODUCTION AND BACKGROUND

The British Hong Kong government was once a keen promoter of local food production dated 1950s. It served the dual purposes of feeding the influx of migrants from mainland in a relatively isolated colony in the Far East, as well as strategy for coopting and harmonizing the rural population under increasing communist influence. Even when Hong Kong was under rapid industrialization in 1970s, it can still supply 40% of its daily consumed vegetables. However, with the dramatic increase of import from mainland after its open door policy, further growth of not only new towns, but also property developers who began to systematically build up their land banks in New Territories in 1980s, Hong Kong agriculture began to encounter a seemingly unavoidable rapid decline. The glooming of local food production was, rather logically, followed by an upcoming wave of functional diversification in the 1990s. While a lot of farmland was converted into luxurious real estates, equally popular were holiday purposes like barbecue spots, fruit picking gardens, golf training courts and other recreational facilities. At the same time, organic farming also began to take root in the territory, although in small scale and scattered manner, nevertheless gained increasing popularity among supporters associated with environmental groups. The transformation of a productivist into a post-productivist food regime tends to replicate the experiences of Western metropolitan areas. As being demonstrated by Wilson<sup>[1]</sup> post-productivist food regimes can best be characterized by their multi-functionality. Agricultural activities in Hong Kong are undertaken predominantly in the New Territories and the urban fringes. According to the surveys conducted by the Agriculture, Fisheries and Conservation Department (AFCD), there are still around 4,523 hectares of agricultural land (excluding fish ponds) in Hong Kong. About 729 hectares of such land are under active farming (AFCD). However, with the inherent constraints in land ownership and farm size, farmers might be reluctant to commit in long-term investment in their farms, hindering the prospect of

improving and diversifying farming activities. Local agriculture produces only small amount of vegetables, poultry and pigs for local consumption, while most of the food supply is predominantly reliant on imports from the mainland and other countries around the world. After the return of Hong Kong to China in 1997, while the dependency on mainland products was further enhanced, subtle changes in the citizens' attitude towards local agriculture also gradually emerged. It was especially after the SARS outbreak and political turmoil in 2003, that the rise of local identity and related social movement has dramatically grown in its significance. The current reemergence of citizens' interests in local agriculture is increasingly linked with the macro social-spatial transformations and contradictions. Advocates oppose the bull-dozer style of development which represents the interests of state-capital bloc, attempting to demonstrate the possibility of alternative developmental pathways. The image of old farmers practicing family style farming for decades seemingly undisturbed by megalopolization processes, naturally become the role models of admiration and for developing future imaginations. At the same time, Agriculture and Fisheries Department was reorganized as the Agriculture, Fisheries and Conservation Department, and was relocated from Planning and Lands Bureau into the Food and Health Bureau. The emerging infectious diseases and food safety problems seemed to have overwhelmed the production and livelihood problems. The official policy discourse that emphasized the dying down of agriculture industry due to natural market forces, has ironically fueled the movement for local and communal food with a clear target to attack. In January 2014, however, subtle shifts were witnessed in Hong Kong SAR Government, which represents the interests of majorities of conventional farms, for their positions in agricultural policies. Neo-productivist discourses seem to be under reformulation and may serve as substitute to the post-productivist food imaginations. The Chief Executive CY Leung announces in his second Policy Address <sup>[2]</sup>. "The Government will review its agricultural policy to enhance productivity and promote sustainable development. This will include introducing modern and environment-friendly agricultural technologies that help conserve our natural resources and the agricultural ecology, so as to supply quality produce to our people and promote the diversified development of the rural areas. Consultation will be carried out within this year." In recent decades, agriculture is never to serve for food subsistence and food security functions in Hong Kong Produce Green Foundation <sup>[3]</sup>. Instead, it plays more important roles in leading healthy or green lifestyle, promoting green leisure or even for urban development such as Northeast New Territories. For instances, <sup>[4]</sup> green diet claimed that organic living was about organic farming, sustainable development, environmental protection, environmental education and revolution towards new capitalism within limited space, time, resources and knowledge. The transformation of the functions of agriculture and new trends of development in Hong Kong has shown its great potential and has drawn increasing research and policy attention in the past 15 years. Despite its small scale, the local agriculture still plays an important role in meeting the public's aspiration and demand for food with high safety standard. Therefore, it is of great significance to review the local agriculture from a historical and developmental perspective. The objectives of this study are to identify main themes and focal issues in local agricultural development, identify the shifting roles of agriculture in different historical and socio-economic contexts, and provide important suggestions for the policy refinement and implications for the future directions of the agriculture, fostering and modernizing the agriculture as well as maximizing its contributions to the well-being of society.

## METHODOLOGY

### The Search and Selection Strategy

The most recent versions of the following four key databases served as the main sources of evidence for this study, namely, (a) EBSCOhost-Academic Search Premier, which contains full text articles from more than 4600 refereed journals including full texts of around 4000 titles published since 1975; (b) Wise News, which contains news and magazine articles that are published in all major newspapers in Hong Kong, Internet news, Xinhua News Agency and many magazines from Hong Kong, Macau, China and Taiwan; and (c) International Digital Dissertation Consortium, which provides a comprehensive collection of more than 50,000 dissertations and theses from 1980 onwards. Adopting a content analysis approach, searching literature from the above three databases has generated a lexicon of key terms, which included Agriculture Or Food Or Fisheries Or Organic farming Or Land Grab Or Green Lifestyle and Hong Kong, New Territories, China. Papers were then selected whose title or abstract where available indicated a possible relation to the development and functions of agriculture in Hong Kong. Once the original papers had been retrieved, their references were carefully read and the potentially relevant ones were then further retrieved and read. This process repeated until no new relevant articles came to light. In the end, there are 85 sources in total, consisting of 38 journal articles, 34 newspapers, 6 magazines and 7 dissertations.

### Data Collection and Analysis

The overview of the literature have generated nine main themes which matched with our framework, namely 1) food subsistence, 2) food security, 3) land grab, 4) organic food, 5) green lifestyle, 6) green leisure, 7) green activism, 8) green modernism, and 9) agroecology . Five researchers worked together on the coding of the literature. When discrepancy emerged, a further discussion would be conducted in order to build consensus. The results of the distribution and characteristics of the reviewed literature are described in **Tables 1-3**, the findings of which are further summarized using the nine themes previously identified. **Table 1** shows the distribution of the interest of various magazines on the nine main themes from 1997-2015. The magazines are from the seven different organizations: Club-O, Organic Forum, Produce Green Foundation, SEED, Kadoorie Farm and Batonic Garden, Vegetable Marketing Organization as well as Agriculture, Fisheries and Conservation Department. It seems that these magazines have paid much attention to issues such as organic food, green lifestyle and green leisure. In addition, the

themes of land grab, green activism as well as green modernism also caught the attention from several magazines. **Table 2** shows the distribution of themes of newspaper articles in different types of newspapers from 1999 to 2014. It is found that Ming Po, Sing Dou Daily, Hong Kong Economic Daily and Apple Daily have focused much on land grab and organic food issues, while discussions about green leisure and green modernism are also available in Ming Po, Tai Kung Po and Government News. **Table 3** presents an overview of the number of newspaper articles regarding the nine themes from 1999 to 2014. The number of news related to different themes has been on rise within 15 year, indicating a broader and improved awareness of the importance of agriculture among the public (**Table 4**). Newspapers have shown consistent interests on issues including land grab, organic food and green modernism within the 15 years. With the idea of building an agriculture park being further proposed by the government, there started to be more discussion on green modernism, green leisure and food subsistence in recent two years. Some debatable issues related to the government policy on agriculture will be further discussed later.

**Table 1.** The distribution of themes focused by magazines from 1997-2015.

Themes	No. of Publication						
	Total	Club-O	Produce Green	SEED	HKORC	KFBG	AFCD
Food Subsistence	-	-	-	-	-	-	-
Food Security	-	-	-	-	-	-	-
Land Grab	5	-	4	-	1	-	-
Organic Food	29	5	11	2	10	-	1
Green Lifestyle	28	21	3	4	-	-	-
Green leisure Community	11	1	3	-	-	7	-
Green activism	5	2	3	-	-	-	-
Green Modernism Hydroponics	4	-	-	-	-	-	4
Agroecology	-	-	-	-	-	-	-

**Table 2.** The distribution of themes of newspaper articles in different types of newspapers from 1999 to 2014.

Media	Themes						
	Food Subsistence	Land Grab	Organic Food	Green Lifestyle	Green Leisure	Green Modernism	Agroecology
Ming Po	5	49	20	-	14	8	1
Sing Dou Daily	2	36	21	1	4	7	1
HK Economic Daily	-	27	24	5	2	6	-
Economic Journal	1	21	-	2	-	7	1
Apple Daily	2	21	6	-	2	2	-
Commercial Daily	3	14	10	-	5	9	5
Sing Po	1	13	17	-	3	10	3
Sun Daily	1	13	9	-	3	3	1
Tai Kung Po	1	12	13	1	12	12	6
Oriental Daily	1	12	7	1	3	6	1
HK Daily News	-	10	6	-	1	2	-
Wen Wei Po	-	5	12	-	3	6	5
Government News	-	4	3	-	14	11	-
Tian Tian Daily	-	2	-	-	-	-	-
Headline Daily	2	2	6	-	2	1	-
AM730	-	2	-	2	-	-	-
Eastweek	-	2	-	-	-	1	-
ET Net	-	2	-	-	-	-	-
Economic Journal Monthly	-	2	-	-	-	-	-
Think Tank	-	2	-	-	-	-	-
Metro Daily	-	1	4	-	1	1	2
Sky Post	-	1	1	-	-	2	-
Next Magazine	-	1	-	1	-	-	-
Open Magazine	-	1	-	-	-	-	-
Kung Kao Po	-	1	-	-	-	-	-

Finet HK	-	1	-	-	-	-	-	-
Eat & Travel Weekly	-	-	4	-	-	1	-	-
Sharp Daily	-	-	3	-	-	-	-	-
Weekend	-	-	-	3	-	1	-	-
U Magazine	-	-	-	1	-	-	-	-
Jetso	-	-	-	-	1	-	-	-
East Touch	-	-	-	-	-	-	-	2
CUP Magazine	1	-	-	-	-	-	-	-
Ming Po Weekly	-	-	-	-	-	-	-	3

**Table 3.** The number of newspaper articles regarding the nine themes from 1999 to 2014.

Themes	Year (1999-2014)															
	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Food Subsistence	0	0	0	0	1	0	1	0	0	0	0	0	0	2	6	10
Food Security	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land Grab	6	11	14	21	16	20	13	11	7	15	14	16	14	27	39	19
Organic Food	5	9	4	7	2	9	16	9	20	17	14	14	11	11	6	13
Green Lifestyle	0	0	0	0	0	0	1	3	0	0	1	1	2	4	3	4
Green Leisure	0	0	0	0	0	0	0	0	5	4	17	0	10	6	10	20
Green Activism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Green Modernism	3	3	6	6	7	3	3	5	3	4	2	4	2	8	16	21
Agroecology	0	3	2	0	0	3	1	3	0	3	0	4	2	6	1	2

**Table 4.** Models of agricultural development in different historical periods in Hong Kong.

Model	Major Historical Period	Key Stake Holders
Food Subsistence	1950-1960s	Officials, peasants, farmers
Food Security	1960-1970s	Officials, farmers
Land Grab and developers	1980-2000s	Officials, land owners
Organic Food	1990s-now	Activists, conservationists farmers
Green Lifestyle	1990s-now	Conservationists, farmers
Green Leisure	2000s-now	Officials, conservationists, farmers
Green Activism	2000s-now	Activists, rural inhabitants, farmers
Green Modernism	2010s	Officials, investors
Agroecology	2010s	Activists, conservationists

## Findings

### Food subsistence

Before the 1950s, food including vegetables was grown mainly for self-consumptions. Due to the influx of migrants from Mainland China in the 1950s, there was a great increase of Hong Kong's population, thus enhanced the purchasing power of vegetable products<sup>[5,6]</sup>. At the end of the World War II, a large volume of vegetables were demanded for the urban market due to the expanding population<sup>[7]</sup>. Hence, local agriculture mainly played the role of food subsistence at that time. The north part of Hong Kong is the most common area of agricultural activities. The land of the New Territories in Hong Kong has a large collection of grass covered. Which is definitely beneficial to the growing of rice and fruit. There were several agricultural regions in Hong Kong, especially the pineapple fields and rice fields that still widely existed in the 1930s by<sup>[5,8]</sup>. Pineapple fields were prominent in the north and southwest parts of Hong Kong. In the rice fields, most of the land was used for growing rice before 1949 and they were mainly found in a group of villages in East of Sheung Shui, South and West of Ping Shan and Kam Tin. These contributed much to food sufficiency and subsistence in Hong Kong. The average per capita consumption of fresh vegetables in the Colony had increased from the early 1950s to the later 1960s. Vegetable cultivating was the predominant economic activities while livestock keeping remained in small scale. Livestock supply was not as important when compared with vegetable farming in Hong Kong. There were only a few pigs and chickens raised around villages in New Territories mainly for self-consumption<sup>[6]</sup>. The discussion about food subsistence emerged again in recent two to three years. Some green organizations and scholars have asked for higher level of self-subsistence in food, and proposed to set a standard food subsistence rate<sup>[9-11]</sup>. With the bird flu issues in mainland China, the voice of livestock subsistence in Hong Kong kept emerging<sup>[12]</sup>. The government has then started to seriously consider the possibility and necessity of establishing an agricultural park so as promote food subsistence in Hong Kong Commercial Daily.

### Food security

From 1960s, due to the industrial development, starting from the post war period, there were great changes in agricultural

activities in Hong Kong. Agriculture began to shrink as farmers decreased by half from 1961 to 1986 due to industrialization. Although many farmlands were able to provide food to local community in the early 1950s, it was still not sufficient for providing agricultural products to the whole Hong Kong community. Local agricultural products only functioned as supplementary in case of insufficient amount of import food<sup>[5]</sup>. Hence, local agriculture also played the role in ensuring food security. Specifically, there were several factors leading to the insufficient food supply in Hong Kong during 1950-1970. First, owing to the fact that most of the land in Hong Kong was covered with small valleys and hills, it was difficult to develop agricultural activities among the limited land Castle Peak Second, with the rapid development of industry, and farmers were unable to manage large production thus hindered the agricultural development in Hong Kong Castle Peak. Third, many farmers refused to continue to be farmers and young people were no longer willing to be farmers as their career. The average age of the farmers and their employees was over 35 years old with little replenishment from the youth. These factors undoubtedly affected the agricultural activities in Hong Kong. Gradually, Hong Kong was no longer adopting a food subsistence approach and began to rely on Mainland China for vegetables and livestock supply. Since the population had kept increasing from the 1950s, it was not feasible to stick to the local supply only. Almost half of the vegetables were imported from the Mainland Castle Peak. Besides, there were not enough farmers to cultivate rice and vegetables. Apart from the vegetables, Hong Kong residents also needed to rely on the livestock supply from Mainland China. A large part of its meat supply such as pork and chicken came from the Canton Delta Castle Peak, 1977. The number of farmers rearing pig and poultry drastically decreased from 1961 to 1986<sup>[6]</sup>. Which definitely intensified the reliance on the imported food in order to satisfy the high demand for food.

## Land Grab

The land development and housing shortage are the major causes of land grabbing in Hong Kong<sup>[13,14]</sup>. The coverage of farmland in Hong Kong has dramatically decreased from 13000 hectare to 5,100 hectare while over 80% of them are being abandoned and about 1000 hectare of land are being held by property developers<sup>[15]</sup>. It is believed that land policy in Hong Kong is favoring land sales and commercial development instead of developing agriculture<sup>[15]</sup>. According to the AFCD (2012), there were only 1,846 hectares of local farmland, of which about 12.6% was for agriculture land usage. One of the crucial issues was that the landlords try to keep the land for resell rather than renting to farmers due to the huge differences of the profits Produce Green Foundation, Hong Kong Organic Resources Centre. Four major types of land grabbing activities have been identified, which include a) urging to change farm land use; b) changing the land use or even offending the law of land use; c) purchasing farmland as investment; and d) government policy and the Northeast New Territories incidents. Apple Daily tends to support reservation of farm land. Hong Kong Daily News and Hong Kong Commercial Daily tend to prioritize city development over agriculture development. Wen Wei Po and Tai Kung Po tend to support the government's decision on most of the agriculture policies. There have been many voices urging the government to release the restriction on the use of farmland so as to allow for developing properties such as business and residential buildings, or commercial building such as theme park Hong Kong Economic Journal<sup>[16,17]</sup>. Some did propose that release of farmland for building houses was the solution for decreasing the unreasonably high price of residential flats in Hong Kong Hong Kong Economic Journal. Some farmland owners changed the farm use directly. Some might even use the grey area of law to change the farmland use, for example building cemetery<sup>[18,19]</sup>. Some property developers destroyed the farmlands they owned and applied for changing its usage to land that could no longer be cropped<sup>[20]</sup>. Some owners of the farmland even offended the law of land use by building container storage for renting Ming Po disposal of waste Oriental Daily and even by building houses<sup>[21]</sup>. Farm land became a major investment item among property developers. The developers could make money from the farm land if the government has future action on it, such as transferring the land into conservation area or town development Ming Po. Developers would also apply for changing the farmland usage for development projects like business or residential towers Ming Po, Hong Kong Economic Journal, Sing Tao Daily. The proposed policy on the development of the Northeast New Territories was also a focus of the media as the development arrangement would remove the farmlands and displaced the local farmers Sing Tao Daily. Some people even suspected that there were interests transfer between the government and the property developers in the Northeast New Territory developing project<sup>[22]</sup>.

## Organic Food

Organic Food has gained its popularity as more and more people are concerned about the food safety and eating healthy. Some focal issues regarding organic food include a) safety of conventional and organic food; b) advantages of consuming organic food; c) other benefits of organic farming. Both organizations and individuals have devoted effort to promoting organic food and organic living in Hong Kong. In 2000, the AFCD started a project to provide supports for organic farming and developed a standard for organic food production AFCD. Meanwhile, there were organization trying to arouse the public' awareness of potentials of organic food<sup>[23,24]</sup>. Hong Kong Organic Resources Centre, Hong Kong Organic Resources Centre, promoting healthy life style with organic food such as Tofu Produce Green Foundation Honey and other products such as mushrooms<sup>[16,21]</sup>, and other types of vegetarian food Produce Green Foundation. They employed different programs to raise public awareness towards organic food such as Organic Day<sup>[25,26]</sup> and Organic Market, inviting celebrities to share their experiences of having organic food by Produce Green Foundation. In order to release public worries, training courses were developed to enhance their knowledge towards organic food and organic farming Hong Kong Organic Resources Centre, Hong Kong Organic Resources Centre, Hong Kong Organic Resources Centre<sup>[26]</sup>. Apart from organizations, there are also some individuals who devoted to promoting organic living in aspects of farming Club-O, cosmetology of Hong Kong Organic Resources Centre and cooking, enhancing experiences of

original taste or even serving them in raw. Besides, organic food also plays an important role in help lessening global warming and promoting low-carbon lifestyle <sup>[27]</sup>. Related news could be divided into several of the following areas: business potential, authentication, government aid and promotion, as well as the quality of organic food. Specifically, for business potential, organic food had been regarded to have good potential in the food market in these years <sup>[28]</sup>. The emergence of organic food in the Hong Kong market is believed to have brought great potential profits for producers and benefits for consumers . Thus, it has become increasingly popular among consumers in the following years. Although organic food was popular to consumers, the authentication problem also lasted for many years. A lot of news reported that there was lack of regulation on organic food and there had been retailers who claimed their inorganic food mostly vegetable and fish was organic <sup>[29-31]</sup>. There had been voices urging the government to improve the authentication system for organic food <sup>[18,32]</sup>. The quality and the regulation of organic food in the market are still not guaranteed. There were frequent news reporting that the government promoted organic food to local farmers and market. The AFCD irregularly promoted organic plant species and planting method to local farmers <sup>[33,34]</sup> Hong Kong Commercial Daily. As was previously reported, the AFCD further promoted the organic products to the market <sup>[35]</sup>. Apart from that, there are some news concerning on the issue of safety of organic food and claiming that some organic food might have harmful effect to human beings because of the containing elements <sup>[36]</sup>.

### **Green lifestyle**

With improved awareness of the importance of environment protection, more and more Hong Kong residents have tried to shift their living style to green lifestyle these years. Urban farming and rooftop farming were popular activities which promoted a green lifestyle among the citizens in order to counteract the trend of faceless skyscrapers in Hong Kong. There were lots of newspapers showing interest on it in recent years. It is believed that a lot of people like to have their own farming area in the urban area. "City Farm", which was an organic farm being set up on the rooftop of a building in Hong Kong, became very popular and attracted many people to join in each year.

Due to the fact that farmland is limited in supply, it is necessary for people to find alternative farming methods. Rooftop farming contributed to improving the urban greenery; enhance environmental, social and economic sustainability. Although rooftop farming plays increasingly important roles in the promotion of green lifestyle, there was no guarantee for the success of this farming method, which was because there were always threats of space supply.

### **Green leisure**

Green leisure is about applying green idea into leisure life for the public such as holiday farm and farmers' market. The term "Agro-Tourism" is one of the popular leisure activities in Hong Kong. Farmlands were to be transformed to provide experiential learning, leisure and retailing for the citizens rather than only focusing on production <sup>[37]</sup>. It was not only the farmers who started developing their new business, but also the public began to go back to enjoy the nature. More and more people were willing to become holiday farmers and have their own piece of land <sup>[38]</sup>. Besides, the Kadoorie Farm and Botanic Garden (KFBG) also provided various activities to raise the public awareness and develop their interests towards the nature. In addition, chances for experiencing farming and interaction with animals and workshops for sustainable agriculture and living were also provided for people to learn something through their leisure activities (KFBG, 2014a; KFBG, 2014b; KFBG, 2014c). There were two critical events concerning green leisure reported by the media. The first event was that the government proposed to develop green leisure in the border restricted area in 2009, which aroused the public discussion. The second one was that the government proposed to build an agriculture park with expectation to help promoting the development of green leisure. Related news could be summarized into several categories, including government policy, urging to promote leisure farming of the public, discussion on the potential to develop leisure farming and the agriculture park. The stakeholders have kept urging the government to take actions to promote green leisure Ming Po. Including reserving area for leisure farming and releasing restriction for developing leisure fisheries <sup>[39]</sup>. The opinions about the potential of developing green leisure and leisure farming are mixed. In 2011, considering that the government policy seemed to promote green leisure, the media claimed that green leisure has potential for development <sup>[40]</sup>. However, in 2013 and 2014, the views towards green leisure tend to be negative <sup>[41]</sup>. Recently, in 2014 the government claimed that the agriculture park can help promote the development of green leisure in Hong Kong.

### **Green activism**

Green activism included two aspects. The first aspect is about the protest against the government policy such as Choy Yuen Village and Long Yuen conservations movement <sup>[42]</sup>. There were also some publications that suggested that more balance was needed for the ecology, agricultural and farming development <sup>[43]</sup>. The second aspect is more about daily living and environmental protection including community work to raise public's awareness, promoting organic and natural life, proposing various ways to deal with pollutions issues and sustainability of spatiality <sup>[44]</sup>. Which was related to the theme of green lifestyle.

### **Green modernism / Hydroponics**

Green modernism refers to the application of new agriculture technologies. AFCD introduced certain techniques and skills on farming and tried to develop new ways of agriculture. The techniques of hydroponics were firstly proposed by the government, which was a method of cultivation without using soil as the growing medium and was often in a controlled-environment of

greenhouses, claiming that it could help solve the problem of inadequacy in land in Hong Kong. Other than hydroponics, AFCD also promoted technologies on controlled environment greenhouses in Hong Kong to explain the structure, facilities, investment and greenhouses agricultural productivity, related pests issues and hygiene factors. The news about hydroponic planting in Hong Kong has emerged since 2009. The government proposed to build the Controlled Environment Hydroponic Research and Development Centre (CEHRDC) center in 2011. The comments on hydroponic planting and on CEHRDC were mixed, with some claimed that hydroponic vegetables were hygienic, healthy and unpolluted<sup>[45,46]</sup>. Apart from that, some civil organizations working on agriculture technology were found in these years, for example Fishing Agriculture Promotion Association of Technology and the Hong Kong Organic Resource Centre. In addition, there were also private farmers, shopping malls and theme parks<sup>[47]</sup>. Promoting hydroponic planting and crops. Hydroponic planting was anticipated by some as the future trend of agriculture by the media.

### **Agroecology/ organic farming**

Due to the problem of food safety in China which covered high portion of imported food in Hong Kong, organic farming became the solution to tackle with the food safety problem and more and more people prefer food from organic farming. Local organic food was perceived to be safer with good quality when compared with the imported food from China<sup>[48]</sup>. Hence, organic farming had grown steadily to meet the increasing demand for organic food in Hong Kong, attracting more media attention. Organic farming is defined as a holistic production management system which promotes and enhances agro ecosystem health, including biodiversity, biological cycles, and soil biological activity, which is a kind of environmental-friendly planting methods. Organic farming produces organic food especially vegetables without artificial materials such as preservatives or irradiations and it is relatively harmless to the environment by using organic farming<sup>[49]</sup>. Although there was a decrease on the scale of the local agriculture because of the modernization in Hong Kong since last century, new ideas such as environmentalism which promoted organic farming and organic food had become increasingly active in dealing with the food safety problem. Urban residents seemed to have paid more attention on food safety issue and be more attracted to those organic food and organic agriculture<sup>[50]</sup>.

## **DISCUSSIONS AND IMPLICATIONS**

With an extensive literature review, we have noted that the development of agriculture is not a linear process while the role of agriculture is changing greatly in different historical and social-economic context. The identification of the nine themes regarding the development and roles of agriculture can inform effective policy and practice strategies for further fostering a more balanced, modernized and sustainable development of local agriculture in Hong Kong.

### **Potential trends of agriculture development in Hong Kong**

Health concern might be one of the major forces that motivate the general public to pay more attention to green lifestyle, organic food and green leisure. Hence, organic food and healthy lifestyle will remain their popularity and importance for the coming years. Green leisure and farmland that offer more natural and practical experiences for individuals will attract families to join their activities in weekends, which will in turn raise their awareness towards green lifestyle<sup>[51]</sup>. Although biodiversity in general and agroecology in specific may become an increasing concern of the government, urban sprawl and ecological damage problems are never remedied by the government. Inappropriate land provision, use of farmland, even land grab brings negative effect to the existing ecology. Besides, since there was not much support provided for the farmers regarding the current farming policy, lack of available and suitable land for farming, high cost and urban development hinders the development of local agriculture, which will be the key concerns and social issues for Hong Kong, for instance, the Choi Yuen Village. In addition, greener activism not only on land issues, but also on green lifestyle and agroecology may be provoked in the future.

### **Sustainable development of agriculture in Hong Kong**

Over-reliance on the imported food would be relatively unstable and insecure. Hence, there is urgent need for urban planners to make decision and achieve the cooperation between stakeholders about the long-term and sustainable strategies for local agriculture policy and sound managements<sup>[50]</sup>. Besides, in order to make a sustainable development in agriculture in Hong Kong, the alternative farming practices in tackling with the unfavorable farming conditions is also needed to be explored and developed. Hong Kong government also proposed a package of measures for developing local agriculture, including setting up a Sustainable Agricultural Development Fund (SADF) to provide the necessary financial support to facilitate the development of modern, sustainable and urban agriculture in Hong Kong. Concerns are however raised upon whether the new policy only favour agro-business and large farms rather than smallholders which still widely exist in the field.

### **Challenges in organic food market in Hong Kong**

There are several challenges for the promotion of organic food in Hong Kong. As the consumer survey conducted by the Hong Kong Organic Resource Center (2011) showed, the high price of organic products was the main reason of the respondents who had never purchased organic products<sup>[52]</sup>. Younger people took more responsibility on environmental protection and supported organic farming; however, they could not afford the high price of organic food<sup>[53,54]</sup>. Besides, the organic certification may not be suitable for enhancing the local organic food market and community. Insufficient official channels for promoting and distributing organic products was also another barrier in developing organic market in Hong Kong. Therefore, some suggestions for generating

an orderly and healthy organic market are proposed here. Firstly, it is worth considering changing from traditional farming to organic farming in agricultural methods so as to meet the needs for environment protection and food safety on the one hand, and promote healthy living lifestyle in Hong Kong on the other. Collaborations or active engagements with urban consumers are a necessary move for the farmers to promote the inclusion of organic food even organic farming in the local market. There is space for further refinement of the collaboration among organic farmers, labeling organizations and wholesale/retailers in order to raise the public awareness of the organic food as well as organic farming <sup>[55]</sup>.

### **Effect of policy on Northeast New Territories and suggestions**

There might be a vicious cycle of the government planning policy on developing the Northeast New Territories. Since the AFCD just plays a facilitating role and it will be up to the farmers and the landowners to negotiate and enter into tenancy agreements, some landowners would prefer leaving their farmland fallow rather than leasing out for farming use due to the low rental return, which will hinder the sustainable development of local agriculture. Hence, there is of urgent need for the government and policy makers to refine the relevant policy measures so as to ensure the stability of the land use for agriculture and protect the interest of the farmers <sup>[56]</sup>. Besides, future policy direction regarding the development of the New Territories should be focused more on protecting the environment as well instead of just concerning about the housing issues. The farmland used to serve as a bridge that linked the community together such as “Manobo farmland”, should now serve the vital functions as food supply, and transmitting ecological and economic values, offering various working opportunities and platforms for people to return to nature in the process of urban development. This research has presented an overview of the development of agriculture in Hong Kong from a historical and developmental perspective. Future studies are greatly needed to facilitate a better understanding of views of different stakeholders on the roles of agriculture, to contribute to a more modernized and sustainable agriculture system with innovations, and to inform policy and practice for fostering a more balanced development of agriculture and economy in Hong Kong.

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