



1. Introduction

1.1 Agriculture and fisheries ("AF") sector takes up less than 0.1% of GDP and 0.5% of total employment in Hong Kong, but it plays an important role in the local supply of fresh vegetables, poultry and fish.¹ However, AF practitioners are prone to damage and losses arising from multiple risks, including (a) weather-related risks (e.g. typhoons, floods, frost and drought); (b) contagious livestock diseases (e.g. avian flu and swine fever); and (c) other disasters (e.g. red tides and water pollution). Although the Government offers relief payments to affected farmers and fishermen at times of emergency, the average amount of such payments was only HK\$6,074 per application in 2018.² This was deemed to be very modest compared with the huge amount of agricultural losses. Taking fishermen as an illustration, the average loss of those fishermen receiving relief payments amounted to HK\$165,000 in 2018.³ Moreover, many AF practitioners find it difficult to restart the business in face of huge amount of post-disaster reinvestment. The AF sector has thus repeatedly urged the Government to provide further financial protection against such agricultural risks, such as establishing an "agricultural insurance scheme" widely seen in other places.⁴

1.2 At the request of Hon Steven HO Chun-yin, the Research Office has undertaken a study on agricultural insurance implemented in selected places

¹ AF activities are abbreviated as agriculture in this note, covering farming, fishing, poultry and livestock keeping. See Agriculture, Fisheries and Conservation Department (2018).

² Analysed by sub-sector, the average amount of grant per approved application was HK\$4,253 for agriculture and HK\$15,090 for fisheries in 2018.

³ The agricultural loss of farmers at times of disasters could be up to hundreds of thousands dollars, although the Government does not compile the statistics on such loss. Taking Typhoon Mangkhut in September 2018 as an illustration, an organic farmer in Yuen Long reported that all his farming facilities and farmland were destroyed, with a total loss of some HK\$500,000. See 香港 01(2018).

⁴ In the Asia-Pacific Region alone, 44 places had established the agricultural insurance scheme by 2010. See Food and Agriculture Organization of the United Nations (2011).

to mitigate risks faced by farmers and fishermen. South Korea and Taiwan are selected for the study because (a) the AF sector in these two Asian places is relatively small; (b) the AF sector there is dominated by smallholders who are especially vulnerable to agricultural risks;⁵ and (c) agricultural insurance schemes have been progressively introduced in these places over the past two decades. The structure of this information note begins with a review of the risks faced by the AF sector and government support schemes available in Hong Kong, followed by a discussion of recent global developments of agricultural insurance and pre-conditions for establishing such a scheme. It then switches to the agricultural insurance schemes in the two selected places, along with a comparative table for easy reference (**Appendix**).

2. Relief measures for the agriculture and fisheries sector in Hong Kong

2.1 During 2007-2017, the value added generated from the local AF sector went up at an average annual rate of 5.5% to HK\$1.74 billion, slightly faster than the respective growth of 4.9% of overall GDP.⁶ The number of persons engaged in the AF sector also increased, though marginally, by 0.1% annually on average over the past decade to some 18 100 in 2017, compared with the corresponding growth of 0.9% in total employment. As Hong Kong is a highly urbanized and service-oriented metropolitan city, the relative contribution of AF activities has declined to less than 0.1% of overall GDP and 0.5% of total employment in 2017. This notwithstanding, the AF sector is still playing a vital role in local food supply chain, meeting 2% of local consumption of fresh vegetables, 4% of fresh water fish, 8% of live pigs, 33% of marine fish and 99% of live poultry, according to Agriculture, Fisheries and Conservation Department ("AFCD").⁷ More recently, there has been growing appreciation over local supply of quality food (e.g. organic vegetables) and the role played by the AF sector in preserving rural environment in the city.⁸

2.2 That said, local AF practitioners have been facing multiple challenges from various fronts, such as increasing farmland shrinkage, polluted marine

⁵ Farm size averages at around 1.5 hectares in South Korea and 1 hectare in Taiwan, compared with 0.3 hectare in Hong Kong. They are far smaller than that of 179 hectares in the United States and 17 hectares in the European Union.

⁶ More specifically, farming and livestock keeping took up about one quarter of the production value of AF sector in 2017, while fisheries accounted for three quarters. There were some 4 300 farmers and 13 800 fishermen or fish farmers in the same year.

⁷ Agriculture, Fisheries and Conservation Department (2018).

⁸ Agriculture, Fisheries and Conservation Department (2015).

resources, inadequate workers, and competition from agricultural imports predominantly from the Mainland.⁹ Above all, AF activities are subject to an exceptionally high degree of business risks induced by bad weather, climate change and outbreaks of contagious diseases amongst livestock. For instance, the strike of Typhoon Mangkhut in September 2018 reportedly damaged some 70% of farming facilities and 90% of crops in Hong Kong, resulting in an average loss of HK\$100,000-HK\$200,000 amongst medium-sized farms, and HK\$0.5 million-HK\$1.0 million amongst larger farms.¹⁰ Moreover, based on the statistics of AFCD, for the 574 approved applications for emergency relief submitted from the fisheries sub-sector in 2018, their total amount of loss was HK\$95 million, averaging at HK\$165,000 per application.¹¹

2.3 The Government currently offers three major schemes to assist agricultural practitioners hit by natural disasters (e.g. fire, flood and typhoon) and epidemics (e.g. swine fever), as summarized below:

- (a) **Emergency Relief Fund ("ERF"):** Under the ERF Ordinance (Cap. 1103) enacted in 1962, needy farmers and fishermen can apply for emergency grants under ERF for rehabilitation of their operations after natural disasters. Key eligibility criteria include (a) small scale farmers or fishermen; (b) at least 50% of income sourcing from farming or fishing; and (c) damage affecting more than one-third of the farm.¹² In 2018, a total of HK\$20.7 million was granted to 3 415 applications, with an average amount of grant of HK\$6,074 per application (**Figure 1**);
- (b) **Low-interest agricultural loans:** While farmers and fishermen can always apply for low-interest credit from three loan funds administered by AFCD for general purposes, special loans can be extended to AF practitioners affected by disasters under Kadoorie Agricultural Aid Loan Fund ("KAALF") on an occasional basis.¹³ In 2016, altogether three loans totalling HK\$0.54 million were extended to fish farmers affected by red tides; and

⁹ GovHK (2016a) and Agriculture, Fisheries and Conservation Department (2017).

¹⁰ 香港商報 (2018)。

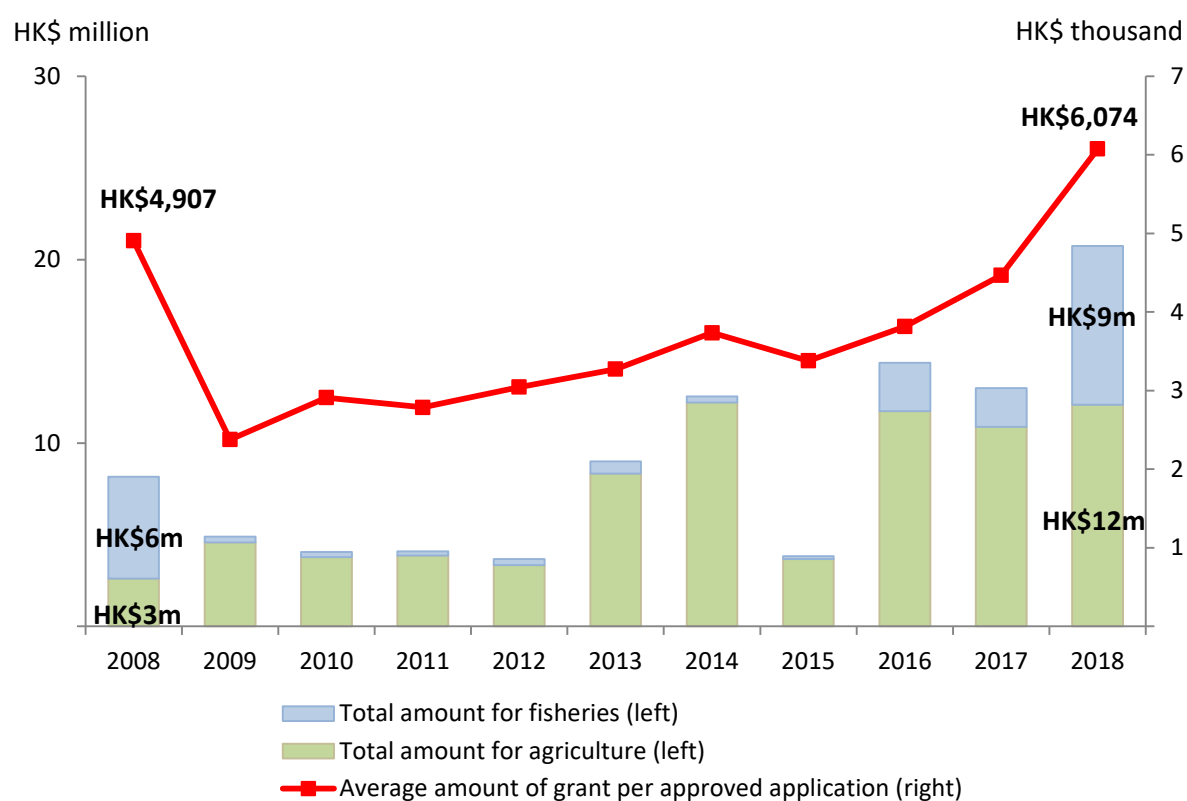
¹¹ Figures provided by AFCD include losses of recipients of the Emergency Relief Fund only.

¹² The damage threshold does not apply to fishermen as their relief payments are calculated on the basis of damaged or lost vessels and fishing gear. See Trustee of Emergency Relief Fund (2018).

¹³ The three funds are the Kadoorie Agricultural Aid Loan Fund, the J.E. Joseph Trust Fund and the Vegetable Marketing Organization Loan Fund.

(c) **Compensation of livestock culled amidst epidemics:** According to the Public Health (Animals and Birds) Ordinance (Cap. 139) last amended in 2008, statutory compensation must be made to owners for animals and birds culled by order due to epidemics, but subject to a payment ceiling. On top of that, ex-gratia payments are made to cover the difference between the market price and the statutory limit in order to alleviate direct financial loss of the owners caused by culling. Most recently in 2019, the Government had to pay a total of HK\$40 million for 10 000 pigs culled in two operations upon the outbreak of African Swine Fever in May 2019.¹⁴

Figure 1 — Relief payments to farmers and fishermen under ERF, 2008-2018



Source: Agriculture, Fisheries and Conservation Department.

¹⁴ For instance, the compensation value of a pig slaughtered shall not exceed HK\$300 per head by law. In the outbreak of the African Swine Fever in May 2019, the market prices of pigs reportedly ranged between HK\$2,500-HK\$5,000. The Government had to make an ex-gratia payment of HK\$3,466 per head to cover the shortfall, on top of the statutory ceiling of HK\$300. See Food and Health Bureau (2019).

2.4 Nonetheless, the AF practitioners feel that these schemes cannot meet their needs, with the following issues of concerns. **First**, the relief grants under the ERF Ordinance "are meant for relief but not compensation" of the financial loss.¹⁵ **Secondly**, relief payments averaged at only HK\$6,074 per application in 2018, which was small compared with five to six-digit loss frequently reported by AF practitioners.¹⁶ Such payments cannot help farmers and fishermen to resume business after disasters. **Thirdly**, as grants and loans are open for application only at times of severe disasters, the threshold is deemed to be too high for other risks faced by the AF sector.¹⁷ In view of the caveats of the existing schemes, some local farmers and fishermen call for more disaster protection measures, such as setting up an agricultural insurance scheme in Hong Kong. However, the Government responded in 2016 that a "commercially viable insurance scheme" for the agriculture sector was not established in Hong Kong because of its small scale.¹⁸

3. Global developments of agricultural insurance schemes

3.1 Globally, post-disaster relief payments are generally considered to be too modest and unable to assist AF practitioners to manage agricultural risks in an effective manner. Instead, agricultural insurance is increasingly adopted in many places around the globe as a collective risk management tool, pooling together and sharing agricultural risks faced by participating practitioners. While the modern form of agricultural insurance was first seen in Japan in 1929, it has spread to at least 104 places around the world.¹⁹ During 2005-2018, global premium for agricultural insurance tripled to US\$29.3 billion (HK\$230 billion), representing about 0.9% of agricultural GDP in the world.²⁰

¹⁵ GovHK (2016b).

¹⁶ There are upper limits on total payment for damaged items under ERF, irrespective of loss in each disaster. These payment ceilings include HK\$9,080 for pigs, HK\$5,670 for birds, HK\$11,580 for crops and HK\$28,590 for farm buildings. For fish farms affected by red tides in 2016, they reportedly received HK\$3,000-HK\$11,000 only. See Agriculture, Fisheries and Conservation Department (2019) and South China Morning Post (2016).

¹⁷ 香港農業聯合會 (2018)。

¹⁸ GovHK (2016b).

¹⁹ Publicly managed agricultural insurance schemes began to emerge in the late 1920s, such as the livestock insurance programme in Japan in 1929 and the Federal Crop Insurance Program in the United States in 1938.

²⁰ Globally, some 198 million farmers were covered by agricultural insurance in 2014, taking up one-third of agricultural population. Premium statistics are gathered from various sources. See Adroit Market Research (2019), Food and Agriculture Organization of the United Nations (2011) and World Bank (2019a and 2019b).

3.2 Applying the insurance principle, agricultural risks faced by individual farmers can be transferred to insurers for collective management, upon paying a premium which is usually below 10% of the claimable compensation.²¹ Insured farmers can lodge claims for indemnity usually in a range of 60%-95% of the agricultural loss. The insurance premium collected can then be deployed to meet the administrative expense and indemnity settlement.²²

3.3 Key features of agricultural insurance are briefly summarized below:

- (a) **Coverage of agricultural products:** A wide range of crops, livestock and fish are insurable.²³ Yet crop insurance is the most prevalent, accounting for 90% of global premium of agricultural insurance. Livestock insurance comes next, with a share of 10%;²⁴
- (b) **Type of risks and disasters insured:** Agricultural insurance can cover a wide range of risks arising from natural disasters and epidemics (including those commonly seen in Hong Kong);
- (c) **Compulsory or voluntary participation:** Based on a dedicated study conducted over 65 countries with agricultural insurance by World Bank in 2008, 13% of the surveyed countries (e.g. China, Japan and the Netherlands) made participation compulsory in either crop or livestock insurance schemes.²⁵ By and large, compulsory participation can provide benefits such as (i) creating a larger insurable portfolio; (ii) lowering premium rates on the back of economies of scale; and (iii) minimize adverse selection.²⁶

²¹ While averaging at 3.4%-6.3% usually, the premium rates can be as high as 20% for insurance policies covering multiple perils and high-risk crops. See World Bank (2009 and 2010).

²² There are two types of agricultural insurance products. For the traditional indemnity-based policies, insurers pay the insured based on value of agricultural loss due to disasters, involving complicated and time-consuming assessment of actual losses. More recently, index-based policies have emerged, compensating the insured farmers based on relevant parameters (e.g. temperature, rainfall or wind speed), not the actual losses. See World Bank (2005).

²³ Insurance for capture fisheries mostly involves vessel insurance which is not linked to production loss, and thus is not covered in this note.

²⁴ World Bank (2019a).

²⁵ In most cases, compulsory agricultural insurance is targeted at a specific type of products or risks, such as major staple crops in Japan and epidemic diseases in China and the Netherlands. See World Bank (2010).

²⁶ For those voluntary insurance schemes, they tend to attract those practitioners subject to higher agricultural risk, while those with lower agricultural risk may opt out to save premium expense. Adverse selection undermines financial sustainability of voluntary schemes.

On the other hand, voluntary participation was seen in 77% of the countries (e.g. South Korea and Australia), giving more choice to farmers.²⁷ For the rest of 11% of countries, participation was in general voluntary, but compulsory for farmers or fishermen taking loans;

- (d) **Private or public insurance providers:** Based on the same study of the World Bank, most of the agricultural insurance schemes were operated by private insurance providers, accounting for 91% of the surveyed countries (e.g. Australia, South Korea and the United States) in 2007. The rest of 9% were run by governments.

While pure private sector initiatives may be able to reflect agricultural risks more accurately, the market-based premium could be too high for insured farmers. Coupled with the fact that the huge indemnity could be far beyond the affordability of private insurance companies at times of catastrophe, it requires substantial government involvement such as reinsurance (i.e. settlement of claims over a specific threshold). About 32% of the surveyed places were backed up by government reinsurance (e.g. China, South Korea and the United States);²⁸

- (e) **Agricultural insurance mostly commercially unsustainable on a stand-alone basis:** Premium pricing in agricultural insurance needs to balance two objectives, namely affordability for the insured farmers and financial sustainability of the insurers. Premium calculation requires sophisticated actuarial techniques based on a long time series of high-quality agricultural and weather data, taking into account loss frequency and loss severity of the underlying risk for estimation of annual expected loss.

²⁷ World Bank (2010).

²⁸ According to overseas experiences, failure for government to provide reinsurance may make risk-pooling infeasible and drive private insurers and reinsurers out of the market. See Food and Agriculture Organization of the United Nations (2011) and World Bank (2010).

As a guideline on sustainability of an insurance scheme and taking account of administrative costs, the "**producer loss ratio**" (i.e. the ratio of total indemnity claims to premium revenue collected from AF practitioners, excluding government subsidies) should not exceed 70%-75% on a long-term basis. Based on data of the World Bank study, it was estimated the producer loss ratio of all agricultural insurance schemes taken together was as high as 163% in 2007, more than twice the break-even threshold. This shows that premium collected from farmers and fishermen cannot meet the payouts on a standalone basis.²⁹

Inclusive of government subsidies, an alternative indicator of "**loss ratio**" of global agricultural insurance operators as a whole stood at 77% in 2007. This significant improvement was due to government subsidies, however; and

- (f) **Substantial government subsidies on premium:** Premium subsidy is the norm in global agricultural insurance, accounting for 63% of countries with crop insurance, according to World Bank. Annual premium subsidies amounted to US\$6.6 billion (HK\$51 billion) in 2007, representing as much as 44% of the global agricultural premium.³⁰

This apart, other forms of subsidies are also offered to enhance penetration of agricultural insurance. For instance, there was US\$1.5 billion (HK\$12 billion) of subsidies on administrative costs in running the insurance schemes and US\$2.2 billion (HK\$17 billion) to assist insurers in claims settlement in 2007. Together with other forms of subsidies, annual global subsidies to agricultural insurance increased to over US\$20 billion (HK\$157 billion) in 2019.³¹

²⁹ The calculation is based on data of World Bank. See World Bank (2010).

³⁰ China and the United States have some of the largest subsidized agricultural insurance schemes which have continued to expand since 2008. See World Bank (2010 and 2019a).

³¹ World Bank (2010 and 2019a).

3.4 By and large, ***agricultural insurance schemes can provide a host of benefits to AF practitioners.*** *First*, the compensation to farmers and fishermen is proportionate to the magnitude of agricultural loss. As indemnity payments usually fall within the range of 60%-95% of loss, they provide income security to farmers and enable them to restart the business after disasters. *Secondly*, as agricultural insurance is a risk management tool, its nature is entirely different from disaster relief payments. *Thirdly*, farmers can play their part in risk sharing and prevention, as premiums reflect past trends of claims. *Fourthly*, the government can transfer some of the risks to private insurers, despite premium subsidies.

3.5 That said, ***agricultural insurance has its own limitations.*** *First*, while it can facilitate risk sharing, it cannot cover unexpected, unquantifiable and uninsured risks (e.g. such as post-harvest storage losses). *Secondly*, premium subsidies and other subsidies could become a fiscal burden for governments over time. *Thirdly*, even with agricultural insurance, many governments are still providing disaster assistance to AF practitioners at times of catastrophe. *Fourthly*, it cannot address the problem of agricultural poverty. As such, the United Nations acknowledges that "agricultural insurance is not a panacea".³²

3.6 Based on the above, it appears that ***setting up an agricultural insurance scheme requires many pre-conditions.*** *First*, the size of insured population in the agricultural sector should be sufficiently large for pooling and sharing the risks. *Secondly*, the agricultural risks should occur frequently enough for risk quantification and premium calculation. *Thirdly*, there should be prima facie case for commercial sustainability of such schemes, otherwise private insurance companies would be reluctant to go into this line of business and bear the cost of initial investment. *Fourthly*, heavy government intervention is critical for agricultural insurance, mostly in the form of (a) being the insurance or reinsurance providers; (b) providing up to almost half of the premium to the farmers; or (c) subsidizing administrative costs, set-up costs and infrastructure for implementation.³³

³² Food and Agriculture Organization of the United Nations (2011).

³³ Successful agricultural insurance programmes also require: (a) regulatory framework to ensure payments by insurers; (b) large databases on yield and disasters for correct pricing of premiums; and (c) a pool of experts to design products and assess damage after disasters. All these require government intervention. See Food and Agriculture Organization of the United Nations (2011) and World Bank (2010 and 2019a).

4. Agricultural insurance scheme in South Korea

4.1 In South Korea, the relative contribution of the overall AF sector to the overall economy has registered steady downtrend amidst continued industrialization and urbanization over the past two decades, with its share in GDP falling from 4.5% to 2.0% during 1997-2017, and its share in total employment from 10.8% to 4.8%.³⁴ However, as agricultural employment still stood at a high level of 1.3 million, the South Korean government provides heavy direct subsidies to its farmers, amounting to US\$24.6 billion (HK\$192 billion) in 2017 and representing as much as 1.6% of GDP or 90% of agricultural budget of the country. Around nine-tenths of these subsidies are price subsidies for agricultural products in face of keen competition from agricultural imports under globalization of food trade. Based on a recent study of the Organisation for Economic Co-operation and Development ("OECD"), these government subsidies and support account for as much as half (52%) of the gross farm receipts in South Korea, almost three times the average figure of the member states of OECD.³⁵

4.2 More specifically on agricultural risks, annual reports of extreme weather increased by 141% during 1995-2015 to 1 439 incidents, dampening agricultural production.³⁶ Similar to Hong Kong, the South Korean government used to provide direct relief payments to AF practitioners affected by natural disasters before the late 1990s, along with agricultural loans, subsidies for seeds and fertilizers and tax concessions. However, the AF practitioners reiterated that these measures were inadequate to cover the huge losses. In response, the South Korean government sponsored the development of agricultural insurance by phases, starting with livestock insurance in 1997, followed by crop insurance in 2001 and aquaculture insurance in 2007.

4.3 With the legislation of the Agricultural and Fishery Disaster Insurance Act in 2009, agricultural insurance in South Korea has statutory backing. Here are the salient features of such agricultural insurance schemes:

³⁴ World Bank (2019b).

³⁵ Support to fisheries is relatively low, amounting to US\$426 million (HK\$3,302 million) in 2015, with 12% being direct transfers to fishermen in form of low-interest loans and payments to buy back vessels. See Organisation for Economic Co-operation and Development (2017a and 2018a).

³⁶ Park and Kim (2017).

- (a) **Coverage of agricultural products:** After years of expansion, the three insurance programmes covered a total of 91 types of agricultural products by 2018 (i.e. 56 crops, 16 types of livestock and 19 types of fish).³⁷ The coverage is based on considerations such as scale of agricultural activities, need of practitioners and technical feasibility;
- (b) **Type of risks and disasters insured:** The programmes cover a wide range of agricultural risks (e.g. typhoons, frost and hail for crops; diseases for rice, livestock and fish; and red tides for fish);
- (c) **Voluntary participation:** Although participation is voluntary, it is welcomed by the AF sector. Taking the crop insurance as an example, the insurance penetration rate in terms of the area of farmland covered has almost doubled from 17.5% in 2001 to 33% in 2018;
- (d) **Public-private partnership:** While all three types of insurance (i.e. for crops, livestock and aquaculture) are provided by private insurance companies, the crop insurance operates as a co-insurance pool for economies of scale. The pool is managed by one company assigned by the government, while premiums and claims are allocated among participating insurers based on their share of investment.

The government also plays an active and direct role as the reinsurer of last resort through catastrophic stop loss protection, covering claims exceeding a loss ratio of 150%-180%;³⁸

- (e) **Substantial government subsidies:** On top of underwriting loss exceeding the ratio of 150%-180%, the South Korean government supports the agricultural insurance schemes by subsidizing more than half of the insurance premiums in 2017, for instance with 50% borne by the central government and 32% in average by

³⁷ On top of that, there is insurance for agricultural facilities. See Agricultural Policy Insurance and Finance Service (2019) and Korea Re (2015).

³⁸ After two super typhoons which led to a loss ratio of 434% in 2002 and 291% in 2003, the South Korean government has started to provide reinsurance to private insurers since 2005. At present, the government pays for losses exceeding a specific loss ratio, which varies from 150% to 180% according to the past risk record of the insured crop. For losses below the threshold and above 110%, the risk is absorbed in the private local and international reinsurance market. See 行政院農業委員會農糧署 (2015).

regional governments for crop insurance in 2017. Apart from this, the government also funds 100% of the operating cost of crop insurance and 50% of livestock insurance;

- (f) **Low premium paid by farmers:** Netting out the above subsidies, farmers need to pay only 18% of the market cost of premiums. In 2017, each insured farm paid an average premium of about 322,100 won (HK\$2,222), representing just about 0.8% of the average annual income of a farming household;³⁹
- (g) **Ratio of indemnity:** The insurance policies are indemnity-based, covering 60%-100% of agricultural loss, whereas policy holders need to bear the rest of the loss (i.e. deductibles). Deductibles can be lowered for those policy holders without claim records before; and
- (h) **Eligibility for traditional disaster assistance:** For crop insurance, policy holders are not eligible for traditional post-disaster subsidies. For aquaculture insurance, policy holders can apply for such assistance only when their loss exceeds 30 billion won (HK\$213 million).⁴⁰ For livestock insurance, the government continues to make direct compensation for animals killed and property damaged in nationally-notified epidemic diseases and provides loans for restocking, while the insurance scheme covers loss caused by other diseases.⁴¹

4.4 The agricultural insurance schemes appear to help AF practitioners in South Korea to manage agricultural risks, though with huge government cost. **First**, the total premium (including subsidies) of crop insurance surged from just 3 billion won (HK\$18 million) in 2001 to 550 billion won (HK\$3.9 billion) in 2018 (**Figure 2**). **Secondly**, the agricultural insurance schemes have covered 33% of crops (with a particularly high rate of 67% for high-value fruits such as apples and pears), 93% of livestock and 30% of fish.⁴² **Thirdly**, total claims of 1.7 trillion won (HK\$11 billion) have been paid to some 200 000 farms during

³⁹ The premium rates are determined by the public entity Korea Insurance Development Institute on the basis of (i) insured amount; (ii) previous loss rates; and (iii) deductibles.

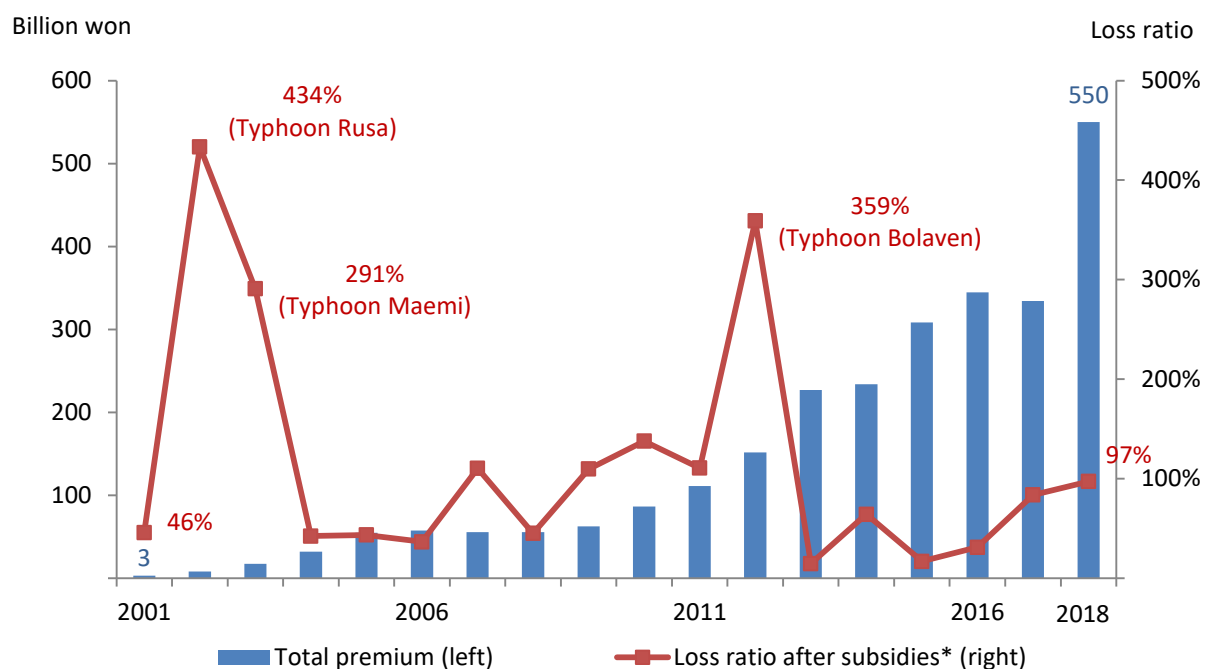
⁴⁰ 行政院研究發展考核委員會 (2011)。

⁴¹ Organisation for Economic Co-operation and Development (2017b).

⁴² Penetration rates are calculated on the basis of farm area for crops and fish and number of animals for livestock. See Agricultural Policy Insurance and Finance Service (2019) and Korean Re (2015).

2001-2017 for crop insurance alone, contributing to more stabilized farming receipts after disasters. **Fourthly**, a study shows that the crop insurance reduces income loss of insured fruit farmers by 74% compared with uninsured farmers at times of disasters.⁴³ **Fifthly**, while the annual average loss ratio (after subsidies) had shot above 130% during 2009-2013, financial sustainability of the insurance schemes seemed to have improved noticeably in the more recent years.⁴⁴ During 2014-2018, the annual loss ratio of crop insurance averaged at only 63%, largely due to reduced incidence of natural disasters and increased premium receipts. This was below the break-even threshold of 70%-75%. **Sixthly**, improved financial situation of the insurance schemes is partly due to heavy annual government subsidies, which increased by 16 times in 14 years to 285.3 billion won (HK\$2 billion) in 2015 and constituted a fiscal burden to the South Korean government.⁴⁵

Figure 2 — Key indicators of the crop insurance programme in South Korea



Note: (*) During 2015-2018, the loss ratio excluding subsidies (i.e. producer loss ratio) averaged at 346%. Data for longer time series are not available.

Sources: 行政院農業委員會農糧署 (2015) and Agricultural Policy Insurance and Finance Service (2019).

⁴³ Park and Kim (2017).

⁴⁴ Huge losses or insurance claims during 2009-2013 were due to hail in 2009, frost in 2010-2011 and Typhoon Bolaven in 2012. See Kim (2013).

⁴⁵ The amount included subsidies on premiums and administrative costs for both crop and livestock insurance schemes. See Organisation for Economic Co-operation and Development (2018b) and Park and Kim (2017).

5. Agricultural insurance scheme in Taiwan

5.1 Similar to South Korea, the relative size of the AF sector in Taiwan also diminished during 1997-2017, with its share in GDP falling from 2.4% to 1.8%, along with a decline in total employment from 9.6% to 4.9%. That said, the AF employment in Taiwan still amounted to some 557 000 in 2017. Coupled with enhanced productivity, the AF output witnessed a 69% rebound to NT\$310 billion (HK\$81 billion) during 2003-2017. Also, it contributed to a self-sufficiency rate in agricultural products of over 30% in recent years.⁴⁶ The Taiwanese government provided direct subsidies of some NT\$48 billion (HK\$12 billion) to farmers as income support in 2018, on top of other support (e.g. agricultural insurance subsidies). This is meant to improve the livelihood of AF practitioners on the one hand, and to recognize the role of the local AF sector in domestic food supply and development of the food industry on the other.⁴⁷

5.2 The AF sector in Taiwan is prone to natural disasters, with an annual average loss of NT\$14 billion (HK\$3.4 billion) during 2008-2017. Before the mid-2010s, the Taiwanese government only offered relief payments to such AF practitioners, averaging at NT\$3.3 billion (HK\$831 million) per annum during the same period, and representing just 24% of the loss. While insurance schemes have been launched for pigs and cattle through farmers' associations for more than 60 years in Taiwan since 1954, they were not extended to crops until 2015 on a pilot basis (and further to birds and aquaculture in 2017), largely due to challenges in quantifying loss and premium rates.⁴⁸

5.3 Based on limited publicly available information on the pilot schemes of agricultural insurance rolled out during 2015-2018, the key features of the schemes in Taiwan are summarized below:

- (a) **Coverage of agricultural products:** On top of the insurance for pigs and cattle since 1954, the pilot schemes have extended to a total of 15 categories of insurance products by June 2019. More specifically, they cover at least 10 types of crops, 4 types of

⁴⁶ The self-sufficiency rate is defined as: production as measured in calories/(production + imports - exports).

⁴⁷ The entire agricultural food chain in Taiwan (comprising AF sector, food manufacturing and services) contributed to 7.5% of GDP in 2016. See Liu (2018) and 行政院 (2016).

⁴⁸ The government completed a study on crop insurance in 2010 and cited difficulty in spreading risk and lack of expertise, data, reinsurance mechanism and public awareness as reasons for not implementing the scheme at that time. See 行政院農業委員會 (2010).

birds and 11 types of aquaculture products. Greenhouse facilities can also be insured;⁴⁹

- (b) **Type of risks and disasters insured:** The insurance programmes cover a wide range of agricultural risks (e.g. typhoons, excessive rain, low temperature for crops; diseases for livestock; and extreme weather for fish);
- (c) **Voluntary participation:** As participation is voluntary, the overall penetration rate in terms of farm areas was still low at the initial stage, rising from 0.9% in 2015 to 6.2% in 2018;
- (d) **Public-private partnership:** The agricultural insurance products are offered by either private insurance companies or farmers' associations. Yet the government also plays a key role in providing premium subsidies and necessary data for premium calculation and loss assessment.

To address business risks faced by insurers, the government aims at submitting a bill to the legislature in 2019 to give tax concessions to the insurers. It also aims to set up a government fund to provide reinsurance, with substantial government injections totalling NT\$5 billion (HK\$1.3 billion);⁵⁰

- (e) **Premium subsidies:** The Council of Agriculture subsidized one-third to one-half of the insurance premium in 2017, whereas local governments supported another 0%-40%. As such, farmers need to pay only 10%-50% of the premium cost.⁵¹ Furthermore, the government provides loans for farmers to buy insurance;⁵²
- (f) **Ratio of indemnity:** At times of agricultural loss, most products see an indemnity ratio ranging from 80% (e.g. bananas) to 95% (e.g. sugar apples), relative to the actual damage or loss of revenue. For livestock insurance, while indemnity over avian flu covers only 15%-25% of losses, the government provides additional compensation of 60% for birds culled by order;

⁴⁹ Some insurance products cover more than one species. See 農業金融局 (2019).

⁵⁰ 行政院 (2019) and 中時電子報 (2019).

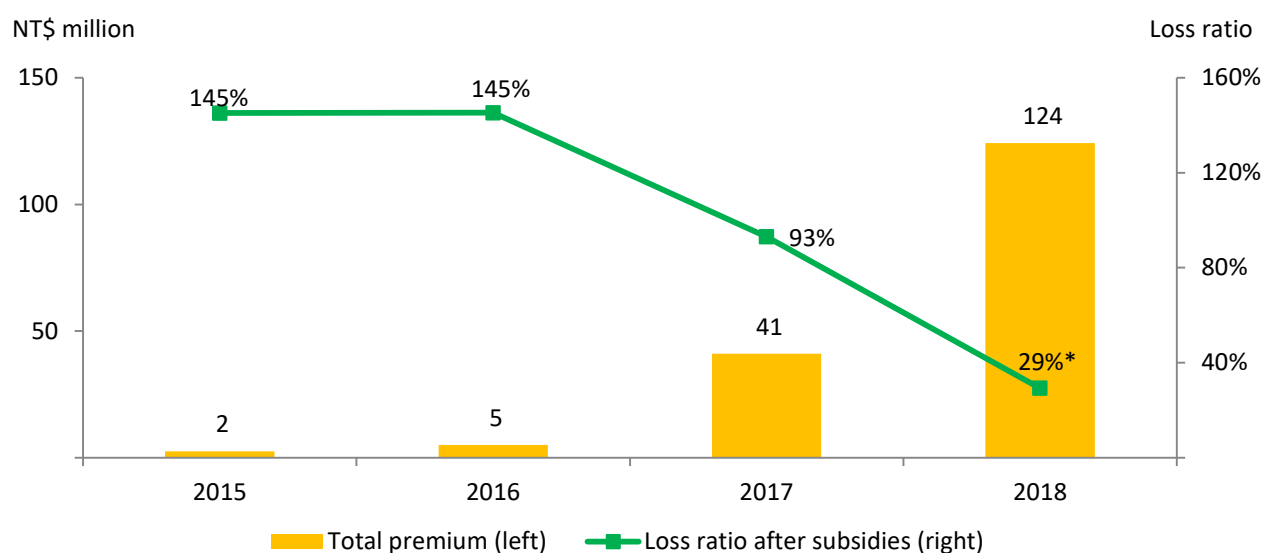
⁵¹ 台灣經濟日報 (2018).

⁵² Loans for purchasing policies have been made available since 2017 to cover the full cost of premium below NT\$300,000 (HK\$78,900). See 農業金融局 (2017).

- (g) **Insurance premium:** Including government subsidies, average premium under the pilot schemes was NT\$10,246 (HK\$2,695) in 2018, representing less than 0.8% of the average annual income of a farming household; and
- (h) **Substitutability with other measures of disaster assistance:** As the programme is still at a pilot stage, all policyholders are still eligible for other government relief measures.

5.4 It seems to be too early to assess the effectiveness of the agricultural insurance schemes in Taiwan, as the crop and aquaculture insurance schemes were rolled out for less than five years. While the total insurance premium surged by more than 60 folds in three years to NT\$124 million (HK\$33 million) in 2018, the penetration rate was low at only 6% because farmers are still reluctant to pay premium out of their own pockets (**Figure 3**).⁵³ The loss ratio has ranged widely between 29%-145%, mainly attributable to the small pool of insured population at the initial stage.⁵⁴

Figure 3 — Key indicators of the crop insurance programme in Taiwan



Note: (*) The loss ratio in 2018 should be read with caution as a considerable number of claims have not yet been settled by the time of report.

Source: 行政院農業委員會 (2019).

⁵³ Figures exclude insurance for pigs and cattle.

⁵⁴ The loss ratio of 29% in 2018 should be read with caution as some claims have not been settled. In addition, some policies for aquaculture suffered a loss ratio as high as 925%. See 中時電子報 (2018) and 行政院農業委員會 (2019).

6. Concluding remarks

6.1 In Hong Kong, farmers and fishermen often suffer unbearable loss at times of natural disasters and epidemics. As emergency relief provided by the Government is too small for them to resume operation, there are suggestions to establish an "agricultural insurance scheme" seen in more than 100 places around the world, including South Korea and Taiwan.

6.2 Globally, agricultural insurance schemes are conceived to help farmers and fishermen to manage disaster-related risks. Yet there are key pre-conditions to set up such agricultural insurance schemes, including (a) a sufficiently large size of agricultural population for pooling and sharing the risks; (b) sufficiently long data series on agricultural risks for building actuarial models to quantify risks and premium rates; (c) huge government subsidies and intervention as most of such insurance schemes are not commercially viable on a standalone basis.

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Agricultural insurance schemes in selected places

	Hong Kong	South Korea			Taiwan		
(A) Economic contribution of agricultural and fisheries sector in 2017							
1. Value added of the sector (% of GDP)	HK\$1.7 billion (0.1%)	33.9 trillion won (HK\$233.9 billion) (2.0%)			NT\$310.5 billion (HK\$81.4 billion) (1.8%)		
2. Employment in the sector (% of total employment)	18 142 (0.5%)	1.3 million (4.8%)			557 000 (4.9%)		
(B) Key features of agricultural insurance schemes							
		Livestock	Crop	Aquaculture	Livestock*	Crop	Aquaculture
1. Year of introduction		1997	2001	2007	2017	2015	2017
2. Compensation model							
- Number of products covered		16	56	19	4	10	11
- Protection against natural disasters		✓	✓	✓	✗	✓	✓
- Protection against diseases		✓	✓	✓	✓	✗	✗
- Voluntary participation		✓	✓	✓	✓	✓	✓
- Operated by private insurers		✓	✓	✓	✓	✓	✓
- Maximum ratio of compensation to loss		60%-100%	60%-90%	90%	15%-25%	80%-95%	N.A.#
- Overlap with relief payments		✗	✗	✗	✓	✓	✓
3. Government subsidy							
- Premium subsidies as % of premium		59%	82%	59%	50%-75%	50%-90%	66%
- Operation costs		✓	✓	✓	✗	✗	✗
- Reinsurance		✓	✓	✓	✗	✗	✗
4. Financial performance							
- Total premium		187 billion won (HK\$1 billion) (2018)	550 billion won (HK\$4 billion) (2018)	144 billion won (HK\$1 billion) (2007)	NT\$124 million (HK\$33 million) (2018)		
- Penetration rate		93% (2018)	33% (2018)	30% (2014)	6% (2018)		
- Loss ratio		125% (2018)	97% (2018)	72% (2007)	93% (2017)		

Notes: (*) For birds only.
 (#) Not applicable.

References

Hong Kong

1. Agriculture, Fisheries and Conservation Department. (2014) *The New Agricultural Policy: Sustainable Agricultural Development in Hong Kong*. Available from: https://www.gov.hk/en/residents/government/publication/consultation/docs/2015/Agricultural_Policy.pdf [Accessed August 2019].
2. Agriculture, Fisheries and Conservation Department. (2015) *Public Consultation on the New Agricultural Policy*. LC Paper No. CB(2)1621/14-15(07).
3. Agriculture, Fisheries and Conservation Department. (2017) *Progress Report on the Implementation of the Sustainable Fisheries Development Fund*. LC Paper No. CB(2)263/17-18(07).
4. Agriculture, Fisheries and Conservation Department. (2018) *Departmental Annual Report 2017-2018*. Available from: <https://www.afcd.gov.hk/misc/download/annualreport2018/eng/index.html> [Accessed August 2019].
5. Agriculture, Fisheries and Conservation Department. (2019) *Emergency Relief Fund*. Available from: https://www.afcd.gov.hk/english/agriculture/agr_loan/agr_loan_erf/agr_loan_erf_pay.html [Accessed August 2019].
6. Food and Health Bureau. (2019) *Financial Commitment for Culling of Pigs and Follow-up Work due to African Swine Fever*. LC Paper No. CB(2)1594/18-19(07). Available from: <https://www.legco.gov.hk/yr18-19/english/panels/fseh/papers/fseh20190611cb2-1594-7-e.pdf> [Accessed August 2019]
7. GovHK. (2012) *LCQ10: Development of local agriculture and fisheries*. Available from: <https://www.info.gov.hk/gia/general/201202/15/P201202150375.htm> [Accessed August 2019].
8. GovHK. (2016a) *LCQ8: New Agriculture Policy*. Available from: <https://www.info.gov.hk/gia/general/201603/02/P201603020633.htm> [Accessed August 2019].

9. GovHK. (2016b) *LCQ10: Red tides and massive fish deaths*. Available from: <https://www.info.gov.hk/gia/general/201611/23/P2016112300452.htm> [Accessed August 2019].
10. GovHK. (2019) *LCQ20: Incidents of pigs in slaughterhouses infected with infectious diseases*. Available from: <https://www.info.gov.hk/gia/general/201905/29/P2019052900204.htm> [Accessed August 2019].
11. South China Morning Post. (2016) *Hong Kong fish farmers claim proliferation of red tides is worst 'unnatural disaster' to hit industry in years, 30 April*. Available from: <https://www.scmp.com/news/hong-kong/health-environment/article/1940239/hong-kong-fish-farmers-claim-proliferation-red> [Accessed August 2019].
12. Trustee of Emergency Relief Fund. (2018) *Emergency Relief Fund Annual Report By The Trustee For The Year Ended 31 March 2018*. Available from: <https://www.legco.gov.hk/yr18-19/english/counmtg/papers/cm20181114-sp025-e.pdf> [Accessed August 2019].
13. 香港 01 : 《【颱風山竹】農作倒、設施毀 農夫欣然面對：當山竹送禮賀生日》，2018 年 9 月 18 日，網址：<https://www.hk01.com/社會新聞/236371/颱風山竹-農作倒-設施毀-農夫欣然面對-當山竹送禮賀生日> [於 2019 年 8 月登入]。
14. 香港商報：《山竹蹂躪 歐羅農場損失慘重》，2018 年 9 月 22 日，網址：http://hk.hkcd.com/content/2018-09/22/content_3758509.htm [於 2019 年 8 月登入]。
15. 香港農業聯合會：《香港農業聯合會有關土地供應的建議書》，2018 年 9 月 1 日，網址：<https://www.legco.gov.hk/yr17-18/chinese/panels/dev/papers/dev20180919cb1-1398-1-c.pdf> [於 2019 年 8 月登入]。

South Korea

16. Agricultural Policy Insurance and Finance Service. (2019) *Agricultural Policy Insurance – Performance Record* (in Korean). Available from: <https://www.apfs.kr/front/contents/Indicators.do?menuId=5365> [Accessed August 2019].

17. Im, J. (2019) *Recent Agricultural Policy Development in Korea*. Available from: http://ap.fftc.agnet.org/ap_db.php?id=955 [Accessed August 2019].
18. Kim, R. (2013) *Lesson learned from the Crop Insurance Program in Korea*. Available from: http://www.aict.org.tw/past_conference/17th_eaac/ckfinder/userfiles/files/09_Parallel%2028-Robert%20Kim.pdf [Accessed August 2019]
19. Korean Re. (2015) *Bulletin NO. 149. July - Aug 2015*. Available from: http://www.koreanre.co.kr/webzine/blentin_149/KOREANRE_Bulletin_149.pdf [Accessed August 2019].
20. Ministry of Agriculture, Food and Rural Affairs. (2018) *Korea's Agricultural Policy: History, Challenges and Ways Forward*. Available from: https://www.wto.org/english/tratop_e/agric_e/cnt_policy_korea_e.pdf [Accessed August 2019].
21. Ministry of Agriculture, Food and Rural Affairs. (2019) *Crop damage insurance*. Available from: <http://www.mafra.go.kr/english/1422/subview.do> [Accessed August 2019].
22. Organisation for Economic Co-operation and Development. (2017a) *OECD Review of Fisheries: Policies and Summary Statistics 2017*. Available from: http://www.oecd-ilibrary.org/deliver/5316011e.pdf?itemId=/content/book/rev_fish_stat_en-2017-en&mimeType=application/pdf [Accessed August 2019].
23. Organisation for Economic Co-operation and Development. (2017b) *Producer Incentives in Livestock Disease Management*. Available from: <https://doi.org/10.1787/9789264279483-en> [Accessed August 2019].
24. Organisation for Economic Co-operation and Development. (2018a) *Agricultural Policy Monitoring and Evaluation 2018*. Available from: <https://doi.org/10.1787/22217371> [Accessed August 2019].
25. Organisation for Economic Co-operation and Development. (2018b) *Innovation, Agricultural Productivity and Sustainability in Korea*. Available from: <http://www.oecd-ilibrary.org/deliver/9789264307773-en.pdf?itemId=/content/publication/9789264307773-en&mimeType=application/pdf> [Accessed August 2019].

26. Park, J. and Kim, C. G. (2017) *An Economic Effect Of The Crop Insurance At The Farmland In Korea*. Available from: <http://library.krei.re.kr/pyxis-api/1/digital-files/9ac9fe68-0875-490f-bccf-285c32fcc7f3> [Accessed August 2019].
27. 行政院研究發展考核委員會：《養殖漁業保險制度之研究》，2011年3月，網址：<https://ws.ndc.gov.tw/Download.ashx?u=LzAwMS9hZG1pbmlzdHJhdG9yLzEwL3JlbGZpbGUvNTY0NC8zMjQxLzAwNTg5MjNfMS5wZGY%3D&n=MjAxMTA2MjJkxNTQwMDY1MTAzMTAwLnBkZg%3D%3D&icon=.pdf> [於2019年8月登入]。
28. 行政院農業委員會農糧署：《韓國農業天然災害救助及農業保險制度》，2015年6月，網址：<https://report.nat.gov.tw/ReportFront/PageSystem/reportFileDownload/C10400849/001> [於2019年8月登入]

Taiwan

29. Liu, W. (2018) *An Overview of New Agricultural Policies for Taiwan in 2018*. Available from: http://ap.fftc.agnet.org/ap_db.php?id=867 [Accessed July 2019].
30. 中時電子報：《農保專法政院拍板 商機估逾百億》，2019年7月19日，網址：<https://www.chinatimes.com/newspapers/20190719000263-260202?chdtv> [於2019年7月登入]。
31. 中時電子報：《農業保險覆蓋率 最慘不到 1%》，2018年8月21日，網址：<https://www.chinatimes.com/newspapers/20180821000325-260205?chdtv> [於2019年8月登入]。
32. 台灣經濟日報：《農業保險比天然災害補助好？聽聽保戶心聲》，2018年2月23日，網址：<https://vision.udn.com/vision/story/11841/2995500> [於2019年8月登入]。
33. 行政院：《強本革新一新農業創新推動方案》，2016年，網址：<https://www.ey.gov.tw/Page/5A8A0CB5B41DA11E/a4143f94-8a2e-4a0f-8d66-333c0a7ddfc4> [於2019年8月登入]。

34. 行政院：《行政院會通過「農業保險法」草案》，2019年7月18日，網址：<https://www.ey.gov.tw/Page/9277F759E41CCD91/2dfefb11-2cfe-4969-8ecb-2b9762806911> [於2019年8月登入]。
35. 行政院農業委員會：《推動農業保險成果與未來施政重點》，2019年7月18日，網址：<https://www.boaf.gov.tw/site/boaf/public/Attachment/971817495271.pdf> [於2019年8月登入]。
36. 行政院農業委員會：《農業保險制度之分析》，2010年，網址：<https://www.coa.gov.tw/ws.php?id=21404&print=Y> [於2019年8月登入]。
37. 行政院農業委員會：《農業指標》，網址：<https://agrstat.coa.gov.tw/sdweb/public/indicator/Indicator.aspx> [於2019年8月登入]。
38. 農業金融局：《農業保險投保情形表(資料日期：108年6月30日)》，2019年，網址：<https://www.boaf.gov.tw/site/boaf/public/Attachment/9731653471.pdf> [於2019年8月登入]。
39. 農業金融局：《農業發展基金貸款》，2017年，網址：<https://www.boaf.gov.tw/boafwww/index.jsp?a=ct&xltem=652393&ctNo de=240> [於2019年7月登入]。

Others

40. Adroit Market Research. (2019) *Agricultural Insurance Market will grow at a CAGR of 2.8% to hit \$32.8 Billion by 2022*. Available from : <https://www.globenewswire.com/news-release/2019/04/23/1807792/0/en/Agricultural-Insurance-Market-will-grow-at-a-CAGR-of-2-8-to-hit-32-8-Billion-by-2022-Global-Analysis-by-Price-Trends-Size-Share-Business-Opportunities-and-Key-Players-Adroit-Market.html> [Accessed August 2019].
41. Food and Agriculture Organization of the United Nations. (2011) *Agricultural insurance in Asia and the Pacific region*. Available from: <http://www.fao.org/3/i2344e/i2344e00.pdf> [Accessed August 2019].

42. Organisation for Economic Co-operation and Development. (2011) *Managing Risk in Agriculture: Policy Assessment and Design*. Available from: <https://doi.org/10.1787/9789264116146-en> [Accessed August 2019].
43. World Bank. (2005) *Managing Agricultural Production Risk : Innovations in Developing Countries*. Available from: <https://openknowledge.worldbank.org/handle/10986/8797> [Accessed August 2019].
44. World Bank. (2009) *Agricultural Insurance*. Available from: <http://documents.worldbank.org/curated/en/985551468150558970/pdf/625120NWP0Agri00Box0361486B0PUBLIC0.pdf> [Accessed August 2019].
45. World Bank. (2010) *Government Support to Agricultural Insurance: Challenges and Options for Developing Countries*. Available from: <http://documents.worldbank.org/curated/en/%20698091468163160913/pdf/538810PUB0Gove101Official0Use0Only1.pdf> [Accessed August 2019].
46. World Bank. (2019a) *When and How Should Agricultural Insurance be Subsidized? : Issues and Good Practices*. Available from: <http://documents.worldbank.org/curated/en/330501498850168402/When-and-How-Should-Agricultural-Insurance-be-Subsidized-Issues-and-Good-Practices> [Accessed August 2019].
47. World Bank. (2019b) *World Bank Open Data*. Available from: <https://data.worldbank.org/> [Accessed August 2019].