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香港水務概覽
An Overview of Water Supplies in Hong Kong

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水是人類生命的泉源，也是社會興存所繫。在香港，供水服務由政府轄下水務署負責。本文概述香港水務的一些主要範疇，包括供水系統的設施及其服務範圍，以及食水耗用和原水供應的概況。

本文是 2003 年出版的專題文章的更新版。

Water is the lifeblood of mankind. Our community's survival and prosperity depend on it. In Hong Kong, the provision of water supply services falls under the ambit of the Water Supplies Department of the Government. This article briefly describes selected major aspects of water supplies in Hong Kong. These include a general profile of the water supply system and its service coverage, consumption of fresh water, and supply of raw water.

This article is an updated version of the article published in 2003.

本文內的統計數字是根據水務署的資料來源所得。如對本文有任何查詢，請聯絡水務署統計組
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1. 引言

1.1 淡水是十分珍貴的天然資源。雖然地球有接近四分之三面積被水覆蓋，但絕大部分（97%）的水資源是海洋中的鹹水；而餘下的 3% 則大都被冰封於極地冰川之中。只有不足 1% 的水資源可作飲用、灌溉和工業用途。

1.2 香港缺乏天然水源，在應付用水需求方面較世界其他城市面對更大的挑戰。香港政府自 1851 年首次動用公帑在中區開掘水井以來，一直肩負供應居民食水的重任。今天，香港水務的發展已取得驕人的成就。

1.3 香港的水務發展可從多個不同角度審視，饒有趣味。它不單與本地的經濟及社會發展息息相關，亦涉及工程、環保和可持續發展等其他專項。本文概述香港水務的一些主要範疇，包括供水系統的設施及其服務範圍，以及食水耗用和原水供應的概況。

2. 供水系統

2.1 香港公共供水服務可追溯至 1851 年，當時政府首次動用公帑在中區開掘 4 口水井。多年來，隨着香港社會及經濟急速發展，居民對用水的需求日益增加。為應付需求，政府不斷改善和擴展供水系統。

1. Introduction

1.1 Fresh water is a scarce natural resource. While nearly three-quarters of the Earth is covered with water, almost all (97%) the planet's water is salt water in seas and oceans, and the majority of the remaining 3% is frozen in glaciers or polar ice. Only a fraction of 1% is available for drinking, irrigation and industrial use.

1.2 With limited water resources, Hong Kong faces a bigger challenge than many other cities in the world in the provision of sufficient water for its needs. Ever since the first government-funded wells were sunk in Central in 1851, the Hong Kong Government has been taking up this challenge and has been making remarkable success by today.

1.3 The development of water supplies in Hong Kong can be studied from many different perspectives and is indeed fascinating. It is not only closely correlated to the economic and social developments of the territory, but also related to other technical aspects such as engineering, environmental protection, and sustainable development. This article briefly describes selected major aspects of water supplies in Hong Kong. These include a general profile of the water supply system and its service coverage, consumption of fresh water, and supply of raw water.

2. Water supply system

2.1 The history of the public water supply services in Hong Kong can be dated back to 1851 when 4 government-funded wells were sunk in Central. Over the years, the Government has been making continuous effort to improve and extend the water supply system to meet the society's ever-increasing demand for water arising from the rapid social and economic developments of Hong Kong.

2.2 於 2014 年 3 月底，香港的主要水務設施包括 17 個水塘（總容量為 5.86 億立方米）、21 間濾水廠、193 個抽水站、222 個配水庫及大約 8 400 公里長的輸水管。此外，全港約有三分之一的土地面積亦已闢作集水區。

2.3 從工程角度來看，香港的供水系統在設計和建造技術上都成為國際間的典範，例如分別在 1968 年及 1978 年於海上建成的船灣淡水湖和萬宜水庫，便是其中的表表者。這兩個水庫是香港最大的水塘，其容量共佔本地水塘總容量的 87%。除供應食水外，水塘及附近的集水區亦成為備受歡迎的自然風景郊遊點。

2.4 現時，差不多全港居民（99.9%）都能獲得源源不絕的優質食水供應。只有很少數居於較偏遠地方的居民，還未能享用公共供水服務。水務署會繼續以具成本效益的方法擴展供水網絡，為這些居民提供食水。

2.5 自 50 年代起，香港創建一套獨特的分質供水系統，讓居民得以利用海水沖廁，從而節省珍貴的食水。多年來，這套系統的服務範圍不斷擴展。現時，全港約有 8 成居民使用海水沖廁。在 2014 年，每天供應的沖廁海水平均達 743 000 立方米，因而節省了等量的食水。在利用海水沖廁以節省食水資源方面，香港在國際間一直享有領先地位，所取得的成就亦得到不少讚譽。

3. 食水耗用

3.1 在 2013 年，香港的食水耗用量為 9.33 億立方米，相等於全港水塘總容量的 1.6 倍。與 2012 年比較，耗水量微跌 0.3%。

2.2 As at the end of March 2014, the major waterworks installations of Hong Kong included 17 impounding reservoirs with a total storage capacity of 586 million cubic metres (mcm), 21 water treatment works, 193 pumping stations, 222 service reservoirs and about 8 400 kilometres (km) of water mains. In addition, about one-third of the total land area of Hong Kong has been established as water gathering grounds.

2.3 From an engineering perspective, the water supply system of Hong Kong has developed into a world class example of engineering skill in both design and construction. The Plover Cove and High Island Reservoirs, which were built in the sea in 1968 and 1978 respectively, are typical examples. Being the two largest reservoirs in Hong Kong, they account for 87% of the total storage capacity. Apart from supplying water, the reservoirs and the water gathering grounds in the vicinity have become popular natural scenic spots.

2.4 Today, the water supply system provides nearly all (99.9%) the people in Hong Kong with a continuous supply of quality water. Only a very small number of people who live in remote areas are not yet serviced by the public water supply system. The Water Supplies Department (WSD) will continue to extend the water supply network in a cost-effective way to provide these residents with potable water.

2.5 To save precious fresh water, a unique separate system has been developed in Hong Kong since the 1950s for supplying seawater for flushing. Over the years, the service coverage of the system has extended continuously. At present, about 80% of the population in Hong Kong use seawater for flushing. In 2014, an average of 743 000 cubic metres per day of seawater was supplied for flushing, conserving an equivalent amount of potable water. Hong Kong has won international recognition for its leading role and success in making use of seawater for flushing to save fresh water resources.

3. Fresh water consumption

3.1 The fresh water consumption in Hong Kong for 2013 was 933 mcm, being 1.6 times the total storage capacity of all the impounding reservoirs. Compared with 2012, it decreased slightly by 0.3%.

3.2 過去多年，水務署積極調整及管理供水，以準確滿足用水需求，同時透過廣泛推廣節約用水措施，社會整體對節約用水的意識及投入程度亦大幅提高。在 2003 年至 2013 年期間，食水耗用量下跌了 4.2%。縱然在人口和經濟增長情況下，過往數年用水需求仍然能控制在每年 9.50 億立方米左右的水平。

3.2 Over the past years, by proactively adjusting and managing our supplies of water to precisely meet demand and through extensively promoted conservation measures, there has been a surge in community-wide awareness and commitment to the need to conserve precious water supplies. Between 2003 and 2013, the fresh water consumption dropped by 4.2%. Despite the growth in population and economy, the annual water demand has been maintained at around 950 mcm in recent years.

3.3 香港食水的主要使用者可分為住宅用戶、服務業及商業用戶和工業用戶，當中以住宅用戶的數目最多。於 2014 年 3 月底，住宅用戶的數目約為 257 萬，佔用戶總數的 90%。在耗水量方面，住宅用戶在 2013 年的耗水量佔該年全港食水耗用量的 54%。在 2003 年至 2013 年期間，住宅用戶的食水耗用量微跌 1.4%。（圖 1）

3.3 In Hong Kong, fresh water is mainly for domestic, service trade and industrial uses. Of the various groups of users, the domestic sector constitutes the largest customer sector. As at the end of March 2014, there were about 2.57 million domestic accounts. This represented 90% of the total number of customer accounts in March 2014. As for the volume of consumption, the domestic sector accounted for 54% of the total fresh water consumption in 2013. Between 2003 and 2013, the fresh water consumption of the domestic sector dropped slightly by 1.4%. (Chart 1)

3.4 於 2014 年 3 月底，服務業及商業用戶和工業用戶共約 238 000 個。雖然這兩類用戶的數目遠較住宅用戶為少，但在 2013 年的耗水量仍合共佔該年食水總耗用量的 31%。

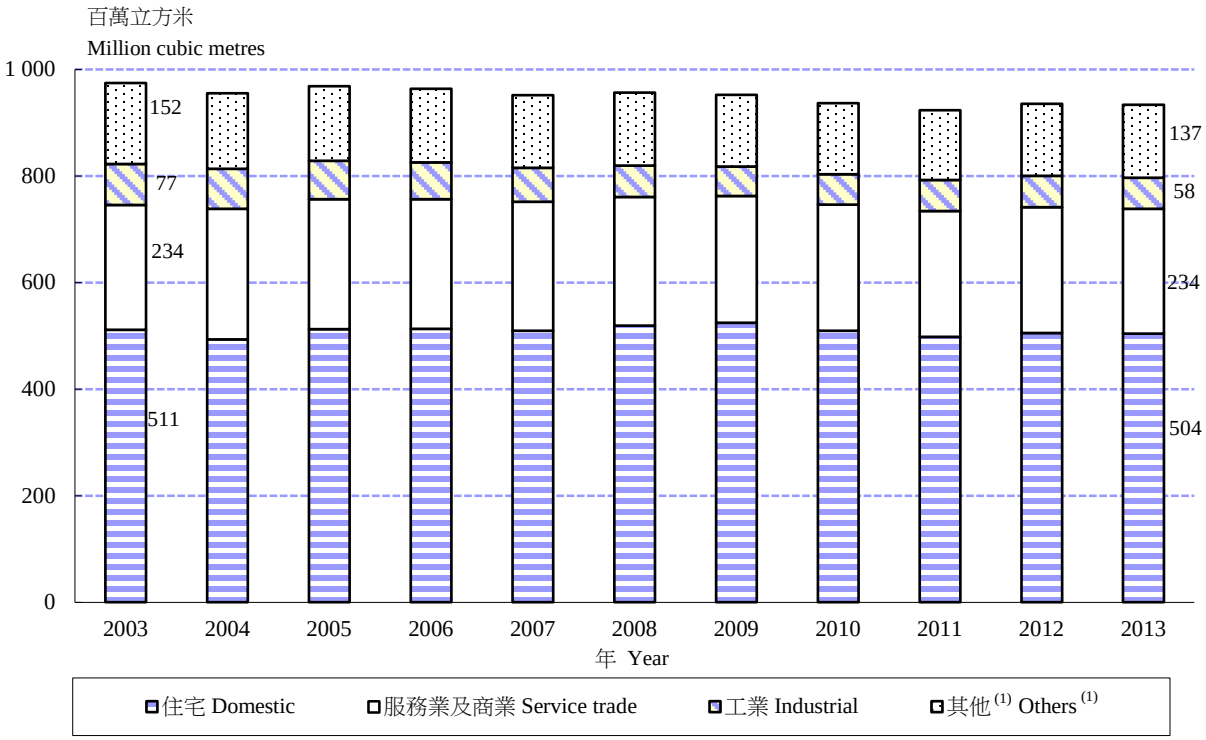
3.4 As regards the service trade sector and the industrial sector, there were altogether about 238 000 customers as at the end of March 2014. While there were much less customers in these two sectors than in the domestic sector, the fresh water consumption of the two sectors as a whole accounted for 31% of the total consumption in 2013.

3.5 在 2003 年至 2013 年期間，工業耗水量大幅下跌 24.7%。相比之下，服務業及商業的耗水量在同期維持穩定。（圖 1）

3.5 Between 2003 and 2013, the fresh water consumption of the industrial sector fell considerably by 24.7%. In comparison, the fresh water consumption of the service trade sector remained stable over the period. (Chart 1)

圖 1　　2003 年至 2013 年按主要使用者類別劃分的食水耗用量

Chart 1　　Fresh water consumption by major customer sector, 2003 to 2013



註釋： (1) 包括政府單位、建築地盤及船舶用水，以及淡水沖廁用水。

Note: (1) Including fresh water consumption of government units, construction sites and ships, and for flushing.

3.6　香港的食水在輸送給用戶之前均經徹底淨化處理。香港食水水質一直處於全球優質之列，完全符合世界衞生組織的「飲用水水質指引」（2011 年），可直接飲用。為確保水質符合國際標準，水務署對整個供水系統及濾水過程均進行持續而嚴格的監察。讀者可透過水務署的網站 (www.wsd.gov.hk) 查閱香港食水及東江水最新的水質資料。

3.6　In Hong Kong, raw water is thoroughly purified before distribution to users. The quality of treated water in Hong Kong has been among the best in the world. It complies fully with the World Health Organization Guidelines for Drinking-water Quality (2011) and is suitable for direct consumption. To ensure that the water quality is up to international standards, WSD has been closely monitoring the water quality throughout the entire supply system and treatment processes. Readers may visit the WSD's website (www.wsd.gov.hk) to obtain up-to-date data on quality of treated water and Dongjiang water.

3.7　然而，為確保客戶得享優質自來水，樓宇業主亦須妥善維修水管系統。為鼓勵業主盡其責任，水務署於 2008 年推出「大廈優質食水認可計劃」（於 2008 年之前稱為「食水系統優質維修認可計劃」），頒發證書給符合該計劃要求的樓宇。

3.7　Nevertheless, in order to ensure that consumers can enjoy good quality of water at the taps, building owners have to maintain their plumbing systems properly as well. To encourage the building owners to do this, WSD launched the Quality Water Recognition Scheme for Buildings in 2008 (known as Fresh Water Plumbing Quality Maintenance Recognition Scheme prior to 2008). Certificates will be issued to those buildings which comply with the requirements of the Scheme.

4. 原水供應

4.1 雨水是香港唯一的本地原水（即未經處理的水）來源。香港缺乏天然水源，沒有天然湖泊、磅礴的河流或充裕的地下泉水。在 80 年代前，香港主要倚賴興建水塘和開闢集水區收集雨水，以應付食水需求。

4.2 可是，收集得來的雨水量絕不足以應付香港的食水需求。此外，由於降雨量既不穩定又不平均，每年的集水量有相當大的差異。在 2013 年，香港全年降雨量為 2 847 毫米，而水塘收集得的雨水量有 3.36 億立方米，僅為該年全港總耗水量的 36%。（圖 2）

4.3 目前，香港主要依靠廣東省東江供應原水。在 2013 年，東江供應香港約 6.12 億立方米原水，相等於該年食水耗用量的 66%。（圖 2）

4.4 自 1960 年起，香港便一直由鄰近的廣東省輸入原水。初時，原水輸入量僅約為當時香港每年耗水量的兩成，並不足以應付需求，所以香港偶爾仍須實施制水。

4.5 為解決供水問題，香港其後與廣東省政府簽訂協議，提高供水系統的輸水量以增加對香港的供水量，並在 1965 年開始從位於深圳以北約 83 公里的東江輸入原水，而輸水量亦按年遞增。因此，香港在 1982 年 5 月後已無須再實施制水。在 80 年代中期，東江為香港供應約耗水量一半的用水。

4. Supply of raw water

4.1 Rainwater is our only local source of raw water (i.e. water not yet treated). Hong Kong lacks natural water resources. It does not possess natural lakes, sizable rivers or substantial underground water. Before the 1980s, the construction of large reservoirs and setting up of water gathering grounds to store rainwater was the major approach adopted to meet our demand for water.

4.2 The collected rainwater is grossly inadequate to cope with Hong Kong's fresh water demand. Besides, the rainfall is erratic and uneven, and hence the yield varies significantly from year to year. In 2013, the total rainfall was 2 847 millimetres and the reservoir yield was 336 mcm, which represented only 36% of the total fresh water consumed in the territory for the year. (Chart 2)

4.3 The Dongjiang River in Guangdong Province is now the major source of raw water for Hong Kong. In 2013, the Dongjiang River supplied Hong Kong with a total of about 612 mcm of raw water, amounting to 66% of the total fresh water consumption for the year. (Chart 2)

4.4 Hong Kong has been importing raw water from its neighbouring Guangdong Province since 1960. During the early years, the quantity of raw water imported only accounted for about 20% of Hong Kong's annual consumption and could not cope with the demand. Hence, Hong Kong had to impose water restriction occasionally.

4.5 In order to resolve the water supply problem, agreements with the Guangdong Authority were therefore subsequently made to expand the supply system capacity so as to increase the supply quantity to Hong Kong. As from 1965, raw water has been supplied from the Dongjiang River, some 83 km north of Shenzhen, with increasing annual supply quantities. With these agreements in place, Hong Kong had not imposed any water restriction after May 1982. In mid-1980s, water supplied from the Dongjiang River constituted about half of the total consumption of water in Hong Kong.

4.6 此外，雙方在 1989 年所達成的協議更訂明長遠來說，香港每年可由東江輸入多達 11 億立方米原水。香港的水源問題，亦因這項供水安排而基本上得到解決。

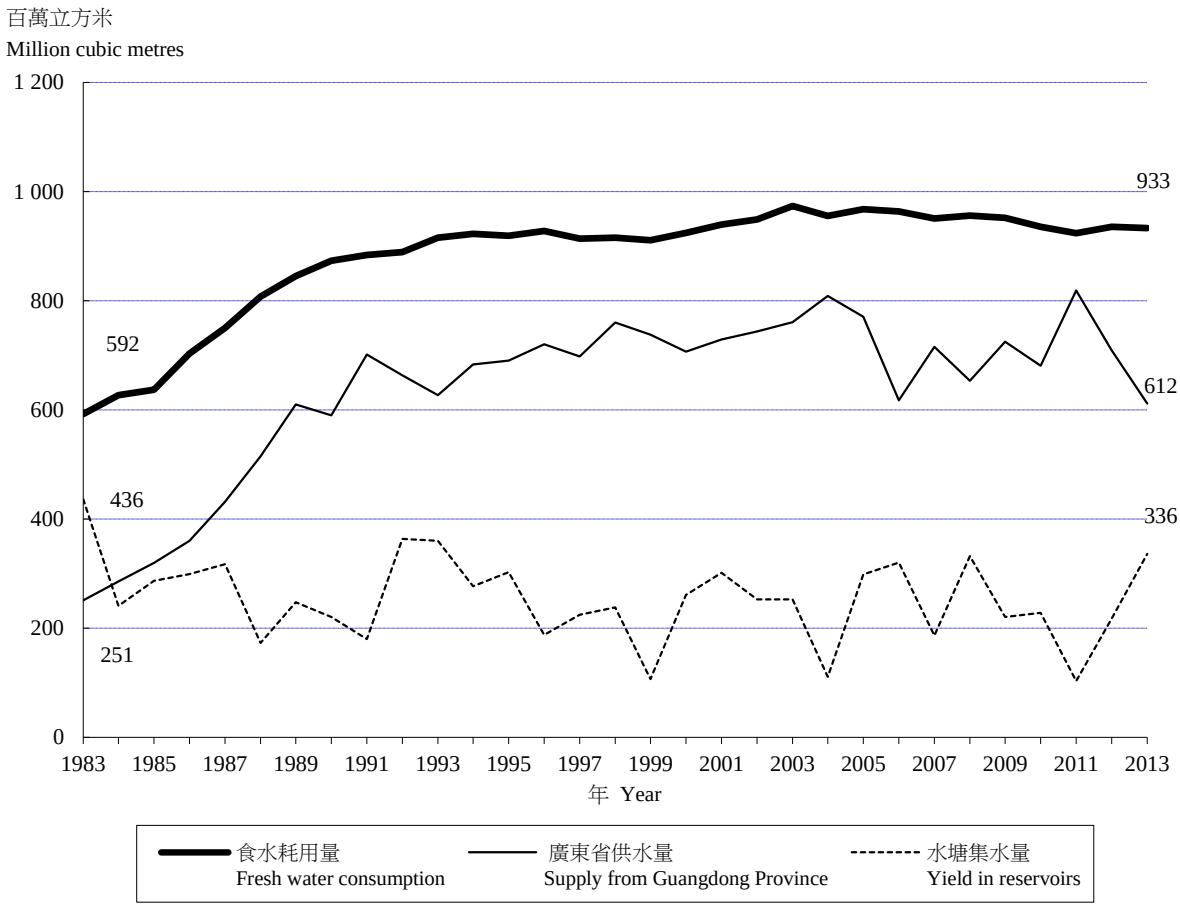
4.7 今年（2015 年），香港購買東江水已踏入 50 周年。隨着多年來人口增加及經濟發展，香港每年耗水量超過 9 億立方米，當中差不多 7 成來自東江。

4.6 Furthermore, an agreement was made in 1989 whereby Hong Kong was allowed to import up to a maximum of 1 100 mcm of raw water from the Dongjiang River annually in the long term. With this supply arrangement, the water resources problem of Hong Kong was basically resolved.

4.7 This year (2015) marks the 50th anniversary of the supply of Dongjiang water to Hong Kong. With the growth in population and economic development over the years, the fresh water consumption in Hong Kong is over 900 mcm annually. The Dongjiang water supply has now accounted for almost 70% of the total consumption of water in the territory.

圖 2 1983 年至 2013 年的食水耗用量、廣東省原水供應量及本地水塘集水量

Chart 2 Fresh water consumption, supply of raw water from Guangdong Province and yield in local reservoirs, 1983 to 2013



註釋： 過剩的原水會貯存於水塘。如水塘存水量過多，便會出現溢流現象。

Note: Surplus of raw water will be stored in reservoirs. If the reservoir storage is high, overflow will occur.

5. 可持續發展

5.1 水務署於 2008 年推行「全面水資源管理策略」（「策略」），當中制訂了平衡用水供求的策略，以確保香港的供水穩定及支持可持續發展。「策略」的重點是「先節後增」，強調節約用水，以控制用水需求的增長。

5.2 「策略」主要分為兩方面：用水需求管理及供水管理。加強公眾教育及宣傳節約用水是用水需求管理措施中的一項，其他措施還包括推廣使用節約用水裝置、加強控制食水滲漏及擴大使用海水沖廁。至於供水管理措施方面，除了制訂海水化淡方案之外，還包括加強保護水資源及積極考慮使用再造水。

5.3 由於「策略」已推行數年，水務署於 2014 年 10 月開展顧問研究進行檢討。這項檢討的範圍包括評估現行「策略」的效益；預測至 2040 年的長遠用水需求及供應；尋求新的水資源措施，並適當調整現行「策略」；然後制定新的「策略」。

5.4 總括而言，我們應該珍惜用水，在經濟發展與保護自然環境兩方面取得平衡，使我們將來可以持續發展，不斷求進。

6. 其他有關刊物

6.1 更多有關的資料可參考以下刊物：

1. 《點滴話當年 — 香港供水一百五十年》，何佩然，商務印書館（香港）有限公司，2001 年；及

2. 《水務署年報 2013 – 2014》，水務署編製。

5. Sustainable development

5.1 The Total Water Management Strategy (the Strategy) promulgated by WSD in 2008 has mapped out the strategy for a balanced supply and demand of water to ensure water security and support sustainable development in Hong Kong. The Strategy puts an emphasis on containing the growth of water demand through promoting water conservation.

5.2 The Strategy focuses on two major areas, namely water demand management and supply management. On water demand management, one of the initiatives is to enhance public education on water conservation. Other initiatives include promoting the use of water-saving devices, enhancing water leakage control and extending the use of seawater for toilet flushing. As regards supply side management, one of the initiatives is to develop the option of seawater desalination. Other initiatives include strengthening the protection of water resources and actively considering water reclamation.

5.3 As the Strategy has been implemented for several years, WSD commissioned a consultancy study to conduct a review in October 2014. The scope of this review comprises evaluating the effectiveness of the Strategy under implementation, forecasting the long-term water demand and supply up to 2040, seeking for new water resources initiatives and adjustments to the existing measures, and then formulating the new Strategy.

5.4 In conclusion, we should be mindful of the need to save water, and to strike a balance between economic development and protection of the natural environment so that we can have an ever-progressing future.

6. Further references

6.1 For more information, reference can be made to the following publications:

1. *Water for a Barren Rock - 150 Years of Water Supply in Hong Kong*, Ho Pui Yin, The Commercial Press (H.K.) Ltd., 2001; and

2. *Water Supplies Department Annual Report 2013 – 2014*, published by the Water Supplies Department.