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紫荊青年商會
Bauhinia Jaycees



合辦

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青少年培訓與實踐計劃

“難得有清泉”

HOW CLEAN IS OUR WATER IN HONG KONG

學生工作計劃摘要

DELIVERED 29 DEC 1989



PB 10

贊助機構：
蘋果電腦國際有限公司

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序

香港青年商會總會會長 何淑賢

紫荊青年商會舉辦「難得有清泉」之青少年培訓與實踐計劃，是一項很有意義的工作活動。該項工作計劃不但祇提供在學青少年朋友有機會藉著所給予之訓練，將建議之活動實踐出來。而且更使參予之同學們多些關注社會問題，從而增加他們對社會的責任感。

作為評判之一，本人更欣賞各參予之同學從策劃建議書，以至將工作計劃完成，製作報告書，以及安排完成之結果及活動資料作展覽，每一方面都做得非常認真，充份表現每一位參予同學之積極態度及合作精神。

謹藉此機會祝賀是次青少年培訓與實踐工作計劃成功並希望紫荊青年商會能夠將這項工作計劃意念進一步推廣。

紫荊青年商會會長獻詞

溫凱珊

環境需要保護？很可能在二十年前有很多人會對這個問題會產生質疑的態度又或者根本不會顧慮到這個問題的存在。

但時至今日，以往很多美麗的地方如河流，溪澗及沙灘等已不再存在，繼而變成五顏六色的臭渠，滿是牲畜糞便的河流溪澗及滿佈垃圾廢物的海灘，這些現象若不加以牽制，我相信香港不難會成爲一個臭港。

本會體會到水質污染問題的嚴重性，故與一向致力於推行環境保護的團體「長春社」合辦此項名為積極參與，共創未來，青少年培訓與實踐計劃之「難得有清泉」的工作計劃。旨在喚起青少年對環境保護的關注，透過實地參觀及研討會，了解香港區域內水質污染和解決方法。

學生們經過差不多兩個月時間的努力籌備及推行其計劃，不但令到社會各界人士對水質污染問題有所關注，而其中有些參賽者更將其計劃所得之結果及建議之解決方法提交區議會作研究。而作為主辦機構，能目睹參加的學生能夠利用暑假餘暇，積極地推行此計劃實感到非常欣慰及鼓舞，從而令到本會有意於明年度繼續籌辦有關環境保護的工作計劃，希望將環保的訊息，繼續推廣，因而令到環境污染有所改善。

序

長春社發言人 熊永達

從六十年代到九十年代短短的三十年間，香港由一個小小商埠和農村發展成爲世界第一流的現代化都會，在現今世界各大貿易經濟體系中名列11位。和各國大城市的發展歷史比較，香港可算是一個奇蹟。

人盡皆知，在創造這個奇蹟的過程中，香港也付出了很大的代價，最顯著的是對自然資源的損耗和環境的破壞。有誰還記得在香港還未屬於英佔地之前，香港最出名的「鰲洋甘瀑」和水坑口及香港仔的瀑布都是中國漁民來取水作補給的勝地。那裡水源充足甘甜。尤其是「鰲洋甘瀑」，更是許多詩人墨客過港必遊之地。

無人能否認水是人類賴以生存的幾種基本資源之一，人體本身就含有大量的水份，香港的水源受到污染，近年已經達到不可挽回的地步，不單昔日的「鰲洋甘瀑」和大小瀑布已無影無踪，連海水也發出臭味，香港人在沉醉于經濟上的偉大成就的同時，對各種惡化中的污染狀況感到震驚。

近年來市民對污染的投訴不斷增加。由一九八六年每月平均投訴數字170宗，增加至一九八八年每月平均260宗，增幅是53%，說明環境不斷惡化和人們對環境的驚覺增高。

香港荊青青年商會與長春社合辦的「難得有清泉—青少年培訓與實踐計劃」。得到許多學校的支持和參予，也充份反映學校對污染問題的關注不亞於一般市民大眾，學生和老師在參與這個活動中，有深入的探討，淺出的表達，提高了個人和市民大眾對環境問題的警覺性，這是可喜的。

事實上，只有市民的環境警覺性提高，自覺減少污染環境的行爲，我們的環境才能有恢復昔日驕美之望。

主辦者決定保留這個活動的成果，將參與學校的研究報告編輯成書，惠及更多市民，這是大大的好事，本人當然十分高興能爲這本書作序，但願這本書能暢銷全港，我們及子孫後代能享有一個好環境。

荊青青年商會會長 陸煥昇

難得有清泉總結

長春社主席 馮兆榮

由荊青青年商會與長春社合辦之「難得有清泉」青少年培訓與實踐計劃，主要目的有二、第一是藉著這項活動，鼓勵青年人參與社區活動，並培養他們關心社會事務的技能和興趣；第二是希望藉著是次實踐計劃的經驗，加強他們對本港日益嚴重的環境污染之注意和了解。

是項活動歷時數月，首先在暑假期間，由大會在云云參加的學校中，挑選了十間較優勝者，給予他們一個參加一連兩天的訓練營機會，由大會灌輸以基本領袖才能訓練，和本港環境問題知識，並指導如何策劃及推行所提交之研究計劃工作，最後，在這十間學校實踐計劃提案中選出六間，由大會資助他們在暑期內實踐其計劃。而在本年十月十五日，假太古城商場西橋，展出這六間參賽學校的工作計劃的報告及成果，並在其中選出兩個優異獎，加以表揚。

這項計劃中一連串的活動，雖然並不是轟天動地的大事，但整個計劃過程，貫徹著充滿活力和認真的專業精神。而荊青青年商會和長春社的衆位負責人，皆以義工身份，以有限的工餘時間，全力以赴來推出這個計劃，致無論在策劃，籌備、組織和推行上都有優良的表現。至於參與實踐計劃的同學們，水準之高，從他們的建議書、工作報告，和計劃展覽作品中，可見一斑。

「難得有清泉」青少年培訓與實踐計劃，得以完滿結束，實有賴各位同學，和負責之各位關心環境的朋友鼎力合作，此外，贊助機構及各方友好的支持和鼓勵，也是功不可沒的。然而，環境保護並不是分割性的一次活動，而是需要不斷的關注和行動。故此，希望曾參與是項活動的每一位人士，能在自己的生活和Work崗位上，繼續參與各式各樣的環境保護行動，使我們賴以棲身的地球，也可在不受污染的環境中活下去。

前言

隨著人口不斷增加，工業日益發達，本港每天產生200多萬公噸污水和工業廢水，這些污水都是經由不同的途徑排放入海，使到本港沿岸水域及內陸水道的水質日趨惡劣。水質惡劣，並引起紅潮，海產污染等問題。有見及此紫荊青年商會與長春社就這日趨迫切的問題，聯合主辦一項名為「難得有清泉」的青少年培訓與實踐計劃。

青少年培訓與實踐計劃「難得有清泉」的主要目的是喚起青少年對環境保護的關注和了解香港區域內水質污染，培養青少年羣策羣力的精神及對社會有歸屬感。以改善香港區域內水質污染的情況。

青少年培訓與實踐計劃「難得有清泉」的各項活動得以順利進行，實有賴蘋果電腦國際有限公司的贊助，柏立基信托基金的撥款資助，及三位名譽顧問及六位評審嘉賓，鼎力支持，兩個合辦機構通力合作，以及工作人員多月來的努力，本人在此謹衷心致謝。

青少年培訓與實踐計劃
「難得有清泉」
籌委會主席
朱惠蓮

引言

除空氣外，食水是另一個維持我們生命的重要資源，從前人們只關注水量的問題，卻很少關注水質的問題，然而，當污染情況愈來愈嚴重時，我們在再無法逃避它們帶來的惡果。

香港本來有很多優美的海灘，可惜它們都已成為美麗的回憶，今天，你不單看到泳客的周圍浮游着大量的廢物，你更可以在顯微鏡下見到數以百萬計的大腸桿菌呢！

本來，我們都為他們有名的海港感到自豪，只是，現在我們只會因每況愈下的海港環境而感到羞慚。

清潔環境固然是解決污染問題的一個途徑，然而「清洗」我們的腦也是很重要的一環，以下的議案就是一個特別為十五至十八歲的中學生而設的。年青人是社會未來的主人翁，相信我們都希望他們不單以經濟為導向，同時也能注意環境保護的問題。

基本上，我們同時面對食水污染和海水污染兩個問題，我們建議參予的同學能深入地研究其中的問題。

主 題：關注環境，服務社羣。

- 宗 旨：**
1. 喚起青少年對環境保護的關注。
 2. 了解香港區域內水質的污染和解決的方法。
 3. 透過實地參觀及研討會，增進青少年對水質污染的認識。
 4. 提供基本工作計劃實踐的技巧及掌握時間的概念。
 5. 響應香港政府的呼籲「關心社會、服務社羣」及國際青年商會的口號「青年共創和平」，透過此項訓練和實踐，使青少年獲得體驗，使他們在人生中訂立一目標。
 6. 培養青少年羣策羣力的精神及對社會有歸屬感。
 7. 推廣香港青年商會四大發展機會：
(a)領袖才能訓練 (b)國際事務關注
(c)個人發展 (d)社區發展

- 參加資格：**
1. 參加者須16歲以上之中四至中六學生。
 2. 參加者須以學校名義申請。
 3. 每間申請中學分別派出十名學生（其中一人為隊長）及一名老師參加。
 4. 參加老師除出席訓練營外，同時負責該校的聯絡及協助一切事宜。
 5. 是項訓練計劃只接納十隊。

訓練和實踐：

訓練營：

日期及時間：一九八九年七月十五日上午八時至七月十六日下午六時

地 點：香港中文大學崇基書院學生宿舍

程 序：七月十五日

上午分別安排參觀：(a)打鼓嶺實驗農場
(b)污水處理廠
(c)濠涌河的污染
(d)環境保護署實驗室

下 午：研究會(a)工作計劃的技巧
(b)時間管理研討會

晚 上：錄映帶放映，討論及發問

七月十六日上午：研討會
(a)本港水質污染概況及政府採取的措施
(b)水質污染對生態環境的影響
(c)個案研究

下午：(a)角色扮演
(b)問答比賽（環境保護）

實踐：經過兩天的訓練後，參賽隊伍須於一九八九年七月卅一日前遞交一份有關水質污染的工作計劃書，經評審委員評核後，選出六隊實踐其工作計劃入選隊伍最高可獲港幣肆仟圓為其工作計劃的經費（實報實銷，每一參賽學校，主辦機構將委派一名代表協助推行其工作計劃），必須於一九八九年九月卅日前遞交其完成工作報告書。

名譽顧問：Prof. B.S. MORTON
香港大學動物系教授
Dr. I.J. HODGKISS
香港大學植物系講師
Mr. JAMES FUNG
香港理工學院土木工程系講師

評審嘉賓：何淑賢參議員（香港青年商會會長）
排名不分先後 馮兆榮先生（長春社主席）
熊永達先生（長春社發言人）
葉雪儀博士（環境保護署，環境保護主任）
羅慶麟先生（教育司署地理科高級督學）
周全浩博士（浸會學院地理系講師）

獎項：傑出工作計劃獎—精美獎座一個及書券乙份 得獎學校—培英中學
整體最佳表現獎—精美獎座一個及書券乙份 得獎學校—寶安商會王少清中學
其餘參賽隊伍均獲紀念品乙份

青少年培訓與實踐計劃「難得有清泉」

一九八九年度活動表

活 動	地點/內容	日期/時間
記者招待會	九龍尖沙咀海員俱樂部七海廳 由香港大學植物系講師DR. I.J. HODGKISS 主講。	五月十四日 下午二時
宣傳及接受報名		五月至六月
營前簡介	香港青年商會所一向參加學校的同學和老師介紹今次工作計劃的詳情	七月八日
訓練營	香港中文大學崇基書院學生宿舍 程序：七月十五日 上午分別安排參觀(a)打鼓嶺實驗農場 (b)污水處理廠 (c)濠涌河的污染 (d)環境保護署實驗室 下午：研討會(a)工作計劃的技巧—講者：青年商會副會長容建宜先生 (b)時間管理研討會—講者：前任青年商會會長李文超參議員 晚上：錄影帶放映，討論及發問。 七月十六日上午：研討會 (a)本港水質污染概況及政府採取的措施—講者：張肇堅先生 (b)水質污染對生態環境的影響—講者：MISS NAYNA JHAVERI (c)個案研究 下午：(a)角色扮演 (b)問答比賽（環境保護）	七月十五日 上午八時至 七月十六日 下午六時
草擬工作計劃書	各參加學校各自搜集知識或諮詢其它機構，以工作計劃書的草擬，提交主辦機構。	七月中至 七月三十一日
實踐工作計劃	評判從十間參加學校揀選其中六間學校，以實踐其工作計劃並於完成後遞交工作計劃報告書以作評審。選出的學校每間可得港幣肆仟元作為經費。	八月中至九月
記者招待會	尖沙咀海員俱樂部會議室，由長春社發言人熊永達先生主講：「五十年污水處理大計」	十月八日 下午二時
學生工作計劃展覽會	香港太古城中心西橋	十月十四日至十五日
頒獎典禮	香港太古城中心西橋	十月十五日下午三時
學生工作計劃報告撮要刊物	分派港九各中學及有關團體和機構	十二月下旬

紫荊青年商會簡介：

紫荊青年商會為香港青年商會屬下第一個以中文為法定語文之全女性分會，其組織為一個國際性的領袖訓練及非牟利之團體。紫荊青年商會自一九七九年九月創會以來，一向秉承青年商會的信條，以「訓練自己，服務社會」為宗旨，並積極推廣以下四個發展機會：

(一)個人發展機會

為提供訓練給各會員，經常舉辦研討會及課程包括個人潛能，演講技巧，辯論技巧領袖才能訓練會議程序，激勵及分配技巧等等。

(二)行政管理機會

為提供機會給每一位會員籍以增加管理能力，訓練機會包括：管理訓練，如何領導會議，財政管理，獎勵計劃，社交活動聯宜及體能訓練等。

(三)社會發展機會

為提供服務社會之機會，所舉辦之工作計劃以領先引起社會人士之關注。

曾舉辦之社會工作計劃包括：

- 文明社會下之職業婦女。
- 助養——行動共愛心。
- 全港禮貌運動。
- 投資中國大陸前景研討會。
- 香港前景——1997？！
- 「電腦——我們的明天」。
- 「地產與你」。
- 南海油田與香港經濟。
- 兒童健康週。
- 4·27公民步伐齊向前。
- 背柱治防有道理。
- 青少年營養巡禮。
- 「丸仔一幕」話劇比賽。
- 愛心速遞頌和平。

(四)國際關係機會

為提供會員機會認識海外不同國籍人士，了解世界各國之傳統文化，更可籍參予每年舉行之亞太區會議及世界大會。

紫荊青年商會

董事局成員

會長：溫凱珊

前任會長：何美冰

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青少年培訓與實踐計劃「難得有清泉」工作委員會。

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副主席：陳健基（長春社）

秘書及司庫：歐寶玲

推廣及宣傳主委：何惠霞

公關主委：鄭廣羣

場地及總務主委：張淑貞

場地及總務主委：楊婉娣

評審主委：李淑蓮

監督副會長：鄭柔娟

顧問：薛沈蓮英

如有興趣成為紫荊青年商會會員，

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長春社簡介

一九六八年，由一羣關心全港生活環境質素的人士創立的非牟利性民間團體——長春社，經過二十多年來的發展及蛻變，現今除了在組織上已有鞏固的根基外，最近還成立了一個集社區、教育及資料中心於一身的「香港環境中心」。

工作宗旨

- (一) 遏止環境繼續受到人類的破壞；
- (二) 提倡人類與大自然之間和諧共處；
- (三) 保持動植物的品種繁衍及維持生態平衡；
- (四) 推行有關以上的宣傳及教育的活動。

近年活動

- (一) 「慎用膠袋」運動；
- (二) 「減少垃圾」運動；
- (三) 「天地有淨氣？」空氣測試運動；
- (四) 「難得有清泉」暑期計劃。

「香港環境中心」的服務

- (一) 提供一個儲有各樣與環境保育有關之書籍、雜誌、剪報、幻燈和錄影帶的資料庫；
- (二) 出版環保刊物；「綠色警覺」季刊及環保公民手冊及便覽；
- (三) 製作環保教材及流動展板；
- (四) 協助推行社區及學校環保教育。

長春社——學生暑期計劃工作小組

爲了推行這個「難得有清泉」暑期工作計劃，長春社特別成立了一個工作小組，除了專門解決有關技術及資料的問題外，還協助雙方面組成的工作委員會策劃及推行有關的活動。該工作小組的成員分列如下：

- 主席：陳健基
- 秘書：文玉卿
- 委員：張肇堅
- 張麗萍
- 劉振國
- 周伯偉
- 高韻芝
- 葉文輝
- 馬錫成
- 鍾姍姍

長春社入會辦法

任何有興趣的人士也可以申請入會。只要填妥會員申請表，並連同年費港幣一百元，支票請劃綫抬頭「長春社」，寄回香港郵政總局信箱167號。

通訊地址：香港郵政總局信箱167號

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How Clean is Our Water in Hong Kong

Group of Pui Ying Secondary School

Introduction

Hong Kong is a modern industrialized city. So the industrial waste poses a great pollution problem to Hong Kong, and therefore a constraint to the already limited material resources and man-power as well, in our effort to solve the problem.

In fact, the waterways in Hong Kong have long been polluted. And that problem has become more and more serious in the recent years. Polluted water, which contains poisonous waste, is extremely hazardous to our health. It is sure that no one does like living in an unwholesome environment.

In fact, the chemical waste content of the water around Hong Kong has exceeded the international standard. The point is many profiteering industrialists simply ignore the laws of protecting environment as making money is their only concern. It is they who discharge the tremendous industrial waste at the sea. That is the main cause of Hong Kong's water pollution. You only have to think of the many different kinds of industry that have been expanding in Hong Kong, you would be able to see how terrible the industrial waste could mean to our water.

The other pollutant which affects the water is the washed-down-droppings of the domestic animals. It makes the water smell stinky and helps the germs to grow

fast. Although we have an ideal quality of life, our environment is put in real danger.

Our Activity

Our group held a multi-purpose activity at the Star Ferry Pier's covered area. It is a public place where people like to go to when they are free, therefore, we thought that it was a suitable place for us to carry out our implementation plan.

The days selected to carry out our implementation plan are 25th, 26th, 27th of August (Friday, Saturday, Sunday). We selected these three days to welcome the meeting crowds. In fact, it is a world-wide practice that people go out more often at the weekends. Besides, at the seaside, people interviewed could find nowhere but just in the water next to them the floating pollutant.

In fact, we saw many polystyrene broken pieces mixed with some plastic bags floating in the sea. The eye-sore was so strong as an evidence that the interviewers were triggered off deep thinking of what was said. Another reason for us to set filter to the other places was our safety.

About our choice — STAR FERRY PIER

We carried out our implementation plan in the public area - Star Ferry Pier. It is our

choice because of the throngs of people. We found out that there were over 5000 people walking past the Star Ferry Pier per hour and it covered an area of three thousand square meters.

The theme—

WHERE IS OUR CLEAN SPRING?

The theme of our activity is "Where is our clean Spring?" and it really has a great educational value. Someone says that the pollution problem is always getting away from the public eyes. We therefore want to say to our visitors, "It's high time we took an action to stop the terrible pollution, and the first thing that we can do is check our dumping habit."

Exhibition

The exhibition area covered about ten square meters. It was open to the public. Although the covered area was limited, it made on the viewers a deep and

unforgettable impression. Of course the theme of the exhibition was "Where is our clean Spring?" Although there was no opening speech and there was no ribbon-cutting ceremony, it was a great success. (Let's look at the photographs below.) It attracted a large audience by the photographs, newspaper cutting and the field "Something we can do" and the audience enjoyed the visit very much.

The exhibition was made rather eye-catching because it was the main part of our plan. We did not think it was that creative but we believed it could bring out the atmosphere and magnify the publicity effect by drawing crowds of people around the booth. Usually, it is a strange event that Hong Kong people out of curiosity, like to stop to see what as happened while a group of people are standing somewhere.

Questionnaire

Through the questionnaire, we



(Left)
The exhibition attracted a large audience.

hoped to see how much people knew about water pollution and the latest. And White Paper on the same subject matter. It was found that the people showed much of it as their pleasure when doing the questionnaires. Because of our limited time and man-power and to shorten the interception, we simplified the questionnaire to a group of ten questions only.

We had planned to distribute one thousand questionnaires at the Star Ferry Pier. Though the 1000 didn't seem to be a big number, it was difficult to finish the task within our limited time. On the first day (25th August, 1989), we handed out four hundred and twenty-two questionnaires; on the second day, it was three hundred and forty-six and on the last day, two hundred and sixty three, and the total number of questionnaires we passed out was one thousand and thirty-one copies. We were very pleased to hear that.

Upon the collection of the questionnaires, we had a procedure to analyze the data. To begin with, we had a member who was good at computer language, especially the dBase programming write a dBase program for us and he used Clipper to compile the program into an executable program, before we started our work feeding in the data. In seven hours, we completed the data entry, and started out data analysis right away.

Chain Letter

In addition to the publicity bills, about 10,000 chain letters were mailed to produce a rippling effect. The people received the letters were asked to make their own duplicates and send them out as what we had done. It's hoped that the message of 'keeping our waters clean' could speak for itself and reach out far and extensively.



(Left)

One of our group members was interviewing a visitor.

Publicity bill

Although the activity layout - interviewing the public - was not that creative, we stuck to it in a hope to bring home the message as it's already mentioned there're always big crowds of people in those areas. (According to the statistics, there are over five thousand people each hour passing by.) Not to cause further inconvenience to the public, we decided to shorten the interception by leaving their a publicity bill which we hoped they would read on their way ahead.

The quantity of our publicity bills was forty thousand and this size of circulation was much dependent on the number of people interviewed, the man-power of our group and how long the days' activity lasted. We did count the number of people passing by the area on 3th August and 4th August, 1989. We discovered that there were five thousand of them per hour. And our interviewing program lasted for

three days, with eight hours a days. So the total number of passers-by was three times five thousand multiplied by 8 ($5000 \times 3 \times 8$) and that's equal to 120,000. It was a large number of people for us to handle because we were so inexperienced to organize such a spectacular activity in the public.

We were doing something about the water pollution problem, and we knew clearly that the public should play an important role in an effort to solve the problem. It was to appeal for their co-operation, we started the three days of publicity program. The publicity bill was our helping hand, but on the other hand, it could be a rubbish too. We were very much afraid that the two piers of our propaganda would become the rubbish collection centers of our publicity bills; however, to our relief there were only a few of them dumping our publicity bills. To make sure things would go alright, we had a collection box of the returned publicity bills at the exhibition hall.

Conclusion

In these three days of our co-operation, we learnt how to handle a project in the public area. We felt very happy to have a chance to do a meaningful task in the summer. Although our project will soon come to its end after this report, the task to protect our environment will still be holding on. We know that it is exclusively something we should do on our own responsibility and we really mean to. In fact, it's not only our group's concern, but also that of all the "Hong Kongers".

ACKNOWLEDGMENT

I would like to thank Ms. Wong Sui Chun and Mr. Wong Kwai Kam, for their kind supervision on the project as well as their encouragement. Also, helping hands from our school are highly appreciated.

Special thanks to Ms. Wong Wai Kee for her endless support.

I. INTRODUCTION

Tsuen Wan is the earliest developed and thus the largest new town. The population is increasing drastically. In 1976, the population is about 441,000 while in 1981, it increased to about 599,000. Such crowded living condition has led to many environmental problems, for example, water pollution is one of the most serious among all.

In Tsuen Wan, there are three main polluted streams: Sam Dip Tam, Sham Tseng Nullah and Chung Hang Nullah.

Sam Dip Tam was identified as the first target for improvement. It had been studied by E.P.D. thoroughly and rated as the highest priority to improve. So, it has not been chosen.

For Sham Tseng Nullah, it is too far away from our school so it has not been chosen too.

For Chung Hang Nullah, the location of it is easily accessible from school. As we are more concerned with our own environment, it is chosen to be our site of research. Although part of Chung Hang Nullah had been coordinated by the departments concerned recently, the problem seems to be unsolved.

Therefore, Chung Hang Nullah is chosen for the study.

II. THE STUDY OF CHUNG HANG NULLAH

II-1 Problem Identification

In order to identify the problem in Chung Hang Nullah, a preliminary survey in the form of a pre-trip has been carried out.

From our observation, the colour of the stream was black looking, especially the lower stream. The whole stream has a bad smell. At the lower stream, the smell was unbearably strong. The water is not clear. The flow rate is quite slow and there is quite a large amount of floating waste.

Quite a number of squatters locate right to the stream. The China Dyeing Works is located near to the stream. It is believed that the water is polluted by industrial waste discharge and municipal wastes etc.

II-2 Objectives of the study

The first objective of the study is to arouse the awareness of environmental conservation of the people.

The second objective is to help people realizing their responsibility on environmental protection.

The third objective is to study the water quality in Chung Hang Nullah so as to ascertain the effects of domestic wastes and industrial effluent on water quality.

The fourth objective is to propose possible solutions to improve the water quality of Chung Hang Nullah.

III. PLANNING FOR SURVEY

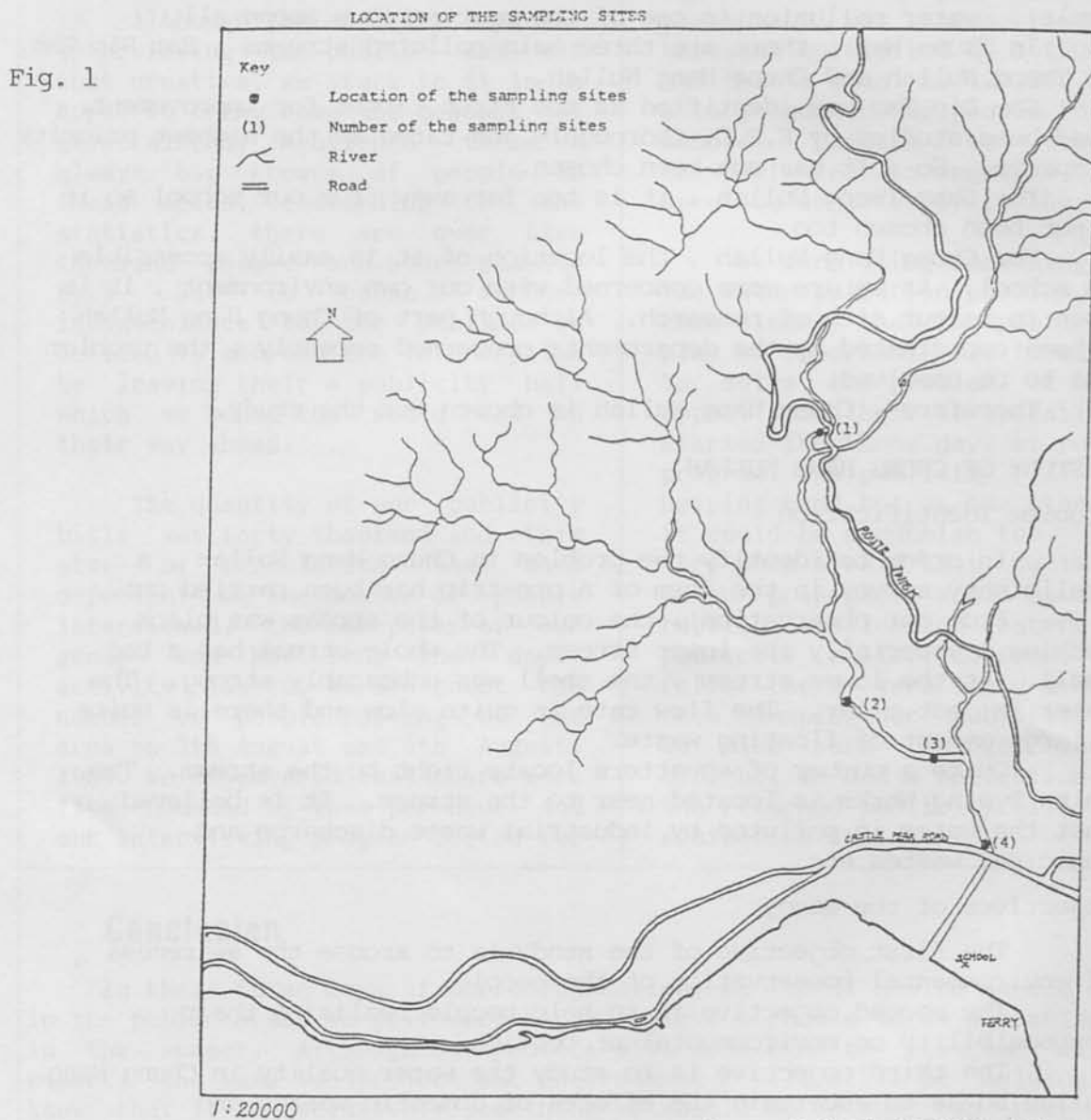
III-1 Selection of sampling sites

Based on the different land uses along the stream and different possible sources of pollution, totally 4 sampling sites are selected, as shown in Fig..1 .

Besides , 3 sub-sites are chosen at each site because there may be some variations within the same site. The result will be more accurate by taking the average of the 3.

From site 1 to 3 , only one measurement was taken at each sub-site.

For site 4 , three measurements at 10:05a.m., 1:00p.m., 3:50p.m. were taken in the same day since the level of pollution may vary according to time within the same day. This may be caused by the industrial effluent from China Dyeing Works which situates there.



Source: Fieldwork, Hona Kona, 1989

III-2 Questionnaire Survey

Totally 100 residents and pedestrians around the area were investigated in order to find out their attitude towards the stream.

III-3 Stream Survey

- a) Land use mapping
- b) Analysis of polluted water

The following parameters are measured in each site :

1) Physical Parameters

The following are measured : colour, odour, temperature & suspended solids.

2) Chemical Parameters :

Dissolved oxygen level (D.O.), ammonia content, phosphate content, pH value and presence of detergent.

3) Biological Parameters

IV-1 Summary Table of Results

SITE NO.	DATE OF SURVEY	TIME	STREAM APPEARANCE			FLOW RATE
			FLOATING MATTER	COLOUR	SMELL	
1	17/8/89	11:30a.m.	NONE	VERY CLEAR (SUB-SITE 2 SLIGHTLY BROWN)	MODERATE	SLOW
2	16/8/89	12:00noon	NONE	CLEAR	NONE	SLOW
3	16/8/89	3:00p.m.	NONE	SLIGHTLY BROWN	NONE	SLOW
4	16/8/89	10:05a.m.	LOW	GREEN + PINK + BROWN	NONE	SLOW
	16/8/89	1:00p.m.	LOW	PINK + BROWN LOOKING	MODERATE	SLOW
	16/8/89	3:50p.m.	LOW	PINK + GREEN + RED + BROWN	STRONG	SLOW

SITE NO.	SUB-SITE NO.	TEMP.	pH	TOTAL SUSPENDED SOLIDS (mg/dm ³)	AMMONIA CONTENT (ppm)	PHOSPHATE CONTENT (ppm)	DISSOLVED O ₂ (g) (ppm)	PRESENCE OF DETERGENT	
1	1	29.5	7.7	0.55	10	10	8.8	NIL	
	2	29	6.7	4.1	8	9	8.7		
	3	29	6.5	REJECTED	5	7	5.2		
	AVERAGE	29.17	6.97	2.3	7.67	8.67	7.6		
2	1	28.5	6.6	1.4	3	4	8.1	NIL	
	2	28	6.0	REJECTED	3	5	8.3		
	3	29	6.7	REJECTED	3	4	8.7		
	AVERAGE	28.5	6.43	1.4	3	4.33	8.4		
3	1	30.5	7.1	REJECTED	8	9	7.1	NIL	
	2	30	7.1	2.1	8	9	6.5		
	3	29.5	7.2	REJECTED	9	10	6.5		
	AVERAGE	30	7.13	2.1	8.33	9.33	6.7		
4	1	32	9.1	40.5	NIL	NIL	8.4	SMALL AMOUNT	
	2	34	9.5	72.1			rejected		
	3	34	9.9	406.5			8.5		
	AVERAGE	33.3	9.5	173			8.5		
	4	1	37	10.4	282	NIL	NIL	8.9	NIL
		2	37	11.0	746			7.9	
		3	45	11.1	522			6.8	
		AVERAGE	39.7	10.83	517			7.9	
	4	1	35.5	10.7	199	NIL	NIL	6.5	SMALL AMOUNT
		2	40	9.7	847	3	4	rejected	
		3	47.5	10.2	54	NIL	NIL	rejected	
		AVERAGE	41	10.2	367	1	1.33	6.5	

From the results obtained , we have the following findings :

- (1) The level of pollution increases downstream. However , the water in site 2 is the least polluted. This may be due to the self-purification of water flowing from site 1 to site 2 as it is very sparsely inhabited.
- (2) The water quality in site 4 is the poorest. This is caused by industrial effluent from China Dyeing Works and the nearby factories, as well as the accumulation of pollution and wastes from upper course.
- (3) The water in site 4 was less adverse in the morning (10:00a.m.) than in the afternoon (1:00p.m. and 3:50p.m.) on the survey day. This might predominately be caused by the tidal action in that morning that diluted the pollutants, but partial operation of the nearby factories in the morning might also be considered.
- (4) The poor planning on land use and the lenient regulation on industrial and domestic effluent are to be blamed for the pollution of the Chung Hang Nullah. In the view of public , the responsibility for the preservice of the environment lies on the government and the industrialists. Although citizens should also share the responsibility , it is generally neglected.

V. LIMITATION OF THE STUDY

The timing of the stream survey poses problem to the study. The survey is carried out in August , that is , during the wet season. The increased rainfall , surface runoff and base flow may result in the dilution of waste effluent in stream. Moreover , there was heavy rainfall of about 2 hours duration at the night before the stream survey. Thus , the results of the survey may be affected. And the present study cannot show the stream quality in Chung Hang Nullah at its worst. It should be also borne in mind that only the water quality of 4 selected sites were studied in August , 1989. The results derived would be subjected to the trend of that particular period of time and limited to the specific sites.

VI. SUGGESTED MEASURES FOR IMPROVEMENT

Having carried out the detail studies , the level of pollution of Chung Hang Nullah is not as serious as what some people may think. The major problems seem to be the industrial effluent from China Dyeing Works and the domestic wastes from squatters at Tso Kung Tam and Pak Tin Pa San Tsuen. In order to improve the water quality , a list of suggested measures is given below :

1. Land use zoning and town planning.
Polluting industries should be relocated from the densely populated areas or mixed land use zones to the suburbs.
2. Legislation
Laws should be passed to control and punish the improper disposal of industrial effluents.
3. Treatment of waste before disposal.
 - a. Sewage treatment system have to set up by the government so that the domestic discharges can be channeled into the system.
 - b. A wastewater treatment system should be set up in China Dyeing Works to
 - i. reduce the amount of suspended solids.
 - ii. lower the pH and temperature. in their discharges.
4. By monitoring environmental pollution.
Before the long term remedial , such as the waste water treatment system , is established ; the E.P.D. should have the responsibility to set up monitoring stations to collect data on water quality of the stream regularly. Immediate action should be taken if the situation becomes not acceptable.
5. Education on anti-pollution and environmental conservation should be introduced to arouse citizen's personal concern and responsibility for the care of the environment.

SUMMARY OF PROJECT

A STUDY OF WATER QUALITY OF SOME BEACHES IN HONG KONG

by

GOOD HOPE SCHOOL

INTRODUCTION

Objectives of the Project:

Participating in the project has been an invaluable learning experience for our team members in the sense that it provides us with an opportunity to apply what we have learnt to solve some problems in real situations, to be more alert of the environmental problems in the society we live, and to learn some useful techniques in scientific and social studies. It is an opinion generally held by the public that the beaches in the east coast of Hong Kong are cleaner and less polluted than that at the west coast. Therefore, it would be interesting if we could investigate and compare some of the beaches from both coasts in regard to their water quality, possible causes of pollution, sea bathers' opinion of them and why they have been chosen to visit. After much deliberation, the following pairs of beaches were chosen:

West coast-----Lido
Casam

East coast-----First Beach of Clear Water Bay
Second Beach of Clear Water Bay

Therefore, the objectives for the project are as follows:

1. to investigate and compare the water quality of the selected beaches by measuring some properties of the sea water there, namely, the temperature, acidity /pH value, transparency, total suspended solids, dissolved oxygen and the foam test.
2. to inspect the environment and the conditions of these beaches so as to identify some sources of pollution
3. to conduct a survey on sea-bathers' criteria for the selection of beaches which they will visit, and their awareness of the effect of water quality of these beaches on their health.

Division of Labour:

Four groups(A - D), each consisting of 5 students, were formed to take up different responsibilities.

Group A and Group B were responsible for the field work at west coast and east coast respectively whereas Group C and Group D were responsible for the laboratory work on alternate days.

Each group was supervised by one or two teachers.

On each site, two members of the group collected water samples and the others staying on the beach carried out some tests on the water samples, inspected the environment and interviewed the bathers.

Limitations of the study:

The team was fully aware of the difficulties and limitations to the project at early stages of planning. The difficulties and limitations originated mainly from the very short time span for the project and the much limited manpower and laboratory facilities that would be available from a single secondary school. Through literature review, the team was aware that in addition to the degree of being polluted, the water quality of beaches in Hong Kong was affected by a number of other factors such as geographical factor, seasonal difference, tidal effect and sampling depth.

However, due to limited time (the field work has to be finished within a few weeks time), equipment and manpower available, the team could only manage to visit the selected beaches for three times within 2 weeks time. Therefore, the scope of the study was limited to water quality in summer. In order to minimize the influence of the above factors on the comparison of the sea-water at different beaches, all water samples were collected within the same period of time, 10 a.m. to 1 p.m. in each visit, and the sampling of water was made at five different locations, each of about 1.3 m deep, of individual beach. The water samples at about 0.5 m below the water surface were collected.

REPORT ON INVESTIGATION AND COMPARISON OF THE WATER QUALITY OF THE SELECTED BEACHES

Water samples were collected at 5 different locations of each beach as described in the previous section of this report. Four parameters of the water quality, namely, temperature, dissolved oxygen, pH value and the foam test were studied at the beaches right after the collection of the water samples. The transparency of water at 5 different locations of the beach was also measured. And the amount of total suspended solids in each sample was determined in the school laboratory in the afternoons of the days of investigation.

The parameters were measured by the following methods:

1. The temperature of the fresh water samples was measured by using a thermometer.
2. The dissolved oxygen was measured by using a calibrated oxygen meter and it is expressed in percentage of saturation.
3. The pH value was measured by using a calibrated pH meter.
4. The transparency of the sea-water was measured by lowering the Secchi Disc into water until the black and white sections on

the disc could not be distinguished. The distance between the disc and the water surface was measured.

5. The Foam Test was carried out by shaking half bottle of water sample for 20 times and measuring the time required for the bubbles to disappear.
6. The amount of total suspended solids in each sample was obtained by careful filtration and drying of the solids in the laboratory. The amount of solids is expressed in mg/l.

The mean values of the data collected are listed in the following table:

Beach	Lido	Casam	Clear Water Bay	
			1st Beach	2nd Beach
Temperature (°C)	29.0	28.8	31.2	31.1
Dissolved O ₂ (% sat'n)	71.6	72.0	87.0	93.5
pH value	7.8	7.8	8.0	8.0
Transparency (cm)	60	67	270	144
Foam Test (sec)	7.7	9.6	13.1	17.6
Total suspended solids (mg/l)	14.75	11.20	11.25	56.30

Note: The result of foam test on distilled water was 6 seconds.

According to the information given in the book 'Water Analysis' (1), the water with a pH value about 6 to 9 and the dissolved oxygen content about 80 to 120 % saturation is suitable for swimming. Therefore, the water of the four beaches in regard to these parameters, is of acceptable quality. Besides, our findings also conform to the results of the surveys done by the Environmental Protection Department of Hong Kong in 1988 (2).

REPORT ON THE SURVEY

Before the commencement of the field work, the students designed a questionnaire for collecting views from the bathers concerning their criteria for the selection of the beach and their awareness of the effect of the water quality on their health. The interviewees' answers to the questionnaires were collected on each day of the investigation period and were analysed.

It had been planned to interview 20 bathers on each beach

each day. However, on some days, only a few interviews were made because only a few bathers were present on the beach at that time.

It is found that the most popular criterion adopted by sea bathers for beach selection is that it must be easy to reach. It seems that as long as it is convenient, people will still visit a beach even if they think the water quality there being 'below average' or 'bad' (37.2% for Lido Beach), and they have worried of sustaining infection (40% for Lido Beach, 27.3% for Second Beach of Clear Water Bay). Therefore, the government has taken the right step in publishing regularly the information of suitability of beaches for swimming and closing up the ones that have been too badly polluted. From the sample collected, the majority of sea bathers (88%) are people above 15 years of age, therefore, people in this age group should be the target of government effort in future campaigns for beach cleanliness.

It is interesting to note that Lido had been awarded grade 'A' for its water quality by the government during our investigation period but the visitors to the beach came exclusively from West Kowloon and West New Territory, and only 28.6% of people felt that the water quality was excellent or acceptable. On the contrary, Clear Water Bay was awarded a 'B' grade, but there were about 15% of visitors who are living quite far away from it and more than 40% of people interviewed felt that the water there was acceptable or excellent. Therefore, there is some discrepancy between the grade awarded by the government and the feeling of sea bathers in regard to the water quality. However, it must be pointed out that the value of E. Coli count in grading water quality is confirmed by the data collected in this survey that there had been relatively low percentage(4.6%) of people who had ever sustained any disease due to swimming in these beaches.

REPORT ON IDENTIFICATION OF SOURCES OF POLLUTION

In our investigation, no direct sources of water pollutants were identified. However, more resorts are found at Lido and Casam than at the beaches of Clear Water Bay. Moreover, there is a barbecue site at Lido. The wastes from these places obviously aggravate the pollution problem of the beach. According to our observation, a lot of unburnt charcoal, broken bowls and soft drink bottles were found in Lido where the barbecue stoves have been installed.

CONCLUSION

According to our observation in these few days, debris and large pieces of rubbish such as glasses and charcoal, which were not at all found on eastern beaches, were commonly seen among the sand on the western beaches. In our opinion, the rubbish problem can only be solved by improving the beach management, for example, by increasing the number of wardens to collect the rubbish among sand as well as on the sea. Education through mass media is also important, and therefore, 'Clean the Beaches Campaign' should be even more widely promoted. Moreover, the government should put up more warning against littering in the beaches and impose more severe penalty to the offenders.

At present, the grading of the beaches is entirely based on the E. Coli count. In our opinion, the grading system should include other parameters such as 'cleanliness' and 'garbage density'. Besides the advantage of giving a more accurate picture, this way of grading will also encourage good management of the beaches which are equally important in their conservation.

In conclusion, this project is, indeed, a very meaningful one. Besides arousing our interest and drawing our attention to the problem of pollution in Hong Kong, our observational power and analytical technique are also improved. Through this activity, we also realize the importance of being co-operative. Above all, we enjoyed the project very much!

References:

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How clean is our water in HK - typhoon shelter

by Tak Oi Secondary School

Introduction:

Hong Kong is very busy and crowded, over 2 million tonnes of sewage and industrial waste water are generated daily by the community. Since there are not enough sewage treatment plants, much of the waste water is ended up in the sea. This deteriorated the quality of our inshore water and inland watercourses.

In this project, we want to investigate how clean is our water in Cheung Chau and Yau Ma Tei typhoon shelters.

Objective:

1. To investigate the level of water pollution in typhoon shelters - by means of case study in Yau Ma Tei and Cheung Chau typhoon shelters.
2. To educate the residents near the two typhoon shelters.
3. To remind the citizens to have a closer look in their surrounding environment.
4. To compare the water quality of the two typhoon shelters, in order to find out the reasons why the pollution level in these two typhoon shelters are so different.
5. To suggest possible solutions to the related government departments.

Background information

Yau Ma Tei Typhoon Shelter

Yau Ma Tei typhoon shelter is one of the worst in Hong Kong, where the water is grey in colour and awful smell is present also. Not long ago, it was mainly a parking site for both living and fishing boats. However, nowadays, the government has prohibited the parking of living boats, hoping that the water quality there can be improved.

Cheung Chau Typhoon Shelter

Cheung Chau typhoon shelter is the largest one in Hong Kong, with 59.9 square metres. It was built on the September of 1983. Now there are 11 living boats and about 60 people, others are fishing boats, some do not park there permanently. On the living boats, most are old people but those on the fishing boats are young men. There are two motor-boat to collect rubbish on the surface of the sea from 8:00 to 16:00 and the collected rubbish is sent to the sewage treatment plant in Cheung Kwai village. For the rubbish that is collected by the people living on the boats, it is sent to the land by themselves.

Experimental results:

	<u>O₂ content (mg/l)</u>	<u>Phosphate (ppm)</u>	<u>Total suspended solid (mg/l)</u>
Yau Ma Tei typhoon shelter	2.949 ± 1.957	0.1598 ± 0.0900	286.78 ± 278.21
Cheung Chau typhoon shelter	3.5844 ± 1.9644	0.0362 ± 0.0169	37.67 ± 27.55

From the above data, the oxygen content was greater in Cheung Chau typhoon shelter than that in Yau Ma Tei typhoon shelter. But the total suspended solid and phosphate content in the two places were just a reverse.

By comparing the two sets of data, the level of pollution in Yau Ma Tei typhoon shelter was much more serious than that in Cheung Chau typhoon shelter. This might be accounted for by the factories and residential areas there. Thus the water might be polluted by the chemical substances and domestic

wastes and sewage, such as detergent, oil or by-products from the factories and home which was driven out into the typhoon shelter. By observation, we have found that there was a large sewage pipe which conveyed wastes into the typhoon shelter though we could not confirm where was its origin. Moreover, methane gas bubbles were also found. The smell of the water there was disgusting and might affect the health of the residents and environmental hygiene.

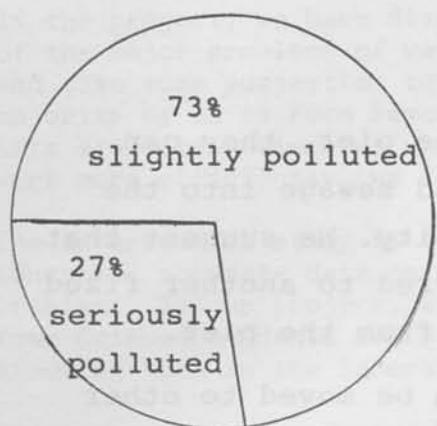
The high phosphate content and low dissolved oxygen content resulted in rapid growth of anaerobic bacteria in the water and further deteriorated the water quality.

However, at Cheung Chau typhoon shelter, there were fewer factories and people, therefore, the concentration of oxygen is higher but phosphate content and amount of total suspended solid were lower. This was to say the water quality there was better than that of Yau Ma Tei.

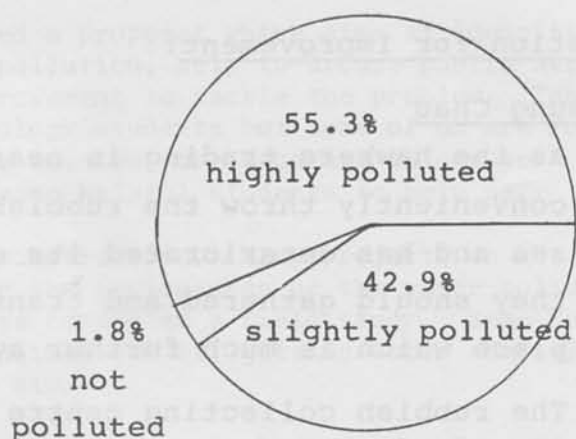
Results of survey:

On 21st of August, 1989, we have done two surveys by means of questionnaires in Cheung Chau and YauMa Tei respectively. There were 41 interviewees in Cheung Chau and 56 interviewees in Yau Ma Tei.

For the survey carried out in Cheung Chau, most of the interviewed resident (79%) had lived there for more than 5 years. They thought that the main sources of pollution were stemmed from the boat people (57%) and domestic sewage (14%). As a whole, the pollution was not seriously polluted to them and they could tolerate it. By the way, the disgust smell of polluted water still disturbed them and swimmers who swam in the nearby beach. In addition, they were aware of the effect on their health. As a result, some of them (7.5%) were willing to reflect their opinions to the related departments such as Marine Department and hoped that the problem could be solved as soon as possible.



Opinions of the interviewees about the degree of pollution of the Cheung Chau typhoon shelter



Opinions of the interviewees about the degree of pollution of the Yau Ma Tei typhoon shelter

Among the 56 interviewees in YauMa Tei, most (60.7%) were residents, with 45% living there for more than 5 years. Majority of people believed that the highly serious pollution there was mainly caused by the people living on the boat and discharging of waste water from nearby factories and pedestrians. Moreover, 24 of the interviewees thought that their health had been affected by the awful smell of the typhoon shelter. They have suggested some methods to improve this situation like disposition of detergents, inclination, collecting rubbish and propagander campaign. Furthermore, they also thought that the Environmental Protection Department should pay more attention to the pollution problem in the Yau Ma Tei typhoon shelter. However only a few of them (2) had reported their opinions to the Environmental Protection Department and the Housing Department respectively.

During our survey, most of the interviewees were friendly and helpful. They were very co-operative and thought carefully before they answered our questions, while some of them were not so helpful and they just answered the questions in a haste. Thus the degree of accuracy of the information found in the surveys might be affected. It was sometime difficult to eliminate this problem.

Suggestion for improvement:

Cheung Chau

1. As the hawkers trading is near the pier, they can conveniently throw the rubbish and sewage into the sea and has deteriorated its quality. We suggest that they should gathered and transferred to another fixed place which is much further away from the pier.
2. The rubbish collecting centre can be moved to other places so that it will not affect the quality of water and the beautiful environment.
3. The large pieces of rubbish can be filtered by a net.

Yau Ma Tei

1. According to the information we have, the Yau Ma Tei typhoon shelter will be inclined in the future. It seems that it is the only solution to solve the problem.

In the project, we have discussed a proposal which aims at identification of the major problems of water pollution, help to arouse public awareness and give some suggestion to improvement to tackle the problem. The majority of us is Form Seven biology students but some of us are Form Four Arts students. Since we want to involve more students in our work and work more efficiently, we find some helpful students to help us.

The experimental study is very constructive. Many projects do not find concrete, accurate data to prove the seriousness of the water pollution problem. In our project, we have conducted a field study. Some Form Four Science students are responsible for it, getting water samples, studying them in the laboratory etc.

The surveys were conducted by a survey team including some Form Four Science students. Their work includes the production of the questionnaires and carry out the surveys, sending letters to factories, analysing the results.

Production of a poster, a pamphlet containing information, a leaflet with suggestion to improvement were carried out by some different form students. Together with the experimental report and the survey report, they are sent to 200 schools and some organization.

Some students are responsible for the bookmark and poster competition, arranging the closing ceremony, taking photos etc.

In the exhibition, four Form Six students are in charge of the presentation of our works and some Form Three students are involved in the decoration of the exhibition boards.

EXPERIMENTAL STUDY

In this project, we studied the water quality of Hong Kong water in Shing Mun River, Lam Tsuen River, River Beas, Yuen Long Creek and Tuen Mun River, identified the degree of water pollution of the rivers studied, and announced the experimental result to the public.

The field study was conducted on 9/9. The students involved are of Form Four. We were led by our Biology teacher. We measured the pH, temperature and flow rate of the rivers. We noted down the smell and colour, the presence of any oil, detergents, floating rubbish e.g., plastics, paper etc.. The presence of any living biological indicator organisms was also considered. We took photos of the river and the sources and causes of pollution were investigated. Finally, we took water samples which would be studied in our school laboratory.

The students participated in the field study were taught by our Biology teacher to use the laboratory materials and apparatus to study the pH, turbidity total suspended solid (T.S.S.) and dissolved oxygen (D.O.) in our Biology laboratory.

An experimental report in Chinese was printed in a form of a table. They were sent to the 160 schools and 20 other organisations to arouse the public awareness and serve some educational purposes.

The report is shown on the next page.

實驗結果

	清 水	城 門 河	林 村 河	雙 魚 河	元 朗 渠	屯 門 河
臭 味	沒 有	濃	頗 濃	頗 濃	極 濃	極 濃
顏 色	透 明	接 近 透 明	灰 黑	灰 黑	黑	深 黑
P H 值	8	9	8	8	9	9
溫 度 / °C	3 0	3 0	3 2	3 0	3 4	3 5
浮 上 物	0	++	+	+++++	+++++	+++++
混 濁 程 度	0	+	++	+++	++++	+++++
油 污	0	++++	+++	+	+++	++++
洗 潔 精	0	+	0	++++	++	0
可 沉 澱 物	0	+	+++	+++++	+++++	+++++
懸 浮 固 體 / (mg/l)	0	0	0	2	1 2	2 3
溶 氧 量 / (mg/l)	1 3	2	1	2	1	1
魚 隻	不 適 用	+++	+	0	0	0
可 見 的 昆 蟲 幼 蟲	不 適 用	0	0	0	+	++++

「+」的數目代表程度

上述為聖言中學『難得有清泉』青年培訓計劃實驗組，在一九八九年九月進行的水質研究報告。

SURVEY

Our aims in the survey include the identification of the major problems in Hong Kong water, investigation of the methods used by some farmers, factories owners in discharging the sewage produced, investigation of whether people know water pollution and its control much or not.

We conducted two surveys, one for industrial section, one for public. Six Form Four students forming the survey team were involved in the making the questionnaire and conducting the surveys. Other information was given by our teachers. For the industrial sector, we have sent letters with questionnaire to 100 factories which are suspected to discharge sewage. They are asked if they produced sewage and what the method of discharge is.

Fifty questionnaires on public section were published. Some people were asked to find out if they know a lot in water pollution and its control in Hong Kong. The results were collected and analysed and were written on a report on 21/9 and then send to 200 secondary schools plus some other organisations.

聖言中學『難得有清泉』培訓計劃組

問卷調查報告

1. 禽畜廢料

本港私人養鷄及養豬農場大約有九萬多個，多位於元朗、大埔、粉嶺及上水等地。在未實行廢料管制前，大部份農民只會用水將禽糞沖進河道，造成污染。後來通過廢物處理條例，條例規定禁止非法將任何液體廢料（除非達到五十：五十的標準，即是低於 50 mg/l 生化需氧量， 50 mg/l 懸浮固體）排入河道或公眾污水渠。調查所得大部份的農民開始採用新方法，減少污染。

2. 工業廢料

以下為產生大量污水的工廠及其在港數目：

- a) 電鍍 (570間) b) 染廠 (580間)
- c) 菲林沖晒 (200間) d) 食物製造 (800間)
- e) 化學原料製造 (760間)

一百封信及問卷曾寄往那些會產生污水的工廠，調查所得：

百分一百的廠房皆排出低於五千噸的污水。

百分之九十的廠房將污水排入污水渠。

百分之十的廠房將其污水經過處理。

* (但假設將沒有回音的工廠，視為將污水排入雨水渠的廠房，那麼百分之八十將構成水質污染。)

3. 市民調查

在五十份問卷調查中：

有5% 不知道河中污水多來自何處。

有5% 不知道構成污染水質的工廠多屬何種。

有70% 不知道那裏受到水質管制。

有50% 不知道非法接駁雨水渠的嚴重性。

有10% 不知道水質受污染的害處。

有80% 不知道污水處理的方法。

AROUSING PUBLIC AWARENESS

A poster were designed by a Form Three students in our school. a pamphlet which contains information extracted from the white paper on pollution in Hong Kong and its associated booklets were produced. A leaflet containing information of suggestion of improvement was issued. Together with the experimental report and the survey report, they were sent to 200 secondary schools and other organisations on 26/9 to arouse the public awareness.

A poster and bookmark competition was held. The advertising notice was used to advertise the activity. Many competition pieces from students were received. The winners were awarded with prizes on 26/9. On that day, a closing ceremony was conducted. Our school teacher has made a speech to the students as well.

An exhibition will be held on October 14 (1 p.m. to 7 p.m.) and 15 (10 a.m. - 7 p.m.) at the City Plaza in Tai Koo Shing. In the exhibition, we intend to exhibit our previous works e.g. experiments, survey. We also display some suggestion to improvement to arouse public awareness.

SUGGESTIONS TO IMPROVEMENT

1. Sewerage

To persuade factories and farmers to install sewers so that the sewage discharged can be collected up and pass into the legal sewers and pass to the right position of the sea to minimize the harmful effects to the environment.

It was estimated many factories and farms simply discharge their sewages directly into the waterways and storm-water drains, causing water pollution there. It is simply due to the lack of the sewerage system. Our sewerage system is over 100 years old, and thus requiring a complete overhaul because the number of new factories and farms are rapidly increasing in this crowded city.

In the White Paper on Pollution in Hong Kong, new system is being introduced to improve the current situation. The collecting will be done through a series of 21 sewerage master plans covering the whole of Hong Kong; and the disposal scheme will result from the Sewage Strategy Study, due to be completed in August 1989. Putting our sewerage right will be very expensive, and could cost us \$12 billion over the next 10 years.

This plan is urgently needed because about 50% of the sewages are discharged illegally into the storm-water drains and then Hong Kong river and the sea without treatment.

2. Sewage Treatment

Some factories have installed small-scale sewage treatment system so that the toxicity of the sewage is reduced. Some heavy metals can be chemically complexed with some other chemicals so that the toxicity is reduced. The organic substances e.g. organic solvents or dye can be decomposed by bacteria so that the effluents are less harmful. Hot water from laundry and dyeing factories should be cooled down first before discharge.

Large-scale treatment plants should be installed by government. Tolo Harbour, Tsuen Wan, Kwai Chung, Yuen Long and Tuen Mun have no sewers. The pollution there is very serious as we have studied in the experiment. Besides installing proper sewerage system, sewage treatment plants should be constructed in order to make the water cleaner.

3. Research

In order to identify the requirements for, and make appropriate provision for, the disposal of particularly difficult wastes research should be done. The Government laboratory and EPD are doing investigation including field study and experiment using nineteen test columns.

The columns are packed with various difficult wastes and pulverised refuse. The wastes under study are tannery wastes, metal sludges, batteries, waste oils, paint waste, boiler grit, dewatered sewage sludge, high flash-point solvents, gasoline sludge, cyanide-contaminated waste and mercury-contaminated waste. The columns are irrigated, and leachate and gas collected to determine the nature of the waste degradation process.

Livestock waste research had been done and four systems are developed:

- (a) dry muck out
- (b) sequential batch reactor
- (c) batchwise activated sludge treatment system
- (d) pig-on-litter system

4. Legislation

- A. The water pollution control zone should be expanded from the present sites to the entire water district.
- B. Enforcement of the control is not very effective. The ordinance should be firmly enforced and thus it should be urgently amended. For example, the new factories before constructed should install legal sewers; the private sewer and the small scale private treatment plant are closely supervised.
- C. Floating rubbish in the typhoon shelters should draw some concern.

5. Education and Arousing Public Awareness

- A. Environmental protection campaign can be held to arouse public awareness. The programme can include exhibition, concert, seminar, talks, etc.
- B. A new curriculum in the Cert. and higher level is needed.

BEACH POLLUTION

by H.K. & Kln. Chiu Chow School

Introduction

In regard to the apparent different water quality in Lido Bay and Ting Kau Bay, a project is carried out by the students of Hong Kong and Kowloon Chiu Chow School in order to find out the reasons.

Lido and Ting Kau Bay are both located in Tsuen Wan, they are just separated by a headland. In spite of their nearness, Lido Bay is classified to be grade A while Ting Kau is at grade C by the governmental criteria of beach quality. Swimmers have already been persuaded not to swim in Ting Kau for about two years. Now, the condition of Ting Kau is deteriorating. The shore is full of rubbish while the water is obviously not clear. As for Lido Bay, condition is reverse. The sand is shiny white and more holiday makers are attracted to visit this beach instead of Ting Kau Bay.

This project is composed of three programmes. The first programme is an overall study on these beaches. A general survey and some experiments were conducted on the 15th of September in 1989. Members of the experiment team and inter-viewers of the survey are divided into two groups. Their studies on these two beaches commenced from 9:30 a.m. to 5:30 p.m.. Finally they did the experiments on these two beaches smoothly and 53 repondents were interviewed totally.

The second programme, Inter-class Environmental conservation and Geography knowledge quiz, was carried out on the 21st of September in 1989. This quiz was organized by the Geography club of the school. The aim is to enhance student's knowledge of environmental conservation and responsibility of protecting the environment.

The third programme is a board display held from the 27th of September to the 6th of October in 1989. The aim is to arouse the interest of the students in the environmental pollution and environmental conservation. The board display is to be lasted for 1 week. All the photos taken from the Lido and Ting Kau Bay as well as the Dai Koo Land Agricultural Laboratory are displayed.

The problem of beach pollution becomes serious recently. It brings many swimmers inconvenience and also affect our ecosystem. In order to find out solutions to solve the problem, we study on it by taking a strange example, Lido and Ting Kau. We know that Lido and Ting Kau are just separated by a headland but the quality of water is extremely different where as Lido and Ting Kau are classified as grade A and grade C respectively. In our project, survey and experiments were conducted.

The overall result of the survey shows that people of higher education level will be more concerned about the beach pollution problem and they want to have a good-qualified water beach. Also, a far but pollution-free beach are chosen by majority of people. Moreover, it indicates that Lido have a better water quality than in Ting Kau.

To whom the public criticized for the causes of beach pollution in Ting Kau are the swimmers, residents who live in Ting Kau. Furthermore, the wind direction and wastage giving out from the nearby industrial area also affect the water quality.

Community blame the government's lack of management and they think that government should take up the responsibility to tackle the problem. They said that more money and resources should be used to protect our environment by the government. In this survey, it gives us a general idea of the public opinion about the water pollution though this survey cannot solve the problem directly.

Besides survey, we rained out research into the reasons for the bad quality of water in Ting Kau but of good quality in Lido by some experiments and observations. The objectives are to look at the current situation of the beaches. Access the extent of pollution existing in the beaches and to examine the water quality of the beaches by conducting some experiment.

First, we observed that Lido has a coastline of 'opened' pattern whereas Ting Kau has a coastline of 'closed' pattern. By 'closed' pattern, it is hard to exchange sea water from outside, so it reduces the oxygen level and keep calm of the sea water. Thus, pollution level of sea water is increased. Moreover, some polluted water comes from Tsuen Wan industrial area contain toxic substances may stay in Ting Kau. Account for the rising problem of pollution, the leaving rubbish by residents is one of the main reasons. On the contrary, the account of rubbish covered Lido is comparatively little due to the little settlement around the beach area.

From the models of Ting Kau and Lido, we can see that water qualities would be distinctively different from place to place and from time to time. In general, the sea water in Hong Kong is heavily polluted. The highest record of E.Coli level in Hong Kong is in Deep Bay.

Compared with record of Deep Bay, water in Lido is very clean that its E.Coli level is very low. Nevertheless, through the experiments and observations, we know that a higher level of suspended solids and detergent in Lido may be on signal that Lido beach is beginning to be polluted. The quality of water tends to be deteriorated.

All these information show that the problems of beach pollution in Hong Kong is urged to be improved. More and more public are concern their surrounded environment as well as their entertained place - beaches. Apart from this, polluted beaches will also deteriorate the beauty of our environment. Sooner or later, beautiful beaches will totally disappear and we will lose many holiday making areas if the problem of beach pollution cannot be well checked.

Knowing that it is very important for us to protect our environment, we should promote awareness to students. An Environmental Conservation and Geography Knowledge Quiz and a Board Display named 'How clean is our water in Hong Kong' is held and organized.

The knowledge quiz is held in order to aim at letting students recognize more environmental protection and their responsibility to the protection of the environmental in Hong Kong. However, the response of the students is not so satisfactory account for the inadequacy of time for preparing the quiz. It also shows that education on environmental conservation is not enough to aware students' attention. More activities are promotion on this topic are suggested to be carried out in the future. The Board Display is also an effective promotion on conservation of environment. Photographs and explanation are provided on board showing what the government is doing to improve the polluted physical environment and explain the urged problem of environmental pollution. On the whole, we know that all our effort has more or less arouse students' attention on environmental conservation.

Since pollution is a big problem, we cannot change the condition in one or two days. In order to fight against pollution, large amount of resources must be utilized and we will take a long time to carry on. The most important is that we must have co-operation of all kinds of people in Hong Kong. We have to promote environmental awareness in the public.

The government should hold the responsibility in controlling beaches pollution. The government should control water pollution in three ways, such as education and moral persuasion, legislation, and incentives structures. If these can be carried out successfully, we believe that the condition would be improved.



* Beach of Lido.



* Beach of Ting Kau.

Conclusion

To conclude, although our experiment results are in vain to explain the distinct water quality of the Lido Bay, Ting Kau Bay, we gain a valuable experience in carrying out programmes. Some experiments were done by non-science class students, but they performed very well. They even took part in the laboratory work after the collection of samples from the two beaches.

As for the quiz, it is admitted to be not so satisfactory. However, the students build up the team spirit among themselves and enrich their minds with the knowledge of environmental conservation. What they learn from the failure of poor publicity of the quiz provides a good experience in carrying out competitions.

The survey, on the other hand, is a very successful one. Students learn the skill of interview through the survey. The survey, as a whole, can help to account for the dissatisfactory result of the experiments. From the survey, it is found that many a people is very concerned about their environment, most of them are more willing to swim in a clean but remote beach than in a close but polluted beach.

To end the project, we are looking forward to seeing a successful exhibition in Tai Koo.

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