
Sound Practice No.1

Saving the Streams in Quezon City (Oplan: Sagip Batis sa QC)¹

Overview

As a result of indiscriminate dumping of solid and liquid waste by residents living along the riverways and creeks as well as the illegal dumping of effluents and other wastes from factories and other industrial establishments, clogged waterways and repeated urban flooding, for many decades, has been a perennial problem to the Quezon City Government. Thus, in April 2003, Oplan: Sagip Batis sa QC (SB sa QC) was coined as an innovative project aimed at **cleaning and clearing all waterways surrounding the City**. Spearheaded by the City Environmental Protection and Waste Management Department (EPWMD), this project enjoined the active participation and support, not only of the different Departments of the City Government, but more so, the many residents along the 41 riverways and creeks traversing 101 barangays. It was deemed necessary for the City Government to mobilize these communities from project conception to its implementation as they are considered vital players in the success of the project. Using a consensus-based approach where all stakeholders have a role to play, the old tradition of "bayanihan"² was employed as communities and barangays were encouraged to volunteer. Almost 1000 Sagip Batis Volunteers (SB Volunteer) signed up to participate.

The City believes that environmental management should facilitate community participation because ultimately, it is their lives who will be affected if the environment around them is not sustainably utilized and managed. As mentioned in the UNEP paper entitled, "Environmental Management and Community Participation: Enhancing Local Programmes," a strong commitment from the local government to be inclusive or show leadership will necessitate the involvement of the community. A prudent local government will involve the community in order to ensure broad commitment, instill responsibility, authority and accountability from all residents of the City.

¹ This practice is prepared and written by PHIVOLCS according to the "MEGACITIES PROJECT: Sound Practices Write-up Template" prepared by EdM-Team 4

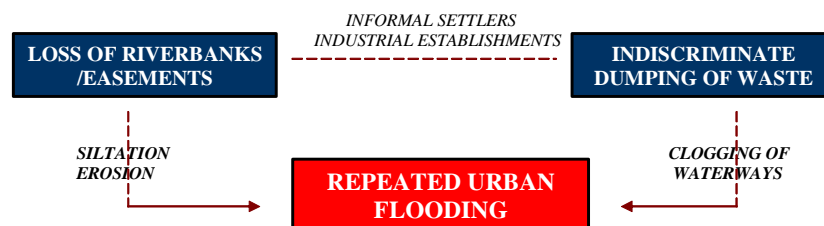
² Bayanihan (buy-uh-nee-hun) is the Filipino tradition where neighbors would help in relocating a family by gathering under their house, and carrying it to its new place. More generally, the word bayanihan has come to mean the communal spirit that makes very difficult tasks possible through unity and cooperation.

Inspired by the many citations from different sectors as well as government agencies in the implementation of the project, the EPWMD decided to expand its gains and implement the 2nd Phase in February 2004, ten months following its enormous success. This time, the focus of its implementation was on pollution control, specifically on illegal and/or excessive wastewater discharges by factories and establishments located near and/or along the riverways. Disposal of human waste by informal settlers as well as the repair and rehabilitation of riverbanks was also included in the scope of work. Moreover, the continuation of the 1st Phase was implemented, aimed at furthering and enhancing the awareness level as well as the participation and commitment of the communities involved.

Background

History of the Problem

During heavy rains, flashfloods is one of the many risks people are confronted with especially for those living along and/or near the riverways. In Quezon City, flooding occurs mainly in the barangays along San Francisco Del Monte-San Juan Rivers which is the outfall of Dario and Bagbag Rivers and Balingasa and Mariblo Creek. This is mainly caused by two important factors, as shown in the following diagram:



Gone were the days when rivers and creeks served the needs of the people. What used to be a source of life has become a basin of rubbish, losing both its aesthetic appeal and water quality. Fish and other marine life had long ago died and ceased to exist and only the communities of mosquitoes, worms and microbes remained. The mere existence of what they call "janitor fishes" in most of the river systems around the Metropolis is a clear indication of how abysmal and horrendous this resource has become in the past several years.

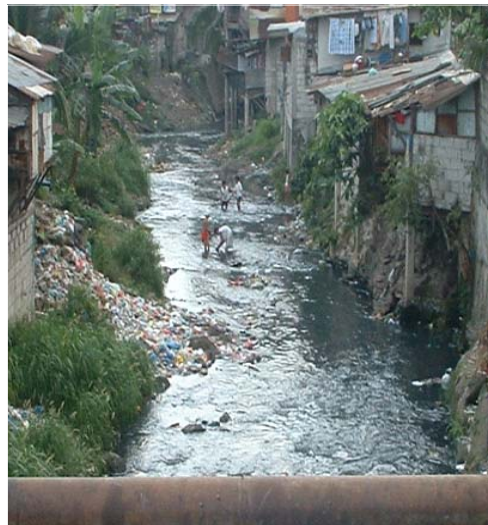
From the mid-50's to the late '80's, urbanization, successive development and social improvement has occurred in the City. Consequently, rapid population growth and the massive influx of people from the provinces to the highly-urbanized Metropolis ensued. Simultaneously, commercial and industrial establishments were constructed near and beside the rivers or creeks. Residential houses also mushroomed from one creek to the other, from one river to the next.

Including the main river basins, there are 41 waterways and tributaries in the City

traversing along 101 barangays. Of the total 142 Barangays, around 77.46% or 110 barangays has immediate access to the 125.61 kilometer resource. With apathetic residents and adamant establishments, rivers and creeks are challenged by a web of quandary:

A. Loss of Riverbanks/Easements

Riverbanks/Easements serve as protective boundaries from structures being built near the river systems. Due to encroachment from informal settlers as well as the advent of industrialization, this protective boundary slowly vanished from view. The absence of trees in these areas also contributed to its erosion and consequently, siltation or river run-off worsened, thus, stagnating the natural flow of waterways. As a result, some of the major river systems in the Metropolis, such as that of the Marikina River, became highly-silted to this date.



One of the very noticeable changes in the natural landscape of rivers and creeks could be traced along the San Juan River and the Tullahan-Tenejeros River System. In an ocular inspection, it was found that private properties and subdivisions as well as informal settlers have already encroached on the river easements in almost the entire length of the riversystem. Moreover, a tributary creek in Novaliches Proper was found "missing" from the time when commercial establishments were constructed on top of it.

Clearly, it can be deduced that by disturbing the landscape and physical characteristics of natural resources, an ecological backlash is almost inevitable.

B. Indiscriminate Dumping of Waste

Following the encroachment of informal settlers as well as the proliferation of factories and other industrial establishments along the riverways and creeks, the indiscriminate dumping of waste, from that perspective, is almost a given. Without proper education and awareness of the effects of disposing domestic wastes as well as effluents in the riverways, it is likely that the said resource would be placed at high risk from abuse and pollution. Such was the case of most riverways and creeks in the City.

Take for example the Tullahan-Tenejeros River System, which is considered as one of the most polluted river systems in the country. Part of the river's pollution is caused by industries situated in the river basin whose significant portion is

designated as industrial area. Many heavy industries are situated in Barangay Nagkaisang Nayon which is contiguous with the industrial areas in Caloocan City and Valenzuela. These industries usually discharge liquid wastes that sometimes contain harmful chemicals.

Alarmingly, though, while it is the general perception that industrial waste is the culprit to the worsening condition of riverways, the Pasig River Rehabilitation Program Feasibility Study (1991) shows that the principal source of pollution is the liquid and solid domestic waste coming from the depressed communities and squatter areas that generate highly organic wastes. These communities lack the sanitary sewerage facilities and usually are not accessible to garbage trucks.

Significance of the Problem

The City is drained thru four river basins, namely: the San Juan-San Francisco Del Monte River, Marikina River, Tullahan River and Maycauayan River basin. Both the San Juan River, which traverses to the central and southern sections of the City, and the Marikina River along the eastern boundary, discharges to the Pasig River. Tullahan River, on the other hand, traverses to the Novaliches area and discharges to the Tenejeros River in Malabon. Finally, the creeks at the most northwestern portion of the City drains to Meycauayan, Bulacan. Ultimately, the drainage outfall of all this river systems is the Manila Bay. Hence, the initial assumption would be that Quezon City contributes significantly to the condition of Manila Bay. Whatever the City throws to its rivers and creeks eventually ends up in Manila Bay.

This is, in fact, confirmed by a recent study made by the Pasig River Rehabilitation Program. The study shows that of the total biochemical oxygen demand (BOD) loadings of 327 tons/day discharged to the Pasig River, 86 tons/day or 26.30% comes from the San Juan River Basin, which is located in Quezon City. In the absence of data showing the actual contribution of QC in the pollution load of the San Juan River and Pasig River, an approximation was made using population ration. Roughly, the City's share in pollution would be about 83% of San Juan River and 21% of Pasig River.

Evidently, it can be told that the City is indeed, a major contributor to the worsening pollution of the Metropolis' river systems. In order to pursue and sustain the efforts being made by other groups in the rehabilitation and restoration of riverways outside the boundaries of Quezon City, it is imperative for the City to implement the same efforts in its jurisdiction as its moral responsibility, not only to its constituents, but more so, to the neighboring towns and cities in the Metropolis. The trickle-down effect of implementing projects such as these will not only benefit the present generation but the future as well. At this point, without the cooperation of the City, efforts to rehabilitate and restore Manila Bay would seem pointless.

Similar Attempts at Remediation

At present, there are two (2) major programs implemented by the National Government to rehabilitate the riverways in the Metropolis: the **Pasig River Rehabilitation Program (PRRP)** and the **Ilog ko, Irog ko: Tullahan-Tenejeros Rivers Improvement Program**.



PRRP is an on-going effort of the national government in coordination with the local government units as well as various GO's, NGO's and private businesses. Its primary aim is to restore the pristine beauty of the Pasig River to acceptable environmental standards. Among the major targets of the program is the reduction of the amount of pollution being discharged or dumped into the river; the development of riverside parks; and the relocation and/or development of squatter communities living along the banks.

Similarly, **Ilog ko, Irog Ko** is a multi-sectoral project aimed at upgrading the Tullahan River in Quezon City and Valenzuela and the downstream Tenejeros and Tonsuya Rivers in Malabon and Navotas. The project enlisted the involvement of the private sector, i.e. various businesses and industries located along the river through a Memorandum of Agreement outlining their participation and cooperation. However, due to organizational structure rigidity, the project soon became inoperable resulting to cessation of meetings and project activities.

In 2002, the Quezon City Government also organized a response-action-group aptly called the **Riverways Sanitation Services**, whose main responsibility is to respond to complaints related to riverways as well as conduct regular clearing and cleaning operations in all waterways surrounding the City.

Details

As mentioned, the **Sagip Batis sa QC Project** was implemented in two phases. The first phase was conducted on March 31 to May 31 of 2003. Its objectives include the cleaning and clearing of the City's Waterways of solid wastes, improve its aesthetic condition taking into account its banks and easements, increase the level of awareness of the community on the proper disposal of solid wastes and promote active participation of the communities in cleaning and maintaining the waterways within their respective Barangays. Its total operational cost is P11, 393,000.00. Six million is allotted for the daily food allowance of the volunteers for the whole duration of the cleaning



and clearing activity. The rest covers food expenses, and rentals of chairs for the pre-operational activities as well as the supplies, materials and equipment utilized.

Volunteers from each Barangay were recruited based on the length and width of the river/creek traversing the Barangay considering also the volume of waste found on it. Thus, a volunteer was expected to clean 125.61 meters of the river/creek for a span of 2 months but they only worked for 6 hours a day five times a week. Their main responsibility is to clean and clear the rivers/creeks of all kinds of solid waste whether floating or submerged. The EPWMD would then see to it that the solid wastes are hauled and disposed properly.

Various Departments and Offices of the City Government including the Local Barangay Council worked together to attain high efficiency and effectiveness of the project and create greater impact. The Environmental Protection and Waste Management Department (EPWMD), which is the primary department tasked to implement the project supervised all the activities of all concerned departments and offices to ensure a well-coordinated effort. On the other hand, the Barangay Operations Center (BOC) handled the information dissemination and orientation at the Barangay level to ascertain the full support and cooperation of the Barangay Officials and Volunteers. Likewise, the Engineering Department provided man power support.

Similarly, the Parks Development and Administration Department (PDAD) handled all improvement and beautification activities of river banks and easements.

Aside from these, support group departments such as the General Services Office, Personnel Department, Accounting Department, Public Affairs and Information Services Office, the concerned barangays, etc., assisted on the immediate and fast processing of personal data sheets, job contracts, payrolls, purchase documents, press release and the recruitment of the SB Volunteers, among others. The MMDA Flood Control Unit provided all the necessary equipment such as the backhoe and crane for easier hauling of garbage and where manual labor is not enough. In the documentation part are the major river systems of the City and its tributaries where the Sagip Batis Project was undertaken.

After the successful implementation of the 1st phase, the City decided to execute the 2nd phase of the project on February 14 to April 14, 2004. It basically operated on the same principle, but its objectives were expanded to include pollution control on illegal discharges of waste water by factories, disposal of human waste by informal settlers and repair and rehabilitation of river banks, etc. Its total operational cost is P8, 414,860.00 and the total volume of garbage collected is 2, 059.7cu-m or 61,791 sacks.

Water samples from the Tullahan River, San Juan River, and Kalamiong Creek were collected and tested before and after the implementation of the 2nd phase of the project to determine whether there was an improvement on the water quality. The Dissolved Oxygen (DO) and the (BOD) were measured and results showed that while the values of these two parameters improved, it was not significant enough to cause a change in the condition of the mentioned rivers as it remained under the Class C classification under DENR-AO 34 suitable only for the propagation of aquatic life and other recreational purposes except for swimming and washing.

The primary beneficiaries of the project were the volunteers as they were directly involved with the project, and the communities situated along the rivers and creeks wherein the impact of the project was felt directly. Ultimately, it is the whole of Quezon City as well as the neighboring cities that benefited from this project whether directly or indirectly since rivers and creeks traverses different communities and an improvement in one part of the river would mean a development on the whole river system.

The Megacity context

Ultimately, it is the vision of the City Government that in working with the citizenry in the implementation of impact projects such as this, providing a "Quality City" where people can live, work and do business in a hospitable, progressive and peaceful environment will soon be realized. Indeed, Oplan: Sagip Batis sa QC could be considered as a Sound Practice for Megacities as it is not only seen as a micro-project but potentially, as a comprehensive measure towards water quality improvement and river restoration in the whole of the Metropolis, if not, the entire country. It is the hope of this project that ecological balance for this resource will be maintained and further dreams that the historically pristine beauty and life of all rivers and waterways in Quezon City will be restored as time progresses.

Supporting Documentation

Table 1. MARIKINA RIVER SYSTEM				
MAJOR TRIBUTARIES	MINOR TRIBUTARIES	AVERAGE WIDTH (m)	APPROX. LENGTH (km)	BARANGAYS TRAVERSED
MARIKINA RIVER		50.00	4.90	Blue Ridge B, Bagumbayan, Ugong Norte
		50.00	4.20	B. Silangan, Payatas
Lumban Creek			2.00	Matandang Balara, Capitol Hills, S. Mateo
MR 1			0.35	Libis, B. Serrano, Libis Dulo-Marikina Boundary, Pasig Boundary
MR 2			1.70	Matandang Balara, Filinvest I.
MR 3			4.50	Bagong Silangan, Filinvest II-B
MR 4			6.20	Commonwealth
				Bagong Silangan
MR 5			2.35	Bagong Silangan, Doña Nicias Subd.

BEFORE OPERATIONS



AFTER 2 WEEKS OF OPERATIONS



BEFORE OPERATIONS



AFTER 2 WEEKS OF OPERATIONS



MAJOR TRIBUTARIES	MINOR TRIBUTARIES	AVERAGE WIDTH (m)	APPROX. LENGTH (km)	BARANGAYS TRAVERSED
TULLAHAN RIVER		20.00	7.60	Talipapa, Bagbag, San Bartolome, Gulod
LA MESA CREEK		5.00	5.60	Sta. Lucia, Fairview
	Ilang-Ilang Creek	8.00	2.45	Sta. Lucia, Pasong Putik
	Libis Creek	3.00	4.00	Fairview, Holy Spirit, Don Enrique Heights
	Paltok Creek	4.00	2.85	IBP Complex, Fairview
	La Mesa Creek 1	4.00	1.30	Jordan Plains, Sta. Monica, Sta. Lucia
	La Mesa Creek 2		2.25	Fairview Park, Sta. Lucia, Sauyo
TR 1		2.50	0.88	Doña Rosario Hts, Novaliches Proper
TR 2			1.03	San Bartolome, Greenheights
TR 3		2.50	1.14	Novaliches Proper, Gen. Luis Ave.
TR 4		1.00	0.09	Novaliches Proper, Buenamar and Doña Rosario Subd.
TR 5		2.0-3.0	1.47	Bagbag, San Bartolome, Holy Cross Memorial Park

BEFORE OPERATIONS

AFTER 2 WEEKS OF OPERATIONS



Table 3. SAN JUAN-SAN FRANCISCO RIVER SYSTEM				
MAJOR	MINOR	AVERAGE	APPROX.	BARANGAYS
TRIBUTARIES	TRIBUTARIES	WIDTH (m)	LENGTH (km)	TRAVERSED
SAN JUAN RIVER			4.55	Dona Imelda, Damayan
				Lagi, Talayan, Tatalon, Roxas, Kalusugan
SALAPAN RIVER			2.75	Damayan Lagi
				Valencia, Horseshoe
	Lagarian Creek		2.55	Valencia, Horseshoe, SM De Porres
	Estero De Valencia		0.80	BL Crame, Horseshoe
SAN FRANCISCO RIVER		18.00	3.80	San Antonio, SFDM, Damayan, Mariblo
	Halang Creek		0.35	San Antonio, Proj.7
	Culiat Creek		6.40	Sto. Cristo, B. Pagasa, Proj. 6, Vasra, Old Capitol, UP Vill.
	Bagbag	2.00	2.75	Tlipapa, Bagbag, San Bartolome, Rockville Subd., Baesa
	Dario River	5.0-10.0	6.40	Sauyo, Tandang Sora, Bahay Toro, A. Samson & Katipunan, NPC Housing prov, San Antonio, SFDM, Sagandaan, Baesa
	Pasong Tamo	5-19	4.20	Bahay Toro, Culiat, Kalaw Subd., Vasra, Pag-Asa, Sto. Kristo, Alicia, Bago Bantay, Katipunan
	Tandang Sora		5.70	Culiat, Pasong Tamo, San Antonio Hts., Kalaw Subd., Holy Spirit
Mariblo Creek			3.65	Mariblo, Sta. Cruz, N.

Table 4. Before Implementation of SB sa QC II

Parameters	Standard Parameter	SAMPLE IDENTIFICATION		
		Tullahan River	San Juan River	Kalamiong Creek
1. BioC Oxygen Demand (BOD)	7	30	53	
2. Dissolved Oxygen (DO)	Not be lowered than 5 mg/L	0	0	
3. Oil & Grease (OG)	2			
4. Total Suspended Solids (TSS)	*			
5. Total Dissolved Solids (TDS)	**			

EQ-LSS-04-042



Republic of the Philippines
 Department of Environment and Natural Resources
 ENVIRONMENTAL MANAGEMENT BUREAU-National Capital Region
 EQD-LABORATORY SUPPORT SERVICES
 BFD Compd., East Avenue, Diliman Q.C.
 Tel No. 928 - 78 - 03

SOURCE
 ADDRESS
 DATE SAMPLED
 DATE RECEIVED
 DATE ANALYZED

C/O EPWMD QUEZON CITY HALL

Gate No.6, Kalayaan Avenue, Diliman, Quezon City

February 12, 2004

SAMPLED BY

Heldreth Bayabos

February 12, 2004

DATE COMPLETED

February 18, 2004

February 12, 2004

DATE REPORTED

February 18, 2004

RESULTS OF PHYSICAL & CHEMICAL ANALYSES

Sample Identification	Station Number	Laboratory Number	Time	
			Started	Finished
SAN JUAN RIVER-E.Rodriguez Ave.	1	04-061	0930H	
TULLAHAN RIVER-Quirino Highway	2	04-062		

Nothing Follows

PARAMETERS	STATIONS				
	#1	#2	#3	#4	#5
Dissolved Oxygen, mg/L	0	0			
BOD (5-day, 20°C), mg/L	53	30			

REMARKS: LABORATORY DO

REFERENCE/S:

- METHODS OF ANALYSIS: Standard Methods for the Examination of Water and Wastewater, 19th Ed 1995, APHA, AWWA, WEF.
- Paid Under O. R. No. _____ dated _____ in the amount of Six Hundred Forty pesos (Php 640.00) only.

ANALYST/S:

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CHECKED/APPROVED:

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Chief, Laboratory Services

NOTED:

EMILIANO P. KEMPIS, JR.

Chief, Environmental Quality Division

Document 1 Water Quality Analysis (Before project implementation)



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 Tel No. 928 - 78 - 03

EQ-L5S-04-083

SOURCE	C/O EPWMD QUEZON CITY HALL		
ADDRESS	Gate No.6, Kalayaan Avenue, Diliman, Quezon City		
DATE SAMPLED	March 3, 2004	SAMPLED BY	Heldreth Bayabos
DATE RECEIVED	March 3, 2004	DATE COMPLETED	March 9, 2004
DATE ANALYZED	March 3, 2004	DATE REPORTED	March 10, 2004

RESULTS OF PHYSICAL & CHEMICAL ANALYSES

Sample Identification	Station Number	Laboratory Number	Time	
			Started	Finished
TULLAHAN RIVER-Quirino Highway	1	04-120		
SAN JUAN RIVER-Araneta Avenue	2	04-121		
KALAMIONG CREEK-Waterhole Payatas	3	04-122		
Nothing Follows				

PARAMETERS	STATION/S				
	#1	#2	#3	#4	#5
Dissolved Oxygen, mg/L	0	0	0		
BOD (5-day, 20°C), mg/L	36	30	50		
Total Suspended Solids, mg/L	40	20	40		
Oil and Grease, mg/L	10.26	9.7	8.43		

REMARKS: LABORATORY DO

REFERENCE/S:

- METHODS OF ANALYSIS: Standard Methods for the Examination of Water and Wastewater, 19th Ed 1995, APHA, AWWA, WEF.
- Paid Under O. R. No. _____ dated _____ in the amount of One Thousand Four Hundred Thirty pesos (P1430.00) only.

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Document 2: Water Quality Analysis (20 days after project implementation)

Knowledge Base Coding Reference:

Name of the Practice: Saving the Streams in Quezon City (Oplan: Sagip Batis sa QC)
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