



## **Association pour le Développement Durable (ADD)**

**ADD/CJ/UNESCO Sandwatch implementation in collaboration with the  
Ministry of Education and Human Resources, Tertiary Education & Scientific  
Research and La Gaulette State Secondary School with the support of  
Currimjee Foundation**

**(January – July 2018)**



### **Summary report**

**July 2018**

**Sandwatch implementation at La Gaulette State Secondary School**

## **Summary**

Sandwatch activities were implemented at La Gaulette SSS from January to July 2018 by the Association pour le Développement Durable (ADD) in collaboration with the Ministry of Education and Human Resources, Tertiary Education and Scientific Research (MOEHRTE) and with the support of the Currimjee Foundation (CF). Seven science students were selected to participate in the programme with field works at La Preneuse public beach. They were mostly from Grade 10 class. Five educators were involved in the process. Four field exercises were conducted to collect data on water quality from a portable multimeter, beach width and profile using a locally made instrument based on the principle that water always finds its own level, animals and plants and footprint of human activities along 4 transect lines. Three classroom sessions were organised to train students on the use UNESCO Database for data archival and analysis and to enter data collected and generate products. A closing ceremony was held on 13 July 2018 whereby students presented the results and achievements. Representatives for the MOEHRTE, CF and ADD attended the event. Certificates of Achievements were awarded to the 7 students who participated in all activities and Certificates of Participation to 11 students who were involved in some initial activities. Students expressed interest to replicate the programme next year. The School and especially the educators saw the value of the Programme and were prepared to participate in another similar exercise.

### **Sandwatch implementation at La Gaulette State Secondary School**

#### **1. Background**

Sandwatch is an educational process, developed by UNESCO in 1999, to inspire students and teachers to work together to monitor the coastal environment and develop sustainable approaches to address coastal issues. It was initially implemented in Mauritius in January 2007 by the Centre for Research and Documentation in the South West Indian Ocean (CEDREFI) at Flic en Flac and Le Morne villages whereby students and local communities were sensitized through hands-on activities to monitor the coastal environment and propose solutions to address coastal problems. However, no follow up took place after the termination of the project.

The Association pour le Développement Durable (ADD) has long been contemplating the idea of reactivating the programme. It was at the top of the list of proposals for future activities as decided by

participants during the celebration of 10<sup>th</sup> ADD Anniversary (22 April 2017, De conti Hotel, Pointe aux Piments). This is understandable: Marine Science is already a subject that can be taken by students for the school and higher school certificate examinations. Moreover, the Government has targeted ocean economy as one the pillars for development. However, much still remains to be done to enhance, within the school community, ocean literacy.

As a contribution to the promotion of science, in general, and in order to stimulate interest in marine science, in particular, ADD decided to focus its attention on the implementation of the Sandwatch programme in 2017/2018. A concept note was submitted to the Ministry of Education and Human Resources, Tertiary Education and Sciences Research in December 2017. The Ministry gave its approval and selected La Gaulette SSS for a pilot project. Currimjee Foundation, on a request from ADD, agreed to provide funding to implement the programme under the CSR scheme.

## **2. Implementation process**

A first meeting was held at La Gaulette SSS on 29 January 2018 with the Rector, Mr. M. Kim Currun and Educators to discuss the modalities and agree upon a programme. A brief on Sandwatch was provided by ADD and its benefits to the school and students in terms of visibility and enhanced knowledge on coastal ecosystems, were highlighted. The responsibilities of La Gaulette SSS and ADD in the implementation process were clearly defined. It was finally decided to involve mostly Grade 10 science students and also co-opt some promising students from other grades. Fifteen students were initially selected.



Figure 1: Some members of the Implementation Team

### **2.1 Introduction to Sandwatch to Educators and students**

The first contact with the students was made on 20 February 2018. Fifteen students, three educators and five ADD members participated in the session. Details about the Sandwatch programme were provided.

The activities and tasks to be undertaken by students and the important role of the educators were discussed using a power point presentation. ADD highlighted its responsibilities to ensure the smooth implementation of the programme



Figure 2: Mr. S.N. Sok Appadu briefing on the meteorology component of Sandwatch

## 2.2 First field exercise at La Preneuse beach

The main purpose of the first exercise was to get students acquainted with the beach and its physical characteristics with the assistance of the educators. Fifteen students and 5 teachers participated in the exercise. Sandwatch manuals obtained from UNESCO were distributed to the educators and students and Mr. Ragoonaden provided some explanation on how to use it. He encouraged them to visit the Martello tower as a landmark of the La Preneuse beach to gather information that could be included in the Sandwatch report. They met and discussed with Mr. Michael, a resident of Rivière Noire, who knows the public beach since his childhood, about his recollection on the evolution of the beach since his early days. They gathered that gradual and sometimes drastic changes have taken place to the beach and the lagoon. Erosion has been very severe in the past decade. The shoreline was almost 50 m away seaward from its present position about 5 years ago.

They also noted the rows of sandbags placed about 3 years ago to address coastal erosion. They made observations about the prevailing weather using guidance from the manual and filled the data sheet provided for the purpose. They took note of the footprint of human activities on the beach.

Another important output of the visit was the identification of four landmarks – river canal, vertical wall, cannon and sand accretion region - whereby transect lines would be drawn for detailed biological,

chemical and physical studies. Data sheets to be filled later for beach profile, water quality and plants and animals along the transect lines were provided.



Figure 3: A view of the sand characteristics of La Preneuse beach and the cannon as a key landmark and reference mark

### **2.3 Second field exercise**

Eight students were selected for this exercise. A kit with a brief on Sandwatch and data sheets and clipboards were distributed to students and teachers. The students were divided into 2 groups – one group focused on identifying animal and plants and the other group on conducting beach profiling along the four transect lines ( section 2.2). The profiles lines were divided into 3 zones (i) low lying water up to low water mark; (ii) between low water mark and high water mark; and (iii) between high water mark and the edge of the vegetation (Figure 4). The different plants and animals were identified in each zone and noted on a data sheet.

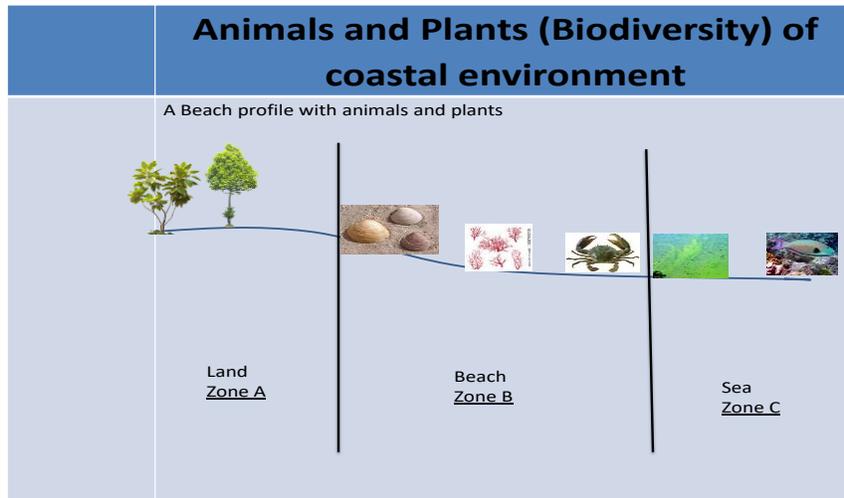


Figure 4: The three zones for in-depth studies

For conducting beach profiling, an equipment, based on a paper “Simple Method of Measuring Beach Profiles (Andrade F. and Ferreira M.A. (2006)) made locally, was used for the purpose. The method known as the “Emery method” uses the principle that water always finds its own level. Experience has shown that data obtained using this simple method for beach monitoring profile is comparable to those obtained from sophisticated equipment used by surveyors.



Figure 5: Locally made wooden instrument for beach profiling using the “Emery method”

Differences in water levels from the two vertical tubes along various segments on each profile line from the reference mark to the shoreline – river, wall and cannon - were noted on a datasheet by the students with some assistance from teachers for analysis and graph plotting later.

## **2.4 First classroom exercise**

The first class room session focused on the training of students and familiarisation of educators on the UNESCO International Database. Mr. Ragoonaden highlighted that the database was an important tool developed by UNESCO to archive, on a permanent basis, data and information collected during the implementation of Sandwatch and would be accessible to all participants to enable comparison. A 1 page information sheet, giving succinct details on the database, was initially discussed with the educators and then distributed to the students. Explanation was provided on the different categories of users, namely Beach Administrator, Beach Editor and Beach Viewer. Each step to get access to the different section of the database was then clarified.

He demonstrated how to enter the data already collected. Entry of some data was made and students were requested to continue the task. A username and password was provided to the students to get access to the database.

## **2.5 Third field exercise**

The two groups (Section 2.3) constituted in the previous field exercise swapped tasks to provide opportunities to students to cover all components of the Sandwatch activities. Beaches width were measured using a measuring tape and beach profiles conducted using the locally made instrument along the 3 transect lines – the wire fence near the river canal discharge to the sandbags; the end of the wall to sandbags and the landward end of the stone supporting the cannon up to the first row of geo-textile sand bags - to cross check data obtained during the second exercise. At the accretion region only the beach width from a pole to the High Water Mark (HWM) was measured and beach profiling was postponed for the next field exercise. The students were provided with tips how to identify HWM.



Figure 6: Measuring beach width up to the High Water Mark at the accretion site of the beach

For the first time, water quality measurement was made using a portable multimeter acquired within the framework of the project. The students were trained how to use the meter and obtain data on salinity, conductivity, pH and sea surface temperature. Data were collected at 2 different sites – near the river outflow and opposite the cannon.



Figure 7: The water quality monitoring instrument.

## 2.6 Second classroom exercise

Data already entered into database were reviewed and further hands-on training on data entry as well as on how to add and update photos were provided. This exercise carried out with the assistance of the educators boosted the confidence of students on the proper use of the database for data and photos archival.



Figure 8: Participants at the training on the UNESCO Database

### **2.7 Fourth field work exercise - 06 June**

In this last field exercise, (i) the slope of the beach profile in the region of the accretion site was mapped for the first time, (ii) animals and plants datasheet along the 4 identified beach profiles were updated, and (iii) water quality parameters was once more collected using the multimeter which was recalibrated by the distributor as some data collected previously were considered erroneous.



Figure 9: Beach profiling in the region of accretion



Figure 10 Monitoring animals and plants in three zones shown in Figure 4

Animals and plants along the 4 beach profiles namely along the river canal, wall near the kiosk, cannon and accretion zone were updated and missing information added.

### **2.8 Third class work exercise – 02 July**

Data entry was completed. Presentation by the students on the day of the closing ceremony was discussed and a tentative programme prepared with the help of the Rector.

Detail reports on the field and classroom exercises are available.

### **3. Closing ceremony – 13 July**

The closing ceremony was attended by (i) Mrs D. Munohur, representative of the Ministry of Education and Human Resources, Tertiary Education & Scientific Research (ii) Dr. I. Bhugun and Mr. P.Fleur, Representatives of Currimjee Foundation (iii) Messrs S,N. Sok Appadu, S. Chacowry, R.Nookadee, S.Ragoonaden, Dr. B Pathack and Mrs O.Ragoonaden from ADD, Mr. M. Kim Currun, Rector and 4 Educators from La Gaulette SSS and 17 students. Speeches were delivered by Mrs Munohur, Mr. Sok Appadu, Dr. Bhugun and Mr. Kim Currun.



Figure 11 Mrs Munohur delivering her speech

Each of the 7 students who participated actively in the programme made presentations on the outcomes and achievements on the various activities implemented using a narrative approach illustrated by photos.



Figure 12 A student making her presentation

It was followed by the award of Certificate of Achievement to the 7 students who participated up to the end of the programme and to 11 students who participated in the first training and initially in a few sandwich activities, by the invitees.



Figure 13 Award of certificate to one student by Dr. Bhugun of Currimjee Foundation

Mr. Kim Currun, in his closing remarks, thanked all the invitees present and the students for their considerable effort and perseverance. He then invited all participants for some refreshment.

A detailed report on the closing ceremony is available.

#### **4. Experience gained and lessons learnt**

This was the first time that Sandwatch had been implemented in Mauritius using guidance from the UNESCO Sandwatch manual. Most of the key activities had been completed. Valuable data and information about La Preneuse Beach has been collected. These would prove useful for future studies and comparison. The educators took considerable interest in the Programme leading to the success of the activities. The students have benefited from the programme as they learnt more about the importance of science in their daily life and how principles and laws from text books could be applied in practice on the field. It has demonstrated that a school of average level, if provided with opportunities and facilities, can achieve much in terms of initiatives and innovations. The school has also become more visible within the Ministry of Education and Human Resources, Tertiary Education and Scientific Research.

The implementation process was slow at the beginning. Discussion with the school to agree upon a tentative programme for the first two terms was held only at the end of January 2018. Only a few initial activities could be planned in advance. Initially, considerable effort was devoted to clarifying the objective of the Programme and the specific activities would be undertaken. ADD was testing the use of the Sandwatch manual and archival of data in the UNESCO database for the first time. However, the

expected outcomes became clearer through “learning by doing” as activities evolved. Students gained more confidence and data and information collection accelerated in the second half of the programme. The educators played a crucial role in sustaining the interest of the students and in mentoring them with a high degree of commitment.

La Preneuse beach was selected in view of its proximity. However, the erosion problem was already addressed with the placement of sandbags about 3 years ago. Measurement of the width of the beach was possible from the fixed reference marks to the first rows of sandbags. However, there were no sandbags in the accretion zone and it was doable to measure its width from a wooden pole as the reference mark up to the High Water Mark. The width extent would most probable increase in the future due to the impact of the adjacent sandbags. Subsequent measurement could thus demonstrate the adverse effect of placing hard structures in the coastal region.



Figure 14 Sandbags placed to address coastal erosion



Figure 15 Gradual degradation of the sandbags-state after about 2 years

The UNESCO Database has been a valuable tool to archive the collected data on a permanent basis. This would be available to future Sandwatch participants and practitioners to identify changes and conduct appropriate studies. However, though tutorials and guidance are available, it took the students sometime to familiarize themselves with it. They have continued to enter some information and photos in the database.



### Login to Database

Username:

Password:

Log In

Reset

#### Sandwatch International Database

Welcome to the Sandwatch International Database!

The database was launched in Mauritius on 20th March 2013. The database provides participating Sandwatch groups the opportunity to upload their monitoring data to a secure site. Not only will this allow for proper archiving of environmental data, but it will also allow users to analyse their results, create their own charts and graphs, and communicate their findings visually with the wider community.

Non-Sandwatch groups can also visit the site and view the data.

To access the database, you need a username and password. Please [click here](#) to find out how to get a username and password.

If you have any questions or comments about the database, or if you have forgotten your password please send an email to [sandwatchdatabase@gmail.com](mailto:sandwatchdatabase@gmail.com)



For a sample of what the Sandwatch International Database looks like and to see what you can expect, please click on the following links to see a PDF copy of the User Guide and the Getting Started Tutorial:

- [Sandwatch Database User's Guide](#)
- [Getting Started Tutorial](#)

Click on the following link to see a PDF copy of the Sandwatch Methods Manual:

Figure 16 The cover page of the UNESCO Database

One shortcoming identified is that the Database is not flexible enough to allow profile data collected by the “Emery method” to be entered directly. The database has been designed to accept data such as slope angle obtained by using an Abney level instrument. Excel was thus used for data entry, analysis and plotting and the product incorporated in the database.

Everyone involved in the Programme learned quite a lot on how to use the Sandwatch manual and the UNESCO database. The number of field and class work sessions is considered adequate. ADD is confident that the next Sandwatch programme will be more productive and beneficial to students.

## 5. Concluding remarks

A photo mural of size 60cm by 84 cm printed on vinyl and stick on a white teak board showing a narration of the implementation process through photos will be presented to the school. This will be a recollection that La Gaulette SSS is the first secondary school to implement the UNESCO sandwatch.

La Gaulette SSS has appreciated the benefits accrued to the students and school. The participating students are now better aware of the fragility of the coast and to look for quantitative signs of its evolution. The Rector and Educators have expressed interest to replicate the programme next year with a

mix of the experienced students and new ones to share knowledge. La Prairie beach in the south has been proposed on account of its proximity and the prevailing severe coastal erosion problem it is facing.

## **6. Acknowledgements**

ADD is much grateful to the Ministry of Education and Human Resources, Tertiary Education and Scientific Research for providing the opportunity to implement the programme and making arrangement with La Gaulette SSS; the Rector, Educators and students for their support and participation and Currimjee Foundation for providing funding and encouragement throughout the design and implementation phases.