ENVIRONMENTAL AND SOCIAL MANAGEMENT IN PORT DREDGING: A CASE STUDY OF THE 2017 KINGSTON HARBOUR DREDGING CAMPAIGN

By

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INTRODUCTION

Kingston Freeport Terminal Limited (KFTL), a subsidiary of the CMA CGM Group of companies entered into a thirty year concession agreement (starting July 2016) with the Government of Jamaica to operate the Kingston Container Terminal (KCT). As part of the concession agreement, KFTL is obligated to expand and upgrade the nautical access into the Kingston Harbour by capital dredging in order to accommodate larger vessels traversing the Panama Canal since its recent expansion. The Kingston Harbour is an environmental resource of importance surrounding the Greater Kingston Metropolitan area, notwithstanding its steady decline over the last 50 years. The Harbour receives inputs from a number of point and non-point sources associated with Industry, agriculture and residential developments. The topic of Capital Dredging prior to KFTL's 2017 campaign has been highly controversial among fishing and environmental interests, with the former being vehemently opposed initially based on a reported decline in fish catch and habitat, years after the last Capital Dredging campaign in 2001. As part of the company's obligation to its financiers as well as its own overarching commitment to operating in an environmentally and socially responsible manner, a multi-faceted environmental and social intervention was implemented to ensure that the 2017 dredging campaign was executed with minimal impact/ displacement.

ENVIRONMENTAL MANAGEMENT OF THE 2017 KINGSTON HARBOUR DREDGING CAMPAIGN

As part of due diligence and compliance obligations, KFTL developed a comprehensive Dredge Management Plan. The project was also guided by conditions stipulated in an environmental permit issued by the National Environmental and Planning Agency (NEPA). KFTL undertook to dredge 7.15 million cubic meters of sand from the sea floor utilizing both Cutter Suction and Trailing Hopper Suction Dredgers. Dredge spoils were disposed offshore, outside the Kington Harbour at a depth 600m. The dumpsite was scientifically determined by 3D hydrodynamic modelling. The parameters of interest and their monitoring frequency are given in Table 1.

Parameters	**Frequency**	**Method**
Turbidity	24/hr/7days	Fixed In-situ
Temperature,DO,pH, Turbidity	Weekly	Mobile In-situ
Oil and Grease, TPH	Weekly	Mobile In-situ
BOD,PCB,nitrate,phosphate,heavy metals	Monthly	In-situ
Siltation	Biweekly	Dive observation
Seagrass Surveys	Pre/ During/ Post	Transect
Sound Monitoring	During	Mobile
Aerial Surveys	Monthly	Drone Surveillance
Tracking of vessels to disposal site	Daily	GPS

Table 1-Environmental Parameters

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Notwithstanding the extensive monitoring campaign, the parameter of interest was turbidity as it was a marker for the impact of dredging on fisheries and ecology of the Harbour. Six (6) continuous turbidity monitoring devices recording over 6600 monthly averages were deployed to establish baseline conditions as well as to verify probable impact during dredging operations. In addition turbidity was also captured at two depths using a handheld probe at various predetermined points across the Harbour. KFTL was required to ensure as a condition of its Environmental Permit that turbidity levels associated with dredging operations not exceed 29NTU within 10m outside the nautical access or face cessation of operations. To avoid this scenario an adaptive management process was implemented where operational changes such as dredging without overflow, would be made once turbidity levels associated with dredging reached a self-imposed lower trigger limit of 20NTU. A weekly monitoring report was issued to NEPA throughout the life of the project. The results indicated that turbidity associated with dredging never exceeded the prescribed limits outside the shipping channel and therefore was unlikely to impact fish species resulting in a reduction in catch outside the normal cycles associated with the trade. On the contrary it was demonstrated that peaks in turbidity coincided with major rainfall events, resulting recorded peaks of over 200NTU in some areas.

Siltation and Seagrass surveys were also conducted at sensitive locations within the Kingston Harbour, to include the Sunken city of Port Royal; a designated heritage site for which KFTL through its dredging contractors was required to maintain a 400m silt curtain to protect the area from further siltation. The results show clearly that there was no observed reduction in coverage or extensive siltation in these areas.

Another finding of interest inferred from the data is the impact of industry on the marine water quality within the Harbour. Elevated levels of copper and nickel were recorded at some monitoring stations close to outfalls. Total Petroleum Hydrocarbons were also recorded at elevated levels in waters in the vicinity of the petroleum refinery in particular after small spills occurred.

SOCIAL MANAGEMENT OF THE 2017 KINGSTON HARBOUR DREDGING CAMPAIGN

KFTL embarked on a robust fourfold course of social management, focused mainly on the 4,778 fisher folk from the 13 landing sites that surround the Kingston Harbour. The 4 areas of the social management of the project were stakeholder engagement, the monitoring of pre and during dredging fish catch data, establishment of a livelihood support system for fishers and the sponsoring and implementation of community development initiatives aimed at improving the living and working conditions of fisher folk as well as promoting the sustainability and rejuvenation of the Kingston Harbour's biodiversity.

Fisher Folk Stakeholder Engagement

As previously stated, prior to KFTL's 2017 campaign, the topic of Capital Dredging was very controversial among fishers, particularly because it was perceived that their fish catch declined and did not recover for over 10 years after the last Capital dredging campaign in 2001. Against this backdrop, KFTL was compelled to differentiate itself from the previous campaign and embarked on a deliberate programme to ensure fisher folk were engaged up front in order to avoid conflict during project implementation. Fisher folk stakeholder engagement was multi-faceted. It consisted of the establishment of a Monitoring and Implementation Committee (MIC) to oversee the livelihood support process, which included 3 beach leaders(for transparency), the establishment of a 20 person beach leadership assembly and the hosting of beach meetings at all of the 13 landing sites to increase understanding of the dredging process. To build further consensus, approximately 30 beach leaders and selected fishers were granted access to board either of the two dredgers to observe the process. Furthermore, 9 fishers were trained and employed to monitor the silt curtain which was placed around the Sunken City at Port Royal as previously mentioned.

Monitoring of Fish Catch

To ascertain the potential impact of dredging on fishers' livelihood, KFTL committed resources to monitor their daily catch. The data were collected via boat side survey and recorded on a Catch and Effort form. It was then uploaded to an excel database from which analysis was completed. The data collected were also utilised for verification in the livelihood support process. When KFTL's fish catch data were compared to data collected by KFTL's independent consultant in 2015/2016 and to a rapid assessment completed by Jamaica's Fisheries Division in 2013, the results showed that the dredging did not have any significant impact on fish catch over the comparable time periods (Figure 1).

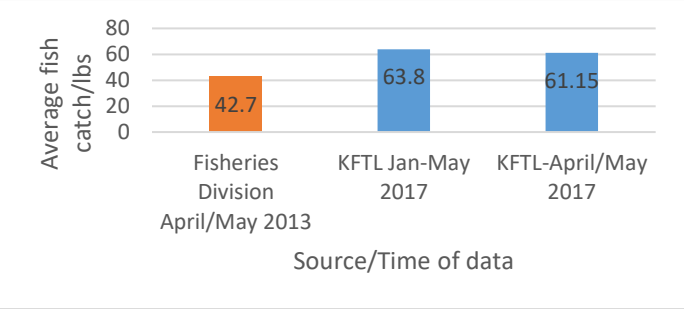

Figure 1-Average fish catch comparison- KFTL vs Fisheries Division

Livelihood Support System

Despite the fact that the dredging did not impact fish catch, KFTL still established a multi- criteria based livelihood support system whereby fisher folk could access monetary support for the days when, for whatever reason, they would have caught less than anticipated or nothing at all. The system was overseen by the Livelihood Support Sub-committee of the MIC which included two fisher folk representatives. Fisher folk submitted applications for support which were blind reviewed weekly on a case by case basis. Using the multiple criteria method which assessed applications based on location in which the applicant was fishing, turbidity level at said location along with the applicant's usual average fish catch, fishers were either awarded a set amount in support or the application was denied based on inconsistencies. For the entire dredging, 1265 applications were received from 10 of the 13 Kingston Harbour landing sites. Of this total, 807 were approved and 458 were denied.

Community Development Initiatives

Acknowledging that not all fishers would apply for livelihood support, but still committing to have a meaningful impact in fishing communities, KFTL invested in a series of short and long term community development initiatives. The former were aimed at improving fisher folk living and working conditions while the latter are geared towards improving the sustainability of the fishery resource of the Kingston Harbour. For the long term initiatives, KFTL partnered with the Centre for Marine Sciences at the University of the West Indies to implement two projects specifically aimed at improving the fish stock in the harbour as well as being potential avenues of alternative livelihoods through eco-tourism tours. The first project is the Rehabilitation of the Refuge Cay mangrove system which was covered in approximately 1 to 2 feet of garbage that was impeding water flow, creating a central dead zone. The rehabilitation project includes the cleaning of the garbage, the replanting of mangrove and installation of garbage barriers. The clean-up portion of the project which was completed in 6 weeks by 23 fishers, yielded over 8600 bags of garbage along with 213 tyres and 30 refrigerators.

Conclusion

KFTL was able to successfully execute a capital dredging campaign in the Kingston Harbour with limited environmental and social impact. The company was also able to gain significant goodwill with fishing stakeholders and the environmental community by enhancing their lives and livelihoods and the