TC Abstract

I. Basic project data

▪ Country/Region:	Trinidad and Tobago/Caribbean
▪ TC Name:	Piloting an innovative approach to adaptation in Tobago
▪ TC Number:	TT-T1057
▪ Team Leader/Members:	Gerard Alleng (team leader), Sara Valero Freitag, Anaitee Mills, and Juan Carlos Gomez (INE/CCS); Dale James (CCB/CTT); Vashtie Dookiesingh (MIF/CTT); Adela Moreda (INE/RND); Rodrigo Riquelme (INE/WSA), Luis Simon (CSO/EXR), and Maria Elisa Arango (LEG/SGO)
▪ Taxonomy:	Client Support
▪ If Operational Support TC:	N/A
▪ Reference to Request:	IDBDOCS# 39540045
▪ Date of TC Abstract:	TBD
▪ Beneficiary:	Trinidad and Tobago
Executing Agency and contact name:	The Cropper Foundation Mr. Mark Thomas CEO (mthomas@thecropperfoundation.org)
▪ IDB Funding Requested:	USD$ 555,000
▪ Local counterpart funding:	USD$ 137,000 (in kind and in cash)
▪ Disbursement period:	18 months (14 months execution)
▪ Required start date:	August 1st 2015
▪ Types of consultants:	Firms and/or Individuals
▪ Prepared by Unit:	INE/CCS
▪ UDR:	INE
▪ Included in Country Strategy (y/n); ▪ TC included in CPD (y/n):	n n
▪ GCI-9 Sector Priority:	Protect the environment, respond to climate change and promote renewable energy and food security

II. Objective and Justification

2.1 Caribbean nations are particularly vulnerable to the effects of climate change as a result of their relative isolation, small land masses, concentrations of population and infrastructure in coastal areas, limited economic bases, high dependence on international tourism and climate-sensitive ecosystems and limited financial, technical, and institutional capacity for adaptation. Expected impacts of climate change in the Caribbean region for the upcoming years include: (i) sea level rise (SLR); (ii) decreased mean annual precipitations; (iii) increased annual temperatures; (iv) increased sea surface temperature; and (v) increased storm activity and intensity. The implications of these changes on the socio-economic and environmental conditions are expected to be significant, including the degradation of coastal ecosystems.

2.2 Coastal coral reefs have been documented (Vergara et al, 2009) substantial economic services to coastal communities in the Caribbean. The value of services provided by corals in the Caribbean, including primary loss in productivity of fisheries, coastal

protection, tourism and others has been estimated in US$5-11 billion/year. These ecosystems have been identified as one of the systems vulnerable (with high confidence) to the impacts of climate change, to the extent that even though impacts may vary across regions and localities, it is virtually certain that these will be overwhelmingly negative. Thermal stresses, low adaptive capacity of coral reef systems together with small variations in sea surface temperatures are projected to increase the frequency of coral bleaching and morbidity. The negative effects of these climate change related impacts will put reefs under additional stress as they are already experiencing anthropogenic stressors such as population growth, over-fishing and pollution increase, which are also likely to increase. Under these and the projected conditions, reefs that are already stressed may not survive or may be degraded to the extent that they could not be considered as functional or healthy. In order to provide some measure of resilience, coral reef rehabilitation practices will have to be implemented together with ecosystem management interventions.

2.3 The Buccoo Reef Marine Park is Tobago's main tourism attraction with over 50% of the island's tourists visiting the site. Tourism accounts for 46% of Tobago's gross domestic product, and employs 60% of its workforce. Furthermore, while tourists spend USD 9 million per year at Buccoo Reef (e.g., on water sports, like snorkeling and SCUBA diving), the reef contributes an additional USD 250 million to Tobago's economy via on-land tourist spending (e.g., hotel payments and restaurant dining). Over the years the system has been negatively impacted by overcapacity of visitors to the site, excessive land based pollution which has resulted in excessive nutrient loading in the water column. A study of water quality and benthic biota at fringing coral reefs in Tobago found that recent increases in local nutrient pollution, particularly from sewage, had served to push Tobago's coral reefs over the threshold indicative of eutrophication on Caribbean coral reefs (La Pointe, 2007). Additionally there are more recent negative impacts related to climate change in which mass coral reef bleaching events associated with increases in seawater temperature have occurred. Bleaching events were first observed at Buccoo Reef in 1998 and, since then, has occurred in 2002, 2005, 2008, 2010, 2012, 2013 and 2014—making what was once a rare occurrence an annual event. It is anticipated that these impacts will be exacerbated if measures are not put in place to alleviate the level of stressors to the system.

2.4 The Cropper Foundation, in collaboration with world-renowned Trinidad and Tobago artist Peter Minshall, has conceptualized a three-year project to create an underwater art installation—called *Tobago Water Colors*, which will help addressing the indirect effects of climate change on Buccoo Reef by serving as a rival tourist attraction to the reef. Fewer tourists would spend less disruptive man-hours on the reef stimulating and accelerating its rehabilitation and remediation. Additionally, because the effects of environmental stresses on corals are cumulative, the reduction of the smothering seaweed threat to the reef will also enhance the corals' ability to cope with climate change-related heat stress. There is precedent for the use of underwater sculpture parks as rival tourist attractions to (and as successful conservation and remediation tools for) coral reefs in Cancun (Mexico), Molinere Bay (Grenada) and the Florida Keys (USA). It has been demonstrated that underwater parks such as the one being proposed for

Tobago foster economic development not only from the community based industries that are developed around them (as it is the case for Molinere Bay where the unique production of art works has evolved, as a result of the park apart from it serving as an alternative ecosystem for marine life and/or support for the recovery of damaged ecosystems) but also due to the direct income that it provides for the country and the communities around. The Subaquatic Museum of Art in Cancun (MUSA) is the world's largest underwater museum with over 500 permanent life-size sculptures. It is estimated that it attracts 300,000 visitors per year generating over $40 M US in profits.

2.5 As part of this initiative a Water Colors Trust Fund will be established with earnings from park's ticket and memorabilia sales, making the attraction a novel, long-term, sustainable, income-generating mechanism for financing management and activities at Buccoo Reef[1]—with a focus on climate change adaptation. Furthermore, in addition to these environmental benefits Water Colors will achieve Triple Bottom Line outcomes, benefitting Tobago's economy by giving the island another marketable attraction (and local communities' craftspeople new souvenir and memorabilia trades - cultural and creative industries), and enhancing Trinidad and Tobago's cultural heritage by providing the country's first major public artwork.

2.6 Rapid growth in technology access is enabling the creation of a wide range of skilled jobs in vibrant cultural and creative industries. These industries involve the development, production and distribution of cultural and creative products and services. Cultural industries include visual and performing arts, festivals, museums, audiovisual production (film, TV, radio), music and crafts, among others. Creative industries range from digital animation, software development, video games, to interactive multimedia and scientific visualization. Such industries represent an important contribution to economic growth, employment and income generation and export earnings, while also promoting more sustainable, inclusive and climate resilient development. In Trinidad and Tobago, cultural and creative industries are estimated to account for 4.8% of GDP and 5% of all jobs in 2011. These industries are growing rapidly and outperforming other exportable sectors. The net flow of foreign exchange derived from these industries grew from $32M US in 2000 to $50M US in 2011. In the Americas, they account for approximately $87 billion of world creative exports, approximately 14% of the world total[2].

2.7 The cultural and creative industries represent untapped economic potential, and make a positive contribution to the innovation economy and other sectors of the economy through supply chain effects. If the Caribbean is to continue to increase competitiveness in this changing global environment, they need to promote the right conditions for creativity and innovation to prosper in a new entrepreneurial culture. There is a lot of untapped potential in the cultural and creative industries to create growth and jobs. The

[1] It is expected that once the trust fund is in full effect, the activities financed will be expanded to other areas of Tobago and cover different approaches to remediation and climate change adaptation.

[2] WIPO. 2011. WIPO Studies on the Economic Contribution of the Copyright Industries. Building Competitive Advantage, Six strategic business clusters. Ministry of Planning and Sustainable Development, Government of The Republic of Trinidad & Tobago (2012).

Government of Trinidad and Tobago has identified cultural and creative industries as one of its six business development priorities[3].

2.8 The objective of this TC is to pilot this innovative approach to climate change adaptation and to support sustainable and environmentally friendly development for Tobago's economy by undertaking a feasibility assessment for the implementation of a large underwater art installation that will help facilitate the natural recovery of the reef and provide a new source of income for the tourism and cultural and creative industries sectors in Tobago. The park will serve as an alternative attraction reducing the number of visitors to the reef and facilitating its natural rehabilitation and remediation. The TC will also finance the implementation of a study on water pollution mitigation in order to explore the options to reduce anthropogenic pollution loading on the system[4]. These activities geared towards reducing pollution loading on the reef will allow the ecosystem to recover more rapidly and improve Tobago's adaptive capacity. Finally, the TC will also involve a market study to ascertain the optimal ticket and memorabilia prices for the attraction, forecast its annual income, and determine the best way to advertise the attraction in order to ensure long term sustainability of the installation. It will also provide inputs for private sector involvement in this initiative as the larger project will have to rely on private sponsors to allow for the completion of the underwater installation and the development of other complementary cultural and creative industries. The park also has the potential to further enhance its cultural offer and support local economic development through the development of cultural products and services tied to climate change adaptation and reef preservation (performing arts, festivals, carnival related activities, crafts, audiovisual production, video games, scientific visualization, photography, etc.). As part of the market study, an analysis will be conducted to determine cultural and tourism products and services that can be developed to contribute to the local economy. Cultural and creative industries represent business opportunities that can enhance the underwater park's financial sustainability.

2.9 The proposed TC will contribute to the following GCI-9 lending targets: (i) supporting development in small and vulnerable countries (GN-2616-2); and (ii) climate change, sustainable (including renewable) energy, and environmental sustainability. It is also aligned with the IDB's Integrated Strategy for Climate Change Adaptation and Mitigation and Sustainable Renewable Energy (GN-2609-1) and its Action Plan (GN-2609-3) as well as with the objectives of the Biodiversity and Ecosystem Services program. Finally it is also aligned with the development pillars of the recently updated Institutional Strategy for the Bank (2010-2020) by promoting innovation and sustainable growth and contributing to the region's efforts to cope with climate change, while also developing the region's creative economy.

2.10 This TC has synergies with other IDB on-going projects such as the "Caribbean Smart Islands Program (RG-T2543)" and "Piloting the Integration of CZM and CCA in Tobago (TT-T1034)" led by INE/CCS; "WASA Modernization and Wastewater Infrastructure Rehabilitation Program (TT-L1018), "Multi-phase Wastewater Rehabilitation Program-

[3] Building Competitive Advantage, Ministry of Planning and Sustainable Development 2012

[4] This study will provide valuable inputs for the preparation of a future INE/WSA loan operation on waste water treatment in Tobago.

Phase I (TT-L1026)" and "Testing a Prototype Caribbean Regional Fund for Wastewater management GEF (TT-X1011)" led by INE/WSA; "Feasibility Studies for a risk-resilient Coastal Zone Management program (TT-T1038)" led by INE/RND; and "Program to promote PPPs for infrastructure in T&T (TT-M1019)" and "ICT Innovations for the Development of the Masquerade Industry of T&T (TT-M1021)" led by MIF. It supports inter-divisional collaboration within INE and with the private sector arm of the Bank (MIF) and has great potential to lead to bigger investment opportunities for the IDB.

III. Description of activities and outputs

3.1 **Component I: Piloting of an underwater installation for adaptation.** This component will finance the development of an environmental and aesthetic assessment of at least 3 potential project sites in Tobago that will be evaluated in terms of their environmental capacity to support the establishment of the water park as well as based on their appropriateness from an attraction and business point of view. As part of the environmental assessment, an Environmental Management Plan will be also developed. Cost-benefit and multi-criteria analysis tools will be utilized in these assessments. The component will also finance the piloting of two pilot sculptures in order to inform the design of the bigger art installation in regards to appropriate materials for the marine environment, construction and deployment methodologies/techniques and best layout, among others. The expected results of this component are (i) the determination of the feasibility of and potential for scaling-up of the pilot activities; and (ii) the identification of the final project site.

3.2 **Component II. Study on water pollution mitigation.** This component will finance a feasibility study for water pollution control in the Buccoo Reef area by undertaking a hydrological study, nutrient study, discharge audit/cadaster, treatment level study and a cost study. The result of this component is the assessment of current pollution levels and the identification of interventions and infrastructure needs that could be implemented to improve water quality.

3.3 **Component III. Market and communications study.** This component will finance a market study to identify the optimal financial conditions for the success of the attraction, willingness of the target audience and stakeholders to utilize the attraction, forecast annual income, ways of attracting sponsors and private sector involvement and determine the best way to advertise the attraction to its target audience[5]. This study will include the assessment of the willingness to visit and pay of the target audience utilizing the results from Component I. The study will also provide inputs to be utilized in the establishment of the Water Colors Trust Fund which is of utmost importance for the sustainability of the project. As part of the study, an analysis will be conducted to determine tourism, cultural and creative products and services that would complement the underwater park and its surrounding communities to contribute to the local economy while promoting climate resilient development. The result of this component is the generation of key information to attract sponsors and visitors for the establishment and sustainability of the park as well as a way to demonstrate in an innovative manner, the interaction between art and climate change adaptation.

[5] The marketing component in terms of tourist attraction should include the definition of a campaign including virtual visits to the park so that visitors can visit the sculpture park in real time from remote locations.

IV. Budget

4.1 The total cost of this project is expected to be USD$ 692,000 of which USD$ 555,000 will come from non-reimbursable resources of the Bank and USD$ 137,000 will be provided in kind and in cash by the Cropper Foundation in their role as executing agency for the project.

Component	Description	IDB	Counterpart	Total
Component I	Piloting an innovative approach to climate change adaptation	270,000	37,000	307,000
Component II	Study on water pollution mitigation	170,000	20,000	190,000
Component III	Market and communications study	50,000	10,000	60,000
Project administration		40,000	40,000	80,000
M&E		15,000	30,000	45,000
Auditing		10,000	-	10,000
TOTAL		**555,000**	**137,000**	**692,000**

V. Executing agency and execution structure

5.1 The Cropper Foundation is a not-for-profit organization established in 2000 with a focus on environmentally-sustainable and economically-equitable development in Trinidad and Tobago (T&T). Its work is geared towards influencing local, regional and global development policy and practice so that socio-economic and political issues and environmental concerns are addressed in a holistic manner, within the framework of sustainable development. The Foundation is a past recipient of IDB funding for its EcoAgriCulture project, which built capacity among small-scale farmers in T&T in the use of sustainable farming practices.

VI. Project Risks and issues

6.1 The main risks in this project will be: (i) low interest of the target audience in visiting and paying for the proposed attraction, which will be mitigated by piloting the construction of 2 sculptures that will support the generation of information to be used in the market study; (ii) resistance to utilize the selected pilot project site by tour operators. This will be mitigated by stakeholder involvement activities during design and implementation of the project.

VII. Environmental and Social Classification

7.1 It is not anticipated that the activities to be financed in this TC will have negative direct social or environmental impacts. Therefore, the team considers that, according to the Bank's Safeguards Screening Toolkit, this operation should be given a classification of "C": (i) no environmental or social risks; and (ii) direct contribution to solve an environmental issue.