

Participatory Three-Dimensional Modelling (P3DM) in the Caribbean

Impact study on the introduction, adoption and replication of the practice



by **Neila Bobb-Prescott**, consultant
and **Giacomo Rambaldi**, study coordinator

Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA)

CTA contract ref: 1-1-14-3-3-4/2014-741

July 2015

Table of Contents

1	EXECUTIVE SUMMARY	5
1.1	Background and context.....	5
1.2	Outputs	5
1.3	Outcomes.....	6
1.4	Impacts	6
1.5	Lessons learned, recommendations and conclusion	7
2	INTRODUCTION	8
2.1	Background	8
2.2	Context.....	8
2.3	CTA investment.....	9
2.4	Key events and products which contributed to the adoption of P3DM in the Caribbean	10
2.5	Complementary Capacity Building Initiatives	12
2.6	Objective and purpose	12
2.7	Methodology.....	13
3	FINDINGS	14
3.1	Funding Sources / complementary funding.....	14
3.2	Outputs	15
3.2.1	Models produced and people trained via direct involvement by CTA	15
3.2.2	Changes in capabilities of direct beneficiaries.....	15
3.2.3	Publication and dissemination of knowledge products	15
3.3	Outcomes: Replication and Effective Use.....	17
3.3.1	Replication of the P3DM process	17
3.3.2	Dissemination of lessons learned in implementing the P3DM process.....	18
3.3.3	Train others in organizing and facilitating P3DM processes	18
3.3.4	Institutional adoption of P3DM process	19
3.3.5	Use of captured data via GIS	19
3.4	Impacts at Institutional level	19
3.4.1	P3DM mainstreamed (at institutional level).....	19
3.4.2	Funds mobilised and service contracts acquired.....	19
3.5	Impacts at societal level	20
3.5.1	Improved relationship with constituency and partners	20
3.5.2	Facilitating, transmission and documentation of cultural and landscape heritage	20
3.5.3	Contribution to improved disaster management.....	20
3.5.4	Contribution to coastal restoration.....	20
3.5.5	Potential contribution to income generation activities to support sustainable livelihoods.....	21
3.5.6	Potential contribution to improved spatial planning	21

4	LESSONS LEARNED	22
5	RECOMMENDATIONS	23
6	CONCLUSION	24
7	REFERENCES	25

List of Tables

Table 1	Summary of direct investment by CTA in the region in support of the adoption of PGIS	9
Table 2	Milestones related to P3DM practice in the Caribbean Region.....	11
Table 3	Organisations involved in P3DM activities in the Caribbean.....	14
Table 4	List of organizations that participated in the training exercise in Tobago (September to October, 2012)	36
Table 5	List of organizations that participated in the training exercise on Union Island, St. Vincent and the Grenadines (February to March, 2013).....	37

List of Appendices

Appendix 1	Questionnaire	26
Appendix 2	Operational in-country schedule	29
Appendix 3	List of P3DM exercises done and planned (year 2015) in the Caribbean.....	30
Appendix 5	Case study: Catalysing the practice of P3DM in the Caribbean region	36
Appendix 6	Case study: Proliferation of the practice of P3DM in the Caribbean.....	38

List of Abbreviations and Acronyms

3D	Three-Dimensional
ACP	African, Caribbean, Pacific
AVSF	Agronomes et Vétérinaires Sans Frontières
BMZ	Bundesministerium Für Wirtschaftliche Zusammenarbeit (German Federal Ministry for Economic Development Cooperation)
CANARI	Caribbean Natural Resources Institute
CARDI	Caribbean Agricultural Research and Development Institute
CARPHA	Caribbean Public Health Agency
CATS	Caribbean Aqua-Terrestrial Solutions-Programme
CCAM	Caribbean Coastal Area Management Foundation
CCCCC	Caribbean Community Climate Change Centre
CEDEMA	Caribbean Disaster Emergency Management Agency
CEHI	Caribbean Environmental Health Institute
CIMH	Caribbean Institute for Metrology and Hydrology
CRFM	Caribbean Regional Fisheries Mechanisms
CROSE	Coordination Régionale des Organisations du Sud-Est
CTA	Technical Centre for Agricultural and Rural Cooperation ACP-EU
DNRE	Department of Natural Resources and the Environment
EC	European Commission
GEF-SGP	Global Environment Facility, Small Grant Programme
GFC	Grenada Fund for Conservation Inc.
GIS	Geographic Information Systems
GIZ	Gesellschaft für Internationale Zusammenarbeit (German Agency for Intl. Cooperation)
GPS	Geographic Positioning Systems
IAPAD	Integrated Approaches to Participatory Development
ICT	Information Communication Technology
MSc	Master of Science degree
IFAD	International Fund for Agricultural Development
P3DM	Participatory three-Dimensional Modelling
PGIS	Participatory Geographic Information Systems
PGIS	Participatory Geographic Information Systems
PWM	Partners with Melanesians
SGP	Small Grant Programme
SIDS	Small Island Developing States
SP	Strategic Plan
SusGren	Sustainable Grenadines Inc.
TEMA	Tobago Emergency Management Agency
THA	Tobago House of Assembly
TIS	Tropenbos International Suriname
TNC	The Nature Conservancy
ToT	Training of Trainers
UNDP	United Nations Development Programme
UWI	University of the West Indies
VSG	Association of Saramaccan Authorities or Vereniging van Saramakaanse Gezagsdraggers
WWF	World Wide Fund for Nature
UNESCO	United Nations Education Scientific and Cultural Organisation

1 EXECUTIVE SUMMARY

1.1 Background and context

In its 2011-15 Strategic Plan (SP), the Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA) recognizes that “smallholders, subsistence farmers, pastoralists and fishers are especially vulnerable” to climate change. In addition, it highlights that “demands on natural resources for agriculture (land, water, plant nutrients and biodiversity) are increasing, and are leading to conflicts due to competing claims”. In this context, CTA strategy promotes the establishment of enabling policy environments for implementing effective long-term adaptation actions. In this regard, CTA has implemented the 2014-2016 project **MP3.1** *‘Enhancing Institutional and Grassroots ICT Capacity to Influence Agricultural and Rural development Processes and Value Chain development’* and specifically its Sub-project **MP3.1.2** *‘Participatory Spatial Information Management and Communication for Empowering Grassroots in Climate Change Adaptation, Advocacy and Policy Processes’* and is currently implementing the 2012-2014 antecedent *Promoting participatory ICTs for adding value to traditional knowledge in climate change adaptation, advocacy and policy processes in the Pacific and Caribbean*. The CTA is now seeking to assess **outputs**, **outcomes** and possibly **impacts** resulting from CTA interventions in support of the introduction, adoption and replication of P3DM practice in the Caribbean.

CTA introduced the practice of Participatory 3-Dimensional Modelling (P3DM) in the Caribbean in September-October 2012 via a project implemented by the Caribbean Natural Resources Institute (CANARI) and the University of West Indies (UWI) on the island of Tobago. However, as early as 2005, CTA piloted a number of key activities and events to lay the foundation for this exercise. As of May 2015, there has been a total of 12 models built in seven countries (Dominica, Grenada, Guyana, Haiti, St. Vincent and the Grenadines, Trinidad and Tobago and Suriname) by 15 different implementing organisations. CTA has directly invested EUR 157, 414. In addition to this monetary investment, CTA staff has expended great effort in remotely coaching/training practitioners and their institutions, mobilising resources via other donor agencies, stimulating exchanges of experiences via e-discussion fora, documenting case studies, and facilitating professional linkages between individuals and institutions. CTA has also extended the opportunity to selected staff responsible for communication and outreach from institutions in the region to be trained in Web 2.0 and Social Media via face to face or distance learning courses to enhance their capacity to collaborate and to create, share and publish information and eventually mount advocacy campaigns.

1.2 Outputs

Four of the 12 models were produced in the framework of CTA-supported projects involving CTA’s provision of both financial and technical inputs. Events took place in Trinidad and Tobago, Grenada, Saint Vincent and the Grenadines and Suriname. People trained in practicing P3DM include representatives from the above countries plus Colombia, Dominican Republic, Haiti, Jamaica and St. Lucia. Three of the implementing organizations (CANARI, UWI and the Nature Conservancy (TNC) involved in the 2012 Tobago P3DM exercise, reported improved skills and experience gained in using participatory tools, Web 2.0 and social media to communicate the work they do and in interacting with their constituencies. The evaluations completed by trainees from 19 organizations who participated in the 2012 Tobago P3DM exercise indicated improved understanding and skills in facilitating community processes; strengthened and reinforced knowledge in analysing climate change impacts on the landscape and doing adaptation planning at the local level; and improved awareness of GIS mapping processes in analysis and planning. Knowledge products disseminated during and after model building exercises included videos, articles, blogs and technical papers.

1.3 Outcomes

To date the P3DM process has been replicated in the Caribbean Region eight times since the first 3D model was built in Tobago in 2012 and an additional four models were built previous to 2012 in Guyana and Haiti. Five of the 12 models that were built in total, were done by direct beneficiaries of the Tobago 2012 exercise (CANARI, UWI, SusGren, Union Environmental Attackers Inc., TNC and GFC). Dissemination of lessons learned in implementing the P3DM process has occurred via informal (face-to-face meetings) and formal means like policy brief (4 languages), a case study, video productions, research papers and through presentations at regional and national fora.

CTA has been promoting the Training of Trainers (TOT) approach whenever it contributed to the implementation of a P3DM exercise. In this respect in May 2012 CTA supported the participation of representatives from CANARI, TNC and SusGren in a regional workshop which took place in Honiara, Solomon Islands. All these organisations later on successfully replicated the process in Tobago in 2012 and in St. Vincent and the Grenadines in 2013. According to a project brief released in April 2014, UWI trained a number of people in Geographic Information Systems (GIS) and its use for climate change impact analysis.

Four institutions (CANARI, UWI, Tropenbos International Suriname (TIS) and Agronomes et Vétérinaires Sans Frontières (AVSF)) have mainstreamed the practice of P3DM into their work. These institutions are engaged in implementing model building activities in Dominica, Trinidad and Suriname.

Research to date revealed that of the 12 models that were completed, only two have been completely converted to GIS data. However, only the data from the Dominica model has been handed over to the local government authority. Of all other models, seven are reportedly in the process of being digitised or there are plans to digitise them.

1.4 Impacts

CANARI, UWI and TIS have adopted the P3DM process as a component of their work. CANARI, SusGren and TIS were successful in mobilising funds to build additional models and conduct follow-up activities. UWI has obtained approval to use savings from the 2012 GEF-SGP funded exercise in Tobago to build a model in Mayaro, Trinidad in 2015. The Grenada Fund for Conservation (GFC) was able to mobilize USD 200,000 for coastline restoration activities.

All persons who took part in the building of the eight models (policy makers, resource users, natural resource managers, GIS practitioners, researchers and the media), subsequent to the manufacture of the 2012 Tobago 3D model, were interviewed in the framework of this study. They readily highlighted how the P3DM process has created or strengthened relationships among participants. Participants in the Tobago, Union Island and Grenada P3DM exercises specifically highlighted the exchange of experiences among the youth and the elders which created or strengthened intra-generational relationships. Also participants in the Tobago, Union Island P3DM exercises indicated that the model building process provided an opportunity for the exchange of history, folk stories and experiences among knowledge holders. Interviewees from Union Island explained that this is extremely significant in their case, as there is no documented record of local history.

The 2012 3D mapping in Tobago also contributed to islanders improving their approach to disaster management. The process helped them address the previous lack of local data needed to inform development of community disaster risk reduction strategies. These strategies now include a civil society agenda which documents plans to address the impacts of climate change and the implementation of community-driven disaster management and mitigation strategies for vulnerable areas.

The Union Island model has made a significant contribution to plans to restore the Ashton Lagoon, as the model building exercise catalysed previously stalled efforts to gain official

approval for commencement of restoration works. Expected benefits from the restoration of Ashton Lagoon include improved mangrove ecosystem health which – in turn - would contribute to improved livelihoods. Two models, the Dominica model and a model to be built by a MSc student of UWI will contribute to improved spatial planning.

1.5 Lessons learned, recommendations and conclusion

In the Caribbean, many modern settlements are composed of people coming from different areas. Traditional familial and cultural ties/similarities present in traditional societies are becoming more rare in settlements. Hence elders do not have the same power and charisma as in traditional societies found in other regions where P3DM has been practised. Community mobilisation for P3DM exercise occurred via different, less traditional channels.

Key lessons discerned in this context are:

- Mobilisation and engagement of stakeholders is key to a successful model building exercise;
- Traditional dissemination pathways (radio segments, face-to-face meetings, town meetings, banners and speakers mounted on cars playing recorded advertisements driving through communities) are very effective means of mobilising informants;
- Training of practitioners in the P3DM process should be hands-on and supported with mentoring by more experienced practitioners from the region;
- A participatory needs analysis with key decision makers should be more strongly promoted as part of the model building process to contribute to the proliferation of the practice in the region; and
- Resources need to be invested into disseminating and promoting documentation to guide natural resource users and managers on how to use existing models to inform management decisions.

The evolution of P3DM practice in the region is encouraging. However, the practice needs more effort exerted in communication, documentation and data extraction to support upscaling and donor support.

Finally, the P3DM process has realised a range of outputs and several important outcomes which have contributed to building the capacity of key institutions in the region. Impacts realised to date are contributing mainly to national and regional actions to address the management of natural resources and to strategize on how to adapt to climate change. In addition, there have been several other social benefits derived from the process, as mentioned above. Sustained support is needed to communicate lessons learned on the process and promote the use of the practice to support development in the region and to build skills in data extraction and documentation. Upscaling and leveraging of donor funds to support the practice could be further supported if participatory needs analysis, with key decision makers, is promoted to make the process more attractive to achieving current development goals and objectives of the region.

2 INTRODUCTION

The adoption of participatory Geographic Information Systems (PGIS) coupled with acquired skills in the use of social media has proved to enable grassroots communities to add value and authority to their local knowledge and to 'have a voice' in influencing policy development.

In its 2011-15 SP, the CTA recognizes that "smallholders, subsistence farmers, pastoralists and fishers are especially vulnerable" to climate change. In addition, it highlights that "demands on natural resources for agriculture (land, water, plant nutrients and biodiversity) are increasing, and are leading to conflicts due to competing claims". In this context, CTA strategy promotes the establishment of enabling policy environments for implementing effective long-term adaptation actions. The SP also aims at enhancing ACP capacity in information, communication and knowledge management for agricultural and rural development, for example through the deployment of information communication Technology (ICT) tools and knowledge management practices favouring multi-stakeholder engagement and knowledge sharing.

The project *Participatory Spatial Information Management and Communication for Empowering Grassroots in Climate Change Adaptation, Advocacy and Policy Processes in the Pacific and Caribbean* intends to promote the accessibility and effective use of PGIS, Web 2.0 and social media among its direct beneficiaries to stimulate their active participation and that of their constituencies (indirect CTA beneficiaries) in planning out climate change adaptation strategies and in feeding their findings and proposed solutions into policy making processes.

2.1 Background

CTA introduced the practice of P3DM in the Caribbean in September-October 2012 via a project implemented by CANARI and UWI on the island of Tobago. The foundations of this activity were set by inviting representatives from CANARI, UWI, TNC and SusGren, an NGO

Participatory Three-Dimensional Modelling (P3DM) Method

P3DM consists of a community-based mapping method which integrates local spatial knowledge with data on land elevations and sea depth to produce stand-alone, scaled and geo-referenced relief models. Its core objective is to add value to traditional knowledge and facilitate grassroots influence in policy-making. Once the model is completed, a geo-referenced grid is applied on the model to facilitate data extraction and/or import, digitisation and plotting. The possibility of exporting to and importing data from GIS provides a bridge between technical and community-generated knowledge

based in Saint Vincent and the Grenadines, to a regional workshop on P3DM organised by CTA in collaboration with UNDP and TNC, which took place in Solomon Islands in May 2012.

In 2013, CTA partnered with TNC and SusGren and the Grenada Fund for Conservation Inc. (GFC) and supported the implementation of two P3DM exercises in Union Island (St. Vincent and the Grenadines) and Grenville (Grenada) respectively. In 2014, CTA partnered with TIS and World Wildlife Fund (WWF) in supporting the deployment of P3DM among Saramaccan people in Suriname.

The CTA is now seeking via this impact study to assess **outputs**, **outcomes** and possibly **impacts** resulting from CTA interventions in support to the introduction, adoption and replication of P3DM practice in the Caribbean.

2.2 Context

This report is produced within the framework of the 2014-2016 project **MP3.1** '*Enhancing Institutional and Grassroots ICT Capacity to Influence Agricultural and Rural development Processes and Value Chain development*' and specifically its Sub-project **MP3.1.2**

'Participatory Spatial Information Management and Communication for Empowering Grassroots in Climate Change Adaptation, Advocacy and Policy Processes'.

Building on the successful introduction of P3DM in the Caribbean, the current sub-project and its 2012-2014 antecedent *Promoting participatory ICTs for adding value to traditional knowledge in climate change adaptation, advocacy and policy processes in the Pacific and Caribbean* were geared towards up-scaling the adoption of the practice in ACP regions.

CTA's initial intervention in Tobago in 2012 was geared towards raising awareness on the practice among potential adopters and building capacity among technology intermediaries in the region. At the same time, the intervention aimed at supporting local stakeholders including fisherfolk, farmers and tourist operators in articulating, documenting and geo-referencing their traditional knowledge with the objective of facilitating the development of community-based action plans. In terms of capacity building of technology intermediaries, the purpose was to establish reference centres which would train others and support the adoption and replication of the process in the region.

2.3 CTA investment

While financial investment in introducing and promoting the practice in the Caribbean has been relatively limited (see Table 1 below), great effort was put by CTA staff in (i) remotely coaching / training practitioners and their institutions, (ii) mobilising resources via other donor agencies, (iii) stimulating exchanges of experiences via e-discussion fora, (iv) documenting case studies, and (v) facilitating professional linkages between individuals and institutions.

Table 1 Summary of direct investment by CTA in the region in support of the adoption of PGIS

Year	Project ID	Project title	CTA budget (EUR)	Complementary funding	
				(EUR)	Source
2012	11141012	Promoting participatory ICTs for adding value to traditional knowledge in climate change adaptation, advocacy and policy processes in the Caribbean	65,000	40,000	UNDP GEF-SGP
2012	11141012	Training and Facilitation of PGIS/P3DM exercise in Tobago	16,804	0	None
2012	11141012	Increased engagement of stakeholders to adopt Information and Communication Technologies (ICT) to influence climate change adaptation policy processes in the Caribbean – St. Vincent and the Grenadines and Grenada	21,500	48,000	TNC
2013	11141012	Video production (2 films) Promoting participatory ICTs for adding value to Traditional Knowledge in Climate Change adaptation, advocacy and policy processes in the Caribbean	23,370	0	None
2014	11143034	Participatory Spatial Information Management and Communication as a contribution to modelling trade-offs between land use scenarios and ecosystem services in the Upper Suriname River area	19,800	77,234	WWF, Tropenbos international Suriname
2014	11143034	Production of two documentary films on the use of participatory 3D modelling for collaborative planning and advocacy purposes in the Suriname	10,940	0	None
Total investment			157,414	165,234	

2.4 Key events and products which contributed to the adoption of P3DM in the Caribbean

While the initial P3DM project in the Caribbean was undertaken in 2012, as early as 2005, some key activities and events supported by CTA laid the foundation for this exercise as outlined in the following timeline.

- In 2005 CTA organised an international conference in Nairobi, Kenya entitled “Mapping for Change: Participatory Spatial Information Management and Communication” (<http://pgis2005.cta.int>). The event took place on 7-10 September 2005. It was attended by 165 practitioners from 45 countries including one representative from CANARI based at that time in St Lucia.
- Based on recommendations made by participants in the 2005 Mapping for Change conference, CTA mobilised funds and in partnership with the International Fund for Agricultural Development (IFAD) produced the Multimedia Training Kit¹ “*Training Kit on Participatory Spatial Information Management and Communication*”. Since 2011 the product is available from the CTA publication catalogue and online. 1000 copies have been purchased by the UNDP Equator Initiative and distributed to all UNDP officers worldwide, including those in the Caribbean region.
- In November 2007 P3DM activities in Fiji, a Small Island Developing State (SIDS) were granted the 2007 WSIS World Summit Award (<http://goo.gl/OYMUqw>) in the category e-culture.
- In 2010 CTA published an updated version of the handbook *Participatory 3-Dimensional Modelling: Guiding Principles and Applications*, which has been largely distributed in printed and electronic formats in the Caribbean.
- In 2012 (May) NGO delegates from Trinidad and Tobago and Saint Vincent and the Grenadines as well as the regional representative of The Nature Conservancy (TNC) in the Caribbean were invited to attend a regional workshop² on P3DM practice in the Pacific. The event took place in Honiara, Solomon Islands. During the events participants, including those coming from the Caribbean started conceptualising interventions having a P3DM component at their core to be carried out within their own countries.
- To support awareness rising on good Participatory Geographic Information Systems (PGIS) practice, CTA launched a number of video productions all available in various languages on CTA’s Vimeo PGIS channel: <https://vimeo.com/channels/pgis>. Several of these video productions document cases of P3DM deployment in the Caribbean.
- CTA has also supported students in carrying out research on P3DM cases and in publishing and disseminating their results. CTA staff further led the production and publication of articles and blogposts on P3DM case studies in collaboration with staff from selected partner organisations.

¹ The product is available in English and Spanish both online and in DVD format. In 2013 a Brazilian Portuguese version was released by the Federal University of Rio de Janeiro with financial support provided by the Ford Foundation under the title “*Guia para Experiências de Mapeamento Comunitário*”.

² Awareness Raising and Planning workshop on Participatory Mapping and Community Empowerment for Climate Change Adaptation, Planning and Advocacy, May 21st to 26th 2012, Mendana Hotel, Honiara, Solomon Islands

Other significant contributions related to the P3DM practice in the Caribbean region are given in Table 2.

Table 2 Milestones related to P3DM practice in the Caribbean Region

Date	Location	Activity
2012-2014	Online	<i>Nurturing an international Community of Practice</i> including practitioners based / operating in the Caribbean Region.
Sept 2005	Nairobi, Kenya	<i>Mapping for Change: Participatory Spatial Information Management and Communication</i> . Attended by delegates from the Caribbean (St Lucia and other countries).
Apr 2006	London, UK	Publication of PLA 54 (IIED/CTA) <i>Mapping for change: practice, technologies and communication</i> (printed). Included case studies from the Pacific.
Nov 2006	Paris, France	Workshop on <i>Participatory Cultural Mapping</i> at UNESCO followed by Publications by UNESCO: Building critical awareness of cultural mapping: a workshop facilitation guide and <i>The role of participatory cultural mapping in promoting intercultural dialogue: We are not hyenas; a reflection Paper</i>
June 2007	London, UK	Publication of PLA 54 (IIED/CTA) <i>Mapping for change: practice, technologies and communication</i> in 12 languages (online & CD)
Nov 2007	Venice, Italy	World Summit Award, category e-culture for the project: <i>Participatory 3D Modelling (P3DM) for Resource Use, Development Planning and Safeguarding Intangible Cultural Heritage in Fiji</i>
2009	Online	The UNESCO World Report on Cultural Diversity makes reference to P3DM done by Ogiek Peoples (2009)
Nov 2010	Online	Publication of new edition of handbook Participatory 3-Dimensional Modelling: Guiding Principles and Applications in English, French, Spanish, Portuguese and Amharic.
Feb 2011	Online / DVD	Launch of the <i>Training Kit on Participatory Spatial Information Management and Communication (English and Spanish version)</i>
May 2012	Honiara, Solomon Islands	Awareness Raising and Planning workshop on <i>Participatory Mapping and Community Empowerment for Climate Change Adaptation, Planning and Advocacy</i> . The event was attended by representatives from the Caribbean
Sept-Oct 2012	Tobago, Trinidad and Tobago	Execution of a regional P3DM training event on the island of Tobago
Oct 2012	Antigua, Antigua & Barbuda	Presentation of the P3DM experience in Tobago at the 2012 Caribbean Week of Agriculture in Antigua
Oct 2012	Tobago, Trinidad and Tobago	Production of civil society agenda for climate change for Tobago (workshop) based on outputs from the recently completed P3DM exercise.
Feb-Mar 2013	Union Island, St Vincent and the Grenadines	Execution of regional P3DM training event in the context of the At the Water's Edge (AWE) project on Union Island
April 2013	Grenville, Grenada	Execution of regional P3DM training event in the context of the At the Water's Edge (AWE) project at Grenville
Sept 2014	Apia, Samoa	Side event at the International Conference on Small Island Developing States " <i>Increasing resilience to climate change and sustainable management of natural resources through participatory three dimensional models with communities in Samoa</i> " organised by MNRE. The event was attended by representatives from the Caribbean
Aug 2014	Jaw Jaw, Suriname	Execution of a P3DM exercise among Saramaccan Peoples in Suriname

Date	Location	Activity
Aug 2014	Paramaribo, Suriname	Seminar on P3DM practice with key stakeholders and donor agencies
Oct 2014	Paramaribo, Suriname	Presentation of the P3DM experience in Suriname at the 2014 Caribbean Week of Agriculture including the screening of a film production
Nov 2014	Sydney, Australia	Execution of 3 major activities focusing on P3DM practice during the 6th World Parks Congress in collaboration with UNDP, IUCN, IPACC and the Indigenous Partnerships Program of the Wet Tropics Management Authority

2.5 Complementary Capacity Building Initiatives

In order to improve the institutional capacity of the institutions whose representatives were exposed to the P3DM exercises in Tobago (2012), Saint Vincent and the Grenadines (2013) and Suriname (2015), CTA extended the opportunity to selected staff responsible for communication and outreach to be trained in Web 2.0 and Social Media via face-to-face or distance learning courses funded by CTA. Over the period 2012-2015 face to face Web 2.0 and Social Media trainings took place in **Trinidad and Tobago, Haiti, St. Lucia, Barbados and Antigua and Barbuda**. Additional capacity building in the domain of Web 2.0 and Social Media was offered over the period 2011-2015 via distance learning courses run by UNITAR and paid for by CTA to individuals from **Dominica, Grenada, Jamaica, Saint Vincent and the Grenadines, St. Kitts and Nevis, and Suriname**. Key stakeholders were trained including staff from agencies involved in PGIS/P3DM processes specifically to enhance their capacity to collaborate and to create, share and publish information and eventually mount advocacy campaigns.

2.6 Objective and purpose

This study is meant to assess **outputs, outcomes** and possibly **impacts** resulting from CTA interventions in support of the introduction, adoption and replication of P3DM practice in the Caribbean.

- (i) **Outputs** are assessed at the level of the partner organisations (direct beneficiaries) or individuals representing such organisations as a direct result of CTA's interventions. Output includes changes in the capabilities of the individuals and partner organisations.
- (ii) **Outcome** is defined as the use to which the raised awareness and capabilities acquired in terms of practicing P3DM (and social media) have been put by the partner organisations to:
 - a) liaise with GIS capable organisations in order to extract, digitize and store the data on behalf of the knowledge holders;
 - b) share the lessons learned in implementing the P3DM process;
 - c) replicate the P3DM process without CTA financial support;
 - d) replicate the P3DM process without CTA financial and technical support;
 - e) train others in organising and facilitating P3DM processes;
 - f) support institutional adoption of P3DM.
- (iii) Considering the limited time elapsed since CTA-supported on-field activities in the Caribbean and this assessment, **effects (medium-, long-term outcomes / impact)** are assessed within the partner organisation itself. These may include the following:
 - a. Proven capacity to (i) mobilise grant funds for implementing P3DM and/or (ii) acquire service contracts to implement P3DM or train other organisations;

- b. Mainstream the use of P3DM within its own operations;
- c. Use or facilitate the use of PGIS/P3DM outputs (e.g. 3D models, geo-referenced data, maps, video productions, geo-coded images, related narratives, etc.) to influence or contribute to effective spatial planning, monitoring, policy making or other.

2.7 Methodology

A preliminary desk study was conducted to gather information on selected cases and establish contacts with relevant participants in project countries (Grenada, St. Vincent and the Grenadines, Suriname and Trinidad and Tobago). A survey questionnaire (Appendix 1) was developed and e-mailed to individuals who participated in P3DM activities in the region and who were identified through the desk study from January to May 2015.

An operational in-country schedule (Appendix 2) with appointments was drafted for Grenada, St. Vincent and the Grenadines, and Trinidad and Tobago to guide face-to-face interviews in the field with people/stakeholders involved in the process of 3D model making and use. Field visits were conducted in Union island and St. Vincent and Grenada during March 2015 and Tobago during May 2015. Interviews were also conducted using Skype.

3 FINDINGS

A total of 36 individuals were interviewed. As of May 2015, there has been a total of 12 models built in seven countries (**Dominica, Grenada, Guyana, Haiti, St. Vincent and the Grenadines, Trinidad and Tobago** and **Suriname**) by 15 different implementing organisations. These models were built for a range of purposes, including planning for the impacts of climate change, spatial planning, planning for storm surges, recording historical perspectives, livelihood assessment and collaborative wetland management. Currently, there are plans to build four more models in the region in 2015. A list of stakeholders that were interviewed is found in **Error! Reference source not found.** and more detail on the 3D models is available in Appendix 3.

3.1 Funding Sources / complementary funding

CTA's activities in the Caribbean have been based on establishing project-related partnerships and in raising awareness among donor agencies about the potential of P3DM practice. This has led to a range of agencies adopting and funding P3DM activities, usually within the framework of larger interventions (critical and essential aspect). Eight of the 12 models built in the Caribbean region received financial and/or technical support from 14 regional and international agencies. The following table lists organisations which have been implementing and or supporting the implementation of P3DM activities in the region to date.

Table 3 Organisations involved in P3DM activities in the Caribbean

Organisation	Project Country	Role
UNDP, GEF-SGP, Suriname Office	Suriname	Funding
UNDP, GEF-SGP, Trinidad Office	Trinidad and Tobago	Funding
Federal Republic of Germany (German Embassy in Port of Spain)	Trinidad and Tobago	Funding
WWF Guyana	Guyana	Funding
Darwin Initiative, London, K	Guyana	Funding
University of the West Indies (UWI) Research and Development Impact Fund (RDIFund)	Trinidad and Tobago	Funding
The Caribbean Aqua-Terrestrial Solutions-Programme (CATS) funded by the German Ministry of Economic Cooperation and Development	Saint Lucia	Funding
European Commission	Haïti	Funding
French Ministry of Foreign Affairs	Haïti	Funding
The Nature Conservancy (TNC)	St. Vincent and the Grenadines and Grenada	Funding and implementation
Physical Planning Unit in the Ministry of Housing, Informal Human Settlements, Physical Planning & Land & Surveys of the Government of St. Vincent and the Grenadines	St. Vincent and the Grenadines	Funding and implementation
CANARI	Trinidad and Tobago, Dominica	Implementation
UWI, Department of Geomatics Engineering and Land Management at the St. Augustine campus	Trinidad and Tobago	Implementation
Agronomes et Vétérinaires Sans Frontières (AVSF)	Haïti	Implementation
Coordination Régionale des Organisations du Sud-Est (CROSE)	Haïti	Implementation

3.2 Outputs

3.2.1 Models produced and people trained via direct involvement by CTA

As shown available in Appendix 3, a total of four 3D models were produced in the framework of CTA-supported projects involving both financial and technical inputs. Events took place in **Trinidad and Tobago, Grenada, Saint Vincent and the Grenadines and Suriname**. People trained in practicing P3DM include representatives from the above countries plus **Colombia, Dominican Republic, Haiti, Jamaica and St. Lucia**.

3.2.2 Changes in capabilities of direct beneficiaries

Three of the implementing organizations (CANARI, UWI and TNC) from the Tobago 2012 exercise, reported improved skills and experience gained in the use of participatory tools, Web 2.0 and social media to communicate the work they do and better interact with their constituencies.

Specifically, CANARI reported:

- Improved skills and experience gained in the use of participatory tools (P3DM, participatory video) and the use of blogging and Facebook;
- Networks expanded regionally and internationally in the areas of climate change and information communication technologies;
- Image strengthened as a lead organisation to pilot innovative participatory approaches in the Caribbean region through presentations at regional fora. e.g. United Nations Education Scientific and Cultural Organisation (UNESCO) Sub-Regional meeting on environmental policy formulation and planning in the Caribbean, 15-16 May 2013; United Nations Development Programme (UNDP) Knowledge Fair, 5-6 June 2013; and the 7th Annual Caribbean Conference on Comprehensive Disaster Management, 10-13 December 2012.

UWI reported improved skills in participatory GIS and the Chair of the Department stated that he gained “significant knowledge in understanding how participatory decision making can be enhanced at the local level” and he has infused this improved understanding into proposals/projects for thesis in Geomatics Engineering and Land Management at the UWI St. Augustine campus. TNC reported strengthened skills in participatory mapping and facilitation of participatory processes.

The evaluations completed by trainees from 19 organizations in the Tobago 2012 exercise indicated improved understanding and skills in facilitating community processes; strengthened and reinforced knowledge in analysing climate change impacts on the landscape and doing adaptation planning at the local level; and improved awareness of GIS mapping processes in analysis and planning.

3.2.3 Publication and dissemination of knowledge products

The following products were disseminated by CANARI during and after the Tobago 2012 exercise:

- A 14-page case study: [Case study on the use of participatory three-dimensional modelling to facilitate effective contribution of civil society in the Caribbean islands in planning for action on climate change](#).
- A 15:38-min video entitled: “[She becomes more beautiful: Capturing the essence of Tobago Island for a better tomorrow](#)”, by CANARI (CTA commissioned).
- 400 copies of a 4-page policy brief in three languages: Using traditional knowledge for decision-making in the Caribbean ([French](#), [Spanish](#) and [English](#)) 2013 (CTA commissioned).

- 10 [blog posts](#) were used to spread information on the building of the model in Tobago, during the period 28 September to 2 October 2012.
- A 10 minute video: entitled "[CANARI - Participatory three-dimensional modelling \(P3DM\) exercise in Tobago](#)".

CTA produced the following products on the Tobago 2012 exercise:

- 2 min video: "[My feelings in being part of a P3DM process.](#)" Feedback from Anthony, the livewire, published on 7 December 2014, G. Rambaldi, CTA
- 2:41 min video: [Participatory data generation: stunning results from the P3DM exercise in Tobago reports Adam Jehu](#), published on 7 December 2014, G. Rambaldi, CTA
- 2-min video: [Goldberg Job reports back on his participation in a participatory 3-dimensional modelling exercise in Tobago](#), published 8 December 2014, G. Rambaldi, CTA

Products disseminated from the three P3DM exercises in which UWI was involved are:

Video production

- 3:59 min video: East Port of Spain 3D Model Time-Lapse, published May 8, 2014, The Caribbean Network for Urban and Land Management (CNULM)

Articles

- Participatory Mapping: Caribbean Small Island Developing States, presented at Sir Arthur Lewis Institute of Social and Economic Studies conference 2015, Port of Spain, Trinidad, A. DeGraff and B. Ramlal, UWI
- Development of a Community Collaborative GIS Model of Sea Level Rise, Roxborough, presented at URISA Caribbean GIS Conference, Spatial Technologies : Fuelling Economic Growth and Development, Nieuwpoort, Curacao, October 2014, A. Seeram, UWI
- Using P3D GIS Modeling in Climate Change Awareness and Adaptation Strategies presented at URISA Caribbean GIS Conference, Spatial Technologies : Fuelling Economic Growth and Development, Nieuwpoort, Curacao, October 2014, B. Ramlal, UWI
- Promoting Participatory Mapping and Modeling for adding value to knowledge in Climate Change resilience building, advocacy and policy processes in Tobago, presented at ***, ***, B. Ramlal, UWI
- Leveraging Built and Cultural Heritage for Economic Development in East Port of Spain, presented at Caribbean Urban Forum, May 2014, Bridgetown, Barbados, B. Ramlal, R. Darmanie, Patasar, S. and De Bruijne G.A.
- [Developing Adaptation Strategies to Global Climate Change in Tobago – Using Participatory 3D Modelling Strategies](#), published December 2012, B. Ramlal, UWI

Informative products published with reference to five other 3D modelling exercises:

Video productions

- 14 minute video documenting the 2014 P3DM exercise in Suriname entitled: [The enabling power of participatory 3D mapping among the Saramaccan People of Suriname](#) (CTA production)

- 3:44-min video entitled: [Local voices in climate change adaptation - Union Island, Caribbean](#), published on 13 March 2013 (CTA production)
- A 13 minute video documentary on the project done in Saint Vincent and the Grenadines: "[Beneath the Surface ~ Mapping Union Island ~ A P3DM exercise, 2013](#)". The video has been produced in four languages by CTA.

Articles

- Article announcing the launch of the film: [The film "Enabling power of 3D mapping among the Saramaccan People" launched at CWA2014 3D modelling exercise along the upper Suriname River](#), published on 11 October 2014
- French version of the article announcing the launch of the film [Lancement du film « Enabling power of 3D mapping among the Saramaccan People » \(Le pouvoir de la cartographie en 3D chez les Saramacas\) à la CWA2014](#), published on 11 October 2014
- [Saramakan's forests: watercourses at the core of a participatory 3D modelling exercise along the upper Suriname River](#), published on 6 September 2014
- [Les forêts des Saramaca : les cours d'eau au coeur d'un exercice de modélisation participative en trois dimensions le long du Haut Suriname](#), published on 6 September 2014
- A [blog](#) on the P3DM exercise done in Union island on the website off the CCCCC, published on 6 March 2013.
- Several short articles and pictures albums have been posted by CTA, SusGren and GFC on their respective Facebook pages.

3.3 Outcomes: Replication and Effective Use

3.3.1 Replication of the P3DM process

Research has revealed that to date the P3DM process has been replicated in the Caribbean region eight times since the model was built in Tobago in 2012 and that four models were built previously in Guyana and Haiti. Five of the 12 models that were built in total, were done by direct beneficiaries of the Tobago 2012 exercise (CANARI, UWI, SusGren, Union Environmental Attackers Inc., TNC and GFC). One was built by a trainee who participated in the Union Island exercise and who is a staff member of the Physical Planning Unit in the Ministry of Housing, Informal Human Settlements, Physical Planning & Land & Surveys of St. Vincent and the Grenadines. The models done in Guyana (2005) and Haiti (2007, 2008 and 2010) were the result of hands-on skills acquired by putting into practice an earlier version of P3DM guidelines³ published in 2002 within the framework of a EU- funded project in the Philippines and networking activities implemented by CTA.

It should be noted that the degree of replication of the process varies among the cases identified. The models built in Dominica, East Port-of-Spain, Union Island, Grenada, and Guyana mirrored the participatory process executed in Tobago. However, the report revealed that the approach to building the Roxborough model in Trinidad and Tobago was based more on a consultative/top-down process rather than on "bottom-up" participation. That model was built and populated by personnel from UWI and villagers were consulted to add information to the model. The model built in St. Vincent for storm surge analysis was built by personnel of the GIS unit and has been used in awareness raising exercises with local residents.

³ Giacomo Rambaldi and Jasmin Callosa-Tarr. 2002. [Participatory 3-Dimensional Modelling: Guiding Principles and Applications](#). ASEAN Regional Center for Biodiversity Conservation (ARCBC), Los Baños, Philippines

3.3.2 Dissemination of lessons learned in implementing the P3DM process

Dissemination of lessons learned in implementing the P3DM process has occurred via formal and informal means. Two regional research institutions, CANARI and UWI, have shared lessons learned through the drafting and dissemination of a policy brief⁴, a case study⁵, research papers and through presentations at regional and national fora.

In 2013 AVSF published a handbook⁶ in French based on its experience in Haiti. Previously it published several blogposts describing P3DM activities in the country.

Lessons learned have also been documented in donor reports, but with the exception of CANARI's report on Tobago, which is posted on the organization's website, these reports are not readily accessible. Most interviewees in this study indicated that they had shared lessons learned with their peers mainly through face to face interactions and several government personnel indicated they had documented their lessons learned in reports submitted to their supervisors.

3.3.3 Train others in organizing and facilitating P3DM processes

CTA has been promoting the TOT approach whenever it contributed to the implementation of a P3DM exercise it invested resources to ensure that representatives from countries in the region were given the opportunity to be exposed and trained in the practice.

In this respect in May 2012 CTA supported the participation of representatives from CANARI, TNC and SusGren in a regional workshop which took place in Honiara, Solomon Islands. The event had a practical P3DM component which served to raise awareness on the process among the Caribbean delegates, who later on successfully replicated the process in their region.

According to a project brief⁷ released in April 2014, UWI trained a number of people in the framework of the GEF-funded component of the Tobago P3DM project. "A GIS training workshop was hosted by the UWI in Tobago at the Department of Natural Resources and the Environment over a three day period to allow for stakeholders to learn about GIS and its use for climate change impact analysis and to compile digital data sets from the photographs of the 3D model. The data was then integrated and cross-validated with existing data sets and separated into thematic layers for use in undertaking further analysis and scenarios modelling".

UWI has also introduced P3DM to three MSc students who used it or are using it in the preparation of their MSc theses. In addition, UWI has trained five members of Caribbean CNULM in the P3DM process.

Further, of the 19 organizations that were initially trained in Tobago, five responded in this study and indicated the following: SusGren has trained peers in community mobilisation; group facilitation during model construction; and reporting on the activity, including the use of social media. THA has encouraged the update and use of the completed model in building awareness and promoting environmental issues. GFC, Caribbean Coastal Area Management Foundation (CCAM) and Union Island Attackers Inc. did not host any training. Union Island Attackers Inc. indicated that there was no need to have formal training for others in their organization, as all members gained extensive knowledge of the process from their participation in the model-building exercise in Union Island.

⁴ Published in four languages, English, French, Spanish and Portuguese.

⁵ A 14-page case study: [Case study on the use of participatory three-dimensional modelling to facilitate effective contribution of civil society in the Caribbean islands in planning for action on climate change](#)

⁶ Delerue Florian. 2013. [Construction participative de maquettes en trois dimensions - Guide méthodologique produit à partir d'une expérience haïtienne](#). AVSF

⁷ Dr. Bheshem Ramlal. 2014. Promoting Participatory Mapping and Modeling for adding value to knowledge in Climate Change resilience building, advocacy and policy processes in Tobago. Project Brief, The University of the West Indies, St. Augustine, Trinidad, West Indies, April 2014

3.3.4 Institutional adoption of P3DM process

CANARI institutionalised the P3DM process and in 2015 it engaged in a project to support adoption and use of a model of Soufriere-Scott's Head (in the Gallion area) among natural resource management agencies in Dominica. The project involves using the completed 3D model for spatial planning to address issues such as allocating additional land for farming or with the fisherfolk and divers locating new moorings. In addition to a facilitated session on possible uses of the model with resource managers, CANARI is currently drafting a guide to assist resource managers to use the model.

UWI has adopted and replicated the P3DM process twice since May 2012. In August 2013, a UWI postgraduate student pursuing a Master of Science degree (MSc) built a model of the village of Roxborough, in Tobago. In March 2014, UWI partnered with the Caribbean Network for Urban and Land Management (CNULM) and BlueSpace Caribbean to build a model of East Port-of-Spain to record the historical perspective and local knowledge of residents of the area. UWI, through the assistance of its students who are completing their MSc theses, currently has plans to build two more models in 2015. More detail on the models is available in Appendix 3.

The Association of Saramaccan Authorities or Vereniging van Saramakaanse Gezagsdragers (VSG), thanks to support provided TIS and CTA, obtained funding from the GEF-SGP for expanding the area covered by the first 3D model done in Suriname by TSI. The latter plans now to act as a resource hub in the sub-region. In fact, with support provided by CTA, in July 2015 it will train delegates from CARIBSAVE (INTASAVE Caribbean) a regional non-governmental organization with headquarters in Barbados.

Finally, AVSF facilitated the deployment of P3DM in Haiti and in 2013 developed a manual on the practice. There are no indications that it further promoted the use of P3DM practice elsewhere in the region.

3.3.5 Use of captured data via GIS

Research to date revealed that of the 12 models that were completed, only two have been completely converted to GIS data : the Roxborough model and the model built by CANARI in Dominica in 2015. However, only the data from the Dominica model has been handed over to the local government authority. Of all other models seven are reportedly in the process of being digitised or there are plans to digitise them. UWI seems to be the organization identified by most in the position to digitise the models; however, an investment in resources is needed to improve UWI's capacity to complete this task. Currently there is a favourable environment for the use of GIS data in management systems as GIS technology exists in many natural resource management agencies in the region.

3.4 Impacts at Institutional level

3.4.1 P3DM mainstreamed (at institutional level)

CANARI, UWI and TIS have adopted the P3DM process as a component of their work. CANARI is promoting P3DM on its website as a tool which the organisation is interested in applying widely across the region to facilitate multi-stakeholder processes. UWI's Chair of the Department of Geomatics Engineering and Land Management at the St. Augustine campus is promoting the use of the P3DM method in the MSc programme. TIS as stated in section 3.3.4 is planning to offer training on the process in July 2015.

3.4.2 Funds mobilised and service contracts acquired

CANARI was able to source (USD 11,485) from the Embassy of the Republic of Germany, Port-of-Spain to implement a project which used the model to formulate a [civil society plan](#) to address climate change in Tobago. CANARI also negotiated funding from GIZ to build three models in the region to inform improved spatial planning for disaster management and risk reduction. To date, one service contract has been signed to build one model in Dominica.

UWI has not sourced additional funding, but has obtained approval to use savings from the 2012 GEF-SGP funded exercise in Tobago to build a model in Mayaro, Trinidad in 2015. SusGren was able to mobilise funding from TNC to conduct P3DM in Union Island and Grenada together with the Grenada Fund for Conservation (GFC). The latter was able to mobilize additional USD 200,000 for coastline restoration activities. In Suriname, TSI was able to assist VSG mobilise a total of USD 50,000 via the GEF-SGP to expand the mapped area in 2015.

3.5 Impacts at societal level

3.5.1 Improved relationship with constituency and partners

All persons who took part in the building of the nine models, subsequent to the manufacture of the 2012 Tobago 3D model, and were interviewed for in the framework of this study readily highlighted how the P3DM process has created or strengthened relationships among participants. Participants included policy makers, resource users, natural resource managers, GIS practitioners, researchers and the media. Participants in the Tobago, Union Island and Grenada P3DM exercises specifically highlighted the exchange of experiences among the youth and the elders which have also created or strengthened relationships.

3.5.2 Facilitating, transmission and documentation of cultural and landscape heritage

The Tobago 2012 exercise achieved the goal of contributing to the exchange of local and traditional knowledge on climate change adaptation among residents on the island of Tobago but it indirectly provided an opportunity for the exchange of history, folk stories and experiences about life on the island of Tobago among participants. Similarly, the Union Island and Grenada models also indirectly provided an exchange of history, folk stories and experiences among participants. Interviewees from Union Island explained that this is extremely significant in their case, as there is no documented record of local history. The objective of the East Port-of-Spain model in Trinidad and Tobago was directly related to eliciting and documenting cultural and landscape heritage.

3.5.3 Contribution to improved disaster management

The 3D mapping in Tobago in 2012 helped islanders to understand the link between natural resource management and resilience to climate change and catastrophic weather events. Blending local knowledge with scientific data, and using the results to guide planning for extreme climate events and climate change, has proved a powerful mix in the case of Tobago, an island where the impacts of climate change are exacerbating ongoing problems caused by human development, such as inappropriate land use, poorly planned physical development and inappropriate agricultural practices. Using P3DM has helped to address the previous lack of local data to inform development of community disaster risk reduction strategies. These strategies now include a civil society agenda which documents plans to address the impacts of climate change and the implementation of community-driven disaster management and mitigation strategies for vulnerable areas. The latter is being executed by the Tobago Emergency Management Agency (TEMA) - the local government agency mandated to coordinate disaster response on the island.

3.5.4 Contribution to coastal restoration

The purpose of the model in Grenada was to identify risks related to climate change and extreme climate events and to produce recommendations on how to deal with the threats. The significant involvement of the community in the P3DM process contributed to influencing donor agencies to provide financial support to reef and mangrove restoration in the Telescope area. To date, an amount of USD 200,000 has been sourced and a further USD 300,000 is needed to complete restoration of the entire area.

3.5.5 Potential contribution to income generation activities to support sustainable livelihoods

The Union Island model has made a significant contribution to plans to restore the Ashton Lagoon, as the model building exercise catalysed previously stalled efforts to gain official approval for commencement of restoration works. Expected benefits from the restoration of Ashton Lagoon include improved mangrove ecosystem health which – in turn - would contribute to improved livelihoods. Ecosystem benefits include increased species diversity e.g. birds and marine species, rejuvenation of stressed mangrove areas and re-colonization of barren sites, decrease in turbidity and improved water quality. Livelihood benefits include: increased revenue to fishers due to increased fish stock as the area is a nursery for juvenile commercial species; and increased opportunities for ecotourism activities such as kayaking and bird watching within the mangroves.

3.5.6 Potential contribution to improved spatial planning

The Dominica model and a model to be built by a MSc student of UWI address improved spatial planning. The purpose of the Dominica model is to inform spatial planning for disaster management and risk reduction. This has not yet been reflected in formal government documents, however, awareness building activities and documentation are being developed to assist managers to effectively use the generated information . Preliminary plans are in place to use the P3DM process for land use planning for agriculture in Trinidad through another MSc student from UWI.

4 LESSONS LEARNED

In the Caribbean, many modern settlements are composed of people coming from different areas. Traditional familial and cultural ties/similarities present in traditional societies are becoming rarer in settlements. Hence elders do not have the same power and charisma as in traditional societies found in other regions where P3DM exercises have been conducted. Community mobilisation occurs via different, less traditional channels. The key lessons presented here are to be considered in this context.

- **Mobilisation and engagement of stakeholders is key to a successful model building exercise.** Strategies to engage stakeholders include:
 - Sourcing, as much as is possible, food and supplies for the activity from the informants to increase their interest and commitment to the exercise.
 - Promoting the event to policy makers and giving them frequent updates to maintain their interest in the exercise.
 - Working with key informants such as Extension Officers and prominent non-government organizations to mobilise informants and publicise the event.
 - Visiting the local media and identifying a media practitioner to liaise with. provide regular updates to keep the local community interested and up-to-date on the 3D model building process.
 - Schedule participation of informants in the P3DM exercise for three to four hours per day instead of for an entire day to allow them to earn money while contributing to the creation of the model.
- **Traditional dissemination pathways (radio segments, face-to-face meetings, town meetings, banners and speakers mounted on cars playing recorded advertisements driving through communities) are very effective means of mobilising informants.** Although Web 2.0 and social media are effective in reaching out to P3DM practitioners and interested parties that are external to rural communities, informants in rural communities in the region tend to rely heavily on the traditional media listed above to get information.
- **Training of practitioners in the P3DM process should be hands-on and supported with mentoring by more experienced practitioners from the region.** Giving trainee practitioners the opportunity to trace, cut, glue, paint, publicise, mobilise, facilitate and document lessons learned improves their understanding of what is required by all participants in the model building process and contributes to them gaining a better appreciation of the roles of the various parties in the process. Partnering trainee practitioners with more experienced practitioners provides an opportunity for the exchange of lessons learned and experiences in model building.
- **A participatory needs analysis with key decision makers should be more strongly promoted as part of the model building process to contribute to the proliferation of the practice in the region.** Engaging key decision makers at this initial stage will contribute to building support for the exercise and build interest in digitization and the use of the data to inform decision-making.
- **Resources need to be invested into disseminating and promoting documentation to guide natural resource users and managers on how to use existing models to inform management decisions.** Of the nine models that have been built subsequent to the Tobago model in 2012, three have been re-used after the initial activity to date. Natural resource users and managers across the region expressed interest in making use of the models but most stated they would benefit from guidance on how best to incorporate the resulting data into their follow-up work.

5 RECOMMENDATIONS

The evolution of P3DM practice in the region is encouraging. However, the practice needs more effort exerted in communication, documentation and data extraction to support upscaling and donor support.

There needs to be a deliberate initiative aimed at promoting success stories, sharing lessons learned and experiences on the P3DM process and showcasing how the process has been and could be used to address current development issues among key stakeholders in the region. A regional gathering (workshop) would provide an opportunity for this exchange among stakeholders and serve to promote networking which can be maintained through interactions on Web 2.0 and Social Media. Linking this process to national and regional development goals and objectives is key to upscaling the practice and leveraging funding for the replication of the practice in the region.

The uptake of the practice is hampered by limited accessibility to data generated during model building exercises because of lack of digitization. Available data are stored on physical models at specific sites. Capacity needs to be built among P3DM practitioners to capture and digitise data visualised on the 3D models. Data in electronic format would be more easily accessible and readily available for further analysis, and blending with scientific data so to better inform decision making. This would contribute to providing actual examples of how the P3DM process can impact development in the region.

While CTA and its partner organisations thoroughly documented through video documentaries, articles and blogposts all the exercises where it has been directly involved in, entities which replicated the process elsewhere paid limited attention in doing so. Hence the evolution of the P3DM process in the region is being hampered by the tendency to neglect documenting experiences and lessons learned on the practice in the region. The region has a strong oral tradition which is relaying experiences and lessons learned about the practice. However, constraints of this dissemination pathway include limitations of accessibility and deteriorating accuracy over time. Resources need to be invested to encourage and train P3DM practitioners to effectively document and analyse their experiences to contribute to formulating a body of knowledge which can be used to tailor the process to more closely fit the needs of the region.

6 CONCLUSION

The P3DM process has realised a range of outputs and several important outcomes which have contributed to building the capacity of key institutions in the region. Impacts realised to date are contributing mainly to national and regional actions to address the management of natural resources and to strategize on how to adapt to climate change. In addition, there have been several other social benefits derived from the process, as mentioned above. Sustained support is needed to communicate lessons learned on the process and promote the use of the practice to support development in the region and to build skills in data extraction and documentation. Upscaling and leveraging of donor funds to support the practice could be further supported if participatory needs analysis, with key decision makers, is promoted to make the process more attractive to achieving current development goals and objectives of the region.

7 REFERENCES

- Alison K. DeGraff and Bheshem Ramlal. 2014. Participatory Mapping: Caribbean Small Island Developing States. Department of Geomatics Engineering and Land Management, Faculty of Engineering, University of the West Indies – Saint Augustine, Trinidad
- Bobb-Prescott, N. 2014. Case study on the use of participatory three-dimensional modelling to facilitate effective contribution of civil society in the Caribbean Islands in planning for action on climate change. Laventille, Trinidad: CANARI Technical Report. Available at: <http://www.canari.org/documents/401CasestudyP3DM.pdf>
- CANARI, 2012. Report on the Participatory three-dimensional (P3DM) modelling exercise in Tobago. Available at: <http://www.canari.org/wpcontent/uploads/2014/09/CANARIREPORTP3DMactivityinTobagoFINAL.pdf>
- CTA, 2014. Maps for traditional knowledge: Bringing the 3rd dimension to the negotiating table. Available at: <http://www.cta.int/en/article/2014-10-11/maps-for-traditional-knowledge-n-bringing-the-3rd-dimension-to-the-negotiating-table-media-release.html>
- CTA, 2011. Empowering ACP agricultural and rural communities through knowledge Strategic Plan 2011–15 (February 2011). Available at: http://www.cta.int/images/docman-files/strategic_plan_2011-2015.pdf
- Florian, D. 2013. Construction participative de maquettes en trois dimensions - Guide méthodologique produit à partir d'une expérience haïtienne. Available at: <http://www.avsf.org/en/posts/1329/full/construction-participative-de-maquettes-en-trois-dimensions-guide-methodologique-produit-a-partir-d-une-experience-haitienne>
- IAPAD, 2012. Collaborative Natural Resources Management, Rupununi, Guyana. Available at: <http://www.iapad.org/applications/plup/rupununi.htm>
- Ramlal, B. 2014. Promoting Participatory Mapping and Modeling for adding value to knowledge in Climate Change resilience building, advocacy and policy processes in Tobago. Project Brief, The University of the West Indies, St. Augustine, Trinidad, West Indies (Word Doc)
- Ramlal, B. 2014. Using P3D GIS Modeling in Climate Change Awareness and Adaptation Strategies, UrisaCaribbean GIS Conference, Spatial Technologies : Fuelling Economic Growth and Development, Nieuwpoort, Curacao, October 2014
- Ramlal, B. et. al. 2014. Leveraging Built and Cultural Heritage for Economic Development in East Port of Spain. Caribbean Urban Forum, May 2014, Bridgetown, Barbados. Available at: <http://bluespacecaribbean.com/posts/urban-planning/rdi-cuf2014/>
- Ramlal, B. 2012. [Developing Adaptation Strategies to Global Climate Change in Tobago – Using Participatory 3D Modelling Strategies](#). Available at: http://www.canari.org/wp-content/uploads/2014/09/GEF-SGP-Newsletter_4th-Edition.pdf
- Rambaldi G and Callosa-Tarr J. 2002. [Participatory 3-Dimensional Modelling: Guiding Principles and Applications](#), ASEAN Regional Centre for Biodiversity Conservation (ARCBC), Los Baños, Laguna, Philippines. July 2002
- SusGren. 2013. Participatory Three Dimensional Modelling (P3DM) Workshop (Working with Nature and Communities to Reduce Climate Change Impacts) (Word Doc)
- Seeram, A. 2014. Development of a Community Collaborative GIS Model of Sea Level Rise, Roxborough, UrisaCaribbean GIS Conference, Spatial Technologies : Fuelling Economic Growth and Development, Nieuwpoort, Curacao, October 2014 (Word Doc)

Appendix 1 Questionnaire

Impact study on the introduction and adoption of P3DM in the Caribbean

The Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA) introduced the practice of Participatory 3D Modelling (P3DM) in the Caribbean in September-October 2012 via a project implemented by the Caribbean Natural Resources Institute (CANARI) and the University of West Indies.

CTA's initial project (Tobago, 2012) was geared towards raising awareness on the practice among potential adopters and building capacity among technology intermediaries in the region. At the same time, the intervention aimed at supporting local stakeholders including fisherfolk, farmers and tourist operators in articulating, documenting and geo-referencing their traditional knowledge, with the objective of facilitating the development of community-based action plans. In terms of capacity building of technology intermediaries, the purpose was to establish reference centres which would train others and support the adoption and replication of the process in the region.

In 2013 CTA partnered with the Nature Conservancy (TNC) and supported the implementation of two P3DM exercises in Union Island (St. Vincent and the Grenadines) and Grenville (Grenada) respectively. In 2014 CTA partnered with Tropenbos International and WWF in supporting the deployment of P3DM among Saramaccan people in Suriname.

The CTA is now seeking via this exercise to assess **outputs, outcomes** and possibly **impacts** resulting from CTA interventions in support of the introduction, adoption and replication of P3DM practice in the Caribbean.

- (iv) **Outputs** at the level of the partner organisations (direct beneficiaries) or individuals representing such organisations as a direct result of CTA's intervention. Output includes changes in the capabilities of the individuals and partner organisations.
- (v) **Outcomes:** the uses to which the raised awareness and capabilities acquired in terms in practicing P3DM (and social media) have been put by the partner organisations to
 - g) liaise with GIS (geographic information system) capable organisations in order to extract, digitize and store the data on behalf of the knowledge holders;
 - h) share the lessons learned in implementing the P3DM process;
 - i) replicate the P3DM process without CTA financial support;
 - j) replicate the P3DM process without CTA technical support;
 - k) train others in organising and facilitating P3DM processes;
 - l) support institutional adoption of P3DM.
- (vi) **Effects (medium-, long-term outcomes / impact)** within the partner organisation itself. These may include the following:
 - a. Proven capacity to (i) mobilise grant funds for implementing P3DM and/or (ii) acquire service contracts to implement P3DM or train other organisations;
 - b. Mainstream the use of P3DM within its own operations;
 - c. Use or facilitate the use of Participatory Geographic Information System (PGIS)/P3DM outputs (e.g. 3D models, geo-referenced data, maps, video productions, geo-coded images, related narratives, etc.) to influence or contribute to effective spatial planning, monitoring, policy making or other.

This questionnaire has been designed to capture feedback on your P3DM experience. Please complete all sections.



1. Personal and background information	
Name	
Position	
Organization	
P3DM Model(s) you were associated with (island and year)	
Date questionnaire completed	
2. Description of your initial P3DM experience	
Describe your initial P3DM experience in the Caribbean. Trainee <input type="checkbox"/> Facilitator <input type="checkbox"/> . Please elaborate.	
Were there benefits or losses to participation?	
What was the most positive aspect of this experience from your point of view?	
What did the knowledge holders tell you or your colleagues when immersed in the P3DM process? Did they feel that their personal knowledge could contribute to a common cause? Were they reluctant to share their knowledge on the model?	
What was the most negative/challenging aspect if any?	
3. Result (outcome and impacts)	
Has how your work changed as a result of participation in the P3DM process? Yes <input type="checkbox"/> No <input type="checkbox"/> Explain your answer.	
Are there members in your organization that have acquired additional skills as a result of participation in the P3DM exercise? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, what were the skills?	
Are there others who have benefited? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, who else has benefited and how?	
Was there any documentation of this change (reports or papers)? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, can you identify these below and can they be shared?	
What worked well to bring about the change and why was this so?	
What did not work well and why?	
Have you shared the lessons learned in implementing the P3DM process with others? (For example at workshops, visits, seminars/conferences?). Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, can you share any documentation on this?	
To your knowledge, has the model and / or the data / information extracted from the model been used since completion to assist in decision making or for influencing policy making (i.e. advocacy)? Yes <input type="checkbox"/> No <input type="checkbox"/>	



If yes, can you share details on its use?
<p>Have you undertaken any activities to train others in implementation of the P3DM process? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><input type="checkbox"/> If yes, what areas of training have been undertaken? (Tick all that apply)</p> <p><input type="checkbox"/> Promotion for participation from CBOs, NGOs, experts</p> <p><input type="checkbox"/> Group facilitation during model construction</p> <p><input type="checkbox"/> Reporting on the activity including use of social media</p> <p><input type="checkbox"/> Encouraging update and use of the completed model</p> <p><input type="checkbox"/> Other, please specify _____</p>
Additional models
<p>Have you been able to source funding to do other similar P3DM projects? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Explain your answer.</p>
<p>Are/have you partnering/partnered with another organization to provide technical support? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>If yes, can you provide more details?</p>
How have you proposed to/did you use P3DM?
How will/has the use of P3DM make/made the particular situation better/ or worse?
Who are/were the target beneficiaries?
<p>For proposed projects, what is the current status (expected start date)? _____</p> <p>For completed projects, where is the model now? Who is safeguarding and / or updating it? What is planned for it ?</p>
4. Additional information
Is there any additional information you will like to share?




Appendix 2 Operational in-country schedule




Location: Union Island	
9 th March	10:35 a.m. – Arrive in Union Island 11:30 am – Orisha Joseph Programme Administration Officer SusGren Inc.
	1:30 pm - Sherma Adams District Officer for the Southern Grenadines Visit model
10 th March	9:30 am – Katrina Collins President Union Island Environmental Attackers
	pm - Visit area mapped – interview community people
11 th March	9:30 am – Terry Charles Director General RedCross
	1:00 pm – Dwayne Adams GIS Officer Physical Planning Unit
12 th March	9:00 am – Hayden Billingy Formerly National Parks Authority (now working as the National Coordinator for the GEF-SGP)
	5:00 pm - Depart Union Island 5:20 pm – Arrive in St. Vincent 7:30 pm – Yoland London and Community Development Officer Ministry of National Mobilization
13 th March	Depart St. Vincent – 9:40 am
Location: Grenada	
23 rd March	6:10 am – Arrive in Grenada 9:00 am - Tyrone Buckmire – Grenada Fund for Conservation Visit to model
	1:00 pm – Aden Forteau Chief Forest Officer Anthony Jeremiah Forester 4:00 pm – Cassandra Mitchell Executive Director Caribbean Association for Youth Development
24 th March	9:00 am – Caliste Francis Chief Fisheries Officer 10:00 am- Terence R. Walters National Disaster Coordinator (Ag.) National Disaster Management Agency (NaDMA)
	1:00 pm – Terry Charles Director Grenada Red Cross Society
25 th March	Visit to mapped area – interview community people 10:05 pm – Depart Grenada
Location: Tobago	
1 st April	9:00 am Krystle Bascombe President Roxborough Police Youth Group 11:00 am Adana Pigott Agricultural scientist (consultant) CARDI
	1:00 pm Visit model of Roxborough and interview residents
2 nd April	9:00 am Cherice Wallace-Harewood Director Lands and Surveys
	1:00 pm Visit model of Tobago 6:00 pm Depart Tobago



Appendix 3 List of P3DM exercises done and planned (year 2015) in the Caribbean

	Date	Location	Country	Purpose	Scale	Photograph	Implementing Agencies	Supporting Agencies (Financial & Technical)	CTA Input
1	2005 (April)	North Rupununi	Guyana	The focus was on the use of techniques for Collaborative Natural Resources Management, GIS and Participatory 3-Dimensional Modelling (P3DM), Data Analysis, and an evaluation of the project's past activities.	1:10000		<ul style="list-style-type: none"> • Iwokrama International Centre • Wildfowl and Wetlands Trust, (UK) • Royal Holloway University, London, (UK) • The Open University, (UK). 	<ul style="list-style-type: none"> • Darwin Initiative 	Handbook, network, community
2	2007 (Oct.)	catchment of the River Fond Melon (75 km ²)	Haïti	The objective was to depict existing land use and cover and facilitate the introduction of more sustainable land management and rehabilitation practices. In addition the facilitators aimed at involving residents in prioritizing and accurately locating priority reclamation areas where to conduct agriculture, erosion control and reforestation. An additional purpose included raising awareness among the population about the poor quality of local services, the precariousness of the rural world and degrading agricultural practices	1 :5000		<p>Agronomes et Vétérinaires Sans Frontières (AVSF)</p> <p>Coordination Régionale des Organisations du Sud-Est (CROSE)</p>	<ul style="list-style-type: none"> • European Commission • Ministère des Affaires Etrangères françaises, • ville de Paris • l'entreprise MBP, 	Handbook, network, community

	Date	Location	Country	Purpose	Scale	Photograph	Implementing Agencies	Supporting Agencies (Financial & Technical)	CTA Input
3	2008 (July)	Jacmel and Fond Melon River catchments (560 km ²), up to the coastline	Haiti	The purpose of this exercise was to provide a birds' eye view of a large Jacmel River catchment area, and raise awareness among civil servants about the existing agricultural production zones, the poor conditions of the mountainous areas and the concentration of social services and utilities in urban areas at the expense of the rural areas. In addition the exercise aimed at raising awareness on the existing risks related to intensifying climatic events related to climate change https://goo.gl/i3MLyu	1 :10500		Agronomes et Vétérinaires Sans Frontières (AVSF) Coordination Régionale des Organisations du Sud-Est (CROSE)	<ul style="list-style-type: none"> • European Commission • Ministère des Affaires Etrangères françaises, • ville de Paris • l'entreprise MBP 	Handbook, network, community
4	2010	Lower portion of the Fond Melon River catchment	Haiti	Develop a 3D model to serve as a medium for developing a sustainable resource management plan for the communal areas and the parallel development of a minimum set of infrastructures which could benefit the local population. Community advocacy.	1 :5000		Agronomes et Vétérinaires Sans Frontières (AVSF) Coordination Régionale des Organisations du Sud-Est (CROSE)	<ul style="list-style-type: none"> • European Commission • Ministère des Affaires Etrangères françaises, • ville de Paris • l'entreprise MBP 	Handbook, network, community

	Date	Location	Country	Purpose	Scale	Photograph	Implementing Agencies	Supporting Agencies (Financial & Technical)	CTA Input
5	2012 (Sept-Oct)	Island of Tobago	Trinidad & Tobago	Overall objective was contributing to increasing the engagement of stakeholders to adopt Information and Communication Technologies (ICT) to influence climate change adaptation policy processes. More specifically, it was built to make local and traditional knowledge and values more recognized and more authoritative in decision making about climate change adaptation in the Caribbean region.	1:10000		<ul style="list-style-type: none"> • CANARI • University of the West Indies (UWI), St. Augustine 	<ul style="list-style-type: none"> • CTA (technical and Financial) • UNDP GEF-SGP (financial) • TNC (financial) • Tobago House of Assembly (in kind) 	Technical on site + Funding
6	2013 (28 Feb. 8 Mar.)	Union Island	St Vincent & the Grenadines	To document, share, and combine traditional and other forms of knowledge to identify the risks from climate change and extreme climate events and to recommend the adaptation policies and actions required.			<ul style="list-style-type: none"> • Sustainable Grenadines, Inc. (SusGren) 	<ul style="list-style-type: none"> • TNC (financial) • CTA (Financial and technical) 	Funding + CTA trained the facilitators in TTO in 2012 + advisory
7	2013 (10-19 April)	Grenville	Grenada	To document, share, and combine traditional and other forms of knowledge to identify the risks from climate change and extreme climate events and to recommend the adaptation policies and actions required.			<ul style="list-style-type: none"> • Grenada Fund for Conservation • Grenada Red Cross Society 	<ul style="list-style-type: none"> • TNC (financial) • CTA (Financial) • Sustainable Grenadines, Inc. (SusGren): Technical 	Funding + CTA trained the facilitators in TTO in 2012 + advisory

	Date	Location	Country	Purpose	Scale	Photograph	Implementing Agencies	Supporting Agencies (Financial & Technical)	CTA Input
8	2013 Aug	Roxborough, Tobago	Trinidad & Tobago	Using P3DM, to support the development of climate change strategies and policies.			<ul style="list-style-type: none"> University of the West Indies (UWI), St. Augustine Tobago Emergency Management Agency (TEMA) 	<ul style="list-style-type: none"> University of the West Indies (UWI), St. Augustine 	t.b.d.
9	2013 Nov.		St Vincent & the Grenadines	Using P3DM to facilitate discussing on planning for storm surges using 25, 50 and 100 yr projections			<ul style="list-style-type: none"> GIS Unit - Physical Planning Unit in the Ministry of Housing, Informal Human Settlements, Physical Planning & Land & Surveys 	<ul style="list-style-type: none"> Physical Planning Unit in the Ministry of Housing, Informal Human Settlements, Physical Planning & Land & Surveys of the Government of St. Vincent and the Grenadines 	N/A
10	2014 Mar	East Port of Spain, Trinidad	Trinidad & Tobago	The model is geared towards recording local understanding of history in East Port of Spain. Attendants were asked to identify various cultural heritage sites dispersed throughout the area on the P3DM using their past and present knowledge of the area.			<ul style="list-style-type: none"> Caribbean Network for Urban and Land Management, Research and Development Impact Fund (CNULM) BlueSpace Caribbean: https://www.facebook.com/blueSpaceCaribbean University of the West Indies (UWI), St. Augustine 	<ul style="list-style-type: none"> UWI-Trinidad and Tobago Research and Development Impact Fund (RDIFund) 	t.b.d.

	Date	Location	Country	Purpose	Scale	Photograph	Implementing Agencies	Supporting Agencies (Financial & Technical)	CTA Input
11	2014 (25 Aug – 6 Sept)	Jaw Jaw village, Saramaccan territory (Cluster 1) Total area: 1,766 km ²	Suriname	Participatory action research regarding ecosystem services that support local livelihoods and assessment of change in ES provision under different land management alternatives.	1:15000		<ul style="list-style-type: none"> • Tropenbos International Suriname 	<ul style="list-style-type: none"> • CTA (financial and Technical) • WWF-Guianas (financial) • Tropenbos International (financial and technical) • Amazon Conservation Team (ACT) (in kind) • Association of Indigenous Village Chiefs in Suriname (VIDS) (in kind) 	Funding + facilitation + advisory
12	2015 (April)	Soufriere-Scott's Head Gallion area,	Dominica	Spatial planning to improve resilience to climate change and extreme events in the Soufriere-Scott's Head Gallion area in Dominica			<ul style="list-style-type: none"> • CANARI 	<ul style="list-style-type: none"> • The Caribbean Aqua-Terrestrial Solutions-Programme (CATS) funded by the German Ministry of Economic Cooperation and Development • Trinidad and Tobago Meteorological Services of Trinidad and Tobago 	CTA trained the facilitators in TTO in 2012
13	2015 (July)	Location : t.b.d. within Saramaccan territory (Cluster2) Total area: 2,090 km ²	Suriname	Participatory action research regarding ecosystem services that support local livelihoods and assessment of change in ES provision under different land management alternatives.	1:15,000	N/A	<ul style="list-style-type: none"> • Tropenbos International Suriname <p>Contact: Sara Olga Ramirez Gomez soi.sararamirez@gmail.com</p>	<ul style="list-style-type: none"> • GEF-SGP (Financial), WWF (financial), Tropenbos International (financial and technical) 	CTA trained the facilitators in Suriname in 2014. CTA provided support c/o GEF-SGP in leveraging additional funding



	Date	Location	Country	Purpose	Scale	Photograph	Implementing Agencies	Supporting Agencies (Financial & Technical)	CTA Input
14	2015 (t.b.d.)	TBA, Trinidad	Trinidad & Tobago	Agriculture-focused P3DM TBA		N/A	<ul style="list-style-type: none"> University of the West Indies (UWI), St. Augustine 	<ul style="list-style-type: none"> TBA 	CTA trained the facilitators in TTO in 2012
15	2015 (t.b.d.)	Mayaro, Trinidad	Trinidad & Tobago	Coastal/Climate Change-focused P3DM TBA		N/A	<ul style="list-style-type: none"> University of the West Indies (UWI), (Dept. of Geoinformatics) St. Augustine 	<ul style="list-style-type: none"> TBA 	Facilitator have been trained by SusGren staff who in turn had been trained by CTA
16	2015 (t.b.d.)	t.b.d.	Dominican Republic	t.b.d.		N/A	<ul style="list-style-type: none"> Global Environments Regional Academy Contact: Daniel Abreu danielabre@gmail.com 	<ul style="list-style-type: none"> Global Diversity Foundation (GDF), www.global-diversity.org 	GDF staff exposed to P3DM through CTA

Appendix 4 Case study: Catalysing the practice of P3DM in the Caribbean region

In late September 2012, a model of the entire island of Tobago was built with the overall objective of contributing to increasing the engagement of stakeholders to adopt ICT to influence climate change adaptation policy processes. More specifically, it was built to make local and traditional knowledge and values more recognized and more authoritative in decision making about climate change adaptation in the Caribbean region.

The exercise was implemented by the Caribbean Natural Resources Institute (CANARI), the University of the West Indies (UWI), the Tobago House of Assembly (THA) (local government authority) with supported co-facilitation of the model building by a Geographical Information Specialist from the Philippines and an experienced P3DM practitioner from Partners with Melanesians (PWM) from Papua New Guinea (PNG). The initiative benefitted from co-funding made available by the UNDP GEF-SGF national office. The event also included the training of 22 representatives from national and regional organizations to use P3DM to facilitate participatory planning for climate change adaptation and on the use of participatory video for project documentation and evaluation. More details on the model building exercise are available in Appendix 3. Table 4 presents a list of organizations from which personnel were trained and their respective countries of operation.

Table 4 List of organizations that participated in the training exercise in Tobago (September to October, 2012)

Organization	Country of operation
Forestry Department, Jamaica	Jamaica
Sustainable Grenadines Inc. (SusGren)	St. Vincent and the Grenadines
Caribbean Disaster Emergency Management Agency (CDEMA)	Regional body (Head Office located in Barbados)
The Caribbean Public Health Agency (CARPHA) - formerly Caribbean Environmental Health Institute (CEHI)	Regional body (Head Office located in Saint Lucia)
Institute of Marine Affairs	Trinidad and Tobago
Trinidad and Tobago Red Cross Society	Trinidad and Tobago
Office of Disaster Preparedness and Management	Trinidad and Tobago
Groupe de Action Francophone pour l'Environnement	Haiti
Caribbean Coastal Area Management Foundation	Jamaica
Caribbean Institute for Meteorology and Hydrology (CIMH)	Barbados
Environment Tobago	Trinidad and Tobago; (specifically Tobago)
Department of Natural Resources and Environment (DNRE) -Tobago House of Assembly (THA)	Trinidad and Tobago (specifically Tobago)
Union Island Environmental Attackers Inc.	St. Vincent and the Grenadines
TNC - Caribbean office	Regional
Grenada Fund for Conservation (GFC)	Grenada
Fondes Amandes Community; Re-forestation Project (FACRP)	Trinidad and Tobago
Consortio Ambiental Dominicano	Dominican Republic
Caribbean Agricultural Research and Development Institute (CARDI)	Regional; (Head Office located in Trinidad)
IOCARIBE - UNESCO Centro	Regional

Subsequent to the building of the model in Tobago, the two main implementing organizations CANARI and UWI have facilitated the building of three additional models. CANARI facilitated, in March 2015, the building of a model in Dominica to inform spatial planning for disaster management and risk reduction. UWI facilitated the building of a model in East Port-of-Spain to record the historical perspective of local residents and a UWI postgraduate student pursuing a Master of Science degree (MSc) built a model of the village of Roxborough, Tobago, geared at incorporating local knowledge into mapping. UWI, through the assistance of its students who are completing their MSc theses, currently has plans to build two more models in 2015.

Four of the organizations trained in Tobago have been involved in building two models: SusGren led on the building of a model of Union Island in St. Vincent and the Grenadines with Union Environmental Attackers Inc., TNC and GFC. The model of Union Island was instrumental in receiving Cabinet approval for the restoration of Ashton Lagoon in January 2015. At the Union Island exercise, six organizations were also trained in model building. Table 5 below presents a list of organizations from which personnel were trained and their respective countries of operation.

Table 5 List of organizations that participated in the training exercise on Union Island, St. Vincent and the Grenadines (February to March, 2013)

Organization	Country of operation
Caribbean Community Climate Change Centre (CCCCC)	Regional
Caribbean Regional Fisheries Mechanism (CRFM) Secretariat	Regional
The Grenada Informer Newspaper	Grenada
Ministry of National Mobilization, St. Vincent and the Grenadines	St. Vincent and the Grenadines
National Parks Authority, St. Vincent and the Grenadines	St. Vincent and the Grenadines
Physical Planning Unit, St. Vincent and the Grenadines	St. Vincent and the Grenadines

One trainee from the exercise in Union Island, the Physical Planning Unit in the Ministry of Housing, Informal Human Settlements, Physical Planning & Land & Surveys of the Government of St. Vincent and the Grenadines, built a model in November 2013, to facilitate discussion and planning for storm surges using 25, 50 and 100 year projections.

GFC led on the building of the model of Grenville in Grenada with SusGren and TNC. The model helped to give visibility to the climate-related challenges facing the island and leveraged donor support in the amount of approximately USD 200,000 for ecosystem based adaptation activities in Telescope Bay.

Appendix 5 Case study: Proliferation of the practice of P3DM in the Caribbean

Dominica

In April 2015, CANARI facilitated the construction of a 1:5000 3D model of the watershed at the Soufriere-Scotts Head-Gallion area in Dominica. The model will be used for participatory spatial planning and the development of land utilisation strategies that should address the need for disaster management and risk reduction. The model represents information given by more than 30 persons over two days from the three communities and government agencies with responsibility for management of resources in the area. It was handed over to the Soufriere Scotts Head Gallion Village Council. The exercise was part of the Caribbean Aqua-Terrestrial Solutions-Programme (CATS) currently funded by Bundesministerium Für Wirtschaftliche Zusammenarbeit (German Federal Ministry for Economic Development Cooperation or BMZ) and implemented by CARPHA and the Deutsche Gesellschaft für Internationale Zusammenarbeit (German Agency for International Cooperation, or GIZ).

Jaw Jaw village, Saramaccan territory, Suriname⁸

In 2014 Tropenbos International Suriname (TIS) assisted Saramaccan communities in building a model at a 1:15,000 scale of an area covering about 1,766 km² of tropical forest along the Suriname River in Suriname. The Productive Landscape Programme of Tropenbos International Suriname and the Capacity Building Strategy for Land Use Planning in Suriname of WWF Guianas have been using the 3D model to involve stakeholders in elaborating land-use scenarios and conducting participatory assessments of ecosystem services. The 3D model, now under the custodianship of the Saramaccan people, will also be used to elaborate proposals for investments in local infrastructure and sustainable development such as electrification and ecotourism. In this particular case CTA provided both technical and financial support and ensured the training of Tropenbos staff in P3DM practice.

In May 2015 the Association of Saramaccan Authorities or Vereniging van Saramakaanse Gezagsdragers, hereafter (VSG) assisted by TIS and CTA was able to secure additional funding equivalent to USD 50,000 to increase the area covered by the first P3DM exercise by additional 2,090 km². Field work will start in July 2015. In the framework of this P3DM activity CTA will support the participation of two representatives from CARIBSAVE (INTASAVE Caribbean), a part of the global not-for-profit organisation 'INTASAVE-CARIBSAVE Group'. CARIBSAVE has a regional headquarters in Barbados with the mission of *"Working with, and supporting, societies, economies, communities and environments in responding to a changing climate; providing innovative, dynamic and evidence-based tools and solutions. Our focus is innovation, and the connection and implementation of effective solutions, for policy and practice, to climate challenges."*

North Rupununi, Guyana⁹

The 2005 3D model was made in the framework of a project supported by the Darwin Initiative based on available guidelines¹⁰. The process was done to support collaborative natural resources management of wetland ecosystems and perform a preliminary assessment of how the communities of Surama, Annai and Toka used the resources of the wetland systems.

⁸ Information extracted from <http://www.cta.int/en/article/2014-10-11/maps-for-traditional-knowledge-n-bringing-the-3rd-dimension-to-the-negotiating-table-media-release.html>

⁹ Information extracted from <http://www.iapad.org/applications/plup/rupununi.htm>

¹⁰ Rambaldi G and Callosa-Tarr J. 2002. Participatory 3-Dimensional Modelling: Guiding Principles and Applications, ASEAN Regional Centre for Biodiversity Conservation (ARCBC), Los Baños, Laguna, Philippines. July 2002

Haïti¹¹

A 2002 version of the P3DM handbook¹⁰ coupled with support provided through the PPGIS network led to the adoption of P3DM practice in a project run by Agronomes et Vétérinaires Sans Frontières (AVSF) in Nicaragua. Acquired skills were later on used by AVSF staff in Haïti where three P3DM exercises were done (see Appendix 3) over the period 2007-2010 with facilitation provided by AVSF and Coordination Régionale des Organisations du Sud-Est (CROSE). The first exercise took place at the end of year 2007. It covered an area of 74.75 km² including the catchment of the River Fond Melon. The objective was to depict existing land use and cover and facilitate the introduction of more sustainable land management and rehabilitation practices. In addition the facilitators aimed at involving residents in prioritizing and accurately locating priority reclamation areas where to conduct agriculture, erosion control and reforestation. An additional purpose included raising awareness among the population about the poor quality of local services, the precariousness of the rural world and degrading agricultural practices.

The second exercise took place during the period July 2008 in the water catchments of the Jacmel and Fond Melon rivers. The area covered was of 1,252 km² at a 1:10,500 scale. It resulted in a large 3D model measuring 4 m x 2.8 m. The purpose of this exercise was to provide a birds' eye view of a large Jacmel River catchment area, and raise awareness among civil servants about the existing agricultural production zones, the poor conditions of the mountainous areas and the concentration of social services and utilities in urban areas at the expense of the rural areas. In addition the exercise aimed at raising awareness on the existing risks related to intensifying climatic events related to climate change.

The third exercise took place in 2010 in the lower portion of the catchment area of the Fond Melon River. The purpose of this exercise was to develop a 3D model which served as a medium for developing a sustainable resource management plan for the communal areas and the parallel development of a minimum infrastructure which could benefit the local population.

None of the exercises in Haïti included a P3DM capacity building components.

¹¹ Delerue Florian, 2013. [Construction participative de maquettes en trois dimensions - Guide méthodologique produit à partir d'une expérience haïtienne](#). AVSF

