**Subsidieaanvraag-disciplines\_digitaal / GrantApplication-discipline\_digital** Dossier nummer / Dossier number: 50-56300-98-5001

**Algemene gegevens / General Information**

Programma / Programme : **COVID-19 Programma**

Subsidieronde / Subsidy round : **COVID-19 Societal dynamics in the Dutch Caribbean: Economic resilience**

Projecttitel / Project title : **COVID-19, Food Security and Economic Diversity in Curaçao, Aruba and Sint Maarten**

Projecttaal / Project language : **Engels / English**

Geplande startdatum / Planned start date : **18-01-2021**

Geplande duur / Planned duration : **24 maanden / months**

Datum indienen / Date of application : **17-12-2020**

Projecttype / Project type : **Anders**

Vervolg eerder ZonMw-project /

Continuation previously funded project ZonMw

**Projectleden / Project members**

: **Nee / No**

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**1**

**Subsidieaanvraag-disciplines\_digitaal / GrantApplication-discipline\_digital** Dossier nummer / Dossier number: 50-56300-98-5001

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SISSTEM

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XX0000 Oranjestad - Aruba

**Projectgegevens / Project information**

**Samenvatting / Summary**

The socio-economic impact of the COVID-19 pandemic upon the island states of Curaçao, Aruba and Sint Maarten has exacerbated the need for both economic diversification and the bolstering of food security. This research project seeks to explore how the pandemic has affected local food systems and how sustainable agricultural production can contribute to diversification strategies that will help make the islands pandemic resilient. Central to this project is the participation of local stakeholders and community members in the design of data collection and interpretation.

Work Package (WP)1 measures the impact of COVID-19 on the sustainability of food systems and community responses to food security since the outbreak of the COVID-19 pandemic. WP 2 explores sustainable economic diversification strategies and food production systems. Together, these will provide important baseline data that can be used to inform evidence-based policy aimed at: 1. increasing local sustainable agricultural development; 2. increasing food and nutrition security; 3. developing innovative small and medium business enterprises supporting agricultural development; 4. building regional consortiums; and 5. promoting economic diversity.

The research consortium consists of a research team on all three islands with institutional support from the University of St. **2**

**Subsidieaanvraag-disciplines\_digitaal / GrantApplication-discipline\_digital** Dossier nummer / Dossier number: 50-56300-98-5001

Martin, the University of Curaçao Research Institute (UCRI) and the University of Aruba Sustainable Island Solutions through Science, Technology, Engineering and Mathematics (SISSTEM).

**Trefwoorden / Keywords**

COVID-19, Economic Diversification, Food Security, Small Island States, Caribbean, Pandemic Resilience, Community Based Participatory Research

**Samenwerking / Collaboration**

**Samenwerking tussen onderzoek en praktijk / Cooperation between research and practice:** Ja / Yes

**Organisaties**

Universiteit van Aruba

Faculty of Arts and Sciences

SISSTEM

University of Curacao

Universtity of Curacao Research Institute

University of St. Martin

Administration

**Inhoud / Content**

**Probleemstelling / Problem definition**

The specific socio-economic and environmental characteristics of small island states call for innovative approaches to address all four dimensions of food security as identified by the FAO (World Food Summit 1996): sufficient availability of appropriate food, equal access to food, proper utilization of food and stability of food supply that build resilience to exogenous shocks. The vulnerability to exogenous shocks was pre-existent to the COVID-19 crisis. However, the pandemic has exacerbated vulnerability in all four aspects of food security and left many people in the Caribbean region dependent on food relief initiatives, ranging from financial aid for large sections of the population to food aid for thousands of citizens in the island states of Aruba, Curacao and Sint Maarten (CAS Islands).

Natural resources and arable land in small island states are limited due to past and current land use policies favoring investment in the mono-economic tourism sector. In the northern island of Sint Maarten, the impacts of climate change are becoming noticeable and the increasing intensity of hurricanes illustrate that mono-economic approaches, such as tourism, are not resilient. In the southern islands of Curacao and Aruba, climate change is negatively influencing erosion patterns and decreasing the availability of freshwater. The economic impact of the COVID-19 pandemic has been catastrophic for the three small island states in the Caribbean part of the Kingdom of the Netherlands, where tourism represented a significant source of income and employment. It is clear that these small island states (SIS) need to diversify their economies and build resilience.

In this collaborative research, we will explore how the COVID-19 pandemic has led to shifting patterns in community-centered local food production initiatives and how they can contribute to innovative economic diversification strategies to increase pandemic resilience. With these tourism-based economies now at a standstill, and with the islands being highly import-dependent (Aruba nearly 100%, Curacao and Sint Maarten around 95%), hunger and malnutrition are now making their incursions into daily life on a larger scale than before COVID-19. Currently, larger segments of the population are now becoming more dependent on food donations and charities. On Sint Maarten, Curacao and Aruba, the COVID-19 pandemic has clearly exposed already existing patterns and structures of social inequity, inequality and poverty, whereby the most vulnerable sectors of society are brought to the brinks of survival. Now more than ever, the need for economic diversification to withstand exogenous shocks has become clear in all island states of the Dutch Caribbean.

Since these patterns have become more apparent, we wish to document changing attitudes to the development of a strong and diversified agricultural sector and sustainable food systems that will increase food security. To do this we will use a qualitative and quantitative approach to explore the changing attitudes surrounding the investment and development of this sector in an effort to build economic diversification and resilience. We will involve key stakeholders and the communities on Sint Maarten, Curacao and Aruba to understand how attitudes towards agriculture and food security have shifted during the COVID-19 pandemic.

The urgent need for applied research to guide and evaluate the upscaling of local food production, consumption and food security in SIS in response to COVID-19 was recently emphasized by Drs Fletcher-Paul and Hutchinson from the Faculty of Food and Agriculture, at the University of the West Indies (Faculty of Food and Agriculture 2020). Berks and Ross (2013) have shown how economic diversification is key to community resilience and how diverse economic and social infrastructures can ensure continued socio-economic functioning following major disruptions or (exogenous) shocks.

**3**

**Subsidieaanvraag-disciplines\_digitaal / GrantApplication-discipline\_digital** Dossier nummer / Dossier number: 50-56300-98-5001

We will use a community based participatory research approach (CBPR). CBPR is a partnership approach to research that equitably involves community members, organizational representatives, researchers, and others in all aspects of the research process, with all partners in the process contributing expertise and sharing in the decision-making and ownership. The aim of CBPR is to increase knowledge and understanding of a given phenomenon and to integrate the knowledge gained with interventions for policy or social change benefiting the community members (Leslie, et al, 2017; Faraclas, Kester & Mijts, 2019. p.11).

Main Objective:

This study aims to explore shifting patterns in community-centered local food production initiatives and how they can contribute to innovative economic diversification strategies to increase pandemic resilience.

**Relevantie / Relevance**

CALL-SPECIFIC RELEVANCE CRITERIA

This research addresses the creativity at the individual level but also at the level of communities, neighbourhoods and institutions. How can we explain the resilience of society to offer help and solutions via a wide range of initiatives at the level of food systems? What can we learn from this, how can positive elements be retained/safeguarded and which aspects can make a contribution to a structural reshaping of society?

ZONMW GENERAL RELEVANCE CRITERIA

This research endeavours to get stakeholders involved in the research process. These stakeholders include end users from target groups and end users with ‘experience expertise’. By ‘involvement’, we mean consulting, seeking advice, collaborating with and/or allowing stakeholders to make or influence decisions concerning projects. We include the cultural, migratory, socioeconomic and linguistic diversity of populations in three Caribbean islands.

**Kennisoverdracht, implementatie, bestendiging / Knowledge transfer, Implementation Consolidation** 3x island research paper (article)

1x cross island paper (article)

9x student report: technical report of the work (not publication)

2x blended seminar

3x blended public symposium

1x public/media outreach product

**Doelstelling / Objective**

This study aims to explore shifting patterns in community-centered local food production initiatives and how they can contribute to innovative economic diversification strategies to increase pandemic resilience.

**Plan van Aanpak / Strategy**

THEORETICAL AND/OR EMPIRICAL SUBSTANTIATION

Compared to continental countries, small island states are subject to numerous extra threats due to their specific environmental, geographical, social and economic characteristics (Briguglio 2003; Ratter, 2018) that leads to greater vulnerability. With limited land capacity, small island states are not only at the forefront of climate change, but also face a multitude of other, immediate, environmental and socio-economic threats for which appropriate indicators have not been fully developed yet (UNEP 2013). The special characteristics of sustainability and resilience is also recognized by the UN SDG platform that lists the following special characteristics: “their small size, remoteness, narrow resource and export base, and exposure to global environmental challenges and external economic shock, including to a large range of impacts from climate change and potentially more frequent and intense natural disasters (UN 2012, p. 46).”

COVID-19 has placed considerable stress on food supply systems among the SIS (Hickey & Unwin, 2020); this is due in part to the islands high dependence on tourism as well as on the importation for the bulk of their food, and increased poverty exasperating the prevalence of non-communicable diseases such as obesity and diabetes. Scholars, experts and international organisations have made calls for the re-shaping of food systems (Ruben 2020) and the boosting of sustainable and local agricultural production, highlighting integrated and community-centred approaches to dealing with the impact of COVID-19 (Petetin 2020).

This research proposal focuses directly on the following UN 2030 SDGs: 1-end to poverty; 2-the eradication of hunger; 3-good health and wellbeing; 4-education and learning; 8- decent work and economic growth; 9-industry, innovation and infrastructure; 11-sustainable cities and communities; 12-responsible consumption and production; 15-life on land; and 17-partnerships for the SDGs.

DESIGN

WP 1 Measures the impact of COVID-19 on the sustainability of food systems (availability and accessibility) and community responses to food security since the outbreak of the COVID-19 pandemic.

The information obtained in WP 1 will provide baseline data to understand how COVID-19 has, and/or is perceived to have, impacted the knowledge, attitudes and practices of the significance of sustainable agriculture as an economic pillar on Sint Maarten, Curacao and Aruba. It will also provide important data on how people view the development of agriculture and its

relation to increasing food security on small island tourism-dependent economies of the Dutch Caribbean islands. The particular methods utilized will render data that can contribute to evidence-based policy and administration focussed on building economic diversification and resilience through local agricultural production.

**4**

**Subsidieaanvraag-disciplines\_digitaal / GrantApplication-discipline\_digital** Dossier nummer / Dossier number: 50-56300-98-5001

We will accomplish this using 2 methodologies including:

1.) Engaging with communities to generate data surrounding local food systems (community-based food production units, households etc. on the three islands through the administration of a stakeholder informed survey and interviews. 2.) Spatial analysis of access to and utilization of locally-available food crops and locally produced food products.

Data will first be collected by engaging with the community to generate data surrounding local food systems (community-based food production units, households etc.) on the three islands.

Using focus groups and interviews consisting of a number of stakeholders. These stakeholders include:

Importers: Will provide data on increases or decreases in products pre- and post COVID-19.

Distributors: Will provide insight into how imports were impacted by COVID-19 (with the decrease of tourists). Local farmers: Will provide information on local production and also indicate whether they upscaled production or adapted production and/or distribution to the local food demand.

Households: Will provide indication of which foods in which food categories people are eating (fruits, vegetables, meat, fish, starch), as well as where the origins of foods,the availability and accessibility of food and the decision-making behind dietary choices both pre and post COVID-19.

Focus groups and individual interviews will be conducted to generate knowledge of dietary practices and food availability among the communities on the islands. Focus groups will be representative of the general population (equal distribution of gender, age, education, and income) (Polit & Beck, 2012).

Purposive sampling will be used to identify participants according to the identified criteria (Polit & Beck, 2012). Systematic research as well as snowballing will be helpful to identify relevant participants. During each focus group we will ask individuals to advise further possible participants according to the selected criteria. Only individuals older than 18 will be considered for the study.

The knowledge obtained through the focus groups will then be used to create a stakeholder-informed survey to be conducted on all three islands. This survey provides data for WP 2.

WP 2 Explore sustainable economic diversification strategies and food production systems.

1.) Identify community-centered business models (e.g. cooperatives.and micro/small businesses/SMEs); 2.) Identify regional networks of sustainable agricultural producers;

3.) Identify the rationale of dietary practices, and explore if interventions are required to promote eating habits that can increase resilience against pandemics such as COVID-19 (consuming more local produced products).

4.) Assess how endogenous economic diversification can be improved by small scale food production projects; 5.) Explore how innovation can be utilized to increase food systems resilience;

6.) Assess if digital technology can assist in developing a more resilient network of Caribbean sustainable agricultural producers with an aim to build economic diversification (best practices for nutritional and economic diversification of already existing community initiatives in the wider Caribbean and other SIS.)

To complete WP2, we will use a similar methodology (focus groups and interviews) to those used in WP1. However, the stakeholders will mainly include government officials, non-profit organizations, and local entrepreneurs who are primarily concerned with economic diversification and pandemic resilience (agriculture, economic affairs, education, chambers of commerce, nature conservation, tourism, creative entrepreneurs etc).

WP 1 plus WP 2 will provide important baseline data that can be used to inform evidence-based policy aimed at: 1.) increasing local sustainable agricultural development; 2.) increasing food and nutritional security; 3.) developing innovative small and medium business enterprises supporting agricultural development; 4.) building regional consortiums; and 5.) promoting economic diversity.

STUDY POPULATION/DATA SOURCES

See “3. Action plan” above for a description of the study population, see “2. Current Research” for the data sources used for the rationale and background of this research proposal.

INTERVENTION (if applicable)

This study does not provide any direct intervention. Rather, it aims to provide insight into shifting patterns in community-centered local food production initiatives and how they can contribute to innovative economic diversification strategies to increase pandemic resilience.

EXPECTED OUTCOME (in parameters or descriptive)

WP 1 plus WP 2 will provide important baseline data that can be used to inform evidence- based policy aimed at: 1.) increasing local sustainable agricultural development; 2.) increasing food and nutrition security; 3.) developing innovative small and medium business enterprises supporting agricultural development; 4.) building regional consortiums; and 5.) promoting economic diversity.

**5**

**Subsidieaanvraag-disciplines\_digitaal / GrantApplication-discipline\_digital** Dossier nummer / Dossier number: 50-56300-98-5001

DATA ANALYSIS

Following the co-creation of the survey in close consultation with the stakeholders, the outputs of the survey will be interpreted and analyzed by the researchers and the stakeholders in focus group meetings that engage the community of practice involved. The community based data will allow conclusions to be made on the impacts of COVID-19 on local food production initiatives and how they can contribute to innovative economic diversification strategies to increase pandemic resilience on a community and island level. The multi-island (Sint Maarten, Aruba, Curacao) level analysis will allow for a comparative study.

Map access to and utilization of locally-available food crops and locally produced food products

Particularly when visiting farms (also local and commercial markets selling local food products) and administering household surveys, geo-location data will be collected to assess accessibility to local fresh products via food shed and material flow analysis (Peters, 2009; Butler, 2013; Beckford, 2016; pacificnetwork.org).

POWER CALCULATION (if applicable)

A power analysis calculation for this research is not applicable. This research uses a community based participatory research approach (CBPR). Using this approach we are assessing impacts. As the island territories in which the research will be conducted are relatively small, the data collection will either be complete when all actors have been interviewed/approached as well as when a sufficient amount of data has been collected that allows for the formulation of conclusions on the basis of recurrence and hence saturation. We will use snowball sampling to ensure maximum engagement of informants that are influential in opinion formation.

MOTIVATION FEASIBILITY

Time Table

Due to the alignment with existing research agendas and projects, the outputs will be co-driven by these projects and hence be feasible.

RECRUITMENT STRATEGY (if applicable)

In order to maximize community engagement, local students will be approached to support and administer the surveys and focus groups.

**Expertise, voorgaande activiteiten en producten / Expertise, prior activities and products** Consortium Supervisory Board: Antonio Carmona (USM), Elisabeth Echteld (UoC-UCRI), Eric Mijts (UA-SISSTEM)

Sounding board: Georges Felix (Coventry University), Francio Guadeloupe (UvA), Corinne Hofman (Leiden University), Teresa Leslie (USM)

Proposed research team: Ergün Erkoçu (UoC), Kryss Facun(UA/KULeuven), Sharona Jurgens (UA/KULeuven), Amber van Veghel (UA/KULeuven), Benjamin Visser (UoC), Eugene Hoogstad(UvA/USM).

3 student assistants will be hired on each island for the administration and interpretation of the surveys as well as in the conduct of the focus groups.

The supervisory board will ensure the execution and alignment of the research from their respective institutions, the sounding board will give input on feasibility of research and interpretation of data, the proposed research team will co-operate on the design and execution of the research.

**Publicaties / Publications**

Georges F. Felíx and Pablo Tittonell, “Use and management of biodiversity by smallholder farmers in semi-arid West Africa”, Global Food Security, Vol. 18, September 2018.

Leslie TE, Carson M, Coeverden EV, De Klein K, Braks M, Krumeich A. An analysis of community perceptions of mosquito-borne disease control and prevention in Sint Eustatius, Caribbean Netherlands. Glob Health Action. 2017;10(1)

Mijts, Eric, Patrick Arens, Nadine Buys & Georges Gielen (2019) Capacity Building for Sustainable Development in Small Island States through Science and Technology Research and Education. ICSD 2019/Columbia University, New York.

**Referenties / References**

Beckford, C & Rhiney, C. Eds. (2016) Globalization, Agriculture and Food in the Caribbean: Climate Change, Gender and Geography. Palgrave MacMillan UK.

Berkes, F. and Ross, H. , 2013. Community resilience: toward an integrated approach. Society & natural resources , 26 (1), 5–20.

Briguglio, L. (2003). The vulnerability index and small island developing states: a review of conceptual and methodological issues. AIMS regional preparatory meeting on the ten year review. Praia, Cape Verde.

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**Subsidieaanvraag-disciplines\_digitaal / GrantApplication-discipline\_digital** Dossier nummer / Dossier number: 50-56300-98-5001

Brouwer, N.-L., Kaya, J., & Vermeeren, R. (2019). Onderzoek naar handelsbelemmeringen en -kansen t.a.v. voedselzekerheid in Caribisch Nederland.

Butler, M. (2013) Analyzing the Foodshed: Toward a more Comprehensive Foodshed Analysis. Geography masters research papers, Portland State University.

FAO (2006), Policy Brief, Issue 2, Food Security

Faraclas, N, E-P. Kester & E. Mijts (2019). Community based research in language policy and planning. Cham: Springer Nature.

Hickey, G & N. Unwin. (2020) Addressing the triple burden of malnutrition in the time of COVID-19 and climate change in Small Island Developing States: what role for improved local food production? Food security 12:831-835. van Geelen, T. L. T. (2020). Food Supply Chain & Logistics – Bonaire, Sint Eustatius and Saba

Verstraeten, S., Griffith-Lendering, M., Pin, R., & Volksgezondheid Instituut Curaçao. (2017). De nationale gezondheidsenquête Curaçao.

Leslie TE, Carson M, Coeverden EV, De Klein K, Braks M, Krumeich A. An analysis of community perceptions of mosquito-borne disease control and prevention in Sint Eustatius, Caribbean Netherlands. Glob Health Action. 2017;10(1) Peters, C. et al. (2009) Foodshed analysis and its relevance to sustainability. Renewable Agriculture and Food Systems, pp. 1-7..

Petetin, L. (2020) The COVID-19 Crisis: an opportunity to integrate food democracy into post-pandemic food systems. European Journal of Risk Regulation, p. 326-336

Ratter, B. (2018). Geography of Small Islands: Outpost of globalization. Cham: Springer Nature.

UN (2012). The future we want: declaration of the UN Conference on Sustainable Development, Rio de Janeiro. UNEP (2013). Emerging issues for Small Island Developing States. United Nations Environment Programme (UNEP), Nairobi, Kenya.

**Disciplines / Disciplines**

• Sociale geneeskunde / Social medicine

• Gezondheidseconomie / Health economics

• Voeding / Nutrition

• Culturele Antropologie / Cultural Anthropology

**Financiële gegevens / Financial data**

**ZonMw budget**

**Jaar / Year**

**Kostenpost** *1 2 3 4 5 6 7 8***Totaal / Total**

Personeel 90.000 90.000 0 0 0 0 0 0 180.000 Materieel 50.000 0 0 0 0 0 0 0 50.000 Implementatie 0 0 0 0 0 0 0 0 0 Apparatuur 0 0 0 0 0 0 0 0 0 Overig 20.000 0 0 0 0 0 0 0 20.000 **Totaal / Total 160.000 90.000 0 0 0 0 0 0 250.000**

**Co-financiering / Cofinancing**

Naam co-financier / Name of cofinancier Bedrag / Amount Status

**Bijzondere gegevens / Additional information**

**Vergunningen / Permits**

Verklaring nodig / Statement required? Status verklaring / Statement status

Ja / Yes Nee / No Verkregen /

Acquired

METC X

DEC X

WBO X

Aangevraagd / Applied

Nog niet

aangevraagd / Not applied yet

**7**

**Subsidieaanvraag-disciplines\_digitaal / GrantApplication-discipline\_digital** Dossier nummer / Dossier number: 50-56300-98-5001

**Onderschrijvingen / Assents**

Ja / Yes Nee / No N.v.t. / N.A.

Code biosecurity / Code

Biosecurity X Code openheid dierproeven /

Code Transparency of Animal

X

Testing

**Andere vergunningen / Other permits**

**Historie subsidieaanvraag / History grant application**

**Deze aanvraag is ook ingediend bij organisatie / This grant application has also been submitted to organization:**

**8**

**|Application form**

**Societal dynamics in the Dutch Caribbean**

**COVID 19 programme**

**Submission deadline: 17 December 2020 (14:00 hours CEST)**

**BASIC DETAILS (front page)**

**NAME OF THE MAIN APPLICANT:**

Antonio Carmona Báez

**ORGANISATION:**

University of St. Martin

**PLEASE SPECIFY THE THEME OF THE PROPOSAL:**

Research into the effectiveness and impact of measures/strategies in response to the coronavirus crisis &

☐ Research into the resilience of Dutch Caribbean societies

X☐ Research into the economic resilience of the Caribbean islands of the Kingdom

**ENGLISH PROJECT TITLE:**

COVID-19, Food Security and Economic Diversity in Curaçao, Aruba and Sint Maarten

**ENGLISH LAYMAN SUMMARY (100 WORDS):**

The socio-economic impact of the COVID-19 pandemic upon the island states of Curaçao, Aruba and Sint Maarten has exacerbated the need for both economic diversification and the bolstering of food security. This research project seeks to explore how the pandemic has affected local food systems and how agriculture can contribute to diversification strategies that will help make the islands pandemic resilient. Central to this project is the participation of local stakeholders and community members in the design of data collection and interpretation.

**RESEARCH PROPOSAL max 8 pages A4**

(including literature references)

(front page with basic details not included - font type Arial 10 pts)

1

**1. PROBLEM DEFINITION, URGENCY AND OBJECTIVE(S)**

Substantiation problem definition, urgency and objective. Make objective SMART (specific, measurable, acceptable, realistic and time-related)

The specific socio-economic and environmental characteristics of small island states call for innovative approaches to address all four dimensions of food security as identified by the FAO (World Food Summit 1996): sufficient availability of appropriate food, equal access to food, proper utilization of food and stability of food supply that build resilience to exogenous shocks. The vulnerability to exogenous shocks was pre-existent to the COVID-19 crisis. However, the pandemic has exacerbated vulnerability in all four aspects of food security and left many people in the Caribbean region dependent on food relief initiatives, ranging from financial aid for large sections of the population to food aid for thousands of citizens in the island states of Aruba, Curacao and Sint Maarten (CAS Islands).

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In this collaborative research, we will explore how the COVID-19 pandemic has led to shifting patterns in community-centered local food production initiatives and how they can contribute to innovative economic diversification strategies to increase pandemic resilience. With these tourism based economies now at a standstill, and with the islands being highly import-dependent (Aruba nearly 100%, Curacao and Sint Maarten around 95%), hunger and malnutrition are now making their incursions into daily life on a larger scale than before COVID-19. Currently, larger segments of the population are now becoming more dependent on food donations and charities. On Sint Maarten, Curacao and Aruba, the COVID-19 pandemic has clearly exposed already existing patterns and structures of social inequity, inequality and poverty, whereby the most vulnerable sectors of society are brought to the brinks of survival. Now more than ever, the need for economic diversification to withstand exogenous shocks has become clear in all island states of the Dutch Caribbean.

Since these patterns have become more apparent, we wish to document changing attitudes to the development of a strong and diversified agricultural sector and sustainable food systems that will increase food security. To do this we will use a qualitative and quantitative approach to explore the changing attitudes surrounding the investment and development of this sector in an effort to build economic diversification and resilience. We will involve key stakeholders and the communities on Sint Maarten, Curacao and Aruba to understand how attitudes towards agriculture and food security have shifted during the COVID-19 pandemic.

The urgent need for applied research to guide and evaluate the upscaling of local food production, consumption and food security in SIS in response to COVID-19 was recently emphasized by Drs Fletcher-Paul and Hutchinson from the Faculty of Food and Agriculture, at the University of the West Indies (Faculty of Food and Agriculture 2020). Berks and Ross (2013) have shown how economic diversification is key to community resilience and how diverse economic and social infrastructures can ensure continued socio-economic functioning following major disruptions or (exogenous) shocks.

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**Main Objective:**

2

**This study aims to explore shifting patterns in community-centered local food production initiatives and how they can contribute to innovative economic diversification strategies to increase pandemic resilience.**

**2. CURRENT RESEARCH**

Briefly describe published research AND current national (and where possible international) research in this area and what your project adds to this. Click here for a list of possible portals.

This project aligns with such ongoing research projects such as:

1. “Spatial Analysis of Urban Metabolism in Small Islands States” (Sharona Jurgens, UA/KU Leuven), which looks at the island as an environment with a closed physical boundary (metabolism) that needs resources to sustain basic human life. Within this project the focus is on the interaction between social, spatial, and environmental dimensions of urban processes and how to address prevailing challenges on numerous spatial scales that are sustainable for all involved.

2. “Vertical Farming in Small Island States - The Aruba case” (Kryss Facun, UA/KU Leuven) which investigates new cultivation techniques of indoor vertical farming by investigating and optimizing the ideal conditions to grow plants in a controlled environment. A favorable specialty crop is chosen with a short storage life, to reduce the dependency of import. Knowledge of plant physiology, agronomy and innovative vertical farming can be translated into a real-life situation to provide locally produced fruits and vegetables and make Aruba's economy and food production more sustainable.

3. “Life cycle management for a more sustainable food chain on (Caribbean) islands” (Amber van Veghel, UA/KU Leuven)

4. Donut Taskforce: Exploring Curaçao’s circular economy.through sustainable environmental and social ecosystems.

5. Curaçao Syntropic Roadmap 2025: rolling out syntropic agroforestry systems at 25 subsistence farms, neighbourhoods, and individual gardens alike by 2025.

6. Georges Félix (2019), has extensively researched the application of agroecological principles to food production, soil restoration in torrid lands and topographies. Where possible alignment with other existing projects will be established in the start up phase.

7. In April 2020, CARICOM (supported by the World Food Programme and the FAO) launched a regional COVID-19 Food Security and Livelihoods Impact Survey via social media, to rapidly gather data on disruptions to food supply chains, impact on employment and access to markets. Curaçao, Aruba and Sint Maarten are not included in this report.

8. In September 2020, the World Bank presented its report to the government of Aruba on the importance of having a strong agricultural sector that can boost resiliency and promote economic diversity.

9. Recent works by van Geelen, et al. (2020), Brouwer et al. (2019), Verstraeten et al. (2017) **3. ACTION PLAN (MOTIVATE CHOICES)**

3

THEORETICAL AND/OR EMPIRICAL SUBSTANTIATION

Compared to continental countries, small island states are subject to numerous extra threats due to their specific environmental, geographical, social and economic characteristics (Briguglio 2003; Ratter, 2018) that leads to greater vulnerability. With limited land capacity, small island states are not only at the forefront of climate change, but also face a multitude of other, immediate, environmental and socio-economic threats for which appropriate indicators have not been fully developed yet (UNEP 2013). The special characteristics of sustainability and resilience is also recognized by the UN SDG platform that lists the following special characteristics: “their small size, remoteness, narrow resource and export base, and exposure to global environmental challenges and external economic shock, including to a large range of impacts from climate change and potentially more frequent and intense natural disasters (UN 2012, p. 46).”

COVID-19 has placed considerable stress on food supply systems among the SIS (Hickey & Unwin, 2020); this is due in part to the islands high dependence on tourism as well as on the importation for the bulk of their food, and increased poverty exasperating the prevalence of non-communicable diseases such as obesity and diabetes. Scholars, experts and international organisations have made calls for the re-shaping of food systems (Ruben 2020) and the boosting of sustainable and local agricultural production, highlighting integrated and community-centred approaches to dealing with the impact of COVID-19 (Petetin 2020).

This research proposal focuses directly on the following UN 2030 SDGs: 1-end to poverty; 2-the eradication of hunger; 3-good health and wellbeing; 4-education and learning; 8- decent work and economic growth; 9-industry, innovation and infrastructure; 11-sustainable cities and communities; 12-responsible consumption and production; 15-life on land; and 17-partnerships for the SDGs.

DESIGN

**WP 1 Measures the impact of COVID-19 on the sustainability of food systems (availability and accessibility) and community responses to food security since the outbreak of the COVID-19 pandemic.**

The information obtained in WP 1 will provide baseline data to understand how COVID-19 has, and/or is perceived to have, impacted the knowledge, attitudes and practices of the significance of sustainable agriculture as an economic pillar on Sint Maarten, Curacao and Aruba. It will also provide important data on how people view the development of agriculture and its relation to increasing food security on small island tourism-dependent economies of the Dutch Caribbean islands.

The particular methods utilized will render data that can contribute to evidence-based policy and administration focussed on building economic diversification and resilience through local agricultural production.

We will accomplish this using 2 methodologies including:

1.) Engaging with communities to generate data surrounding local food systems (community-based food production units, households etc. on the three islands through the administration of a stakeholder informed survey and interviews.

2.) Spatial analysis of access to and utilization of locally-available food crops and locally produced food products.

Data will first be collected by engaging with the community to generate data surrounding local food systems (community-based food production units, households etc.) on the three islands. Using focus groups and interviews consisting of a number of stakeholders. These stakeholders include:

a. Importers: Will provide data on increases or decreases in products pre- and post COVID 19.

b. Distributors: Will provide insight into how imports were impacted by COVID-19 (with the decrease of tourists).

c. Local farmers: Will provide information on local production and also indicate whether they upscaled production or adapted production and/or distribution to the local food demand.

4

d. Households: Will provide indication of which foods in which food categories people are eating (fruits, vegetables, meat, fish, starch), as well as where the origins of foods,the availability and accessibility of food and the decision-making behind dietary choices both pre and post COVID 19.

Focus groups and individual interviews will be conducted to generate knowledge of dietary practices and food availability among the communities on the islands. Focus groups will be representative of the general population (equal distribution of gender, age, education, and income) (Polit & Beck, 2012).

Purposive sampling will be used to identify participants according to the identified criteria (Polit & Beck, 2012). Systematic research as well as snowballing will be helpful to identify relevant participants. During each focus group we will ask individuals to advise further possible participants according to the selected criteria. Only individuals older than 18 will be considered for the study.

The knowledge obtained through the focus groups will then be used to create a stakeholder informed survey to be conducted on all three islands. This survey provides data for WP 2.

**WP 2 Explore sustainable economic diversification strategies and food production systems.**

1.) Identify community-centered business models (e.g. cooperatives.and micro/small businesses/SMEs);

2.) Identify regional networks of sustainable agricultural producers;

3.) Identify the rationale of dietary practices, and explore if interventions are required to promote eating habits that can increase resilience against pandemics such as COVID-19 (consuming more local produced products).

4.) Assess how endogenous economic diversification can be improved by small scale food production projects;

5.) Explore how innovation can be utilized to increase food systems resilience; 6.) Assess if digital technology can assist in developing a more resilient network of Caribbean sustainable agricultural producers with an aim to build economic diversification (best practices for nutritional and economic diversification of already existing community initiatives in the wider Caribbean and other SIS.)

To complete WP2, we will use a similar methodology (focus groups and interviews) to those used in WP1. However, the stakeholders will mainly include government officials, non-profit organizations, and local entrepreneurs who are primarily concerned with economic diversification and pandemic resilience (agriculture, economic affairs, education, chambers of commerce, nature conservation, tourism, creative entrepreneurs etc).

**WP 1 plus WP 2 will provide** important baseline data that can be used to inform evidence-based policy aimed at: 1.) increasing local sustainable agricultural development; 2.) increasing food and nutritional security; 3.) developing innovative small and medium business enterprises supporting agricultural development; 4.) building regional consortiums; and 5.) promoting economic diversity.

STUDY POPULATION/DATA SOURCES

See “3. Action plan” above for a description of the study population, see “2. Current Research” for the data sources used for the rationale and background of this research proposal.

INTERVENTION (if applicable)

This study does not provide any direct intervention. Rather, it aims to provide insight into shifting patterns in community-centered local food production initiatives and how they can contribute to innovative economic diversification strategies to increase pandemic resilience.

EXPECTED OUTCOME (in parameters or descriptive)

5

**WP 1 plus WP 2 will provide** important baseline data that can be used to inform evidence- based policy aimed at: 1.) increasing local sustainable agricultural development; 2.) increasing food and nutrition security; 3.) developing innovative small and medium business enterprises supporting agricultural development; 4.) building regional consortiums; and 5.) promoting economic diversity.

DATA ANALYSIS

Following the co-creation of the survey in close consultation with the stakeholders, the outputs of the survey will be interpreted and analyzed by the researchers and the stakeholders in focus group meetings that engage the community of practice involved. The community based data will allow conclusions to be made on the impacts of COVID-19 on local food production initiatives and how they can contribute to innovative economic diversification strategies to increase pandemic resilience on a community and island level. The multi-island (Sint Maarten, Aruba, Curacao) level analysis will allow for a comparative study.

Map access to and utilization of locally-available food crops and locally produced food products Particularly when visiting farms (also local and commercial markets selling local food products) and administering household surveys, geo-location data will be collected to assess accessibility to local fresh products via food shed and material flow analysis (Peters, 2009; Butler, 2013; Beckford, 2016; pacificnetwork.org).

POWER CALCULATION (if applicable)

A power analysis calculation for this research is not applicable. This research uses a community based participatory research approach (CBPR). Using this approach we are assessing impacts. As the island territories in which the research will be conducted are relatively small, the data collection will either be complete when all actors have been interviewed/approached as well as when a sufficient amount of data has been collected that allows for the formulation of conclusions on the basis of recurrence and hence saturation. We will use snowball sampling to ensure maximum engagement of informants that are influential in opinion formation.

**4. ACTION PLAN (MOTIVATE CHOICES)**

TIMETABLE

6

MOTIVATION FEASIBILITY

Due to the alignment with existing research agendas and projects, the outputs will be co-driven by these projects and hence be feasible.

RECRUITMENT STRATEGY (if applicable)

In order to maximize community engagement, local students will be approached to support and administer the surveys and focus groups.

**5. RELEVANCE**

CALL-SPECIFIC RELEVANCE CRITERIA

This research addresses the creativity at the individual level but also at the level of communities, neighbourhoods and institutions. How can we explain the resilience of society to offer help and solutions via a wide range of initiatives at the level of food systems? What can we learn from this, how can positive elements be retained/safeguarded and which aspects can make a contribution to a structural reshaping of society?

ZONMW GENERAL RELEVANCE CRITERIA

This research endeavours to get stakeholders involved in the research process. These stakeholders include end users from target groups and end users with ‘experience expertise’. By ‘involvement’, we mean consulting, seeking advice, collaborating with and/or allowing stakeholders to make or influence decisions concerning projects. We include the cultural, migratory, socioeconomic and linguistic diversity of populations in three Caribbean islands.

**6. PROJECT GROUP MEMBERS AND THEIR ROLES**

Demonstrate that in the project group, the relevant disciplines with the right expertise and intended target group(s) are represented. Make it clear which participants in the project group will have which role. You should preferably specify work

packages.

Consortium Supervisory Board: Antonio Carmona (USM), Elisabeth Echteld (UoC-UCRI), Eric Mijts (UA-SISSTEM)

Sounding board: Georges Felix (Coventry University), Francio Guadeloupe (UvA), Corinne Hofman (Leiden University), Teresa Leslie (USM)

Proposed research team: Ergün Erkoçu (UoC), Kryss Facun(UA/KULeuven), Sharona Jurgens (UA/KULeuven), Amber van Veghel (UA/KULeuven), Benjamin Visser (UoC)**,** Eugene Hoogstad(UvA/USM).

3 student assistants will be hired on each island for the administration and interpretation of the surveys as well as in the conduct of the focus groups.

The supervisory board will ensure the execution and alignment of the research from their respective institutions, the sounding board will give input on feasibility of research and interpretation of data, the proposed research team will co-operate on the design and execution of the research.

**7. KNOWLEDGE TRANSFER, IMPLEMENTATION, PERPETUATION** Describe how you will disseminate the knowledge acquired in your project, and how you will approach the further implementation of the results and/or products, for example by use in practice or in the formation of policy.

3x island paper

1x cross island paper

9x student report: technical report of the work (not publication)

2x blended seminar

7

3x blended public symposium

1x public/media outreach product

**8. PARTICIPATION OF THE STAKEHOLDER(S) FINAL TARGET GROUPS** Describe which parties (who are possibly not co-applicants, for example patients, care professionals) will be involved in your project and how.

Stakeholders include but are not limited to: food importers, distributors, local farmers, households, government officials, non-profit organisations, and local entrepreneurs.

**9. LITERATURE REFERENCES:**

State here the references that substantively support your proposal and please avoid summaries of publications from your project group (members).

Beckford, C & Rhiney, C. Eds. (2016) Globalization, Agriculture and Food in the Caribbean: Climate Change, Gender and Geography. Palgrave MacMillan UK.

Berkes, F. and Ross, H. , 2013. Community resilience: toward an integrated approach. *Society & natural resources* , 26 (1), 5–20.

Briguglio, L. (2003). The vulnerability index and small island developing states: a review of conceptual and methodological issues. *AIMS regional preparatory meeting on the ten year review*. Praia, Cape Verde.

Brouwer, N.-L., Kaya, J., & Vermeeren, R. (2019). Onderzoek naar handelsbelemmeringen en - kansen t.a.v. voedselzekerheid in Caribisch Nederland.

Butler, M. (2013) *Analyzing the Foodshed: Toward a more Comprehensive Foodshed Analysis*. Geography masters research papers, Portland State University.

FAO (2006), Policy Brief, Issue 2, Food Security

Faraclas, N, E-P. Kester & E. Mijts (2019). Community based research in language policy and planning. Cham: Springer Nature.

Hickey, G & N. Unwin. (2020) Addressing the triple burden of malnutrition in the time of COVID-19 and climate change in Small Island Developing States: what role for improved local food production? *Food security* 12:831-835.

van Geelen, T. L. T. (2020). Food Supply Chain & Logistics – Bonaire, Sint Eustatius and Saba Verstraeten, S., Griffith-Lendering, M., Pin, R., & Volksgezondheid Instituut Curaçao. (2017). De nationale gezondheidsenquête Curaçao.

Leslie TE, Carson M, Coeverden EV, De Klein K, Braks M, Krumeich A. An analysis of community perceptions of mosquito-borne disease control and prevention in Sint Eustatius, Caribbean Netherlands. Glob Health Action. 2017;10(1)

Peters, C. et al. (2009) *Foodshed analysis and its relevance to sustainability*. *Renewable Agriculture and Food Systems,* pp. 1-7..

Petetin, L. (2020) The COVID-19 Crisis: an opportunity to integrate food democracy into post pandemic food systems. *European Journal of Risk Regulation, p. 326-336*

Ratter, B. (2018). *Geography of Small Islands: Outpost of globalization.* Cham: Springer Nature. UN (2012). The future we want: declaration of the UN Conference on Sustainable Development, Rio de Janeiro.

UNEP (2013). Emerging issues for Small Island Developing States. United Nations Environment Programme (UNEP), Nairobi, Kenya.

8

Specification staff

1.a Staff costs (based on salary scale)

nr Function / Name Function/Scale Gross salary - based

Salary costs Gross salary, 40% increment

NFU / VSNU member / Total Months % fte (for the project)

other staff ruling

on table / 1 FTE

Monthly Gross salary (for Other

(for Other ruling only)

Overhead % (for Other ruling only)

1 ~~Administrative support~~ Other Salarisaanvraag 8 € 0 € 2.000 20% 3.200,00 € 1.280,00 € 15% 5.152,00 € 2 Administrative support Other Salarisaanvraag 8 € 0 € 2.000 20% 3.200,00 € 1.280,00 € 15% 5.152,00 € 3 Administrative support Other Salarisaanvraag 8 € 0 € 2.000 20% 3.200,00 € 1.280,00 € 15% 5.152,00 € 4 Researcher UA Other Overig WP 24 € 0 € 4.000 20% 19.200,00 € 7.680,00 € 15% 30.912,00 € 5 Researcher UoC Other Overig WP 24 € 0 € 4.000 20% 19.200,00 € 7.680,00 € 15% 30.912,00 € 6 Researcher USM Other Overig WP 24 € 0 € 4.000 20% 19.200,00 € 7.680,00 € 15% 30.912,00 € 7 € 0 100% - € - € - €

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1.b Staff costs (based on hourly rate)

The hourly rate should be acceptable, reasonable and fair

nr Function Hourly rate number of hours Total

Activity / Actions

1 Student Assistent UA 1 12,50 € 560 7.000 €

Survey support, administration and processing

2 Student Assistent UA 2 12,50 € 560 7.000 €

Survey support, administration and processing

3 Student Assistent UA 3 12,50 € 560 7.000 €

Survey support, administration and processing

4 Student Assistent UoC 1 12,50 € 560 7.000 €

Survey support, administration and processing

5 Student Assistent UoC 2 12,50 € 560 7.000 €

Survey support, administration and processing

6 Student Assistent UoC 3 12,50 € 560 7.000 €

Survey support, administration and processing

7 Student Asssitent USM 1 12,50 € 560 7.000 €

Survey support, administration and processing

8 Student Assistent USM 2 12,50 € 560 7.000 €

Survey support, administration and processing

9 Student Assistent USM 3 12,50 € 560 7.000 €

Survey support, administration and processing

10 - € - € 11 - € - € 12 - € - € 13 - € - € 14 - € - € 15 - € - €

Budget Format

Organisation Type of organisation Quoted costs Quoted co-funding Requested budget

University of Aruba Knowledge institution 58.714,00 - 58.714,00

University of Curacao Knowledge institution 58.714,00 - 58.714,00 

University of St Maarten Knowledge institution 58.714,00 - 58.714,00

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Total 176.142,00 - 176.142,00

Staff costs

Costs Own contribution / 3rd party co-funding Requested budget ZonMw

Function (will be filled based on "staff"sheet) Remarks Organisation (dropdown menu)

Administrative support

Administrative support

Administrative support

Researcher UA

Researcher UoC

Researcher USM

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Student Assistent UA 1

Student Assistent UA 2

Student Assistent UA 3

Student Assistent UoC 1

Student Assistent UoC 2

Student Assistent UoC 3

Student Asssitent USM 1

Student Assistent USM 2

Student Assistent USM 3

0

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0

Material, equipment & consumer goods (itemised)

Discription

3 I-Pads for survey

3 I-Pads for survey

3 I-Pads for survey

Survey Monkey Team Premier subscription

Zoom Webinar subscription 500 attendees

Miscelanious software

Other costs (itemised)

University of Aruba € 5.152,00 € - € 5.152,00 University of Curacao € 5.152,00 € - € 5.152,00 University of St Maarten € 5.152,00 € - € 5.152,00 University of Aruba € 30.912,00 € - € 30.912,00 University of Curacao € 30.912,00 € - € 30.912,00 University of St Maarten € 30.912,00 € - € 30.912,00 € - € - € -

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University of Aruba € 7.000,00 € - € 7.000,00 University of Aruba € 7.000,00 € - € 7.000,00 University of Aruba € 7.000,00 € - € 7.000,00 University of Curacao € 7.000,00 € - € 7.000,00 University of Curacao € 7.000,00 € - € 7.000,00 University of Curacao € 7.000,00 € - € 7.000,00 University of St Maarten € 7.000,00 € - € 7.000,00 University of St Maarten € 7.000,00 € - € 7.000,00 University of St Maarten € 7.000,00 € - € 7.000,00 € - € - € -

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€ 171.192,00 € - € 171.192,00

Costs Own contribution / 3rd party co-funding Requested budget ZonMw

Remarks Organisation (dropdown menu)

University of Aruba € 1.650,00 € - € 1.650,00 University of Curacao € 1.650,00 € - € 1.650,00 University of St Maarten € 1.650,00 € - € 1.650,00

12 users/12 months € 10.800,00 € - € 10.800,00 2 years € 2.800,00 € - € 2.800,00 2 years € 5.000,00 € - € 5.000,00 € - € - € -

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€ 23.550,00 € - € 23.550,00

Costs Own contribution / 3rd party co-funding Requested budget ZonMw

Discription

Publication costs

Public outreach symposium 3 times

Public outreach product

Fair data budget

promotional materials

Caribbean Travel 15 tickets plus 2 nights residence

Sounding Board

Advisory Board

Additional explanation for budget

Approval financial responsible receiving organisation

Receiving organisation

Name:

Function:

E-mail adres:

Date:

cost sort (dropdown menu) Organisation (dropdown menu)

Open Access publication € 3.200,00 € - € 3.200,00 Implementation € 6.000,00 € - € 6.000,00 Outsourcing € 15.000,00 € - € 15.000,00 FAIRness € 5.000,00 € - € 5.000,00 Others, please specify in description € 3.000,00 € - € 3.000,00 Others, please specify in description € 15.000,00 € - € 15.000,00 € 4.000,00 € - € 4.000,00

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€ 55.200,00 € - € 55.200,00

Total costs project € 249.942,00

Own contribution / co-funding € - TOTAL REQUESTED BUDGET ZONMW € 249.942,00

**COVID-19, Food Security and Economic Diversification**

Consortium: University of St. Martin, University of Curacao, University of Aruba Represented by: Antonio Carmona Báez, Elisabeth Echteld, Eric Mijts

Budget Rationale

I The entire project budget will be divided equally among the consortium’s three partnering institutions University of Aruba (SISSTEM), University of St. Martin, University of Curaçao (UCRI) in order to achieve equal and comparable outcomes. In case of cost variations per island, time allocations per island will be adjusted in order to maintain the balance between the consortium partners.

II Budget items include:

Personnel costs:

On every island there will be time allocated for one administrative support for the administration of the student assistants and the survey as well as for the academic and public outreach events. Each university will have 8 months of 20% administrative support. For each island, EUR 5152 has been allocated, totalling EUR 15456.

On every island there will be time allocated for one researcher that is committed to streamlining the research process on the island as well as between the islands. Each university is allotted a researcher for 24 months at 20%. A budget of EUR 30.912 has been reserved for each researcher, totalling EUR 92736.

The research project aims to employ 9 student assistants, 3 per island, to support data collection, administration and processing of the survey and focus group meetings as well as reporting. Each university is allotted 3 student assistants that can engage for 560 hours each (in total 1680 hours per university). At a cost of EUR 12.50/hour for each student the budget is EUR 7000, totalling EUR 63.000

III Materials and Equipment:

For the administration of the survey the consortium will need 3 IPads/Tablets per island to conduct the face to face administration of surveys. This will allow engagement of respondents with less or no access to IT or internet. A total reservation of EUR 4950 has been made to acquire 9 devices.

A SurveyMonkey Team Premier account with 12 users (3 student assistants plus researcher per island) will be set up to administer the survey and to create the raw reports. Budget for this account is EUR 10.800

A Zoom webinar subscription will allow for public seminars that reach all three island territories and beyond as well as will allow for discussions of the research team. Budget for this account is EUR 2800.

The team expects to have additional costs for software licences like Microsoft applications and nvivo. Hence, a reservation of EUR 5000 has been made for that.

IV Other costs

For open Access publications a budget of EUR 3200 has been reserved. 3 \* 800 for the island publication, 1 \* 800 for the cross island paper.

One final Public Outreach Symposium will be organised per island. A budget of EUR 2000 for each is reserved for room rental, catering and promotion. In total this is EUR 6000

1

One Public Outreach Product: the consortium will design a public outreach product that will aim to translate the findings of this research in an accessible and convincing manner. This can be a non-scientific publication or an audio-visual product. A reservation of EUR 15000 has been made for this output.

A FAIR data budget of EUR 5000 has been included.

Promotional materials will be needed to engage community members and the public. A budget of EUR 3000 (1000 per island) will be reserved for printing/social media.

Fo Caribbean travel, a reservation has been made for EUR 15.000. This will allow for 15 times inter island travel for the researchers, including airfare, 2 nights of lodging and subsistence.

The research project will be governed by a Supervisory Board consisting of the three consortium members representing the institutions (Antonio Carmona Báez, Elisabeth Echteld, Eric Mijts). A honorarium of €1333 ea is reserved to be paid to their respective institutions. This adds up to EUR 4000.

Additionally, the project members include an advisory Sounding Board composed of regional experts linked to institutions in the Netherlands, Britain and Sint Maarten. A reservation for compensation of €1000 ea. has been made, with a total of EUR 4000.

2