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Recipes for Resilience: Engaging Caribbean Youth in Climate Action and Food Heritage through Stories and Song

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Abstract: This paper presents findings from the Recipes for Resilience project, an international, interdisciplinary collaboration between Caribbean and UK scholars of history, geography, anthropology, cultural studies, development studies, ethnobotany, and climate-risk studies, and the research partners, the Caribbean Youth Environment Network. The purpose of the project was to investigate how agrifood heritage may be mobilized in creative ways to engage Caribbean youth in climate action and justice. The project utilized arts and humanities methods, such as storytelling, songwriting, online games, and brief research-led talks, culminating in the co-created song: "Food and Resistance for Climate Resilience". The results of the project provide evidence that climate action requires arts and humanities methods to appeal to youth, as opposed to purely fact-based or scientific forms of climate communication. We conclude that co-creative methods such as music and storytelling can inspire youth to engage in climate action, in this case through a (re)valuation culinary and agricultural heritage.

Keywords: food heritage; climate change; climate action; climate justice; storytelling; communication; arts; humanities; emotions; music

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1. Introduction

1.1. Background

Climate change has caused widespread adverse impacts and irreversible damage to ecosystems, human and animal lives, and habitats everywhere [1]. However, the effects of climate change are experienced disproportionately across different geographies [1] and along the lines of gender, race, and class [2–4]. The root causes of climate change include systemic issues resulting from colonialism, capitalism, and conjoined racial and structural inequalities [5–7]. Global food systems, deeply implicated in plantation histories, environmentally destructive practices, and the long-term industrialization of food and agriculture, are also major drivers of carbon emissions [8,9]. In the Caribbean, where the legacies of the

plantation economy continue to shape human and environmental relationships, climate change is identified as a major threat [10,11]. The region's high vulnerability to climate change is evidenced by eroding coastlines, rising sea levels, bleached coral, and exposure to frequent and more intense droughts, storms, and floods [12]. Such climate-related catastrophes have disrupted lives, livelihoods, ecosystems, economies, infrastructure, and property and have exacerbated long-term patterns of food insecurity [13–15].

Race, place, gender, and class shape people's awareness and concerns about climate change as well as their own contribution to the problem. In places where carbon emissions are high, people are likely to be aware of climate change but less likely to feel its immediate effects [16,17]. By contrast, in places with low carbon emissions, climate change has very real and affective consequences on people's lives and environments. In all places experiencing racial and structural inequalities, the struggle to maintain or improve one's living circumstances may impede the adoption of climate action in everyday life. Indeed, climate change may be located outside of, rather than embedded in, everyday habits and routines. In the Caribbean, publics *are* aware of climate change, as first-hand witnesses but also as subjects of an increasingly diverse array of information about the effects of climate change on their environments. Yet, because of the challenges outlined above, this awareness does not always influence everyday decision-making.

1.2. Wider Context: Climate Change Communication

Government approaches to climate-change mitigation have focused heavily on information provision about the issue, in order to raise public awareness and modify behaviours. Framed by the so-called 'information-deficit model' [18], this approach assumes that information alone can lead to pro-environmental values and behaviours; the focus is on positivist education strategies rather than on critical, affective, and ethical engagement in the pursuit of climate action [18–20] Attempts to make meaningful change that could reverse environmental destruction and food insecurity for Caribbean countries have been thwarted by an over-reliance on science-communication strategies that do not always connect effectively with publics [18,21]. Part of the reason for this is that climate change can seem too abstract, which is something that scientists harangue about with their climate models and data. For the general public, climate-science communications may trigger little emotional connection to what is essentially an existential crisis [18,21]. There is, thus, a real disconnect between climate change as a concept and climate action as an imperative. Moreover, it may be difficult for people to imagine how systemic inequalities, plantation legacies, capitalism, and even their own actions can affect something that is happening on a global scale [22].

Effective communication depends upon a range of complex and often subtle factors and necessitates a substantive understanding of the intended recipient: their environment, habits, values, and so on [23]. In this paper, we illustrate how innovative arts and humanities methods can help overcome problems with the information-deficit model, for communicating climate awareness and risks. Methods such as storytelling and music can enhance researchers' and practitioners' understanding of people's experiences, practices, and knowledge, allowing them to engage with climate change in familiar ways and to feel they have some degree of control to respond to the problem [23,24]. We demonstrate this by sharing creative methods and results from a recent collaborative research project, Recipes for Resilience: Engaging Caribbean Youth in Climate Action and Afrodescendant Food Heritage through Storytelling and Song, funded by the Arts and Humanities Research Council, UK Research and Innovation.

1.3. Project Description and Rationale

The Recipes for Resilience project was carried out by an interdisciplinary group of researchers from the Universities of the West Indies, Edinburgh, and London (SOAS), as well as an independent scholar and storyteller from Wild Caribbean (a non-governmental organization), between September 2021 and February 2022. The short timeframe of the

project challenged the research team to deliver rapid workshops using the Conference of Parties 26 (COP26), as an inspirational backdrop to the discussions and final song. The project involved three virtual workshops, designed to engage Afrodescendant and Indigenous youth from different countries in the Caribbean in agrifood-heritage research. The participants comprised 25 youths aged 14–20, recruited by our research partner, the Caribbean Youth Environment Network (CYEN). CYEN operates across 19 Caribbean countries and provides a platform for young people to connect and carry out activities around environmental justice and climate change (see www.cyen.org, accessed on 1 August 2021). Participants were also recruited through our research collaborator: the Black Open University (BOU) of the United Kingdom (https://www.blackopenuniversity.org, accessed on 29 July 2021). The workshops used storytelling, online games, brief research-led talks, and music to extend CYEN's work on climate change.

Our primary research objective was to examine the role of Afrodescendant and Indigenous culinary and agricultural heritage in climate youth action and conceptions of food security. We aimed to achieve this through three workshops employing multiple sensory techniques, culminating in the co-creation of a song. In the third and final workshop, consultants from the Song Academy (https://www.songacademy.co.uk/ accessed on 16 February 2021) fine-tuned participants' perspectives on the appropriate genre, sound, and lyrics for the song, which was later to be named: "Food and Resistance for Climate Resilience". After the workshop, a WhatsApp group (R4R Songwriting Group) was created with the participating youth, researchers, and Song Academy consultants to continue to write the song and arrange a recording session with interested youth.

By presenting the song "Food and Resistance for Climate Resilience", this paper aims to contribute to the current research and discussions surrounding the efficacy of arts and humanities in climate action. We argue that, in order to engage youth and the wider population effectively in climate action, communication strategies must go beyond mere fact sharing and extend to appealing to the emotions. We focus on agrifood-heritage and climate-action themes developed from the final songwriting workshop. Readers can listen to the song and explore other creative outputs of the project by visiting the project website: caribbeanfood4climate.com. The works of Barbadian musician Anthony "Gabby" Carter provided inspiration for the final song, and his song, "Bridgetown", is showcased on the project website along with the project song.

The paper is organized as follows. In Section 2, we provide a brief review of the literature on music as an affective means of communication, followed by a summary of the current challenges for changing youth food behaviours in the Caribbean. In Section 3, we provide a historical account of Caribbean agrifood heritage. Section 4 explains the research methodology, and Section 5 provides the discussion and results of the project. Here, we highlight the stories and themes incorporated into the song lyrics, reflecting on the power of stories and songs to heal and engage emotions, which we argue to be a more effective means to incite climate action than information sharing [18,21]. We conclude that emotional appeal through music and song should be employed to achieve climate resilience and food security in the Caribbean and elsewhere.

2. Music and Affective Communication: Challenges and Opportunities for Changing Food Behaviours

Art forms produce subjectivity and enhance community by drawing on common experiences; in this way, music and other art forms can shift collective knowledges [25]. The Recipes for Resilience research team decided to employ music as an affective art form, since music is prevalent throughout the Caribbean and permeates the everyday lives of Caribbean youth. In the affective sciences, which is an interdisciplinary field exploring the emotional and affective processes, their bodily, neurological, and social causes and effects, 'affect' is a term which encapsulates various moods, emotions, and preferences [26]. Drawing from Spinoza and Deleuze, Hickey-Moody describes affect as the force that moves us: a 'hunch' or a 'visceral prompt' that can be elicited through art to change how we feel

and what we are able to do [25,27–29]. According to Spinoza's philosophy, art teaches us how to feel and these feelings have a politics [30]. Through their ability to create a language of sensation, artworks 'can propel the political agendas of those for whom they speak . . . readjust[ing] what a person is or is not able to feel, understand, produce and connect' [25] (p. 88).

Music has long enabled a deep engagement with politics, and this includes environmental politics. Exploring the role of music festivals in environmental sustainability, Brennan et al. demonstrate the power of songwriting to tease out underlying tensions and inherent contradictions [31]. They illustrate that the creation and dissemination of music in festival communities 'makes audible the tensions between economic or cultural sustainability and environmental sustainability' [31] (p. 272). Similarly, composer John Luther Adams, whose emotive music draws inspiration from their Alaskan environment, argues that 'music can contribute to the awakening of our ecological understanding' and can 'provide a sounding model for the renewal of human consciousness and culture' by deepening the awareness of people with their environment [32] (p. 1). Music has the capacity to contribute to trauma recovery and build resilience [33–38], facilitating a range of attitudes and behaviours [39] and leading to beneficial social change and positive beliefs about one's self and culture [40]. Music can help people communicate by overturning social hierarchies and transmitting information in an easily accessible way.

Our use of songwriting as a method went beyond engaging and helping young people to communicate. It also provided a voice to the marginalized (e.g., Indigenous youth), promoting equality and inclusion, policy dialogue, and community mobilization [41–43]. Odena illustrates how school-based music education offers effective ways to address prejudices amongst young people from different communities [44]. Moreover, studies investigating the benefits of music engagement for young people have demonstrated the positive cognitive, emotional, and social benefits derived from participation in musical creation [45–48]. Speaking of the relationship between music and sustainable development, James Edwards suggests that 'both are methods of negotiating with time and the existence of the Other, who is subject to the same conditions of finitude as the self' and that 'both are grounded in hope' [49] (p. 142).

The multi-dimensional impact of music, and its ability to transmit stories and evoke awareness through emotive appeal, was evidenced in our final workshop, as sensory cues triggered memories and encouraged participants to discuss traditional foodways and reflect on sustainable food practices. This was very exciting for the research team since the 14–20-year-old age group targeted by the project has been notoriously difficult to reach when it comes to changing environmental and food behaviours. This is particularly the case in the Caribbean, where neoliberal foodways intersect with plantation legacies. As in other places, neoliberal policies and strategies in the Caribbean have increased corporate interest and consumer demand for imported and nutrient-poor fast food, narrowing the interest in and use of locally produced, nutrient-rich foods such as yam (*Dioscorea* spp.), cassava (*Manhiot esculenta*), plantain (*Musa paradisiaca*), and breadfruit (*Artocarpus altilis*) which may be recategorized as 'climate-smart' foods [50]. These consumption patterns are especially acute in the Caribbean, where plantation legacies have led to the denigration of so-called 'slave foods' [51] by younger populations, who have seen their elders struggle to sustain rural livelihoods in the face of many hardships. Foods such as plantain, breadfruit, and yam are placed at the bottom of a status hierarchy, which arguably began with status-based distinctions between the foods planted and eaten by enslaved peoples in the field and the more valued, imported foods available to house slaves on sugar plantations [52]. There is a related tendency in some places in the region to devalue locally produced foods, subsistence agriculture, and higglers' produce markets as 'going back' to slavery [53].

These negative evaluations of traditional food and agriculture have been variably adopted by Caribbean peoples and, in some ways, are present in plantation economies across the world. Modernist food hierarchies derived from colonization partially explain why obesity is prevalent among wealthier populations in the majority world, who are eating

high-status foods [54] that also have high carbon footprints or high levels of imported carbon risk, such as corn-based processed foods [53]. There is a general aspiration among younger populations in the postcolonial world to eat in this way, and such behaviours are part of what Corbett and Clark have framed as the 'super wicked problem' [18] of climate change.

Yet, this is not the whole story. A crucial part of the Recipes for Resilience project has been to uncover locally produced foods that enabled Caribbean people to survive in face of past and present challenges, as seen for example in the agrifood-heritage stories we gathered from Belize, Trinidad and Tobago, Jamaica, Saint Vincent, and the Grenadines, Barbados, Saint Kitts, Antigua and Barbuda, Montserrat, Guyana, and other former plantation economies of the Caribbean. Our project has enabled us to understand and share the perspectives of a diverse group of Caribbean youth and elders participating in our workshops, who have a wealth of knowledge about the agrifood heritage of the Caribbean and its possibilities for sustainable-food-system transitions.

3. Caribbean Food Heritage: Past and Present

3.1. Indigenous Caribbean Agrifood Heritage

The Caribbean has a diverse agrifood heritage that combines African, Asian, Indian, European, and Indigenous knowledge about agriculture, cooking, and healing, which, in some ways, overturns the racial-status hierarchies engendered in colonial encounters. Foods such as yam, okra (*Abelmoschus esculentus*), cassava, plantain, rice (*Oryza sativa*), and chicken provided sustenance but also fostered autonomy, resistance, sustainability, and agrobiodiversity and enabled enslaved peoples to stay connected to their ancestral roots in West and Central Africa [55,56].

The Caribbean has long been a dynamic space for migration, and this is reflected in its remarkably diverse food heritage. While Neolithic humans were not the first people to arrive (Paleolithic peoples had previously resided in the region [57]), they left a clear mark on Caribbean foodways, from their arrival around the year 300 BCE. The Neolithic groups were the Tainos and the Kalinagos. Their diet consisted of a blend of foods accessed through wild harvesting, cultivation, hunting, and fishing. Indigenous Caribbean peoples cultivated cassava, maize, and sweet potatoes on raised mounds called conucos. As seafaring people, they consumed various types of fish, shellfish, crabs, oysters, and conch. On land, they hunted small birds and animals, such as the iguana, the agouti, and, occasionally, small dogs [58–60]. Elements of present-day Caribbean cuisines have been influenced by these Indigenous traditions. These include bammy, a flatbread made from cassava, and jerk pork or chicken, both common in Jamaica. The Tainos and Kalinagos thrived for over a millennium before the arrival of Columbus, with no sign that their presence caused destruction of the islands' biodiversity, suggesting that they practised sustainable agricultural, hunting and fishing practices [61].

While decimating most, *but not all*, of the Indigenous populations (there is currently a revival of self-identified Taino and Kalinago communities across the Caribbean today; e.g., see this story of the Jamaican Hummingbird Taino and Maroon peoples: https://jamaicans.com/meet-kasike-the-taino-chief-for-the-jamaican-humming-bird-taino-people/, accessed on30 April 2022), the 'Columbian Exchange' [62] disrupted and transformed Indigenous ways of life. Colonization led to an ever-increasing reliance on external foods, technologies, people, and knowledge. The introduction of sugar plantations from the 15th century onwards destroyed forested areas, disrupted sustainable subsistence practices of Indigenous peoples and denied, on the basis of racial and colonial dominance, local food sovereignty, as all the best lands were predominantly used to cultivate monocultural cash crops for export [61,63].

3.2. Afro-Caribbean Agrifood Heritage

With the rise of the transatlantic trade in enslaved peoples came new migrations, new population demographics, and new foodways [55,64]. Enslaved Africans brought

culinary traditions to the 'new world', such as fufu, or pounded, cooked yam, which was shaped into balls and then dipped into sauce. Enslaved people learned how to use 'new world' plants to make African recipes [65], such as the use of cassava, an Indigenous tuber, for Jamaican bammy. Cassava was also used to make fufu, a substitution that illustrates how new food ingredients were utilized to recreate familiar dishes. While fufu became a regular staple for enslaved peoples [66], the dish was time-consuming to produce. The brutal imperatives of the sugar plantation demanded continuous production, with enslaved peoples forced to labour for 12 h a day, six days a week. It was yam, boiled or roasted, along with imported salted meats and salted fish, that provided the energy necessary to fuel this labour. These foods were accompanied by greens grown by the enslaved in their small gardens [56].

As Wilson Marshall argues: 'From the beginning . . . the foods of African descendant people in the Americas were profoundly embedded in broader social systems of control and resistance' [67] (p. 73). Although disadvantaged and oppressed, enslaved people were resourceful. Diane Wallman examines the creative ways in which enslaved people supplemented the meagre estate provisions they received [68]. This included raising small livestock and fishing. Judith Carney's and Sylvia Wynter's works discuss how the 'slave grounds' or 'plots' were used to maintain African cultural, agricultural, and medicinal practices [55,56,69]. Sustained through the creation of 'food forests' in the provision grounds of enslaved people, such food-production and provisioning practices supported healing and knowledge systems that countered the violence of life on the plantations [70,71]. They also proved useful during periods when imported foods became scarce due to warfare or natural disasters [67,72]. Such is the story of the humble breadfruit. During the American Revolutionary War (1775–1783), Britain restricted trade in foodstuffs from its 'rebel' North American colonies to its Caribbean colonies, and with rising food insecurity on islands such as Saint Vincent, breadfruit was imported to help feed the enslaved. Originating from Tahiti in the Pacific Islands, breadfruit is now part of the national dish of Saint Vincent and the Grenadines, although few people know of this colonial-era heritage.

3.3. Asian Caribbean Agrifood Heritage

The coming of the East Indians and the Chinese, as well as other groups in the post-Emancipation period, enriched Caribbean agrifood heritage. Although foodways were already well defined in the region, post-Emancipation immigrants added their own foods and practices to what was already known, thus expanding the repertoire of foods available for consumption and opening up additional avenues for earning income. Indian and Chinese immigrants joined African Jamaicans in market gardening. Indians planted vegetables such as cabbage (*Brassica oleracea* variety *capitata*), lettuce (*Lactuca sativa*), beet (*Beta vulgaris* subspecies *vulgaris*), eggplant/aubergine (*Solanum melongena*), and callaloo (*Amaranthus* spp.) on rented plots and sold their produce to Chinese shopkeepers. Indian women sold their foods as street traders [73]. Herbs, spices, and condiments from the range of cooking traditions present in the region, as well as from countries such as Germany, Portugal, and Syria as well as the Asian continent, extended food choices and also added to the provisions grown and sold from market gardens.

3.4. Preserving Caribbean Agrifood Heritage through Stories

With recent globalization and the growth of the fast-food industry, some of the survival strategies that allowed Afrodescendant, Asian, and Indigenous Caribbean groups to navigate scarcity and natural and human-made disasters and to claim some autonomy has been lost, *but not entirely*. Through youth engagement with storytelling and music, the Recipes for Resilience project sought to reclaim some of this agrifood heritage. For instance, the project highlighted the story of enslaved women from Suriname plaiting African rice into their hair before escaping the plantations. This rice was then used to sustain a Maroon community of free and escaped slaves in the mountainous terrain of Suriname. Another story is about yam, which came to the Caribbean on slave ships and is a climate-resilient crop, as

the plant produces its carbohydrate-rich tuber underground. Similar stories of survival and social and climatic resilience through the creation of Afrodescendant food networks were shared through the project workshops, representing places across the Caribbean. Interested readers can explore the stories shared in the project workshops through the story maps provided on our website (caribbeanfood4climate.com).

In line with recent findings from Europe [74], our research started from the premise that such agrifood heritage stories have the power to bring Caribbean youth together, reconnect them with their elders, and encourage action for climate-change adaptation and resilience by building a sense of identity and community. In contrast with the majority of climate-change narratives, which tend to emphasize the vulnerability of island nations [75] and represent local communities and, especially, children as victims [76], the R4R project aligns with a growing body of research that reveals the unique capacities of island nations and their youth to participate directly in global climate-change preparation, adaptation, and mitigation efforts [77–79]. Moreover, Indigenous ecological knowledge held by elders in Caribbean communities can make substantial contributions to global attempts to keep the average rise of global temperature at 1.5 °C or lower [80]. The R4R project countered narratives of vulnerability and victimhood by emphasizing the power and potential of Caribbean agrifood heritage as a unique common ground that can bring together Caribbean people from different regions, generations, classes, races, and genders to discuss the future they want by learning from the past.

4. Methodology

4.1. Recruitment and Pedagogy

As previously noted, the Recipes for Resilience project was carried out through three virtual workshops (See Table 1) with a group of 25 youth aged 14 to 20 years old and recruited through our partners, the Caribbean Youth Environment Network (CYEN) and the Black Open University (BOU). These youths were primarily from the English-speaking Caribbean, including Antigua and Barbuda, Barbados, Dominica, Grenada, Guyana, Jamaica, Saint Kitts, and Trinidad and Tobago. Through the BOU, the project involved young people of Afro-Caribbean descent residing in the United Kingdom. Posters and letters about the project were sent by way of CYEN and BOU to their respective youth members and volunteers, inviting them to attend the workshops. Attendance and participation were completely voluntary. Ethical approval for the research was obtained from the University of Edinburgh (2021-556) and The University of the West Indies (CREC-MN.43, 21/22). To achieve the project's aim to engage Caribbean youth in climate food heritage research, we framed what youth participation in climate change action would look like under several modes: (1) contextualizing knowledge on climate, environment and agriculture; (2) advocacy and communication of climate risk and foodways with their parents, elders, community members and other stakeholders; (3) mobilizing and participating in projects that address climate and environmental change (led by our partner CYEN); and (4) sharing knowledge and persuading others to take action through songs and stories. The latter mode led to our primary project outputs. In keeping with ongoing research on effective online pedagogy and learning types [81], we incorporated creative research methods that would engage the youth on multiple levels and create emotional links with the issues we explored. Workshop activities were designed in line with the six learning types (acquisition, inquiry, collaboration, discussion, practice, production) explored by Laurillard [82], but the overall format was intentionally flexible to allow participating youth to steer workshop discussions.

Table 1. Outline of workshops.

Workshop	Description
Workshop 1: Our Past (30 October 2021)	This workshop explored where locally produced foods came from, the long-term marginalisation of Afrodescendant (and Indigenous) agrifood heritage and practices, and implications for agrobiodiversity and climate change. This workshop developed participants' understanding of food and climate-heritage research and sensory methods. It included an information pack for conducting sensory oral-history interviews with elders; stories from the interviews were added to a Caribbean story map (with consent) and inspired the songs co-created in workshop 3.
Workshop 2: Right Here, Right Now (13 November 2021)	Workshop 2 developed participants' understandings of climate adaptation, resilience, and justice research. Using online board games and playful learning, participants traced Caribbean foods back to their source. In this workshop, participants reflected on our food behaviours and their carbon/ecological footprints by identifying ingredients produced on plantations located on the global story map, e.g., palm oil, with age-appropriate insights from scholarly work on the 'plantationocene'. Through games such as Kahoots, we examined which crops were climate resilient and which were not. This workshop explored strategies for a food-secure, climate-resilient, and climate-just future.
Workshop 3: Our Future (12 February 2022)	Workshop 3 aimed to capture the hearts and minds of young people and their vision for a more resilient future, through the co-creation of calypso, soca, reggae, rap, and spoken-word songs. The song-writing process, facilitated by the Song Academy, was inspired by the stories, games and presentations in Workshops 1 and 2. Workshop 3 and post-workshop production resulted in the song: "Food and Resistance for Climate Resilience".

4.2. Workshop Outline and Design

Workshops took place during the COVID-19 pandemic, between October 2021 and February 2022. Due to the exigencies caused by the pandemic, Zoom was utilized to carry out the workshop. Each workshop (See Table 1) was carried out over three hours on Zoom and designed to guide the participants through a storytelling journey that explored different aspects of the relationship between climate change and food production and consumption. Workshop 1, entitled "Our Past", introduced the youth to ancestral foodways and practices by taking a historical lens on food journeys. This showed how some foods came to the Caribbean, how they transformed from 'slave foods' to 'superfoods', and how stigma still prevails around certain types of foods, which are often set in opposition to higher-status processed and imported foods. Workshop 2, "Our Present", explored the implications of intensified large-scale farming on climate change through discussions and online games about fast food, food behaviours, and carbon/ecological footprints, with particular attention to ingredients produced on plantations in the Caribbean and across the globe. Here, youth were introduced to sustainable alternatives through presentations on climate-smart foods, food forests (past and present), and kitchen gardens and tailored biotechnologies. Reflecting on the material and discussions from Workshops 1 and 2, in Workshop 3, "Our Future", the youth co-created the lyrics for a song to raise climate-change-risk awareness and mobilize and persuade others in the Caribbean to take climate action by rethinking their food practices. This was a collaborative effort of elders and youth, facilitated and later finalized and produced by an external consultant, the Song Academy.

In Workshops 1 and 2, we incorporated a variety of activities that drew from sensory and arts-based methods and playful learning through games. We incorporated mini-lectures and stories from our research team's diverse areas of expertise on climate-change risk, vulnerability, and adaptation; plantation-monoculture and industrial-food systems; traditional foodways; Afrodescendant and Indigenous agrifood heritage; sustainable-agricultural practices; ethnobiotechnology and climate justice. These were accompanied by virtual guiding material produced on the platforms Padlet (padlet.com) and ArcGIS Story Maps (storymaps.arcgis.com), which enabled participants to engage in deep learning

through inquiry [82]. We incorporated breakout groups for guided discussion around questions relating to traditional foods and the impact of climate change in communities; the effects of fast food on human health, culture, and agrobiodiversity; the cultural, social, and economic factors driving such changes; and how biotechnologies can be tailored to support sustainable practices in biodiversity-rich tropical islands. We asked participants to reflect on their own experiences, sharing their food stories from across different Caribbean regions. We encouraged them to critically examine the changes taking place around them and to come up with climate-action responses by engaging with some of the material presented by the collaborating researchers. Guiding questions for Workshops 1 and 2 are listed in Table 2, below.

Table 2. Guiding questions in Workshops 1 and 2.

Workshop	Guiding Questions
Workshop 1	• If you could eat anything for dinner tonight, what would it be? • Where do your favourite foods come from? • Does what we eat impact the value we place on our local agrifood heritage? • What are some of the different (Afrodescendant and Indigenous) food heritages you see/know from parents/community? • What are some of the agriculture and food practices that you know about? • Do you think the food we eat impacts on our environment, for example on things such as agrobiodiversity loss or the loss of plants that used to grow in your environment? • Do you think that the food we eat has any impact on the climate changes we have encountered?
Workshop 2	• Can what we eat affect our power to adapt to climate change? • How have some of the foods that we eat, or know about, been impacted by climate changes our communities have encountered? • Are we more climate-resilient if we eat what we grow? • What do you think we need to do if we want our food to have a lower impact on the environment, for example, if we want to reduce our carbon footprint? • Would you be willing to give up some of your favourite foods? • Who should bear the cost of trying to make our farmers/countries/communities better equipped or ready to deal with climate change? • Can the things we like to eat negatively affect our climate futures? • What could we do to reduce that negative link or make more positive connections between our food and the environment?

We designed a series of virtual games and quizzes for Workshops 1 and 2 using online tools such as Padlet, Kahoot (https://kahoot.com/ accessed on 12 November 2021), Mentimeter (https://www.mentimeter.com accessed on 11 November 2021), and Slido (https://www.slido.com/ accessed on 12 November 2021). These kept the youth engaged, enabled interactive learning, and stimulated memories around food. For example, we used Padlet to encourage discussion and the sharing of food stories, whilst introducing the idea of carbon footprints. In Workshop 1, we incorporated sensory storytelling as a method to stimulate episodic memories about locally produced food. Marisa Wilson, the principal investigator of the project, led the workshop participants through a journey into their past experiences of eating, seeing, smelling, touching, and tasting specific foods with their families, prompting them to think about and imagine these moments. Through a series of questions that helped the participants set the scene, think of the people and foods involved, and think about how they felt when experiencing the foods with their five senses, we enabled the participants to reconnect with these foods and the people who they shared

them with. Sensory and arts-based methods have been shown to make significant progress, especially when working with children and vulnerable groups [18,83–87]. Moreover, such methods allow for a participatory approach to research and for mutual learning between researchers and participants. We also designed take-home activities and distributed digital activity packs with traditional Caribbean recipes and an interview toolkit, to enable our participants to interview older family members and learn about their ancestral food stories and heritage. In this way, we encouraged an intergenerational dialogue not only about forgotten or heritage food types but also about changing diets and the possible resilience and adaptation potential of certain foods. Stories from these interviews were collected and compiled into the story maps available on the project's website.

Zoom Breakout Rooms and Focus Group Discussions

The guiding questions (Table 2) were utilized in online games and quizzes and served as icebreakers in breakout-group discussions. There was a main Zoom room (Recipes for Resilience—Main Room) that facilitated the generalized discussions, mini-lectures, and games. Zoom enabled the use of breakout rooms in which focus group discussions were held. These breakout rooms were named after locally produced foods such as yam, breadfruit, chicken, cassava, corn, rice, and okra. Breakout rooms had three to five youth participants under the guidance of one to two researchers. The guiding questions were very useful in starting dialogues about their diet, climate-change awareness, and the role of ancestral foods in climate justice and climate resilience. Important in the discussions was how agrifood heritage can be harnessed to achieve climate adaptation and resilience. Focus-group discussions by way of Zoom breakout rooms enabled safe spaces where youth participants felt comfortable expressing their emotions, as they bemoaned the loss of green spaces and diminished agricultural land, even as imports increased (see Section 5 below).

5. Results and Discussion

5.1. Workshops 1 and 2: Critical Dialogue for Climate-Change Awareness and Action

The workshops demonstrated the criticality of dialogue for climate-change awareness and action. Despite years of rhetoric, climate action is slow, and the youth climate movement demonstrates the frustration of perceived inaction. The participants in the Caribbean reflected this frustration through their recorded messages during Workshop 1 for the Conference of Parties (COP) 26.

> *I am very much annoyed, for over ten years we have been having this COP and no significant action has been done . . . you are playing with our lives . . . small island development states are suffering from climate change significantly.*

The cross-country dialogues opened up the idea of unity, and participants described recipes that their parents or grandparents prepared using similar ingredients but with a specific island or country twist. There was a sense of pride when describing these traditional foods, and their narratives included stories of growing foods. Participants also described the impact of climate change on their ability to grow certain types of food. Some described trees dying and concerns that fertile land was being lost due to heat, drought, and storms:

> *Oceans are warming and temperatures are rising everyday here in Grenada . . . I feel the scorching heat of the sun and it is definitely not good at all . . . youth want them [governments] to take action. . . . We need action now, we do not need it in the next twelve years, we need it now.*

In Workshops 1 and 2, participating youth were exposed to the problems of climate-change risks and impacts. Through presentations by the research team, they were taken through the role of plantations and the neoliberal food and commercial systems, which weaken efforts towards sustainable food practices and undermine Afrodescendant and Indigenous agrifood heritage and practices (these mini-lectures were recorded and are also available on the project website). The researcher and facilitator, Thera Edwards, introduced youth to food forests and kitchen gardens and their potential efficacy for food sovereignty

and preserving ancestral agrifood heritage and agrarian techniques. In her presentation, Edwards used sensory methods such as a clip and reading of a section from the film, *The Harder They Come*, to appeal to participants and forge emotional connections to the subject matter. Responding to this presentation, our elder storyteller, Anthony Richards, shared stories of kitchen farms and food forests on which his family grew mangoes and coconuts that towered over smaller, but still important, plants. Through his personal reminiscences, Richards enlivened the concept of food forests and kitchen gardens. Richards also shared stories of how ancestral food and medicinal heritage are being lost, as the current mode of landscaping has led to people cutting down medicinal plants and herbs under the impression that they are 'weeds'.

At the end of Workshop 2, this focus on solutions was heartening for one participant, who said that they:

> *Learned a lot and [it] open[ed] my eyes to a lot of things that I believe my country can change and we can proceed in doing . . . You know we learn from each other and that's when we make our world, our community, a better place by learning and you know, open your eyes and experiencing today.*

Reflecting on the theme of heritage, another participant said:

> *Culture, you know we have to go back to a time where we live [as] one with nature and we take care of it . . .*

5.2. Workshop 3: Reflecting on Agrifood Heritage for Climate Justice and Climate Resilience

The final workshop demonstrated the pride but also the concerns and frustrations of the participating youth, culminating in powerful music and song lyrics that reflect their desire for action and the powerful role of history and heritage. Facilitators appealed to memory to engage youth in putting forward ideas that could form a song. One participant from Saint Kitts recalled their childhood love of breadfruit and consumption of breadfruit chips, boiled breadfruit, mashed breadfruit, and so on. Breadfruit was a cheaper alternative to bread, as wheat flour is imported. Unfortunately, the frequency of hurricanes in recent years has torn down many breadfruit trees, leading to an escalation in the cost of breadfruit. The participant claimed that, due to the effects of climate change, breadfruit, which was readily enjoyed in their youth, is now expensive. As such, only small bits of breadfruit are used nowadays to season soup and goat water, local dishes in Saint Kitts.

Participants and facilitators from Jamaica discussed the institution of 'run a boat': a communal activity where ingredients and dishes are shared by various people to make a meal. A youth participant from Jamaica reminisced:

> *We join together—one person responsible for necessary preparation to pick and clean up; one person responsible for cooking; one person responsible for cleaning up . . . but after that is done it's usually done in a sense, where persons collect together so they sit around in a circle or grab a chair nearby and then what then happens is that conversation starts and you'd start to recall memories and you discuss and you plan and it's just a sense of bringing persons together . . .*

Their recollection prompted facilitators and participants to reflect on their own experiences of 'running a boat'. Referencing practices in farming communities decades ago, facilitator and researcher Sylvia Mitchell stated:

> *Yeah, they used to do that [run a boat] in Jamaica to where the farmers would all come together and . . . everybody would bring something, and one person would be the cook and everybody else [would] work.*

Such reflections by participants and facilitators indicated that communal practices that ensured the survival of communities are alive and well in various places of the Caribbean. Indeed, collectivity is part of the Caribbean worldview and local survival strategies [88]. Building and reflecting on community food knowledge and sharing was an imperative part of what this project set out to engage with and is akin to the Hornby Island project,

where Andrew Mark concludes, 'we demonstrated that musicking for ourselves and Hornby is that "process of community"' [89] (p. 131). By engaging in storytelling activities, participating youth were connected to their elders and to the legacy of some of the food practices they currently partake in. Importantly, reminiscences about food knowledge and sharing illustrated to participants and facilitators the power of food to bring communities and people closer together. Food-sharing stories also enabled reflection on sustainable practices, as those engaged in food sharing divvy out whatever resources are available. One Jamaican participant recalled a time when some people harvested potatoes and others brought callaloo from their gardens to 'run the boat'. Later, they confessed that, in the urban areas, the items shared are often processed:

> *Now running a boat consists of mostly incorporation of processed foods so you'd get them; well white rice is somewhat process[ed] to me so you'd get . . . white rice, you would get your meat from where[ever] and you take it to this spot. It is not as fluid as before. It is imported from different areas.*

This narrative illustrates how traditional practices evolve as political economies change; in this case the onset of neoliberal policies that encouraged importation at the cost of local production in Jamaica.

One youth participant from Trinidad and Tobago lamented the state of the environment in Trinidad and contrasted it to Tobago. According to this participant, Tobago is more connected to the environment, while Trinidad is more urbanized. They recalled a story from their mother, who relayed a time when a road where people once sold produce was turned into a highway with houses on either side. Good agricultural land was built upon, while imported food replaced locally produced crops:

> *Apples and grapes used to be something to only see Christmas time in the shops and other available throughout the year. And now the food or the food import bill . . . far outweighs the value of what is actually growing... So, we're now valuing these foreign foods over what is produced locally. You can buy potatoes from Idaho and all these different countries, but it's difficult to find sweet potatoes. It's not expensive. . . . I think that Trinidad and Tobago has become disconnected from its food; it's become a commodity; it's not about community; it's not about sustainability and sustaining your lives anymore. It's just about having these foods . . . and [its] kind of sad really but those are my thoughts.*

Lyrics for Change

As they reflected on (dis)connections to foods from the past, participants and facilitators explored the role and place of fast food in current diets. The outcome of these reflections, activities, and discussions was the song, "Food and Resistance for Climate Resilience". The lyrics are as follows:

VERSE 1
Let's talk about how food can connect us all
Let's take dem
Ole time story an cookbook off the wall
Here is the secret to make sure we thrive.
Fe all a we stay alive . . . more
Kitchen gardens, more local foods

VERSE 2
Highway and houses replacing our crops
Me cyah eat brick, hey why can't it stop?
Crises here? Lets run a boat, de love is real.
Food should heal. Food should heal

CHORUS
Food and resistance
For climate resilience
Plants to make the planet last
Hurry hurry
Plants to make the planet last
Hurry hurry Di time is moving fast

POST CHORUS
Fast food, slow food
Past food, sow good fooood!
Fast food, slow food
Past food, sow good fooood!

Hurry hurry Di time is moving fast
Hurry hurry Di time is moving fast

VERSE 3
Finger licking good but ain't all good
Disconnected food from afar make we forget who we are
Come take a walk down memory lane
Mama's beef stew, Grandma's grater cake
Pepperpot, pelau, African rice and callaloo, even okra too
Doh forget the pone and other sweet tings too and de bissy fe heal yu too!
Yuh hear the stirring in the kitchen
Don't replace THAT with jus fast food deal. Hey.

CHORUS
Food and resistance
For climate resilience
Plants to make the planet last
Hurry hurry
Plants to make the planet last
hurry hurry
Di time is moving fast

POST CHORUS Fast food, slow food
Past food, sow good fooood!
Fast food, slow food
Past food, sow good fooood!

Hurry hurry Di time is moving fast
Hurry hurry Di time is moving fast

OUTRO

Fast food, slow food

Past food, sow good fooood!

Fast food, slow food

Past food, sow good fooood!

Fast food, slow food

Past food, sow good fooood!

Fast food, slow food

Past food, sow good fooood!

These lyrics explore and expand upon themes of community and collectivity; the implications of modernism and neoliberal policies; and the role and purposes of food as well as the need to shift consumer behaviours towards locally and sustainably grown 'good' food. Referencing traditional foods, the song illustrates the power of Afrodescendant agrifood heritage and captures the nourishing and healing role of food. The meals prepared and the descriptive emotive lyrics appeal to sentiments and remind listeners that the Caribbean has a food culture worth preserving and utilizing in the face of climate change. In the chorus, reference is made to the Caribbean's long history of resistance, reminding the listener that to solve current and future problems, we must look to the past. To this end, it amplifies the work of Wilson Marshall, who frames Caribbean agrifood heritage as resistance [67]. By referencing kitchen gardens and more local foods, not only does the song capture the presentation by Edwards and the stories of Richards, but it also positions these traditions as solutions to the proliferation of unhealthy foods predicated on long-term food-import dependency and food insecurity.

In the article, "Don't Organise, Mourn: Environmental Loss and Musicking", Andrew Mark discusses ecomusicology's role in coming to terms with environmental loss [89]. Music and the arts in general allow individuals to process their emotions: 'the creative arts give language, signification and ritual to loss, and contribute to the creation of community to recognise and deal with otherwise unspeakable, un-identifiable, un-acknowledgeable and un-grievable loss' [89] (p. 53). In Workshops 2 and 3, participants lamented the loss of environmental diversity and disconnection from food. Verse 2 of the song airs this lament for posterity and critical engagement:

Highway and houses replacing our crops

Me cyah eat brick, hey why can't it stop?

By asking, 'why can't it stop', the song hints at a solution. This solution is indicated in the lyrics: 'run a boat':

Crises here? Let's run a boat, de love is real.

The follow-up lyrics, "*Food should heal. Food should heal*", highlight the role of love and food to heal. Food from grandma's hands, referenced in the opening lyrics of the song, is love; and food from kitchen gardens also speaks to love "*Past food, slow food; Past food, sow good food*". Slow food is food that takes time to make; it is food made without industrial processing, which may be better for nutritional health and the environment. By drawing on love, the song strengthens the power of emotional appeal in climate action.

The urgency of the need for climate action is framed as:

Hurry hurry

Plants to make the planet last

Hurry hurry

Di time is moving fast

The lyrics of "Food and Resistance for Climate Resilience" align with the work of Caribbean climate-change scientists such as Michael Taylor, Tannecia Stephenson, Kim-

berly Stephenson, and others, who emphasize the pressing need for climate action in the region [90]. The song illustrates the power of engaging affectively with the urgency and situatedness of climate change, demonstrating the need for climate-change research to use all tools at its disposal to 'effectively reach and motivate a diverse population—with messages, stories and experiences that are corporally sensed, that illuminate interdependency with the world, that openly engage emotions, and that connect people with place' [18] (p. 19). Through creative methods like storytelling and songwriting, the R4R project provided digital spaces for sharing emotions, grief, and experiences of loss as well as for sharing stories of climate adaptation and resilience through past and present foodways.

5.3. Locating R4R Lyrics in Arts and Humanities Methods for Climate Change

In their recent works, Julia B. Corbett, Brett Clark, and Mike Hulme have proposed the use of arts and humanities methods to emotionally engage audiences on the subject of climate change [18,21]. They argue that methods such as music, performance, and storytelling can make a substantial difference in filling the gap between climate knowledge and meaningful action [18,21]. In this paper, we have explored the power of storytelling and music to raise awareness of climate food heritage in the Caribbean by sharing outcomes from our Recipes for Resilience project. The project enabled the researchers themselves, as well as our partners and collaborators (the Caribbean Youth Environment Network and the Black Open University), to learn about the diversity of food cultures across the Caribbean and how Caribbean youth think about agrifood-related climate change. It was enlightening and empowering for the Caribbean youth in the project to make their voices heard at our special Recipes for Resilience event held at COP26, in Glasgow in November 2021. The emotionally wrenching story of how one youth had personally witnessed climate change in their seaside town and their message to COP26, 'You are playing with our lives!', is the kind of narrative that highlights the 'here and now' of climate change. Methods that emphasize and give space for such storytelling contrast with other approaches to communicating climate change, such as information sharing, which can make climate change seem abstract, distant, or indeed overwhelming.

Welch and Southerton suggest that policy responses to climate change that focus on sustainable consumption often emphasize the importance of modifying consumer behaviour and choices through information provision [20]. However, studies have shown that access to information alone does not necessarily change people's behaviour [91,92]. Translating awareness into action requires a cultural and emotive connection to the issue at hand and its implications for the wider community [74,93,94] as well as multi-scalar and reflexive approaches to carbon-emissions reduction. Our approach outlined in this paper recognizes that food and other kinds of consumption are embedded in wider social, economic, cultural, and material systems [20]. There is a need to move beyond individual consumer action to more holistic societal change, by reconfiguring values around consumption through innovative creative methods such as music.

6. Conclusions

The Recipes for Resilience project demonstrates the possibility of partner-led youth engagement that uses agrifood heritage as a tool for dialogue on climate adaptation, justice, and resilience. The project drew on innovative arts and humanities methods to increase Caribbean youths' awareness of agrifood heritage and its importance for climate-change action. In the Caribbean, music has long been a source of cultural retention and transfer. As a creative methodology, music has the capacity to bring people together to explore a common problem and voice concerns by telling stories in a creative way. In line with the oralized cultures that exist in the Caribbean [95–98], music was used to stimulate participating youths' interest in Afrodescendant and Indigenous foodways and to inspire them to take climate action by enhancing food security through traditional knowledge. The affective impact of music and its ability to transmit stories and evoke awareness through emotive appeal, was reflected in the final workshop, as sensory cues triggered memories

and encouraged participants to discuss traditional foodways and reflect on sustainable food practices that, for some, were lost but not forgotten.

As globalization and fast-food companies expand their hold on the countries of the majority world, replacing locally produced foods, it is imperative to connect youth to their ancestral agrifood heritage. The Recipes for Resilience project demonstrated the power of music to inspire and engage youth in climate action. Incorporating different musical genres from the Caribbean, the "Food and Resistance for Climate Resilience" song continues to inspire the young participants and their social networks to value agrifood heritage as a resource for climate resilience. We hope this project will inspire further research that uses creative arts and humanities methods to promote climate-resilient, socially-just food futures.

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