Logie CH, Van Borek S, Lad A, et al. A creative approach to participatory mapping on climate change impacts among very young adolescents in Kenya. *Journal of Global Health Reports*. 2023;7:e2023036. doi:10.29392/001c.77885

Reports

A creative approach to participatory mapping on climate change impacts among very young adolescents in Kenya

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Keywords: participatory mapping, arts-based methods, adolescents, Kenya, climate resilience

https://doi.org/10.29392/001c.77885

Journal of Global Health Reports

Vol. 7, 2023

Adolescent perspectives are crucially important for developing sustainable solutions to address climate change yet remain overlooked in the literature, particularly in low and middle-income contexts. Kenya is an important context to explore youth climate solutions, as youth constitute the fastest growing population facing climate change-related challenges, such as extreme weather events (e.g., droughts) and issues of water, food, and sanitation security. This manuscript details a methodology for participatory mapping on climate-related issues that was co-developed with Kenyan youth and community-based organizations in Kenya. The aim of this paper is to describe the design of a multi-media participatory mapping tool to identify and address the interconnections between social, health, and environmental well-being with very young adolescents (aged 10-14 years) in six geographically-diverse, climate-affected regions of Kenya (Nairobi, Kisumu, Kilifi, Naivasha, Isiolo, and Kalobeyei Refugee Settlement). The authors describe methods used to develop a strengths-based multi-media participatory mapping approach that combines user-friendly geographic information system (GIS) technology with arts-based methods (dance, drawing, music, video). The aim is to share these methods and process of co-development to inform future participatory mapping approaches with youth climate-related issues.

Climate change drives food, water, and sanitation insecurity — among the biggest threats to human survival and wellbeing.[1] In 2019, 2 billion persons experienced hunger or irregular food access,[2] while 2 billion persons lacked access to safely managed drinking water and 3.6 billion persons had insufficient access to basic sanitation services such as toilets and latrines.[3] Adolescents' experiences of, and solutions to, water, food, and sanitation insecurity are understudied—particularly at the nexus of climate change.[4] This is problematic because very young adolescents aged 10-14, who comprise half of the 1.2 billion adolescent population—and 8% of the world's total population— are under-represented in climate research.[5] This is particularly true in Africa, where most of the global growth of the very young adolescent population is anticipated to rise 34% between 2016 and 2030, from 143 million to 193 million.[5]

Kenya is a salient context to develop a participatory research methodology for examining climate change, and impacts on water, food, and sanitation insecurity—also referred to as resource scarcities—among youth. Youth is the fastest growing group in Kenya[6]: young people under 15 years comprise 39% of the population.[7] Resource scarcities are an urgent problem in Kenya, where 36% of persons live below the international poverty line of $1.90 per day.[8] Under two-thirds (62%) of Kenya's ~53 million population use at least basic water sources, and a third (33%) have basic sanitation services.[3] Food insecurity is widespread[9,10]—evidenced in stunting from malnutrition among 29% of children in rural areas and 20% in cities[8]—and is amplified by climate change.[11] Food insecurity has also been exacerbated by COVID-19, particularly in urban informal settlements in Nairobi and Kisumu[12] and among refugees.[13] Kenya is experiencing increasingly irregular rainfall and a growing number of extreme weather events (EWE), including floods and droughts.[14] EWE will worsen in future decades,[15] impacting the poor and vulnerable in particular.[16] Despite the growing youth population, widespread resource scarcities, and climate-change impacts in Kenya, key knowledge gaps remain regarding climate change-related experiences and priorities among very young adolescents.

Participatory mapping is a collaborative process of creating maps to highlight the relationships between local communities, places, and experiences, with the ultimate goal of bringing about social change.[17] This approach involves setting goals, creating and contextualizing maps, and problem-solving to effect change within the community.[17] Participatory mapping is an increasingly popular tool for engaging communities, as it encourages the sharing of lived experiences among community members who may hold common objectives.[18] The process holds the potential

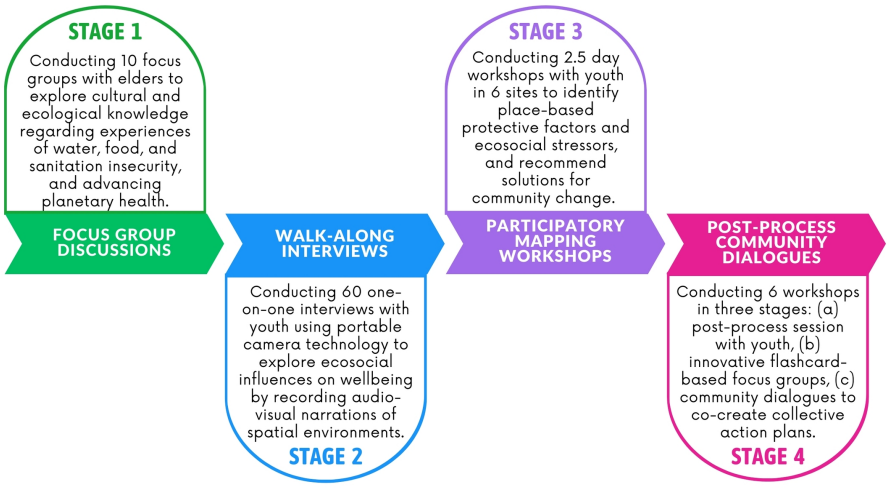

Figure 1. Overview of methodological phases

to promote relationship-building and dialogue.[19] Participatory mapping approaches have been used to explore the social ecologies of HIV risk among youth in Kenya,[20] rank food justice concerns in informal settlements in Nairobi,[21] and examine the links between toilet infrastructure, gender, and health in Mathare's informal settlements.[22]

To this end, participatory mapping is a relevant approach to enhance understanding of very young adolescents' lived experiences, coping, priorities, and recommendation regarding climate change. The purpose of this Report is to detail the development of a multi-media participatory mapping methodology with very young adolescents in Kenya focused on identifying experiences of, and recommendations to address, climate change and resource scarcity.

CASE DESCRIPTION

This methodology was co-developed with Kenyan youth and community-based organizations for initial implementation in Kenya. We designed a multi-site participatory mapping tool to identify and address the interconnections between social, health, and environmental well-being with very young adolescents (aged 10-14). We developed this methodology in a way that it could be implemented in six locations to produce evidence and case studies across diverse ecological contexts affected by resource scarcity[23]: 1) informal settlements in Nairobi; 2) rural and peri-urban areas outside of Kisumu on Lake Victoria, Africa's largest lake; 3) nomadic and pastoralist communities in Isiolo; 4) Kalobeyei Refugee Settlement; 5) flower farm worker and internally displaced families on Lake Naivasha; and 6) small scale coastal farming families in Kilifi. This approach to participatory mapping was also developed using methods to generate youth priorities and recommendations to address climate change and resource scarcity through active participation. We looked at various examples of participatory mapping from the literature and sought to draw from, combine, and build on existing approaches.

This methodology includes several phases that build on one another, as summarized in Figure 1: Phase 1) a qualitative formative phase with walk-along interviews with very young adolescents (n=10 per site) and focus groups with elders (two focus groups per site); Phase 2) developing and implementing multi-media participatory mapping (detailed in this Report) (2 workshops per site, one with adolescent girls and one with adolescent boys); Phase 3) post-participatory mapping workshops, one with adolescents and one with adults per site, and one intergenerational community dialogue per site.

Our methodology employs participatory mapping approaches to identify location-specific issues with a focus on better understanding water, food, and sanitation insecurity and their impact on youth wellbeing[17] in these six sites, as well as generating youth priorities and recommendations. We present below two methodological innovations we used in this study: strengths-based approaches and multi-media approaches.

First, we intentionally prioritized a strengths-based perspective to participatory mapping to identify knowledge, resilience, and collective resources among youth.[24] A focus on mapping problems, which is a common focus in participatory mapping methods,[25] could unintentionally be experienced as disempowering. Alternatively, strengths-based approaches hold the potential to identify mechanisms underpinning protective factors, such as social support

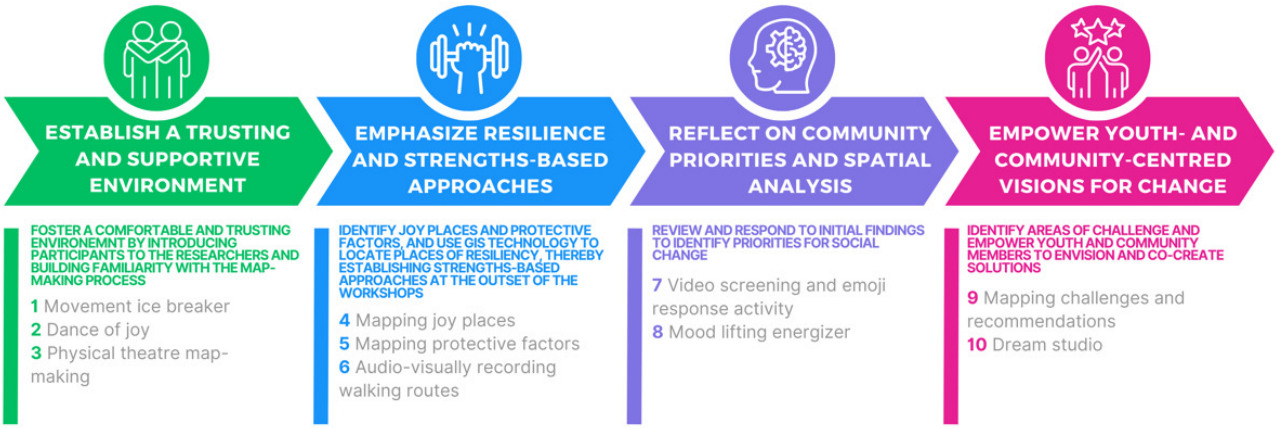

Figure 2. Strengths-based multi-media participatory mapping goals

sources (e.g., family, peers, neighbours) and dimensions (e.g., emotional, instrumental, appraisal, and informational support[26]), as well as multi-level approaches to resilience (e.g., intrapersonal [e.g., coping style], interpersonal [e.g., social cohesion], community [e.g., collective efficacy], structural [e.g., advocacy][27]).

For instance, our strengths-based approach to participatory mapping methods emphasize youth's intrapersonal processes of critical hope—aspirations and belief in the potential of social change in the context of injustice[28]—through integrating mapping and multi-media techniques (song, dance). This approach potentially facilitates youth expressions of joy and dreams for the future to inform recommendations to improve challenging and stressful contexts of resource scarcity. This shifts the focus from a deficit-based approach of what youth struggle with and want to avoid, to a strengths-based approach focused on the changes that youth want to create and envision. This approach builds on a 2013 South African study that empowered adolescents living with HIV to envision and visually create 'dream clinics,' in which they mapped their visions for health and social services inside and around the clinics.[29] This strengths-based approach can also be understood as a form of 'affirmative critique'.[30] This lens seeks to affirm something that exists in what is being assessed, rather than focusing on what could be denounced or avoided.[30]

Second, we designed multi-media approaches to participatory mapping to address the varying levels of literacy and access to technology and internet between and within the six initial target locations for methodological implementation. Multi-media approaches that integrate various art forms also align with youth-friendly approaches that allow for creative self-expression. The activities we detail below present a flexible methodology that may be applied irrespective of the written/reading language proficiency and access to digital infrastructure. The methods include various creative modes of self-expression, such as drawing, collage, writing, video, photography, dance, and music. These various methods engage different learning styles and draw on cultural strengths, including local languages, teachings and traditions. While common approaches to participatory mapping employ various techniques, imagery,[31] drawing,[32] and GIS technologies,[21] some forms of multi-media (e.g., music and dance) are less well characterized. These activities span over 10 sessions and the materials needed for each can be found in Online Supplementary Document, Table S1.

METHODS

Figure 2 presents the four overarching goals that guide the session activities for these multi-media participatory mapping workshops: 1) establish a trusting and supportive environment; 2) emphasize resilience and strengths-based approaches; 3) reflect on community priorities and spatial analysis; and 4) empower youth- and community-centred visions for change.

Aligned with sex and gender-based analyses, each participatory mapping workshop is stratified by gender and includes 10 participants. Half of the participants in each workshop are youth who have participated in Phase 1 walk-along interviews, while the remainder are new youth. This provides walk-along participants the opportunity to reflect on the experiences that they shared and allows the researcher to triangulate across data sources, while simultaneously creating space for new perspectives to emerge.

GOAL 1: ESTABLISH A TRUSTING AND SUPPORTIVE ENVIRONMENT

The first three sessions focus on creating a trusting and supportive environment for reflection and sharing experiences. While facilitators should make sure that participants feel comfortable and supported throughout the workshop, these three sessions are critical in setting a foundation for this, and are described in Table 1.

GOAL 2: EMPHASIZE RESILIENCE AND STRENGTHS-BASED APPROACHES

The subsequent three sessions, as described in Table 2, include methods to identify joy places and protective factors

Table 1. Participatory mapping workshop sessions 1-3

Session	Outline
#1) Welcome, general introductions & movement ice breaker (30 minutes)	• Introduce the project goals and workshop overview. • Review consent forms (with parents/guardians while they are there). • Open the workshop with a fun ice breaker that involves physical movement.
#2) Dance of joy (1 hour)	• Engage youth in choreographing and performing a dance where movements reflect activities they undertake in places within their community which bring them joy (e.g., buying fruit at the market, playing soccer at the school field, etc.). • The aim is for youth to start thinking about community areas that make them feel joy, a foundation that they can later build on to identify protective factors within communities. • Dances can be presented to the full group and photographed. Digital copies of these photos will be used for inspiration in Session 4.
#3) Physical theatre map-making (30 minutes)	• Youth are invited to think of the workshop space as their community and to use their bodies to map out community places that are important to them. This helps to generate knowledge of participants' familiarity with maps and mapping and introduces them to basic mapping techniques. • This also provides insight for researchers to understand which places in the community are important to participants.

linked with such places in the community. These sessions highlight resiliency and are at the core of our philosophy towards participatory mapping activities.

GOAL 3: REFLECT ON COMMUNITY PRIORITIES AND SPATIAL ANALYSIS

There are two sessions whereby youth are engaged in reviewing, validating and building on initial findings from walk-along interviews, which are described in Table 3. This is done using embodied approaches, such as emoji stickers to share non-verbal, emotional responses; and post-response reflexive discussions. This provides the opportunity for walk-along participants to reflect on the experiences that were shared and engage with the perspectives of other youth in their community. This also allows for youth to prioritize the places in their community where they would most like to enact change.

GOAL 4: EMPOWERING YOUTH- AND COMMUNITY-CENTRED VISIONS FOR CHANGE

The final two sessions aim to achieve Goal 4's focus on youth identifying priorities and recommendations for addressing the water, food, and sanitation insecurity challenges detailed in previous participatory mapping workshop sessions above, and are described in Table 4.

CONCLUSIONS

The strengths-based multi-media participatory mapping approach detailed in this Report was co-developed with youth and community-based organizations in six climate-affected regions in Kenya. This methodology offers a flexible approach that has the potential to enhance youth's understanding of climate change and resource scarcity impacts. It also aims to uncover protective factors among young individuals, leveraging existing resources and adaptive coping strategies.[24] This methodological approach addresses calls to meaninfully engage climate-affected adolescents in climate change research to ensure solutions for climate change are tailored for their needs and priorities.[4]

We provided guidelines and descriptions of the methodological innovations we applied to traditional participatory mapping approaches with our goal to enhance youth engagement and age- and contextual- relevance. Expanding on traditional participatory mapping techniques, our approach detailed in this Report integrates multi-media and art-based elements, including emojis, videos, photos, dances, and songs. For instance, emojis provide youth the opportunity to express emotions using youth-friendly social media imagery.[36] These creative avenues provide unique opportunities to engage youth, promote self-expression, foster dialogue, and build relationships.

By prioritizing positive emotions such as joy and dreams and adopting a place-based perspective, this approach holds promise for advancing climate-resilience solutions that are both strengths-focused[24] and driven by youth. Researchers and community-based organizers working on youth, climate issues, and resource scarcity may find this multi-media participatory mapping method described in the Report an engaging and adaptable method for use with diverse regions, contexts, and populations.

Ultimately, this Report presents methodological innovations for participatory mapping that can serve as a valuable resource for youth-led initiatives to address climate and health concerns. However, further research is needed to explore implementation considerations and findings from this method in order to assess its usefulness and adaptability in different contexts. Creative, engaging, and youth-friendly approaches to generating climate-related solutions continue to be of critical importance, particularly with youth in low-and middle-income climate-affected regions whose priorities and recommendations for climate-resilience and solutions are overlooked.[4]

Table 2. Participatory mapping workshop sessions 4-6

Session	Outline
#4) Mapping joy places (1 hour)	• Youth work in small groups (3-5 people) that are guided by a facilitator to identify at least five places that bring them joy on a piece of chart paper, using green dot stickers and drawing/writing the names or description of places. Youth are encouraged to identify at least one place associated with each topic of water, food, and sanitation, as well as two 'wild cards' that could represent any places of joy (e.g. playground, school). • This method is informed by a study in Kenya that used dot mapping focus groups for youth to identify places with positive and negative associations.[20] • Facilitators engage youth in discussing each place and identifying the five most important or meaningful places for the group and why. • Groups then discuss and formulate a walking route to share these five places (or a similar place, for instance, of an operational water pump or clean toilet if the logistical issues with walking distance are too great) on a group walk with the facilitator. This involves discussions of the intended walking route and identification of any possible problem areas (e.g. river where one cannot cross). The group then uses a marker to draw this approximate route linking their meaningful places on the map.
#5) Mapping protective factors (1.5 hours)	• Participants are asked to consider the contexts that surround, or are part of, the joy places on their map that contribute to each place being identified in a positive and meaningful way. • Using drawing and collage (and optional text), participants are encouraged to create some visuals on the maps related to environmental and social elements that produce positive experiences (e.g. environmental elements, infrastructure, people, etc.) • These reflect protective factors (e.g. security, cleanliness, community support, affordability, etc.) that exist in the community and which could potentially contribute to solutions for addressing challenges that may exist in other places. • Each group will present their map to the full group, pointing out and explaining the places of joy, and the protective factors. • These presentations are audio recorded and later transcribed verbatim.
#6) Audio-visual recording of walking routes (2 hours)	• Participants engage in group participatory mapping using 'walk-along' methods with the Relive mobile app[33] on a tablet or mobile phone. • Groups – with youth acting as the 'tour guides' – take the facilitator/s on their walking route, and the route is recorded with the Relive app. • Relive is a story-authoring web-based app that allows the creation of multi-media content with map locations that has a free-of-charge version that allows users to track the global positioning system (GPS) of their movements, geotag photos and comments taken within the app, and produce free three-dimensional (3-D) videos that present a visual representation of the route and photo markers.[33] • Important in working with communities with limited internet connectivity, the Relive mobile app can record the walking route without the use of Wi-Fi data and only requires access to Wi-Fi to later produce the 3-D videos. • Originally designed and marketed as an app for sharing outdoor adventure stories (e.g. run, ride, hike, etc.), we have repurposed this app as a user-friendly social-spatial story mapping tool. • At each joy place that groups identified on their maps in Session 4, the youth or facilitator takes a photo using the tablet and, wherever possible, input a comment from youth on the walking tour related to the photo. • Facilitators engage youth in discussing the joy places as they walk on the route, and audio record the conversation, which is later translated and transcribed verbatim. • Provided there is Wi-Fi access at the workshop venue, facilitators then screen the 3-D videos for youth in the participatory mapping workshop to reflect this place-based knowledge youth shared back to them and to elicit any additional comments.

ETHICS STATEMENT

The study received ethics approval from two bodies: (1) University of Toronto, #27312; (2) AMREF-ERSC, #ESRC P1052-2021.

FUNDING

This research was funded by a Social Sciences and Humanities Research Council of Canada (SSHRC) Partnership Development Grant and the New Frontiers in Research Fund (NFRF). CHL is also supported by funding from the Canada Research Chairs Program and Canada Foundation for Innovation (CFI).

AUTHORSHIP CONTRIBUTIONS

Carmen H. Logie: Substantially contributed to the conception and design of the work as Principal Investigator; acquisition, analysis, and interpretation of data; critically reviewed the manuscript for important intellectual content; provided final approval of the version to be published; agreed to be accountable for all aspects of the work, ensuring accuracy and integrity. Sarah Van Borek: Made substantial contributions to writing the manuscript and project management; critically reviewed the manuscript for important intellectual content; provided final approval of the version to be published; agreed to be accountable for all aspects of the work, ensuring accuracy and integrity. Anoushka Lad: Made substantial contributions to writing the manuscript and project management; critically reviewed the manuscript for important intellectual content; provided final approval of the version to be published; agreed to be accountable for all aspects of the work, ensuring accuracy and integrity. Lesley Gittings: Played a significant role in project conceptualization and execution; critically reviewed the manuscript for important intellectual content; provided final approval of the version to be published; agreed to be accountable for all aspects of the work, ensuring accuracy and integrity. Julia Kagunda, Humphres Evelia, Clara Gachoki, Kevin Oyugi, Mercy Chege, Beldine Omondi, Maryline Okuto, Lina Taing: Contributed to field

Table 3. Participatory mapping workshop sessions 7-8

Session	Outline
#7) Video screening and emoji response activity (1.5 hours)	• Facilitators share Phase 1 qualitative findings that involved place-based photo and video documentation from walk-along interviews, from youth aged 10-14 from the same community. • Phase 1 walk-along videos are to be analysed for key themes and subsequently 3x three-minute videos (one each for water, food, and sanitation insecurity) are produced by the research team using selected excerpts of walk-along footage accompanied by a narrative that summarizes key themes. • These three short videos are screened in this participatory mapping session. • After each video is screened, participants are invited to engage in a Photo Emoji Response Activity. For each video category (water, food, and sanitation), Phase 1 photos from walk-along interviews that reflect a variety of different objects, circumstances and ideas (e.g., toilet with a broken door, garbage in a river) are printed in a large format and displayed on the wall. Participants are given several emoji stickers that reflect a variety of emotions (happy, sad, angry, and confused) and asked to add one or more emoji sticker to each photo that reflects their feeling(s) toward the photo. • As participants move through the 'gallery', each photo accumulates emoji responses, providing insight into trends in perceptions and feelings towards the different photos. • Photos are numbered and participants are given corresponding, numbered index cards. Participants work in groups with a facilitator to write a few words or sentences describing why they added a particular emoji. • This is followed by a facilitated full group discussion where participants have an opportunity to share their emoji descriptions or other related ideas. • This discussion is audio recorded and transcribed verbatim.
#8) Mood-lifting energy activity	• A mood-lifting, energizing activity is conducted to move from this focus on water, food, and sanitation insecurity challenges (Session 7) toward a focus on suggesting recommendations and solutions (Session 9).

Table 4. Participatory mapping workshop sessions 9-10

Session	Outline
#9) Mapping challenges and recommendations	• Youth are engaged in reviewing the similarities and differences between places they drew in the maps of joy with the challenges detailed in the brief videos and emoji photo gallery. • Using maps of joy places developed in Session 4, youth add places where they encounter challenges of water, food, and sanitation insecurity to their maps. Youth have the option of collaging small copies of some of the photos used in the Photo Emoji Response Activity onto maps to assist with this process. Youth also add a red dot sticker to each challenge place to differentiate these from joy places on the map. • Next, youth share recommendations for the changes they wanted to see to address these challenges. • Facilitators record these recommendations on index cards and youth glue them onto the maps. • Each group presents their map, including challenge places alongside their recommendations for change, to the full group. • Presentations are audio recorded and transcribed verbatim.
#10) Dream studio (1.5 hours)	• Youth engage in a creative exercise of envisioning and expressing their dreams for realizing sanitation, water, and food security alongside related safety and wellbeing. • This process involves the production of original songs in groups, aligning with research showing the ways that community music and beat-making can contribute to increased self-esteem and self-efficacy.[34] • Facilitators support groups of youth to use a mobile app, on a tablet to create songs using their own voices and beats or instrumental backing tracks.[35] • Conversations around the recommendations youth developed in Session 9 are developed into song lyrics and ultimately a song that could include singing, rapping, spoken word, poetry, or a combination of these elements, in the youth's preferred language(s) and musical genres. • Youth also complete an "artist statement" explaining motivations and meanings behind their songs. • Each group presents their recorded song to the larger group, followed by a brief facilitated discussion to reflect on the shared experiences.

work involving data collection; critically reviewed the manuscript for important intellectual content; provided final approval of the version to be published; agreed to be accountable for all aspects of the work, ensuring accuracy and integrity.

DISCLOSURE OF INTEREST

The authors completed the ICMJE Disclosure of Interest Form (available upon request from the corresponding author) and disclose no relevant interests.

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Submitted: April 20, 2023 GMT, Accepted: May 30, 2023 GMT

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SUPPLEMENTARY MATERIALS

Online Supplementary Document

Download: https://www.joghr.org/article/77885-a-creative-approach-to-participatory-mapping-on-climate-change-impacts-among-very-young-adolescents-in-kenya/attachment/163456.docx