Institution: University College London
Unit of Assessment: 22-Anthropology
Title of case study: Supporting indigenous and local communities to protect biodiversity and shape understandings of sustainability, and transforming practices in a charity and an activist organisation
Period when the underpinning research was undertaken: 2007-2020

Details of staff conducting the underpinning research from the submitting unit:		
Name(s): Jerome Lewis	**Role:** Associate Professor	**Employed** 2007-present

Period when the claimed impact occurred: 2014-2020
Is this case study continued from a case study submitted in 2014? Y

1. Summary of the impact (indicative maximum 100 words)

Jerome Lewis's prize-winning, bottom-up approach to conservation and environmental justice has supported indigenous and local communities to adapt to rapid environmental change and protect biodiversity in Brazil, Cambodia, Cameroon, Congo-Brazzaville, DR Congo, Ghana, Kenya, Namibia and Zambia. Lewis, together with Prof Muki Haklay (UCL Geography), developed an innovative method for collaborative action research, based on the smartphone app 'Sapelli', to support locals to monitor and protect resources. Data collected by the app has led to illegal loggers, poachers and traffickers being arrested, new community defined reserves (totaling 543,000 hectares) in Brazil and Cambodia, and changes to international law to combat illegal activities. Lewis also led the Flourishing Diversity Series to highlight the key role that cultural diversity plays in sustaining biodiversity, which changed the funding programme of UK charity Synchronicity Earth, founded a funding collective 'Amazon Alliance', and changed the practices of activist organization Extinction Rebellion Youth (XRY) to be guided directly by indigenous people.

2. Underpinning research (indicative maximum 500 words)

Since 1993 Lewis's regular ethnographic research visits to forest communities in the Congo Basin have provided him with unique insights into local cultures and societies, the impact of global and national forces on forest peoples' lives and livelihoods, and the inadequacies of dominant models of sustainable development and conservation **[R1/R2]**. His research, based on long-term immersive participant observation, participatory mapping, interviews, surveys and experiments, shows that top-down models that seek to mitigate the harm done by economic development by creating protected areas that exclude local people (i.e. transforming landscapes into assets for market), are failing to achieve their intended outcomes **[R2/R3]**. The result is degradation of landscapes, species diversity and people **[R1]**. To explore alternatives, Lewis developed bottom-up models for collaborating with indigenous peoples and local communities (IPLC) to co-define the research agenda, collect data, interpret the results, and respond appropriately **[R4-R6]**. This resulted in a collaboration with Professor Muki Haklay (UCL Geography) to establish Extreme Citizen Science (ExCiteS) in 2010, and more recently, the Flourishing Diversity agenda **[R2]** and network **[R3]**, funded by grants from EPSRC, ERC, Newton Fund, and Darwin Fund.

Directed by Haklay and Lewis, ExCiteS brings together researchers from all career stages, in disciplines from Anthropology and Geography to Computer Science, whose research develops participatory citizen science. Building on extensive research with IPLCs in 9 countries since 2007, Lewis led the development of an innovative methodology to make citizen science available to anyone, including non-literate people. Based on his research into how to implement free, prior and informed consent with IPLCs **[R4]**, Lewis developed a participatory research design methodology to address locally identified problems **[R4-R6]**, a participatory design process to populate an app-based decision 'tree' for data collection and locally defined community protocols that describe roles, responsibilities and targeted outcomes **[R4-R6]**. Supported by Haklay and Lewis, the ExCiteS group developed test models, and conducted experiments with local users **[R5/R6]** to formulate the ExCiteS method **[R4]** and design an Android app 'Sapelli'. Sapelli was released in 2012, made available on Github and Google Play in 2014, and is regularly updated. The app runs on cheap smart phones that, following the ExCiteS method, allow users to adapt and create their own bespoke data collection apps. ExCiteS built a data server to store and organise community data securely called 'Geokey' (on Github since 2014) that exports Sapelli data to visualization

platforms such as Community Maps, QGIS, Google maps or ArcGIS Online, and soon 'Sapelli Viewer'.

The theory, methodologies and tools described above were made accessible to support users regardless of literacy or education to engage in citizen science **[R4-R6]**. Lewis's research showed that when marginalised IPLC present their ecological knowledge in more formal ways, notably using maps, their concerns are more readily taken into account by environmental managers **[R5]** and law enforcement bodies. In 2015, the inaugural conference of UCL's Centre for the Anthropology of Sustainability (CAoS), directed by Lewis, brought together researchers in anthropology, human ecology and natural sciences to examine sustainability from anthropological perspectives. From this emerged Lewis's concept of 'flourishing diversity', to recognize the importance of cultural diversity in sustaining biodiversity, and to promote the vital role local communities play in sustaining ecological diversity **[R2]**.

Collaborations in Brazil to further develop methods that support IPLC's local conservation efforts won the 2018 Newton Prize. Success was largely due to the multi-scale partnerships that CAoS facilitated between indigenous Ashaninka and Guaranì peoples and local NGOs, combined with a participatory project design process that prioritized peer-to-peer learning exchanges **[R3]**. This collaborative action research resulted in Lewis organizing the indigenous-led second CAoS conference, the Flourishing Diversity Series **[R3]**, held in London at UCL in 2019.

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3. References to the research (indicative maximum of six references)

R1. Lewis, J. "Our life has turned upside down! And nobody cares." (2016). *Hunter Gatherer Research.* 2 (3): 375-384. https://doi.org/10.3828/hgr.2016.25 Peer reviewed.

R2. Brightman, M. and **Lewis, J.** (eds). *The Anthropology of Sustainability*. (2017). Palgrave Studies in the Anthropology of Sustainability. Palgrave: New York. (Available on request). Peer reviewed.

R3. Lewis, J. Flourishing Diversity – Learning from Indigenous Wisdom Traditions. (2019). https://www.flourishingdiversity.com/report Emerged from grants i and v.

R4. Fryer-Moreira, R. and **Lewis, J.** Methods in anthropology to support the design and implementation of geographic citizen science. (2021). In: Skarlatidou, A. and Haklay, M. (eds) '*Geographic Citizen Science Design - No One Left Behind'*. London: UCL Press. Peer reviewed. Emerged from grant ii. (Available on Request).

R5. Lewis, J. '**Making the invisible visible: Designing technology for nonliterate hunter-gatherers.' (2014). In J. Leach & L. Wilson, eds. *Subversion, Conversion, Development: Public Involvements with Information and Communication Technologies.* Cambridge, MA: MIT Press. pp. 127-152. Peer reviewed. Emerged from grant v. (Available on request).

R6. Stevens, M. Vitos, J. Altenbuchner, G. Conquest, **Lewis, J.** and Haklay, M. "Taking Participatory Citizen Science to Extremes." (2014). In *IEEE Pervasive Computing*, 13 (2): 20-29, Apr.-Jun. 2014. https://www.doi.org/10.1109/MPRV.2014.37 Peer reviewed. Emerged from grant v.

Grants (selected)

i.**2018-20: Newton Prize for Brazil.** Awarded to CAoS, Centro de Trabalho Indigenista (CTI), Guarani Indigenous Association and Apiwtxa (Ashaninka Indigenous Association) Brazil. PI. GBP200,000

ii.**2016-21: ECSAnVis** (Extreme Citizen Science: Analysis and Visualisation). ERC H2020 Advanced Grant Number 694767. I am Co-I and anthropological coordinator with Professor Muki Haklay (UCL Geography) the PI. EUR2,500,000

iii.**2016-19: Illegal Wildlife Trade** Darwin Fund. Developing anti-poaching monitoring solutions for forest people. Consultancy for Zoological Society of London GBP58,000

iv.**2016-17: Environmental and Territorial Management in Indigenous Lands of the Guaranì people in the South and Southeast of Brazil.** Newton Fund Grant. PI. GBP100,000

v.**2011-16: 'Extreme' Citizen Science (ExCiteS).** Engineering and Physical Sciences Research Council, Challenging Engineering Award: (AB)[22729]. Co-I with Professor Muki Haklay (UCL Geography) the PI. GBP1,000,000

4. Details of the impact (indicative maximum 750 words)

The Sapelli platform has been used in over 20 projects in 11 countries (Including Brazil, Cambodia, Cameroon, Congo-Brazzaville, DRCongo, Ghana, Kenya, Namibia and Zambia) to empower and build resilience to climate unpredictability, to document local resources and seek land rights, to document illegal activities and violence, to protect vital resources from damage or removal by industrial companies, and to promote new models of sustainable agro-forestry, community reserves and forest regeneration.

Empowering IPLCs to protect areas of high biodiversity
ExCiteS' Sapelli app, which has 500+ installs from Google Play, has been used by ExCiteS and by organisations to support IPLCs in protecting areas of high biodiversity. Participating IPLCs have developed their digital skills, gained important new knowledge and networks, been empowered to protect and manage resources and had their rights better respected by outsiders. In Brazil, Pantanal fishers in Barra de São Lourenço mapped their territories and obtained a 5,000km^2 community reserve from the Federal Court in Corumbá in a historic decision that allowed them to continue to maintain and expand their traditional way of life without harming natural resources **[A]**. Brazilian Ashaninka reinforced their local teams to monitor illegal logging, poaching and fishing activity in their territory to send those doing so away **[B]**. Khoisan in Namibia documented cattle invasions on their conservancy and sent reports to local authorities to control the cattle **[B]**. The authorities failed to take effective action, but the Khoisan developed further uses for Sapelli in the annual game count to increase their participation in managing their conservancy. Ghanaian farmers use ExCiteS tools to integrate local, indigenous forecasting knowledge with mid-range climate forecasting so they could make more adaptive decisions on when to plant and rotate crops to increase productivity, providing them greater resilience to irregular rainfall **[B]**. Projects have monitored rare orchids in Zambia to support local livelihoods by building up species distribution maps and other information vital to conservation assessments of the different orchid species used in the Chikanda trade **[B]**. Masai warriors in the Masai Mara monitored 134 endangered medicinal plants as they were concerned about the loss of traditional ecological knowledge and threats to these plants from deforestation brought on by expanding settlements on their rangelands, and supported Kenyan farmers to network information to increase resilience to unpredictable weather and pests **[B]**. In 2014, ExCiteS was placed on social investment organisation Nominet Trust's (now Social Tech Trust) NT100 list of organisations using digital technology to change the world for the better.

Taking one example from Cameroon in detail, ExCiteS has collaborated with international conservation charity Zoological Society of London (ZSL) since 2015 to "promote the greater involvement of local communities around the Dja Biosphere Reserve (DBR) in conservation activities" in Cameroon (funded by the Darwin Fund, iii) **[C]**. ZSL provided training and information on Cameroon forestry laws while Lewis and Simon Hoyte co-designed the data collection software with local communities **[C]**. Between May 2017 and August 2020, seven local communities in the DBR used Sapelli to report and map illegal activities, creating almost 800 records of such activity. ZSL staff confirm that they use this information "to inform local forestry authorities, law enforcement patrols and Interpol on the types of activities, frequencies and parties involved in poaching and trafficking for the illegal wildlife trade" **[C]**. It is used "to guide the Ministry of Forestry (MINFOF) enforcement officers on the ground" **[C]**. Information is precise and received quickly "enabling changes in how we implement certain field activities. For example, the number of ecoguards per patrol team has increased from 6 to 8, while [*the length of*] patrol[*s*] […] increased from 7 to 10 days. Some MINFOF control posts have been re-located to better tackle traffickers and camping, and patrolling materials for mobile staff have been improved upon" **[C]**. These actions have had tangible results: "seizures and arrests have increased due to discrete and precise information supplied through the local community networks. Between 12/2017 and 08/2020, 36 arrest incidents (sometimes of multiple perpetrators) and 19 seizures without arrests were recorded" **[C]**. When funding for the ExCiteS-ZSL collaboration ended in 2018, ZSL decided to continue funding the project from their own budget "to maintain and grow the ExCiteS network around the Dja Reserve" **[C]**. This success led Worldwide Fund for Nature (WWF) to introduce the ExCiteS approach around two Reserves (Lobeke and Nki) in Cameroon in late 2020.

In Cambodia, Sapelli is used by the Prey Lang Community Network (PLCN) as part of the 'It's Our Forest Too' initiative, supported by a partnership between PLCN, a peacebuilding organization, a development organization, an IT company, and the University of Copenhagen. A professor at the latter explains that the project partners "used Sapelli to develop an app for smartphones, making it easy for local forest patrols in Cambodia to geo-reference, document, and upload information about forest resources and illegal activities" **[D]**. The Sapelli/Prey Lang app enabled the partners to scale up work to stop illegal logging, map resources, support advocacy, environmental justice, conflict resolution, biodiversity conservation, and mitigate climate change. The professor confirms that since the app was launched in 02/2015 "around 400 community monitors from more than 100 villages have uploaded more than 20,000 observations on natural resources and illegal logging to a database hosted in the cloud" **[D]**. Just as in DBR, Cameroon, in Cambodia, the app has enabled a shorter response time between detection of a crime and law enforcement, increasing arrests and confiscation of equipment. Forest patrols have confiscated logging equipment, "including over 200 chainsaws" and "numerous loggers have been arrested". PLCN has shaped national policy: "Following PLCN petitions, the government of Cambodia gazetted 430,000 hectares as Prey Lang Protected Forest in 2016" **[D]**. PLCN reports have been used by INTERPOL "to investigate illegal timber exports to the EU" and have led to new global protection "as international trade in all species of Rosewood (Dalbergia ssp) is now suspended unless shipments have a CITES exemption certificate" **[D]**. PLCN was awarded the United Nations Equator Prize in 2015, the Innovation Prize of the International Society of Tropical Foresters in 2017, and the Energy Globe Award for Cambodia in 2019.

Raising awareness of Flourishing Diversity to influence the strategies of investors, a charity, and Extinction Rebellion Youth to build support networks with IPLCs to protect diversity

From 2016-2017, Lewis was PI on a Newton Fund project (iv) to develop knowledge-sharing networks between academics, NGOs, and the Ashaninka and Guaranì peoples to support reforesting Brazil's Atlantic Forest by improving the lives of the Guaranì **[E]**. Promoting peer-to-peer learning and collaborative project design produced eight Guaranì indigenous maps and territorial management plans, and increased food security through recovering and replanting lost varieties, and by offering training in adapted agro-forestry techniques **[E]**. The project won the Newton Prize for Brazil 2018 (i) and, in dialogue with partners, Lewis further developed the concept of 'flourishing diversity' **[R3]**. In September 2019, UCL's Centre for the Anthropology of Sustainability (CAoS) hosted the first Flourishing Diversity Series (FDS) that brought 30 representatives from 16 different indigenous groups from 12 countries to London to speak to over 1,000 attendees (general public, students, activists, lawyers and academics) over three days (350/day). Participating IPLCs determined the agenda and content, and garnered significant public support. 12 private sector investors contributed over GBP190,000 and a network of high-profile partner organisations participated, such as UK charity Synchronicity Earth (SE) that "acts to address overlooked and underfunded conservation challenges for globally threatened species and ecosystems". FDS received coverage by 7 major broadcast (BBC, Time, Forbes, Le Monde, Metro) and online outlets reaching 7,630,000 people. In May 2020, *Scientific American* ran an article by Lewis, 'Living with the Forest', which drew on **[R1/R2/R3]** to introduce readers to the concept of 'flourishing diversity'. *Scientific American* has 3,500,000 print and tablet readers worldwide, 5,500,000 global online unique visitors monthly, and is translated into 14 languages **[F]**.

For the Founder of SE and IUCN Patron of Nature, "Flourishing Diversity as both a principle and an action has transformed every aspect of my work" **[G]**. First introduced to the concept by Lewis in 2017 **[R2]**, SE helped promote Lewis's concept of 'flourishing diversity' by organising and funding FDS, including the 'Listening Sessions' that attracted 1,500 people by involving high-profile artists, actors and models such as Peter Gabriel, Brian Eno, Benedict Cumberbatch and Lily Cole to attract new audiences to listen to IPLCs' ecological wisdom. Inspired, in 2020 SE established a new 'Flourishing Diversity' programme that closely maps onto **[R2]** and **[R3]**. SE donors have shown "significant interest in this work", securing USD100,000 immediately and a further GBP144,705 "including GBP65,000 from someone who has not yet funded in the biocultural space before" **[G]**. SE is now supporting the establishment of a charity dedicated to

Flourishing Diversity, "providing administrative, operational, and accounting expertise, alongside financial and in-kind support" **[G]**.

International organisations have incorporated 'flourishing diversity' into their agendas. 'Flourishing diversity' will be one of the two 'pathways' through the World Conservation Congress (WCC), attracting 10-15,000 global conservation leaders and attended by 100,000 people in September 2021 (postponed from June 2020 due to COVID-19). WCC is organised by the International Union for Conservation of Nature (IUCN) - the global authority on the natural world and the measures to safeguard it. The director of IUCN's NatureCulture initiative adopted 'flourishing diversity' as an IUCN goal for 2020 **[G]**. Talks are ongoing with UNESCO and the Convention on Biological Diversity to embed 'flourishing diversity' into their policy frameworks **[G]**. During FDS the 'Amazon Alliance', a network of experts and funders collaborating to provide financial support to threatened indigenous communities was established. As the SE founder explains, "This group is operating under the radar so as to protect those involved, but to date has supported three initiatives: $50,000 granted to the Guaranì and a further $70,000 secured; $100,000 granted to the Kayapo for guard posts to help them secure their territories from external threats; and £90,000 to an urgent funding pot for forest defenders." **[G]**.

Participating in FDS led to its adoption by Extinction Rebellion Youth (XRY) in 2019. A Coordinator of Alliance-building and Education for the XRY Internationalist Solidarity Team explains, "the XR movement was struggling to make our activism relevant to marginalized groups across the world" **[H]**. The concept of 'flourishing diversity' was transformational: "Collaborating with and learning from Flourishing Diversity was invaluable both for our theory of change and to be able to work in true solidarity with communities of resistance across the world" **[H]**. Guided by Lewis, XRY developed "a new, decolonised model for working with indigenous groups as their allies, guided by their approaches". They have changed their practices: "instead of informing people about them and their issues, we have consistently worked to platform Indigenous peoples themselves"; instead of replicating assumptions "we are platforming radical worldviews that question those assumptions in the first place" and instead of planning campaigns to support indigenous rights without consulting indigenous peoples, "we have worked on getting to know them and develop relationships, so that we can understand what work they are already doing and ask them what we can do here to empower their work on the ground" **[H]**. As a result, XRY now has working partnerships with indigenous peoples that enact change and the team grew from 5 people in September 2019 to 10 core members and 20 part-time volunteers in June 2020 and continues to grow. XRY raised GBP8,000 to support 400 Guarani families during COVID-19 to self-isolate **[H]**.

Working with the Guaranì in Brazil, XRY "launch[ed] an international campaign that persuaded Brazilian Supreme Court judge Mr. Edson to temporarily overturn a government directive calling for all Indigenous lands that weren't recognised in 1988 to be declared non-Indigenous and be given to miners and loggers. Without that joint campaign we waged with the Guaranì, the majority of Indigenous lands in Brazil may have been cleared of their communities and of their ecosystems" **[H]**. As a result of these successes, XR Germany have asked to adopt the approach developed from FDS by XRY UK.

5. Sources to corroborate the impact (indicative maximum of 10 references)

A. ECOA (Brazilian NGO) report of the official recognition of 5,000km^2 Panatal reserve https://bit.ly/3eohsfi

B. Extreme Citizen Science blog details UCL projects, methods & technology: https://bit.ly/38l2Ol9 plus PDF pack of posts describing this activity.

C. Testimonial: Director, Field Officer and Law Enforcement Coordinator, ZSL Cameroon

D. Testimonial: University of Copenhagen, Prey Lang Community Network

E. Newton Prize for Brazil (2018): https://bit.ly/3t4wTNQ

F. Media reach evidence https://bit.ly/38mJIv4 and article in *Scientific American*

G. Testimonial: IUCN Patron of Nature, Founder Synchronicity Earth

H. Testimonial: Extinction Rebellion Youth International Solidarity Network