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Cultivating Health in Landscapes of Uncertainty: Mystery Kidney Disease and Agrarian Transformation in Dry Zone Sri Lanka

Nari Senanayake

PhD Candidate, Geography

Since the first reports of a mysterious new form of Chronic Kidney Disease (CKDu) emerged in the early 1990s, Sri Lanka's dry zone has become the epicenter of an epidemic that is slowly crippling agricultural communities across the island's rice belt. In this field report, I provide a detailed description of my fieldwork in two "CKDu hotspots" including an overview of my research design and some preliminary research findings. This work is grounded in feminist methodology and integrates ethnographic and archival fieldwork conducted in the United Kingdom and Sri Lanka over the summers of 2013 and 2015 as well as eleven months of research in Sri Lanka over 2016-17. This article elaborates on fieldwork that I undertook across a range of sites including libraries, farmers' fields, kidney screening clinics, and government offices. Collectively, an analysis of this data provides a deeper understanding of how the problem of CKDu reconfigures human-environment interactions, subjectivities, and relations of expertise in areas where the disease is endemic.

Keywords: Mystery Kidney Disease, Geography, Dry Zone Sri Lanka, Methodology

For over two decades, farming communities across Sri Lanka's dry zone have been caught in a double bind: suffering disproportionately from falling crop prices and from a mysterious kidney disease now endemic in the island's North Central Province (NCP). Named "Chronic Kidney Disease of Unknown Etiology" (CKDu) by the World Health Organization (WHO 2012), this mystery illness frustrates scientific attempts to explain its cause (Athuraliya et al. 2011; Jayatilake et al. 2013). Despite its uncertain status, CKDu generates a distinct geographical pattern of incidence, found within Sri Lanka's dry zone – and particularly within NCP – leading many scholars to conclude that it is an environmentally induced illness (Chandrajith et al. 2011; Nobel et al. 2014). Since the early 2000s, estimates of CKDu's prevalence in the dry zone have risen dramatically and the WHO (2012) believes it could impact between 200,000- 400,000 people (15-30% of NCP's current population). As a result, the disease is considered a "public health crisis" that poses a bigger predicament than even the country's 30-year long civil war (Handunnetti 2012).

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Drawing on fifteen months of ethnographic and archival fieldwork between 2013-2017, my dissertation research makes three critical interventions into existing debates about this mystery disease and its effects. First, I argue that the “problem of CKDu” actually signifies and provides insight into three tightly intertwined problems, which co-constitute each other, namely: disease, the limits of scientific explanation, and the limits of government. Second, I document how this complex of problems *creates* new human-environment interactions in areas where the disease is endemic, particularly by reworking cultivation practices, local tastes, resource use, and subjectivities. Third, I investigate how the problem of CKDu intersects with longstanding schemes to enact health in Sri Lanka’s dry zone and is active in redefining the relationships between agricultural modernization, health, and state building in the dry zone.

This project was organized around two main components:

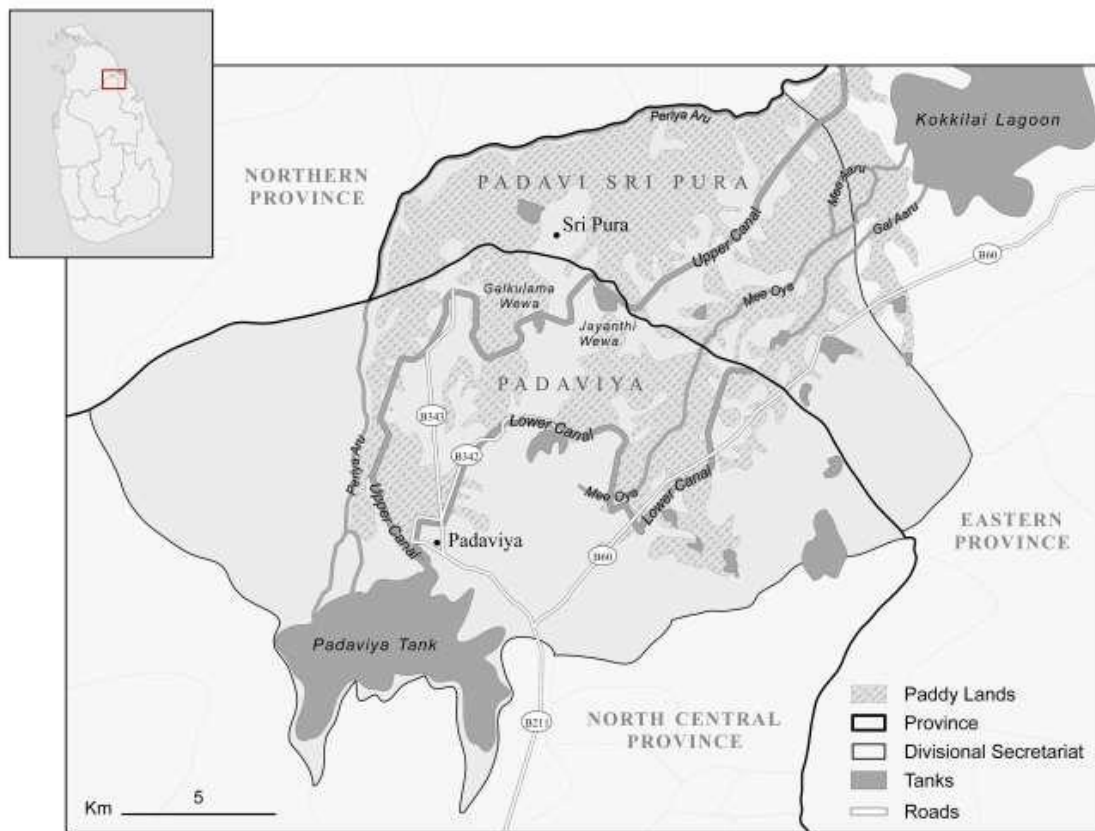
- 1) Archival and library research in Sri Lanka and the UK to investigate how concerns about health intersect with programs of agricultural transformation and state building in Sri Lanka’s dry zone over time.
- 2) Semi-structured interviews, focus group discussions, field transect walks, and participant observation in dry zone villages across my two primary field sites: Padaviya and Sri Pura (refer to Figure 1). Through this work, I was able to investigate how the problem of CKDu socializes new behaviors of consumption and cultivation in areas where it is endemic. I also tracked the mechanisms driving these changes; the emergence of new sets of relations between farmers and the environment; and the perspectives of people about the disease and responses to mitigate its effects in the region. In short, I illustrate how the tripartite problem of CKDu reorganizes landscapes and subjectivities.

More broadly, I anchor my research in feminist methodologies and their commitments to reflexivity and situated knowledges as well as their thematic strengths in analyzing embodiment, subjectivity, and the “intimate” scales of everyday life. According to feminist scholar Donna Haraway (1989), feminist research is tied together by epistemological and methodological commitments— which, in contrast to positivist epistemologies, re-embed knowledge claims “in place”— and accounts for the agency of both the knowledge producer and the object of study in shaping the research process. Central to feminist methodology then “is the idea that there is no one truth out there to be uncovered and, as a result, all knowledge is partial and linked to the contexts in which it is created” (Nightingale 2003, 77). Within feminist approaches, conceptual and empirical weight is also given to documenting obscured dimensions of resource struggle as well as accounting for contradictory and complex human-environment relations (Elmhirst 2015; Nightingale 2011, 2012; Sultana 2011). In my own work, I marshal feminist methodology to illuminate the multi-dimensional nature of suffering in diseased and contaminated landscapes, the plural and often contradictory nature of environmental subjectivities in contexts of toxic uncertainty, and the limits and partiality of existing knowledge about CKDu. Ultimately, my work enacts a feminist methodology by documenting how “local opinions of problems [and] locals themselves have been largely written out of actual scientific practice... [and by] exposing and interrogating the practice of scientific

research and planning in the reproduction of colonial power relationships” (Robbins 2006, 315-16). Or put another way, I seek to “unite inquiry into scientific, environmental research questions with inquiry into the power of science” itself (Robbins 2006, 316).

Field sites

Since 2013, I have been conducting research in villages located in the agricultural settlement schemes of Padaviya and Sri Pura of the North Central Province (see Figure 1). These schemes are: 1) zones of CKDu endemism and have among the highest rates and longest history of disease, 2) currently hotspots of disease-related interventions, and 3) enduring objects of state intervention designed to increase the agricultural productivity and health of the dry zone.



*Figure 1: Map of field sites (hydrological features and land use)
Map designed by Brittany Waltemate*

	Padaviya	Sri Pura
Year of first settlement	1957	1958
<i>Grama Niladhari</i> (administrative) Divisions	15	10
Population (total)	25,438	13,242
Population (families)	7,225	3,817
Total land area	144 km ²	217 km ²
Maximum paddy extent	8246 acres	8254 acres
Land cultivated (wet season 2016-17)	5745 acres	5589 acres
No. families receiving welfare (poverty) payments	2044	836
No. receiving kidney patient stipend	521	298
No. of kidney patients	613	453
No. of Reverse-Osmosis (R.O.) Filters	26	31

*Table 1: Some descriptive characteristics of Padaviya and Sri Pura
(compiled from local government reports)*

Major Activities, Objectives, and Some Preliminary Findings

The archival component of this project documents how CKDu intersects with the long history of agricultural modernization, public health campaigns, and state building projects in the dry zone, and is active in redefining the region's relationship to the Sri Lankan state. This involved five months of historical research at key collections across Sri Lanka and the United Kingdom, at the following sites:

- The National Archives of Sri Lanka
- The National Library of Sri Lanka
- The Royal Asiatic Society Library
- The Mager Institute Library
- University of Colombo, Central Library
- Department of National Museum's Library
- HARTI Library
- Central and Agriculture Libraries of the University of Peradeniya (including the Ceylon collection)
- The National Archives of the UK
- The British Library
- The Royal Commonwealth Society Collection, University of Cambridge Libraries

During this time, I conducted extensive searches of archival and library catalogues to identify and track down primary sources related to the following themes:

- Health and agricultural statistics of the dry zone through time
- Writings on both traditional crops and cultivation methods, including botanical records and scientific periodicals on the dry zone through time
- Writings on the implementation of state-sponsored agricultural settlements (both colonial and post-colonial) in the dry zone, and the restructuring of cultivation practices in the region
- Writings on the rehabilitation of irrigation schemes (colonial and post-colonial) in the dry zone
- Writings on disease and disease-eradication in the dry zone (especially malaria and yaws)
- Writings on green revolution technologies and groundwater irrigation infrastructure during the mid-late 20th century.

As a result of this work, I have built a repository with bibliographical records and notes for more than 200 relevant documents. This collection includes: sessional papers; government gazettes; the Ceylon Register of Correspondence (dispatches between offices and individuals); press cuttings; cabinet papers; original manuscripts; administration reports; botanical records, and samples from both the photography and map collection on Sri Lanka during British colonial rule.

My time at these various libraries and archives has helped validate existing hypotheses and has also been generative of new lines of inquiry. First, through this work, I have tracked shifts of both discourse and policy in colonial and postcolonial interventions on health and agricultural modernization in the dry zone over time. The historical record reveals critical points of reversal as well as continuities in state interventions in the dry zone from the early 20th century to date. For instance, one consistent thread in administration reports of governments (both colonial government and early post-colonial) is the framing of *chena* (upland, slash and burn) cultivation and traditional crops (such as *kurakkan* and *deshi* or indigenous rice varieties) as pathological, not only to human health but also to the agricultural environment and agricultural progress. In this way, many of the transformations of agricultural systems under the British in the early 20th century were justified on the basis of health. In fact, my research suggests that agricultural modernization was positioned as key to achieving and enacting health in the dry zone (particularly in the context of endemic malaria). While reading these documents I was struck by how this narrative has now come full circle as CKDu is increasingly positioned as a problem that *results from* agricultural rationalization and key actors actually advocate a movement back to traditional cultivars and techniques in response to the disease.

The second core component of my research investigates how the “problem of CKDu” restructures human-environment interactions in areas where the disease is endemic. This involved 10 months of ethnographic fieldwork in villages across Padaviya and Sri Pura. To investigate how the problem of CKDu has changed attitudes about the environment, patterns of resource use, and cultivation practices, I conducted:

- A survey of 215 households across four *Grama Niladhari (G.N.)* divisions in the agricultural settlement schemes of Sri Pura, North Central Province
- 11 focus group discussions in villages across Sri Pura and Padaviya
- 74 in-depth, semi-structured interviews with villagers across my field sites
- 76 semi-structured interviews with civil society actors, medical practitioners, and government officials
- Participant observation in fields, community forums, and at mobile screening clinics run by the Kidney Protection Foundation

Methods	(n)
Semi-structured interviews with villagers	74
Semi-structured interviews with government officials	18
Semi-structured interviews with academics	14
Semi-structured interviews with civil society/activists	34
Semi-structured interviews with medical practitioners	10
Household surveys	215
Focus group discussions (with villagers)	11
Participant observation: mobile screening clinic	4
Field transect walks	30

Table 2: Summary of data collected (2013-2017)

The ethnographic component of my research was organized around four sub-questions:

- a) How do farmers perceive their environment and its relation to human health? Have their attitudes towards the environment shifted in response to the problem of CKDu?
- b) What cultivation strategies and crop varieties are adopted by farmers producing in CKDu endemic areas? Have cultivation techniques shifted in response to the problem of CKDu? If so, how? If not, what factors constrain alternative production choices in the dry zone?
- c) How are local tastes and norms of food “purity” attuned by and to suspected environmental health risks? Has the problem of CKDu socialized new behaviors of water consumption in areas where CKDu is endemic?
- d) Do changes in consumption and cultivation practices differ within and between communities? If so, what factors shape these variations?

Empirically, my fieldwork was grounded in an analysis of three ongoing attempts to govern CKDu and by extension, to socialize new behaviors of disease management, consumption, and cultivation: 1) new mobile kidney screening programs and public awareness campaigns, 2) the proliferation of community-level Reverse-Osmosis (RO) water filters, and 3) the roll-out of a national initiative promoting indigenous and organic rice cultivation as a “long-term solution” to the problem of kidney disease.

As part of this analysis, I conducted a structured household survey of 215 families. Household surveys used a non-probability sampling design, which establishes trends and themes in villagers' experiences, behaviors, and understandings "without seeking to make generalizable claims about whole populations" (McGuirk and O'Neill 2010, 205). These surveys included families with and without CKDu patients. Surveys focused on 1) settlement histories, 2) demographic and household information, 3) livelihood portfolios, 4) water consumption practices, 5) disease profiles (including rates of co-disease burden), and 6) cultivation practices. By doing so, my dissertation research is the first study to identify spatial and social patterns in the shift to alternative agricultural techniques and filtered water in areas where CKDu is endemic.

In addition to the structured household survey, I conducted 74 in-depth and open-ended semi-structured interviews with villagers across Padaviya and Sri Pura. Semi-structured interviews provide more in-depth perspectives on: 1) local environmental histories and observed changes in local ecosystems and cultivation techniques; 2) changes in attitudes towards the environment; 3) changes in agricultural livelihood systems in response to the problem of CKDu, 4) changes in water consumption practice in response to the problem of CKDu, and 5) changes in how people come to think of their health, bodies, and identities.

In addition to semi-structured interviews, I conducted field transect walks (Doolittle 2015) and on-site observation to confirm the type of seed and farming practices employed by farmers in my sample. I also conducted participant observation with a mobile kidney screening clinic, which allowed me to observe and document: a) practices of diagnoses and biomedical classification, b) clinical management of disease, and c) attempts to guide and direct behaviors of health management through public awareness campaigns. Ethnographic documentation of everyday, embodied practices has also been useful for understanding how individuals with CKDu manage and regulate body-environment exchanges, and how these activities might engender new environmental subjectivities (Nading 2014). Through long-term participant observation and semi-structured interviews, I have documented daily experiences of environmental suffering, uncertainty, and risk that are often not captured by the methods, scales of analysis, and standards of evidence used in existing research on CKDu.

An emerging finding from my research is that many farmers who were recently encouraged to cultivate traditional rice varieties (as a disease mitigation strategy) are now switching back to improved varieties. Ironically, this shift back to hybrid seeds accompanies the rise of a national movement promoting indigenous rice varieties and "toxic free food." This contradiction has opened up new lines of inquiry in my research, namely: How do we explain the local collapse of *deshi* cultivation at the very moment that the national movement, which promotes it, is expanding in rhetorical coherence and presence? Additionally, I am fascinated by how villagers in my study sites have cultivated new tastes related to toxic-free food, *deshi* varieties of rice, and filtered water as well as how these tastes reconfigure people's relationships to the environment and health. I hope to draw on this work to argue that attending to affective relations can provide a more nuanced account of why rural people are motivated to value, act,

and understand their relation to the environment (in this case, particular systems of cultivation) in certain ways and not others.

Conclusion

The problem of CKDu reconfigures the relations between health, knowledge, agricultural modernization, and state building in ways that are imperative to study given the dry zone's identity as the rice belt of Sri Lanka, its role in maintaining the island's food security and supply, and the long history of state-led interventions designed to resettle and redevelop its productive capacity. This paper details a methodological approach that holds potential for documenting and illuminating the complex relationships between agricultural modernization, diseased landscapes, and everyday practices. It combined a mix of archival, survey, and ethnographic analyses to examine how geographic processes of health-environment interaction and agrarian change shape experiences of risk as well as the possibilities for health, well-being, and agricultural sustainability in Sri Lanka's dry zone.

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