DEVELOPING A BASELINE FOR ASSESSING TRADITIONAL KNOWLEDGE IN GUYANA

Developing a baseline for assessing traditional knowledge in Guyana

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SECTION 1. LESSONS LEARNED & RECOMMENDATIONS

Measuring traditional knowledge quantitatively and objectively in practice would be challenging and choosing individual elements would not capture the complexity of the knowledge, how it is shared within the community, and its status.

Our methodology of using system viability and participatory video captures the dynamic nature of traditional knowledge by knowledge-holders themselves. It underscores how traditional knowledge is fundamental for community survival, is a lived experience, and is constantly responding and evolving in the face of different social and ecological challenges.

Language, craft and related activities, beliefs and stories, and traditional medicines are the most important traditional knowledge related challenges in all Indigenous nations.

There is a general concern amongst all Indigenous communities about the lack of information and outreach about protected areas, especially amongst the youth.

The perceived level of traditional knowledge amongst Indigenous communities is at the threshold of major decline. Across all the communities sampled, traditional knowledge within the majority of communities is perceived to be 'acceptable' or between 'acceptable' and 'good', with some lower than this, and none 'good' or above.

Traditional knowledge in the North Rupununi communities is perceived to be at a lower status compared to Kanashen and the South Rupununi, suggesting the potential for sharing of best practices between Indigenous communities.

The majority of solutions identified by communities themselves to address traditional knowledge challenges are either within their power and/or can be addressed with the help of outsiders. This indicates the importance of promoting and strengthening community owned solutions and tackling traditional knowledge loss by providing enabling conditions for communities to take action.

Surveys regularly monitoring the livelihoods and wellbeing of Indigenous communities living in and around protected areas need to ensure they are focusing on traditional knowledge indicators identified by Indigenous communities as the most important to their viability.

The data collected in this project provides a baseline for traditional knowledge at the national level, and identifies points of intervention used to develop a Traditional Knowledge National Action Plan, currently in public consultation, and a model of best practice for other countries worldwide.

SECTION 2. INTRODUCTION

The international community has failed to make sufficient progress towards the Convention on Biological Diversity's Aichi Biodiversity Target 18. This states that by 2020, "the traditional knowledge, innovations and practices of Indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of Indigenous and local communities, at all relevant levels".

"Indigenous knowledge is the vehicle through which the principles of Indigenous worldviews, beliefs, traditions, practices, and institutions are transmitted and put into practice"[1]. It is a knowledge held collectively, transmitted orally and through learning by doing, and is relational, in that it is considered to include all living things, non-living things, and supernatural beings that interact and connect in space and time. Indigenous knowledge is adapted over time through everyday life experiences of repetition, learning and experimentation, and is therefore not static but constantly changing. Although there is increasing recognition for the importance of traditional knowledge for biodiversity conservation[2,3], poverty alleviation and climate change mitigation, Indigenous knowledge is under threat[4]. It is rapidly decreasing worldwide as a result of changes in lifestyle, education and belief systems, economic and cultural globalisation, urbanization and poverty[5,6].

The Darwin Initiative "Integrating Traditional Knowledge into National Policy and Practice in Guyana" project aimed to provide policy-level guidance, capacity development and research-led experience for safeguarding traditional knowledge and for greater respect and representation of traditional knowledge and Indigenous Peoples rights in conservation and sustainable development decision-making. This was through:

- evaluating the opportunities and barriers to traditional knowledge inclusion using case studies focused on protected areas management;
- streamlining a participatory cross-scalar process to incorporate traditional knowledge at the national scale, and;
- developing a Traditional Knowledge National Action Plan that can be used as a model of best practice for other countries in South America and worldwide.

This report presents the work done to develop a baseline for traditional knowledge in Guyana using participatory, transparent and evidence-based processes.

SECTION 3. METHODS

3.1 Research background

We aimed to take an Indigenous methodological approach, namely where the approach to, and undertaking of, research processes and practices take Indigenous worldviews, perspectives, values and lived experience as their central axis[7,8,9,10]. We wanted to collect data that met Indigenous needs and aspirations, and reflected the embodied social, political, historical, and cultural realities of Indigenous people's lives. This is critical to avoid falling into the 'deficit' mental framing of Indigenous Peoples or what Walter[11,12] describes as the 5D of Indigenous statistics; Indigenous difference, disparity, disadvantage, dysfunction and deprivation. Our goal was to disrupt deficit narratives, while at the same time to shift the power dynamics that constrain Indigenous influence in inequitable and unaccountable biodiversity conservation and policy contexts.

The research was shaped by strong and long-term collaborations with Indigenous Peoples in Guyana. Indigenous representative organisations contributed to the design of the research, and at a practical level, research activities were led by Indigenous researchers. This involved established senior community researchers, who had prior and extensive experience of participatory research in their communities, and authors of this report, organising and facilitating workshops, and carrying out training and data collection. They trained and worked directly with community researchers in each village, and synthesised video material for non-Indigenous audiences.

In this report, we present work from three districts associated with three protected areas: the North Rupununi (20 communities of approximately 5,300 people, majority from Makushi nation) associated with the Iwokrama Forest; the South Rupununi (21 communities of approximately 12,400 people, majority from Wapishan nation) associated with the Kanuku Mountains, and; Kanashen (1 community of approximately 224 people, majority from Wai Wai nation) legally protected as a Amerindian Protected Area (Figure 1). Despite a common history of colonisation by European forces, and subsequent oppression by national governments[13], all three districts have differing development pathways influenced by the agency of Indigenous and non-Indigenous actors, historic and evolving forms of governance, livelihood strategies, culture and worldviews, and underpinned by state policies, markets and changing environmental conditions. This has no doubt contributed to the current state of Indigenous knowledge between these nations as well as within them.

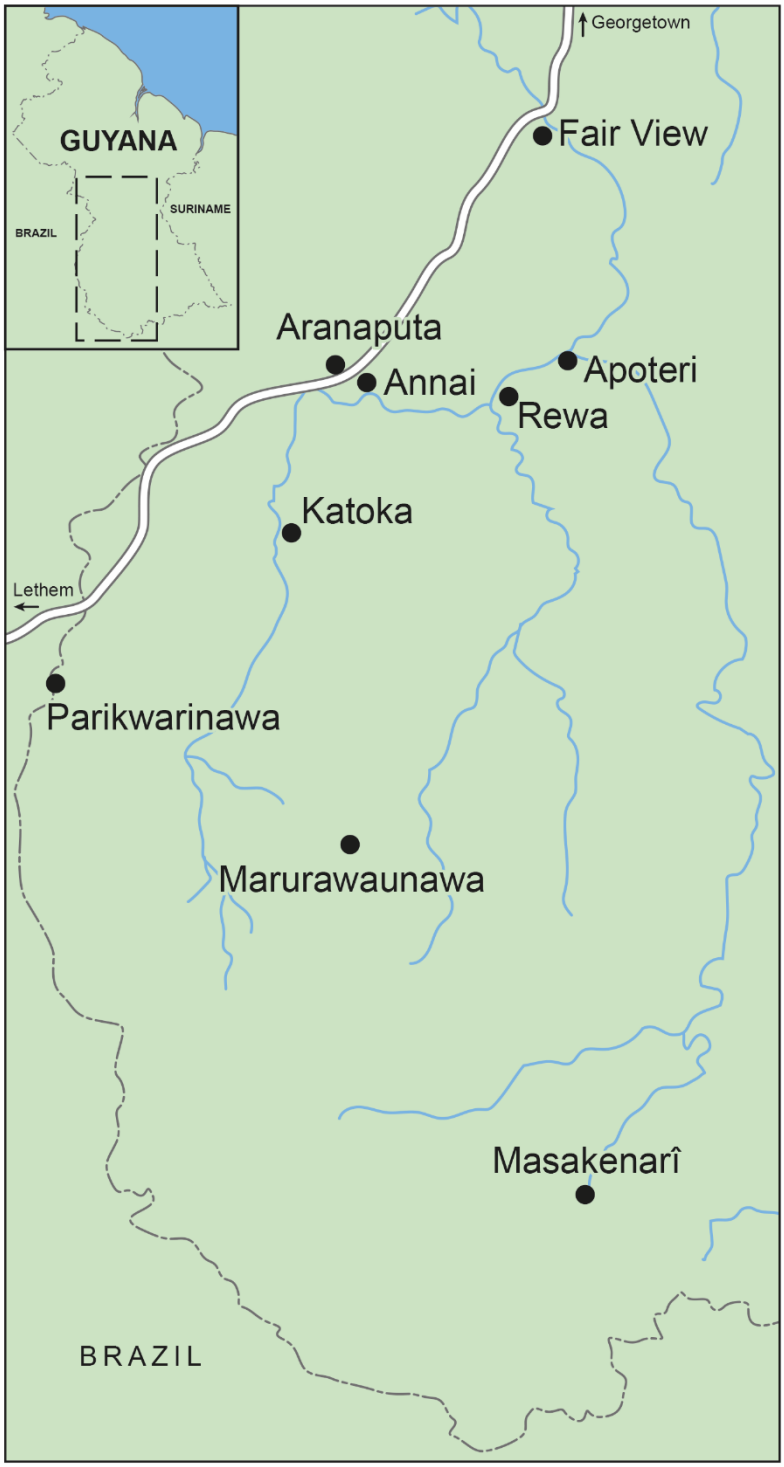

Figure 1. Map showing location of communities directly working in the research.

We worked directly and intensively with 8 Indigenous communities within the three districts (Figure 1). These were: Aranaputa, Apoteri, Fairview and Rewa (North Rupununi); Katoka, Marurawaunawa and Parikwarinawa (South Rupununi); Masakenarî (Kanashen) (Table 1). To date we have had 413 people at meetings, 205 at workshops and 1428 at screenings, representing 60% of the villages population, and out of these 31% were female. Results

from these communities were then compiled by the senior community researchers, and shared with communities at a district level. Thus, we facilitated a cascading system of participation; from individual participants in a village to the whole community and then to other communities. The participatory films and traditional knowledge status data (see below) was then shared in facilitated video-mediated dialogues to specific decision-makers[14]. Here, the aim was to build deeper insights within decision-makers about Indigenous worldviews and knowledge, and to foster inclusive, collaborative and responsive relations between Indigenous communities and decision-makers, particularly around biodiversity conservation and protected areas. Importantly, the data formed the basis of the TKNAP[15], identifying where and how interventions were needed to safeguard traditional knowledge.

Table 1. Participation records as a percentage of the population in each of the eight communities.

VILLAGE	POP	% Attendance Meetings	% Attendance Workshop	% Attendance Screening	% Female Attendance
Apoteri	283	14	8	40	44
Aranaputa	563	4	3	11	14
Fairview	201	22	11	78	96
Rewa	271	22	8	76	71
Katoka	800	13	4	38	17
Parikwaranawa	211	18	15	63	47
Maruranau	830	7	4	37	20
Masakanarî	224	21	11	65	32

3.2 Participatory analysis of traditional knowledge status

Building on previous research with Indigenous Peoples across the Guiana Shield region of South America, we used the system viability framework to evaluate contemporary understandings of how traditional knowledge contributes to Indigenous Peoples lives. As traditional knowledge underpins biocultural sustainability, our aim was to understand the current state of and challenges for that knowledge in order to identify points of intervention. System viability recognises that the healthy survival of any system at any scale requires attention to a number of essential responses to different 'environmental' states (where 'environment' can be the biophysical, social, economic, political)[16,17,18]. Our system viability framework, adapted through previous research with Indigenous Peoples[19,20,21,22], focuses on community responses or strategies to different environmental states, asking the following questions: How do we meet our basic needs? – to exist under normal environmental conditions, you need basic resources such as food, water, heath, shelter and fuel; How do we work with others? – to co-exist with other communities and/or organisations and institutions outside the community, you need good relationships; How do we maintain our identity? – to resist temporary changes in the environment, you need to

draw on past experiences; How have we adapted to new challenges and influences? – to adapt to major and permanent changes in the environment, you need to learn to do new things; What gives us choice and flexibility? – to be flexible in a highly variable environment, you need to have more options; What helps us to be organised and efficient? – to be successful when resources in the environment are scarce, you need to become well organised.

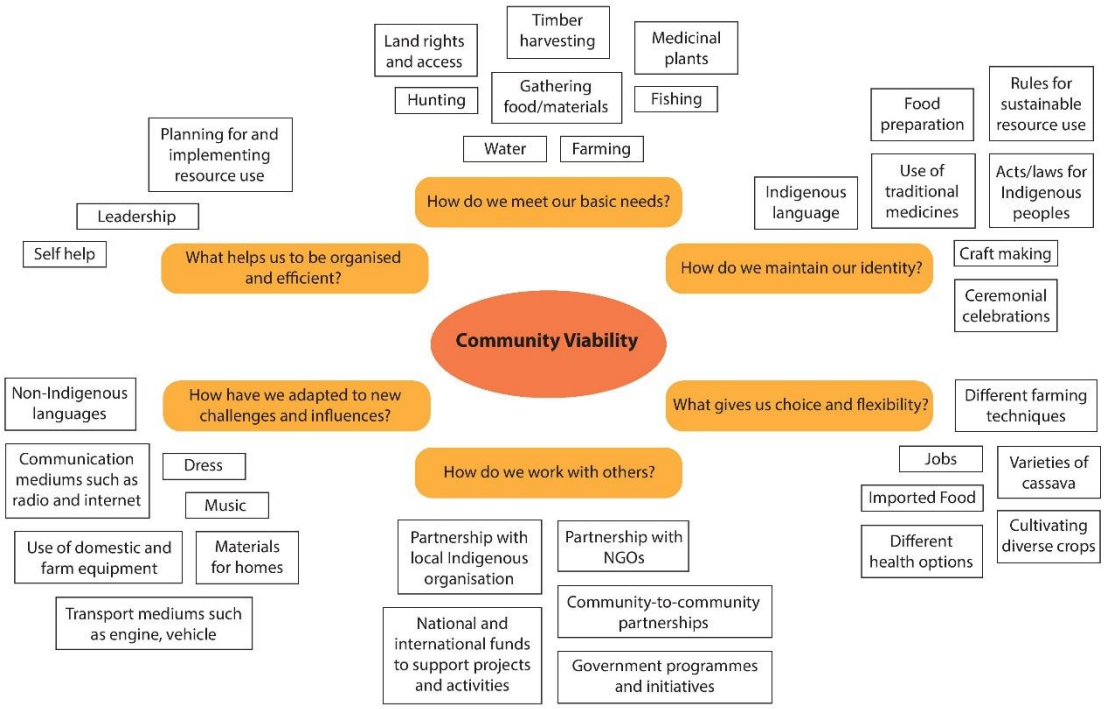

Figure 2. Map of strategies for community viability.

From our previous participatory work with Indigenous communities across the Guiana Shield, we identified a range of strategies that contribute to community viability or survival (Figure 2). This map was used to guide the process of identifying how traditional knowledge contributed to community strategies, and in particular to encourage the senior community researchers who steered the process to systematically scan the multiple dimensions of traditional knowledge in the community being considered. While we recognise that system viability is externally constructed and imposed, we wanted to use a framework that would allow us to compare different districts/Indigenous nations, and importantly, capture the dynamics and adaptive nature of Indigenous knowledge. Our previous research had shown that while Indigenous knowledge systems from different regions are unique, there are common strategies and challenges that they share.

Using the community strategies map as a 'structuring' frame, we undertook 1-2 day participatory workshops in each of the 8 Indigenous communities. In order to foster greater participation and account for differing perspectives, particularly amongst those with less voice within Indigenous communities, we divided community participants into men, women and youth. The senior community researchers led a process of explaining and discussing the community strategies, including identifying any strategies missing from the map. Participants were then asked to identify which strategies in the diagram rely on Indigenous knowledge and why/how. To assess the perceived state of traditional knowledge for each strategy, we used emojis to represent current state from extinct, very bad, bad, acceptable, good, very good and excellent. These choices of possible states were identified and agreed amongst the participating communities through meetings and prior discussions involving the participants and wider community members including village toshaos (leader) and elected village councillors. Each state was characterised as follows: extinct – knowledge completely absent in the community; very bad – poor, sketchy knowledge present in the community; bad – some limited knowledge present in the community; acceptable – adequate, passable knowledge present in the community; good – reasonable, good knowledge present in the community; very good – sound, detailed knowledge present in the community; excellent – comprehensive, deep knowledge present in the community.

In total, there were 24 groups of state ratings comprised of 12 from the North Rupununi, 3 from Kanashen and 9 from the South Rupununi. For analysis, the states were assigned a number from 1 to 7 and analysed for median values. Although we recognise the subjective nature of ratings, clear agreements on the descriptions for each state were discussed and agreed. The aim was not to produce precise figures, but to provide an overall understanding of perceived levels of traditional knowledge.

3.3 Participatory video

Participatory video aligns closely with Indigenous (oral and visual) modes of communication, is more self-directed and provides a deeper examination of Indigenous perceptions and worldviews of traditional knowledge[23,24]. Seen as a longer-term community engagement and mobilisation process[25], where films are planned, made, edited and screened for feedback through a series of iterations, we used participatory video to allow Indigenous communities to explore and express how traditional knowledge contributes to biodiversity conservation, their view on the current challenges and identification of possible solutions to tackle these problems (Figure 3.).

Figure 3. Different phases of participatory video, from top clockwise: discussing and planning story ideas; filming; evaluating and editing; screening and sharing.

In each of the 8 Indigenous communities, between 6-10 people were trained in participatory video techniques over 5-6 days. This started with activities for group forming, internal exploration and horizontal (between participants) videoing and dialogue, such as storyboarding, interviewing, filming, editing and consent/ethics exercises. This was then followed by collaborative production and screenings, where participants developed short films on the topic of traditional knowledge that involved working with the wider community and then screening footage at the end of the day and collecting feedback from the audience. At the end of the training, with Village Council approval, interested participants were assigned as community researchers to facilitate the participatory video process in their community, working on issues of how traditional knowledge contributes to biodiversity conservation, challenges for traditional knowledge, potential solutions to address the challenges and best practices in the community. They were supported by the senior community researchers to produce short films, screen them to the wider community to get feedback and comments, thus stimulating second and third iterations of the participatory video process. As part of the community engagement, these senior community researchers developed an accessible visual consent form, so that any material recorded had the participants' free, prior and informed consent to be shown publicly, to specific decision-

makers and uploaded on the Internet via the project website (see Ethics below). The editing of the videos was shared, with initial editing done by the community researchers and then completed by the senior community researchers. Drafts of final videos were screened back to the communities for final comments and changes, and to obtain final consent for sharing and distribution.

Over 150 hours of footage was collected and transcribed. Our data analysis of the participatory videos looked at the emergence of dominant narratives from the visual and audio materials, and how this was received and modified by the local community. Inspired by grounded theory[26], the process involved assigning a large pool of preliminary themes to images and narration, and then analysing the resulting spread and diversity of themes. This was an iterative process as emerging themes evolved and changed, often involving a reappraisal of film sections. Our results therefore report on the main themes which emerged from the data through an adaptive and emergent process of analysis[27]. It is important to note here that in our analysis we were not seeking to produce a harmonious and homogeneous representation from the Indigenous participants, but recognising the unavoidable tensions between perspectives, and maintaining, rather than erasing differences[28].

3.4 Ethics

We followed the Right of Free, Prior and Informed Consent (FPIC) processes stated in the 2007 United Nations Declaration on the Rights of Indigenous Peoples. This involved developing a short video to explain the project, which was used as the basis of consultative visits to all the villages prior to the research. During these meetings, the aims and methods of the research, safeguarding and data sharing protocols were discussed and established, through English and the communities' Indigenous language. A visual consent form - outlining project details, conditions of participation and intended output distribution - developed by the Indigenous researchers was discussed and finalised. We did not see FPIC as a one-off process; during each visit to the community, there was time and space to discuss the research and wider project, and to ensure that people continued to want to participate. In addition, the research underwent a full ethics review at Royal Holloway University of London (UK), and in Guyana we obtained permission from the Environmental Protection Agency, the Ministry of Amerindian Affairs, and each village toshao (leader).

We established data management protocols through the FPIC process. No personal data beyond name and village was collected. Data is owned by the communities in which they were obtained, with storage and access negotiated and agreed at the start of the project. Participants could request for any video recordings made of them to be deleted without requiring justification. Our regular screenings of video material to individuals and within communities aimed to ensure the highest standards of editing ethics, representation and informed consent. Video footage was first broadcast within the contributor groups, and then permission sought for broadcasting to other stakeholder groups and for inclusion online. All materials agreed by the Indigenous communities to be publicly available is licensed under the Creative Commons "Attribution Non-Commercial No Derivatives"

protocol. This stipulates that any distribution of original material will need to have the original authors cited, the material cannot be used for profit-making purposes, and the material cannot be modified/edited/remixed without the consent of the original contributors.

All necessary travel and subsistence costs for participants were covered by the research funds. Community researchers were paid stipends commensurate with local salary scales and agreed by village toshaos and councillors. During village meetings refreshments were provided to community members, and during final screenings of participatory films, food was also provided. This was in line with Indigenous customs of communal provision and sharing of food at celebratory events. In addition, the project supported the village economy through the purchasing of local food items, the use of community members as cooks, and the hiring of local transportation and generators where needed.

Participatory research, including participatory video, is not without its tensions and challenges. Our positionality as foreign academics, non-Indigenous, Indigenous, brown, black, white, male, female, mothers, young, old, all affect how we are perceived and ways in which we interact in the research process[29]. Participation is rarely equal within communities[30], and the Indigenous and community researchers play a critical role that enables greater involvement of people, but can sometimes come at personal cost[31,32]. Although we employed approaches that build Indigenous agency and support collective action, a continual navigation of tensions was fundamental to our research practice, exactly because our project seeks to tackle the balance of social influence where there are vested interests in maintaining inequality. As researchers, we have examined our own beliefs, positioning, judgments and practices during the research process, and how these may have influenced the findings, and the activities and communications that result. And where possible, we have acted upon those reflections as the participatory processes unfolded to make the research more effective and ethical.

SECTION 4. RESULTS AND DISCUSSION

4.1 Challenges for traditional knowledge

Data collected during workshops identified that in all communities the most important challenges associated with traditional knowledge were language, craft and related activities, beliefs and stories, and traditional medicines (Figure 4).

There are some differences between districts (Figure 5); for the North Rupununi communities, beliefs and stories did not play such an important role, perhaps since this type of knowledge is not seen as very practical to everyday living. While it is acknowledged that the art of storytelling and practicing elements of traditional beliefs are on the decline, many people are still knowledgeable of traditional stories and believe enough in the healing spirits and medicines to visit the few remaining shaman or piaimen when they feel modern medicines cannot provide a cure (it should be noted that many of these piaimen are not trained according to older methods of training but are familiar with some of the practices of healing).

In Kanashen, communities were worried about the materials needed for building homes. This issue was raised by the women. The issue surrounds the use of materials for construction projects in the village and not building materials for building homes. They believe that villagers should have the opportunity to bid on and implement construction projects in the village. With this ability it is believed that they should be given the same permissions to collect materials from the protected area as given to outside contractors when carrying out a government contract. They also voiced concerns of chainsaws being used to clear forest for farming in which there is the potential to over-cut i.e. clear more forest than is actually needed. A loss of togetherness was seen to impact the extent to which people in the community volunteered their time for community beneficial activities. It is believed that the drive for finances is what is behind this decrease in community self-help. It is thought that people are looking to be paid to do the work that is needed instead of lending that time. This is because people are looking to buy things not found in the community.

For the South Rupununi communities, the over use of seine nets and carapixes (plastic seine nets) was a concern for the sustainability of their fish resources, as was the increasing reliance on imported non-Indigenous food and its potential impacts on health and well-being.

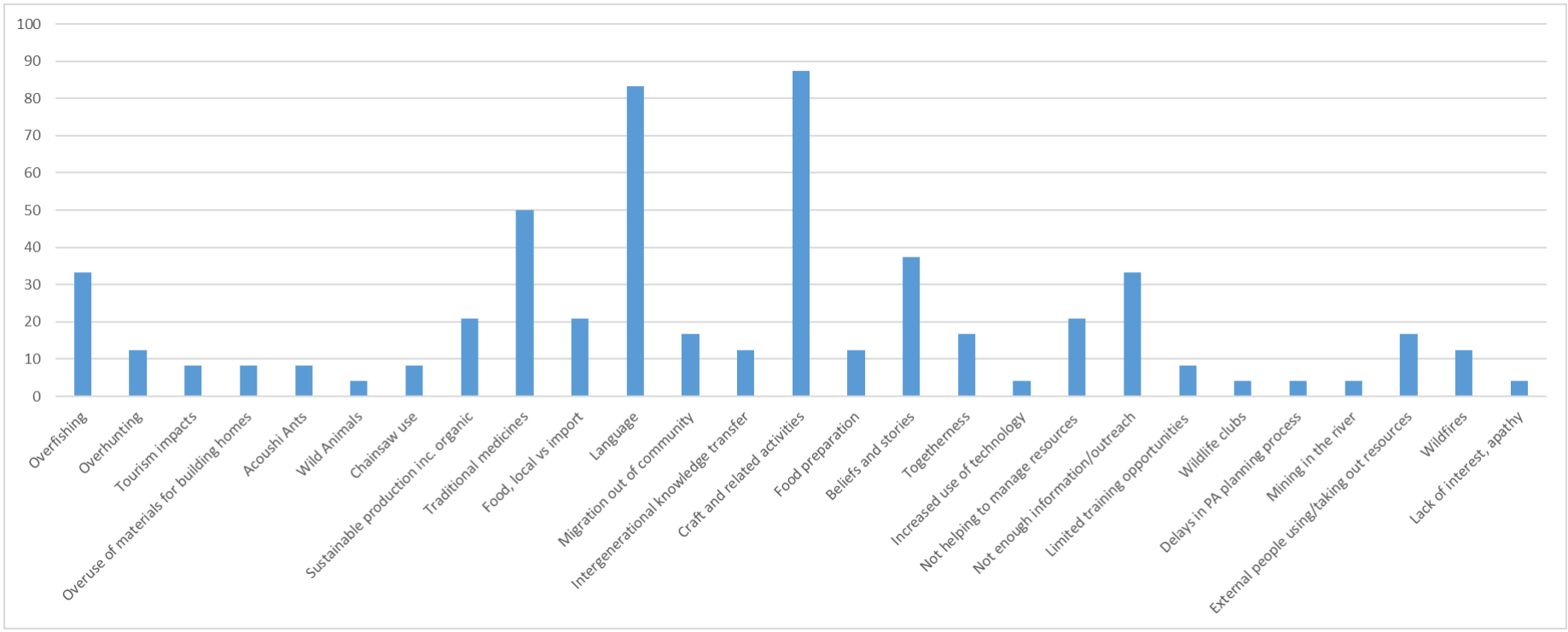

Figure 4. Percentage of focus groups identifying different challenges (n = 24).

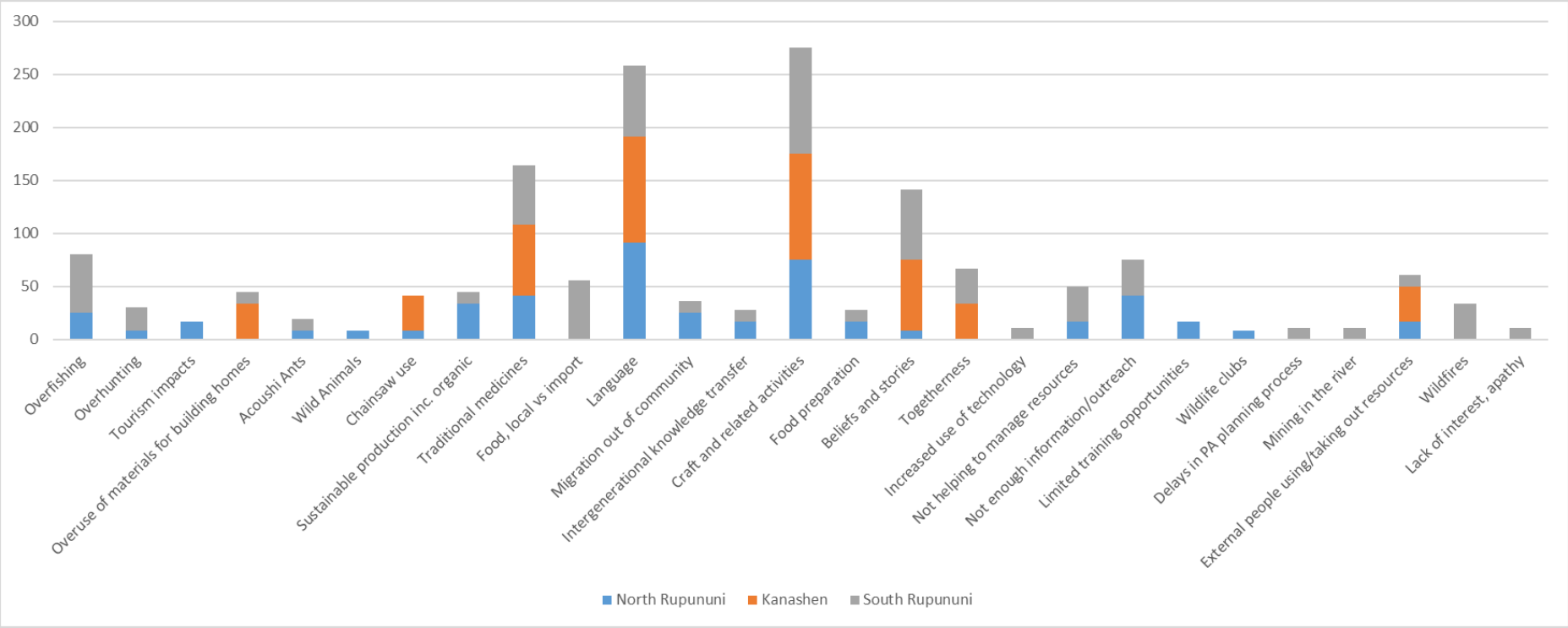

Figure 5. Percentage of focus groups identifying different challenges in each district (North Rupununi = 12, Kanashen = 3, South Rupununi = 9).

In terms of the protected area, communities from the North Rupununi were worried about the lack of information and outreach from Iwokrama following the long history of engagement and interventions of Iwokrama with the North Rupununi communities. Similar concerns were raised by South Rupununi communities, especially in regard to what resources could be extracted / harvested from the protected area. Uncontrollable wildfires were also highlighted by South Rupununi communities as a threat to resources in the protected area. Kanashen's main concern was around external people illegally harvesting resources from their land and their inability to monitor and report on these activities.

Figure 6 shows that all members of the communities agreed that the greatest challenges were language, especially where it pertained to the younger generation being able to read and write the language as well as speak it, and craft making. Men were particularly worried about fish resources, women about food preparation and associated healthy lives, and youth on obtaining information about the protected areas. For many, the engagement and planning for the protected areas occurred while they were very young and as such, they have little understanding of the decisions their elders made in terms of their engagement with the protected area or in becoming a protected area. Non-attendance at community meeting also adds to that continued lack of knowledge.

4.2 Traditional knowledge and community strategies

Table 2 outlines the main ways in which Indigenous Peoples associate traditional knowledge with community survival strategies. It is clear that in most cases, Indigenous People relate to or 'measure' traditional knowledge by a collective sense of whether that knowledge is present in the community, rather than a particular number of people that hold the knowledge. This accounts for the multiple aspects of many strategies, particularly those related to livelihood practices, as well as the knowledge being at different levels of 'expertise' within different age/gender groups. For example, fishing involves knowing different species, the season(s) during which they can be caught sustainably, the different waterways (ponds, creeks, rivers) that different species inhabit, ways of tracking and trapping fish, the various tools (e.g. nets, spear, bow and arrow) specific to different species, and how to make them. Different members of the community – elders, men, women, youth, children – will have different levels of this knowledge. Thus, measuring traditional knowledge quantitatively in practice would be challenging and choosing individual elements would not capture the complexity of the knowledge and its status.

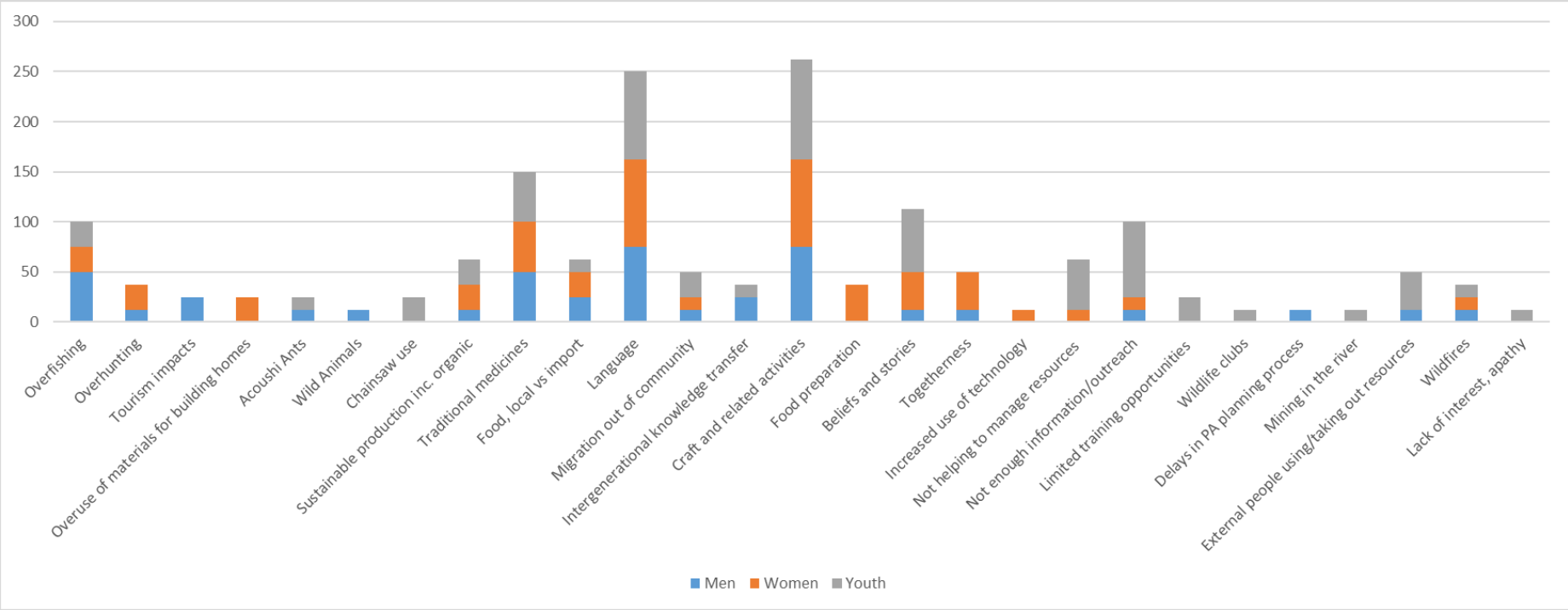

Figure 6. Percentage of focus groups identifying different challenges in each groups of men (n=8), women (n= 8) and youth (n = 8).

Table 2. The ways in which Indigenous Peoples link traditional knowledge to each of the community viability strategies.

Strategy (within system viability category)	**How is it related to traditional knowledge?**
How do we meet our basic needs?	
Land rights and access	Owning land (land title) is the basis of sustainable Indigenous practices. Place is integral to Indigenous identity and worldviews, and the traditional knowledge that stems from it.
Hunting	Knowing the species, seasons, location, ways of tracking and trapping, tools and how to make them.
Medicinal plants	Knowing the species, seasons, location, ways of finding and harvesting.
Fishing	Knowing the species, seasons, location, ways of tracking and trapping, tools and how to make them.
Timber harvesting	Knowing the species, seasons, location, methods of felling.
Farming	Knowing the process of rotational farming; clearing land in the forest, burning, planting, looking after plot and harvesting.
Water	Knowing sources and quality. Knowing different waterbodies and how to navigate waterways.
Gathering food/materials	Knowing the species, seasons, location, ways of finding and ways of harvesting.
Traditional mining (*only in Kanashen*)	Knowing the seasons, location, kinds of soils and rocks, tools and how to make them.
How do we maintain our identity?	
Use of traditional medicines	Knowing species, parts to use and how to use it, including methods of preparation.
Ceremonies, beliefs and stories	Knowing rituals and beliefs, for example, associated with farming, hunting, fishing, landscape, as well as stories associated with identity.
Indigenous language	Knowing how to speak, the words associated with different practices and places.
Food preparation	Knowing how to process and cook crops, particularly cassava and all its by-products.
Craft making	Knowing how to make basketry, cotton weaving, pottery, wood work, and all the tools associated with livelihood practices.
Rules for sustainable resource use	Customary land management, through village toshao (leader) and council, use of traditional beliefs and rituals.

Acts/laws for Indigenous Peoples	Amerindian Act (*legal act created in 2006*). To recognise and protect the collective rights, land and practices of Indigenous communities.
Indigenous dress and music	Knowing how to make and wear traditional dress, jewellery and ornaments, knowing the songs and dances.
Shaman (*known as 'Piaimen'*)	Person who is knowledge holder for prayers, medicine, and spiritual beliefs.
What gives us choice and flexibility?	
Different farming techniques	Knowing various locations, soils, the different methods dependent on location, and how to grow crops in different farm contexts.
Varieties of cassava	Knowing the location, soil and climate, and variety of cassava to plant. Knowing the different varieties of cassava.
Cultivating diverse crops	Knowing the variety of crops, the different location and seasons for planting.
Imported food	Supports local food security, as well as tourism enterprises, alongside diets based on traditional crops.
Different health options	Persons trained in both traditional and conventional medicinal use, to complement each other.
Jobs	Employment opportunities through tourism, craft-making, research and other biodiversity-based enterprises.
How do we work with others?	
National and international funds to support projects and activities	Enable land rights, traditional livelihood practices, culture and conservation.
Partnership with local Indigenous organisations	Represent and promote Indigenous rights and knowledge from the community to the national level.
Community-to-community partnerships	Promote shared understanding, use and governance of land and resources.
Partnership with NGOs	Build alliances and networks to promote land rights, traditional livelihood practices, culture and conservation. Support in advocacy for Indigenous rights.
Government programmes and initiatives	National level efforts to support land rights and traditional knowledge e.g. land titling, bilingual education.
How have we adapted to new challenges and influences?	

Non-Indigenous languages	Support campaigns and lobbying of Indigenous rights, promote traditional knowledge in non-Indigenous arenas, help bi-lingual programmes.
Communication mediums, such as radio, video and internet	Way of sharing information on traditional knowledge and language. Access information to learn what is happening in the wider world regarding other Indigenous groups and their traditional knowledge.
Transport mediums, such as engines and vehicles	Support traditional livelihoods, as well as jobs based traditional knowledge e.g. tourism
Use of domestic and farm equipment	Support community enterprises based on traditional knowledge e.g. forestry, peanut / cassava factories.
Dress	Supports revitalisation of traditional dress / costumes and use of materials / textiles in traditional dress making.
New materials for buildings	Supports local construction, complementing and adapting buildings made with local resources.
Music	Adapting non-Indigenous music genres to support traditional knowledge and language.
What helps us to be organised and efficient?	
Leadership	Person(s) to community in management and governance of land, and maintaining traditional knowledge.
Self help	Promotes collectiveness and social cohesion in community.
Planning for and implementing resource use	Collective planning of resources using traditional knowledge to ensure long-term sustainability.

Figures 7, 8 and 9 show the perceived level of traditional knowledge for the community strategies for all communities, for different groups and for different regions, respectively. The graphs indicate that overall, traditional knowledge is perceived at a relatively low 'acceptable' state, there are few differences between men, women and youth, but there are some marked differences between regions.

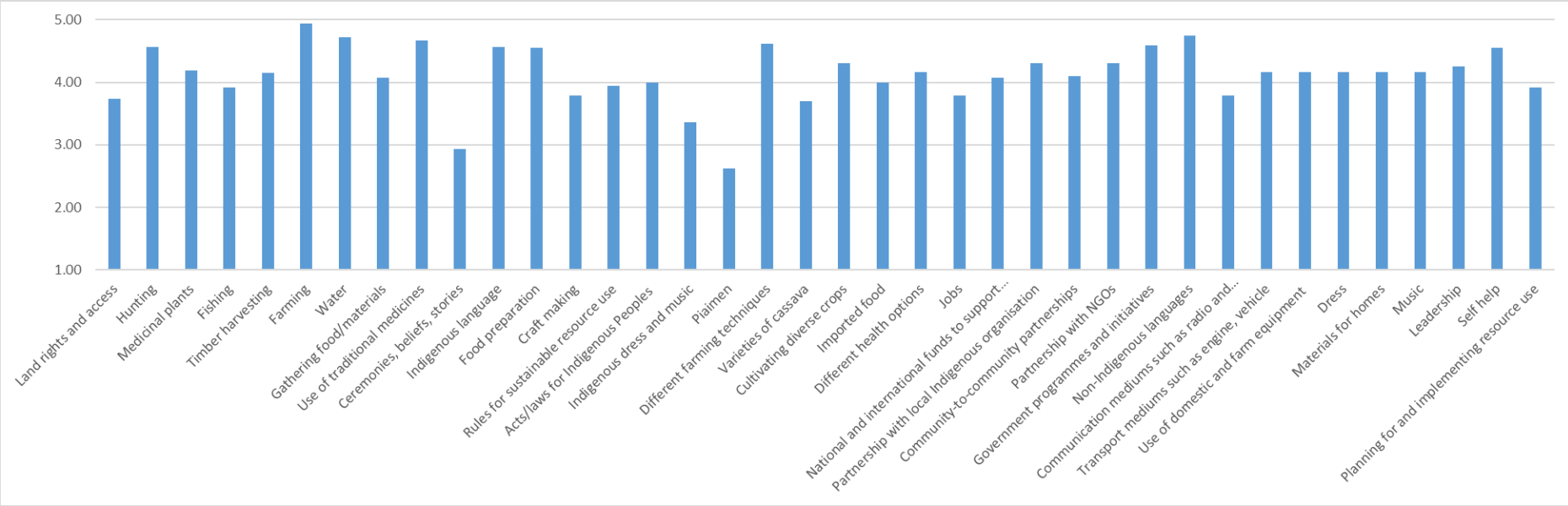

Figure 7. Median traditional knowledge values for all communities sampled, where 1 = extinct, 2 = very bad, 3 = bad, 4 = acceptable, 5 = good, 6 = very good and 7 = excellent.

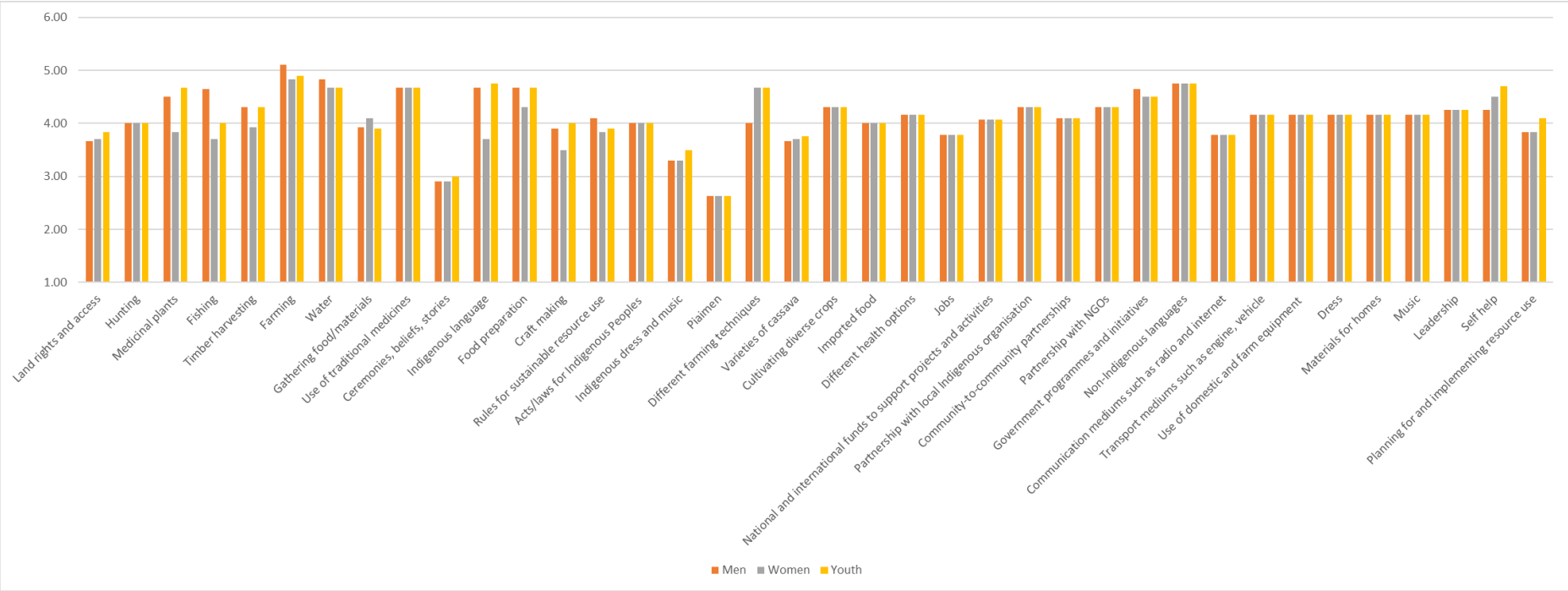

Figure 8. Median traditional knowledge values for men, women and youth in all communities sampled, where 1 = extinct, 2 = very bad, 3 = bad, 4 = acceptable, 5 = good, 6 = very good and 7 = excellent.

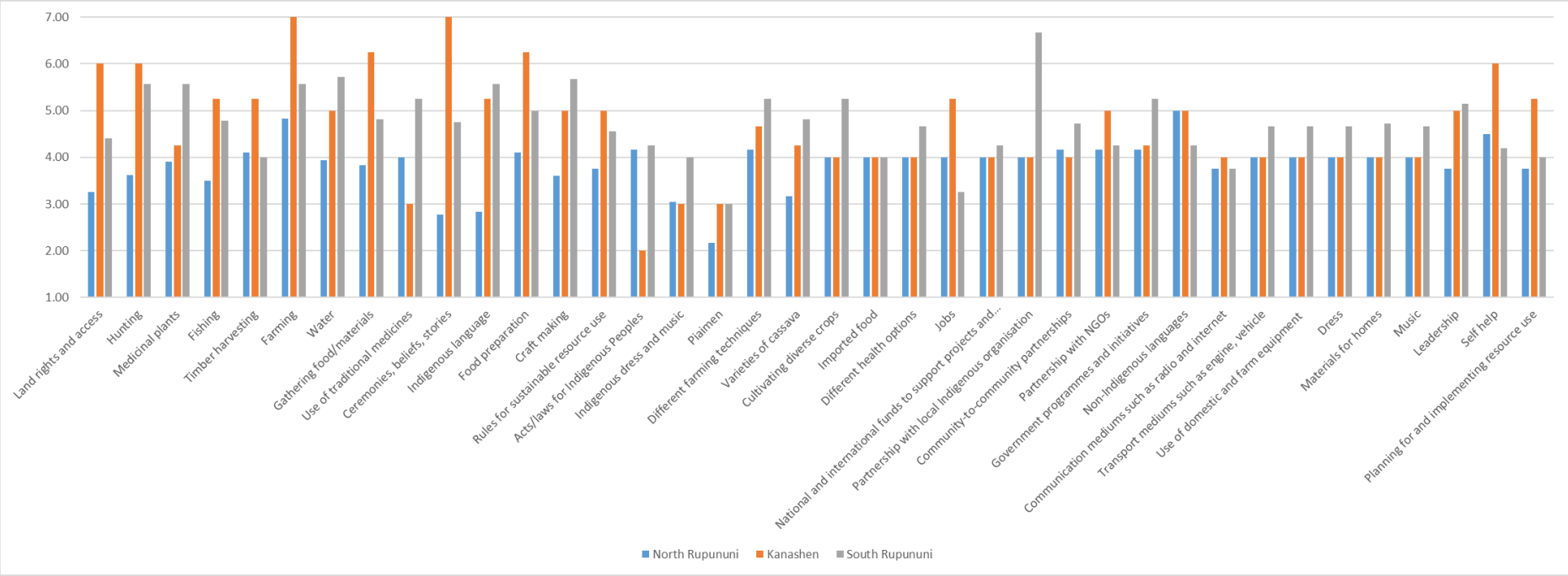

Figure 9. Median traditional knowledge values for communities sampled in each region, where 1 = extinct, 2 = very bad, 3 = bad, 4 = acceptable, 5 = good, 6 = very good and 7 = excellent.

Most traditional knowledge of community strategies in the North Rupununi communities are perceived to be either 'acceptable' or 'bad', with a few in the 'good' category. Many of these were deemed acceptable as they are being practiced on a daily basis or there is some level of engagement with non-governmental and government partners. These are thought to ensure healthy, sustainable living and strong partnerships that promote community development. Of these, timber harvesting, farming, water, Amerindian Act and government programmes and initiatives were considered in a particularly good state. Those areas considered in a 'bad' state are perceived to be on the decline or limited for one reason or another. For example, issues with land rights and access stems from some communities' decision not to accept land title. Communities who have historically utilised resources in the adjacent lands believed to be under neighbouring user rights, made and were granted legal claims to these lands. Particularly community members were then barred from utilising certain resources due to their methods of harvesting which were deemed detrimental to the resources.

Kanashen have more strategies with 'good', and even 'very good' traditional knowledge, such as land rights and access, hunting, gathering food/materials, self-help and planning resource use. Farming is perceived to be 'excellent'. The Wai Wai's are the most isolated of the Indigenous groups in Guyana and as such are heavily dependent on their traditional skills for their survival. The only areas perceived to be 'bad' are ceremonial celebrations and the piaimen, and Indigenous dress and music is perceived to be 'very bad'. Of these two strategies considered 'bad', religion plays a role in their decline. Since their conversion to Christianity in the 1960s, many of the ceremonial celebrations that were related to traditional spiritual beliefs were stopped. It was, however, indicated that some of these elements are not completely dead. It was said that some are still being practiced but not in the open. Indigenous dress and music which was labelled as 'very bad' is linked to the ban of ceremonial celebrations. Any ceremonial dress seen in the community has been borrowed from their Brazilian cousins and made from materials accessed from Brazil. Most of the music played and sung in the community are religious in nature.

South Rupununi communities also have a greater number of 'good', and 'very good' states of traditional knowledge, including livelihood practices such as hunting, fishing and farming, and their ability to speak their Indigenous Wapishana language. Relations with their representative Indigenous organisations, the Kanuku Mountain Community Representative Group (KMCRG) and South Central Peoples Development Association (SCPDA) is perceived to be 'excellent'. The relationship with the community representative groups is seen as excellent as over the past 10 years the communities have seen the benefits these groups can bring. SCPDA has helped the communities with a landscape planning initiative, KMCRG has worked with their communities on resource mapping and planning for community development through the drafting of 10-year village improvement planning. These groups also serve as advocates on community issues. The current Chair and Vice Chair of KMCRG are executive members of the National Toshaos Council holding positions of secretary and chairman respectively.

Areas perceived to be 'bad' are ceremonial celebrations, traditional rules for sustainable resource use, and jobs or employment in the communities, particularly for young people. Ceremonial celebrations are on the decline in most communities. Many of the ceremonies celebrated today are only done during the annual Indigenous Heritage Celebrations. There is little link to these ceremonies throughout the rest of the year and as such, important elements are being lost. The same could be said about using traditional rules for sustainable resource management. Many of these rules were linked to spiritual beliefs and as communities move further from these beliefs in favour of Christianity the impacts felt in conserving resources are reduced. Communities are finding it difficult to develop sustainable enterprises that can bring employment to their villages. The challenges come with obtaining the needed finances and getting products to the market. Many of the initiatives devised so far are linked to their agricultural culture. The difficulty lies with sourcing cost friendly transportation to the markets, good roads that would allow products getting to the markets in a timely manner, inability to sell beyond Guyana's borders – making use of the Brazilian market vs sending products to Georgetown are among the many constraints that communities face. For jobs that are being created through donor funded projects there is a lack of confidence that community members have the qualifications to fill the positions.

In terms of identifying the most important area of traditional knowledge, North Rupununi communities highlighted fishing, farming and language, whereas in Kanashen there were no particularly important indicators. South Rupununi communities identified hunting, fishing, farming, land rights and gathering food /materials. When looking across gender and age, men highlighted fishing and hunting, women farming and language, and youth land rights, hunting and farming.

When the community strategies are grouped according to the system viability categories (Figure 10), there are little differences, with levels of traditional knowledge in most categories around 'acceptable'. Comparing between districts (Figure 11), the largest differences are in the categories of basic needs and being well-organised, with Kanashen having the highest perceived levels. Kanashen and the South Rupununi communities also perceive traditional knowledge for maintaining their identity at a higher level than the North Rupununi.

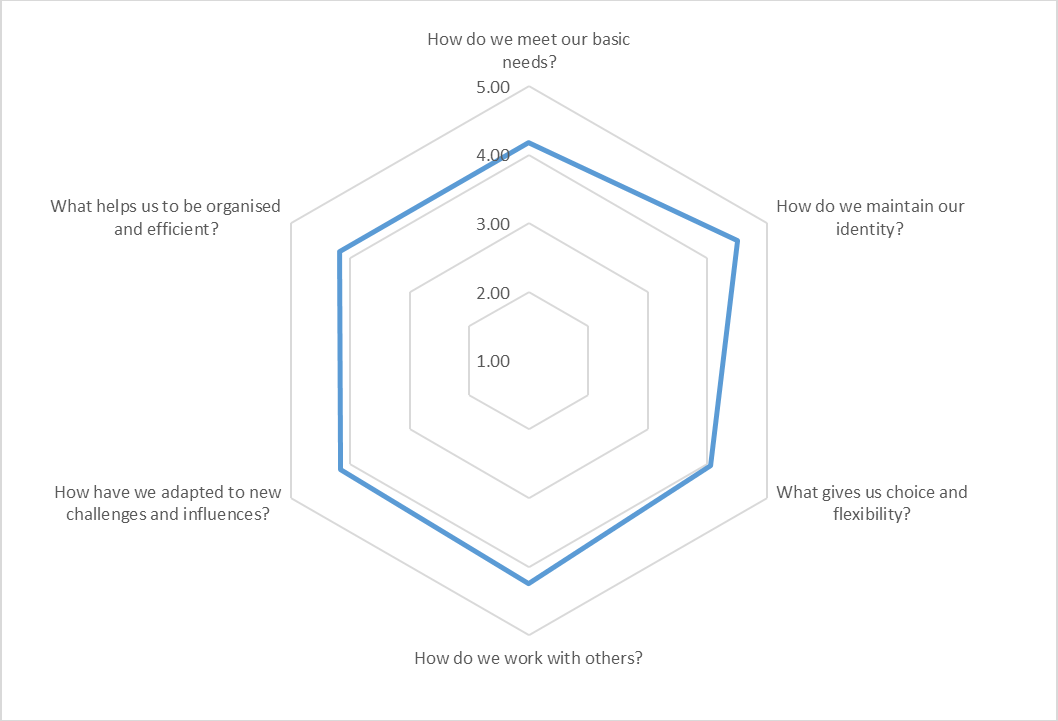

Figure 10. Median traditional knowledge values for each system viability category for all communities sampled, where 1 = extinct, 2 = very bad, 3 = bad, 4 = acceptable, 5 = good, 6 = very good and 7 = excellent.

Figure 11. Median traditional knowledge values for each system viability category for communities sampled in each district, where 1 = extinct, 2 = very bad, 3 = bad, 4 = acceptable, 5 = good, 6 = very good and 7 = excellent.

4.3 Solutions for traditional knowledge loss

There was an overwhelming portrayal within the participatory videos of Indigenous people as custodians of biodiversity (Figure 12), illustrated by quotes such as "*Amerindian always be friendly to the forest because it's their home. The real strength of the Amerindian people, they don't destroy the forest*" and "*We continue to practice our traditional knowledge by keeping our traditional Indigenous language and sustainably manage our forest biodiversity and other ecosystems. We still keep our traditional culture e.g. hunting, fishing and gathering, still living our way of life*". However, there is real concern about extractive and/or illegal activities affecting the biodiversity that people rely on, with fisheries in particular being mentioned by many of the storytellers. At the same time, communities realise that traditional knowledge and governance is declining as exemplified by the following; "*As Amerindians within the community, we also need to look at responsibility to ensure that we continue to do sustainable activities and should adhere to rules and regulation*". This corresponds with the traditional knowledge status data (Figure 7), showing that many livelihood practices and rules for sustainable use are perceived to be 'acceptable' or below.

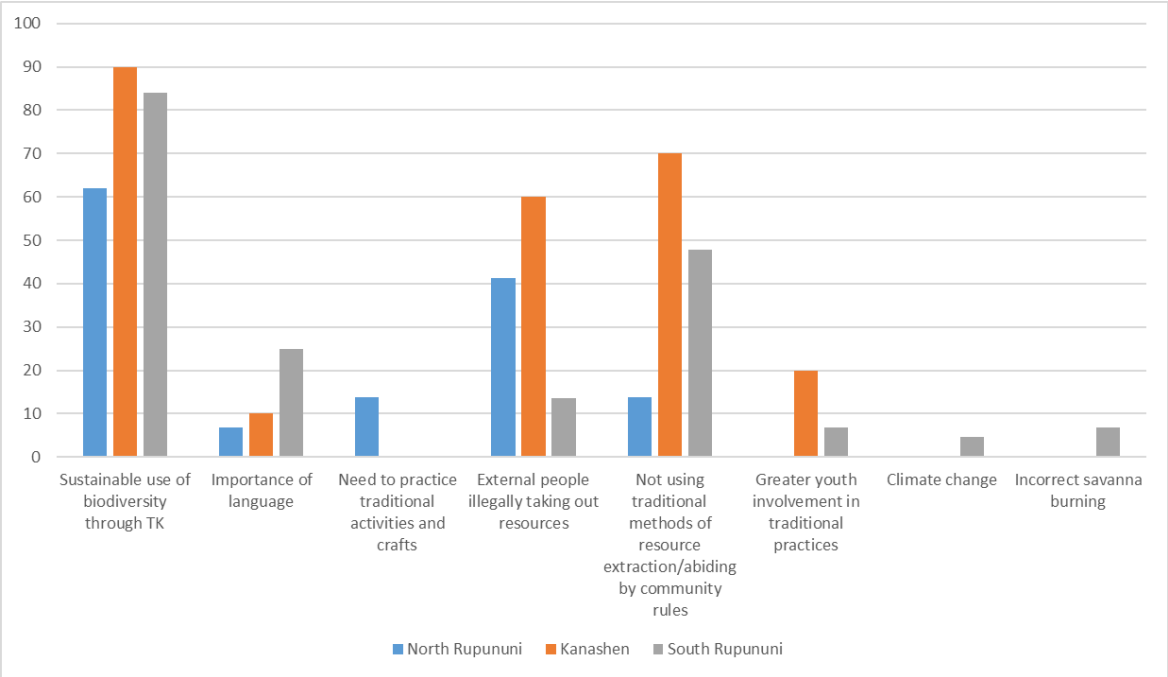

Figure 12. Percentage of main themes mentioned in the participatory films, where number of storytellers were 26, 10 and 44 for the North Rupununi, Kanashen and South Rupununi respectively.

When the participatory videos on traditional knowledge were screened and shared within communities and wider between communities (Table 3), people supported and corroborated the content, particularly the role of livelihood practices such as farming, hunting, fishing and gathering in sustaining biodiversity. They acknowledged the many challenges facing Indigenous Peoples in terms of traditional knowledge loss, including new

methods of fishing and hunting leading to overharvesting, fewer young people speaking Indigenous languages and making craft (for example, objects linked directly to livelihood practices such as baskets), and a sense of collectiveness that ensures community members care and help each other e.g. in farming and village maintenance. At the same time, they were able to easily identify the solutions for addressing their challenges, most of which could be done by Indigenous Peoples themselves. Similarly, for the challenges arising with their associated protected areas, communities identified ways in which their concerns could be addressed (Table 4).

Table 3. Main topics of discussion from community screenings of participatory videos.

Region	**Sustainable use of biodiversity through traditional knowledge**	**Challenges for traditional knowledge**	**Solutions for maintaining and strengthening traditional knowledge**
North Rupununi	Farming, hunting, fishing, gathering, timber harvesting, planning for and implementing resource use	Overharvesting of fish through seine nets, traditional medicines, language, out-migration of youth, craft-making	Communities have consultations, enforce village rules to stop overharvesting. Check points at key fishing locations. Revive use of traditional medicines through demonstrations, video recording, training. Develop craft-based businesses.
Kanashen	Farming, hunting, fishing, gathering, rules on resource use, patrolling territory	Chainsaw use in farming, timber materials, traditional medicines, language, craft-making, beliefs and stories, community cohesion	Involvement of elders in formal language and craft teaching. Documenting traditional knowledge through videos, photostories and books. Encourage activities to bring groups across the community together, such as hunting, gathering, preparing food and eating.
South Rupununi	Farming, hunting, fishing, language, gathering, craft making	Overharvesting of fish through seine nets, traditional medicines, traditional foods, language, craft-making, beliefs and stories, community cohesion	Bi-lingual language teaching in schools. Help youth prepare locally made food for community gatherings or celebrations. Share success stories between communities and Indigenous nations.

Table 4. Solutions identified by all communities to key challenges with protected areas.

	Solutions		
Challenge	**Within the power of the community to address**	**Outside of the power of the community to address**	**Can be addressed by the community with the help of outsiders**
Awareness- Not enough information/outreach about protected area	Share their [protected area] success stories they have achieved since in existence so that communities can copy/replicate same to better manage their community resources. Write Iwokrama officially on their inadequate outreaches and offer recommendations for improvement. Recommend community friendly personnel to do such outreach.		Having workshop with farmers and village council and other persons about protected area boundaries. Focused engagement with youth in communities to inform them about the protected area.
Wildlife clubs – have been neglected	Reforming of wildlife clubs		CI/WWF/Iwokrama/EPA providing support to clubs in form of education material, equipment and outreach.
Protected area management - planning process is dragging, goals not being achieved		Park managers to monitor and inform protected area communities of their activities.	KMCRG to be more active to understand Protected Areas Commission processes.
Illegal resource extraction - External people using/taking out resources	Communities can provide informal information on what is happening on the rivers when they go about their daily business.		More patrols and check points to monitor access. Iwokrama and Protected Areas Commission to help resolve access issues. Check point built at the Siparuni mouth [Iwokrama]. Sign boards.

4.4 Traditional knowledge in other surveys

There are currently two surveys being carried out on a regular basis in Indigenous communities in Guyana. These are the Community Monitoring, Reporting and Verification (CMRV) surveys in the North Rupununi communities, and the Knowledge Attitude and Practice (KAP) surveys being done by the Protected Areas Commission (PAC) in Kanashen, Kanuku, Shell Beach and Kaieteur protected areas associated communities.

The original CMRV program, funded by Global Canopy Programme, started in 2012 and ran until 2014. WWF restarted the CMRV program in August 2016 and concluded in 2018. The programme involved one year of training, and then one year of data collection in 2012 and another in 2018.

The CMRV surveys are carried out by trained local Community Resource and Environment Workers (CREWs). The CREWs carry out a combination of interviews and monitoring activities (GIS mapping) to assess the use of the resources within community lands. Data collected is stored in a central location at the North Rupununi District Development Board (NRDDB) compound Bina Hill, where a data management lab was set up. Each month the CREWs brought in their data to be downloaded, analysed and a report generated that could be shared with the community so they could understand how the data they provided was contributing to making better management decisions and use of community land and resources. Data collection focuses on community wellbeing, farming, fishing, timber, wildlife and other natural products. Although in the initial phase of the data collection, results were shared back with the community, it is not clear whether this has continued and how the data informed community activities. Presently, WWF's monetary support of the process has come to an end and the NRDDB is in the process of identifying and negotiating with other potential supporters of the monitoring scheme.

KAP Surveys are carried out by the staff of the PAC in every village associated with the various protected areas. These surveys help to assess the overall wellbeing of community members regarding their access to resources within the protected areas and what are the major concerns facing them. The survey also provides the opportunity for the PAC to reiterate the purpose of the protected areas and clarify misconceptions related to the use of resources within protected areas by villagers. KAP survey results are shared back with communities and the PAC seeks to use this data to support community needs/interests.

To date, KAP surveys have been completed in the Kanuku associated communities (2016) and results reported back. In the Shell Beach communities, surveys were completed in six communities (2018) and results reported in three. The PAC aimed to continue the surveys in other protected areas during the course of 2019 and 202, but activities have been delayed as a result of Covid-19.

Table 5 shows that the CMRV survey addresses some aspects of traditional knowledge identified by communities as important or in a 'bad' state. However, much of the data being collected in the CMRV is focused on the state of things, for example, fishing in terms of species abundance rather than the knowledge needed to be able to fish sustainability. The KAP surveys are focused on resource use, rather than traditional knowledge per se. This

highlights that there is a need for protected area institutions to consider inclusion of more appropriate measures of traditional knowledge into their monitoring surveys, that better reflect the concerns and worldviews of Indigenous communities.

Table 5. Questions in the Community Monitoring, Reporting and Verification (CMRV) surveys that directly address traditional knowledge.

Questions
Has any of the game species you kill most become notably scarcer over the past 5 years?
Which natural products does your household collect most? (Excluding game, fish and timber)
Has any of these natural products you collect most become notably scarcer or smaller compared to 5 years ago?
Has any of the fish species you catch most become notably scarcer or smaller compared to 5 years ago?
Do you speak your native language?
How many persons in your household speak your native language?
Do you try to keep your culture alive?
If yes, how do you keep your culture alive?
Do you make canoes at the farm?
Do you use medicinal plants?
Do you have Bina plants? What kind of bina? What is the bina used for?
Can you name stars? Stories about stars?
Traditional beliefs and signs that predict the weather?
Change in weather patterns?
Cassava varieties, planting methods, processing, bi-products, amounts?
Crop varieties and amount grown?
Peanuts grown and amounts?
How do you feel about the quality of the leadership in the community?

SECTION 5. CONCLUSIONS

Our results contribute to understanding how Indigenous Peoples in Guyana currently perceive the status of their knowledge, and uniquely, provide a national-level baseline for conservation and development policies. Compared to the pre-determined, broad and frequently expert-led assessments of traditional knowledge at a national level, as exemplified by the Aichi Target 18 measures, we have presented a method that can be used across Indigenous nations and that captures a more detailed and complete picture of the status of traditional knowledge from the knowledge-holders themselves. Critically, the data collected has enabled clear identification of areas for intervention and has directly informed the development of the Traditional Knowledge National Action Plan (TKNAP) that is currently in public consultation phase.

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