

Study on Edible orchids activities in the Nyika National Park and the surrounding communities with focus on drivers and consequences to find entry points for action

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Executive Summary

Northern Malawi is experiencing gradual spread of Chinaka consumption and local-stock depletion of the wild orchids that are used in baking Chinaka cake. Without proper intervention, orchid population will decrease, people will lose part of their livelihood, while others further risk their safety and security by harvesting illegally inside protected areas. Chinaka collection is low capital cost, high-risk, and high-return business for many of the rural households. Most collectors and traders involved in Chinaka activities desire a way for 'legitimate' use and trade to improve their livelihood. Decline in Chinaka orchids is not in their interests, and they are willing to be part of conservation efforts.

This study hopes to contribute to finding pathways to improve the survival of orchids population and the sustainability of community livelihood. Its findings may improve understandings about the issue to consider for specific interventions, be it in policy, management, campaign and outreach, etc. The findings may also contribute to the broader discussion between total-ban versus controlled use. Within this wider context, the objective of this study is *to obtain a better understanding of how people living around the Nyika National Park have come to be a part of the growing regional Chinaka value chain*. To reach such understanding, the study focuses on exploring three dimensions: the *value chain*, its *actors* and their *perspectives*. 1) The "value chain" pieces together a broad picture of how the value chain, or the system from collection to consumption, currently works and has come to the current status. 2) The "actors of the value chain" profiles the group of involved individuals according to their conditions of opportunity, empowerment, and security as well as examining the conditions that make people enter and transition in the value chain. 3) The "perspective" collects individual knowledge, perception and willingness around three topics: orchids, trade, and governance. Below sections briefly summarizes the findings per dimension.

1) Value Chain:

Once subsistence food ingredient, the wild orchid tubers (ranging in 30+ species of terrestrial orchids) have become a commercial commodity for making the dish known as Chinaka. This transition into a commercial commodity is hinged on the growing market. The expansion is estimated to have reached northern Malawi in mid-1990s but became commercial only in mid-2010s. In northern Malawi, Chitipa District Capital (DC) is currently the main hub for Chinaka tuber trade and consumption, where trade among Zambia, Tanzania, and Malawi happens. With Nyika National Park in the center, the western and eastern sides present different snapshots in terms of trade and eating habit: the western side abutting Zambia has a greater eating habit and the eastern side has a greater trading habit. Although orchids were collected around in the village lands before, their decrease has contributed to more harvesting inside the Park. While the park is now largely deemed "getting difficult" to collect due to years of intense harvesting and increased law enforcement, there are views that the Park has unexplored abundant areas.

2) The Actors:

The actors of the value chain are identified as following: Collectors (including "nonchalant" - who are collecting for consumption or local sale, and "risktaker" - who are collecting at commercial scale and mainly inside the Park); Traders who buy and sell wholesale between collectors in villages and vendors in towns; Vendors who are retail sellers at District Capital market or weekly markets; Bake-and-sellers who buy raw tubers from vendors to bake Chinaka cake and sell at markets or around town; and finally Consumers who will buy Chinaka cake as snack or as relish. While the actors' Chinaka incomes are approximated with many assumptions, one rough comparison of their incomes is as follows: a commercial-scale collector's trip to the park (~50L) can make 40,000 MWK or 44 GBP; a trader's trip for wholesale trading about (~240L) can make 131,000 MWK or 143 GBP; a vendor who buys from wholesaler (~70L) and sells in 2-3 days makes about 65,000 MWK or 70 GBP; finally a bake-and-seller who buys 20L and makes 10 cakes for about 10-14 days, the net profit will be about 21,000 MWK or 23

GBP. Over the course of a season that lasts roughly 6 months, each of these actors will undertake multiple cycles of their activity - varying on their cash needs and capacity to focus on Chinaka, etc. Notable findings include that commercial-scale collection inside Nyika National Park are a niche for male-dominant group of collectors who then sell to traders. The main appeal for the commercial-scale collectors is the relatively fast lumpsum cash without requirement of skills or equipment. For the traders, Chinaka is favored as a commodity because its profit margin is greater than other farmed produce. The traders' network in the value chain rewards them with greater profit to accrue wealth. For the vendors, the limited supply and the increasing demand places them into positions where they can have control in price-setting. Both traders and vendors operate based on their personal networks, maintaining some exclusivity in the market. For bake-and-sellers, while the cash income can be sizeable, the profit margin is highly subject to the fluctuating price of the raw tubers. The prohibitive prices of tubers at peak season leaves some bake-and-seller groups to face unreliable income-generation from Chinaka.

3) Their Perspectives:

Given the continuous, if not increasing, demand for Chinaka and the supply getting scarce with harvesting, the price climbs and further attracts people into the supply chain. For the collectors, orchid trade is a rare opportunity to earn hard cash. For the traders higher up in the value chain, the profit accrual can be quite lucrative. Furthermore, harvesting wild orchid tubers does not require any special rights or social status, although accumulated knowledge in identifying edible species and their likely habitat increases one's efficiency. The risk of law enforcement is deemed 'worth-taking': a common perception is that the offense of taking wild plants is 'less severe' than that of taking wild animals, although this is changing in recent years. The current law enforcement efforts on uncontrolled orchid use is limited to greater focus on the "harvestings inside protected areas". It has led to incarceration of "orchid poachers" and deprivation of their families of an active income-earning member. Meanwhile other parts of the supply chain remain untouched: traders - who generally have greater profit than collectors and therefore may have greater vested interest and role in perpetuating the unsustainable harvest and market - operate in a safer environment. Indeed, lack of authorities' intervention undermines interests for sustainable and equitable use of wildlife: mixed knowledge of the regulations (especially with different legal conditions in Zambia influencing the Malawian market) seemed to perpetuate business-as-usual amidst uncertainties. Moreover, the majority of consumer base is unaware/uneducated of how Chinaka is sourced. While collectors and traders sense the plants' decline - without concrete information - imminent business interests prevail. These persisting conditions together seem to generate a passive complacency and weaken efforts to promote decisions better aligned with conservation outcomes.

The paper concludes with recommendations on future action to support more coordinated and diversified approach to make the value chain more sustainable. The study notes the absence of holistic approach to the entire supply chain is failing to curb the trade, while it increases the social and economic risks for the people with less options for alternatives. The ungoverned Chinaka trade has impacts on broader conservation efforts, including passivism to unsustainable natural resource use. It can furthermore compromise the global efforts to better manage international trade of wildlife. A holistic approach to working with diverse actors in the chain is needed. In this regard, the outlook provided by this study's communities is hopeful: nearly all actors along the value chain desire a sustainable market and expressed willingness to cooperate. More promising was their attitude to engage in exploring scenarios of what changes could be introduced to help make Chinaka value chain sustainable.

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Acronyms

CITES	Convention on International Trade of Endangered Species
DC	District Capital
DNPW	Department of National Parks and Wildlife
DOF	Department of Forest
FPIC	Free and Prior Informed Consent
GBP	British pound sterling
LWT	Lilongwe Wildlife Trust
MWK	Malawian Kwacha
NRC	Natural Resources Committee
NTFP	Non-Timber Forest Products
NVA	Nyika-Vwaza Association
NVT	Nyika-Vwaza Trust
SADC	Southern African Development Community
TA	Traditional Authority
TFCA	Trans-Frontier Conservation Area
USD	United States Dollar

Study on Edible orchids activities in the Nyika National Park and the surrounding communities with focus on drivers and consequences to find entry points for action



Around the iconic Nyika National Park of northern Malawi, wild harvesting and trading of edible orchid tubers - and baking and selling of a dish called *Chinaka* - have become a means of livelihood for some people. For some fortunate few, the business in these ground orchids have been quite lucrative; for some unfortunate few, the same has led to fines and even imprisonment. Around Nyika, about 43 species in 5 genera of terrestrial orchids that have been found to be used for making Chinaka - hereafter “Chinaka Orchids” - occur in various types of habitats both inside and outside of the Park boundary. With the rising demands, wild harvesting seeped into park boundaries where higher quantity and quality attracted harvesters to take risks of illegally entering and collecting from the park. Also, the rising enforcement of the law responding to the phenomenon has led to imprisonment. This study was carried out with a practical aim: learn about the people who are engaging in the Chinaka value chain and identify potential interventions to support ecologically and socially (possibly economically also) sustainable future for the plants at stake, communities, and Chinaka trade.

I. Introduction

The Issue of Conserving Edible Orchids: Increasing Demand and Uncertain Sustainability

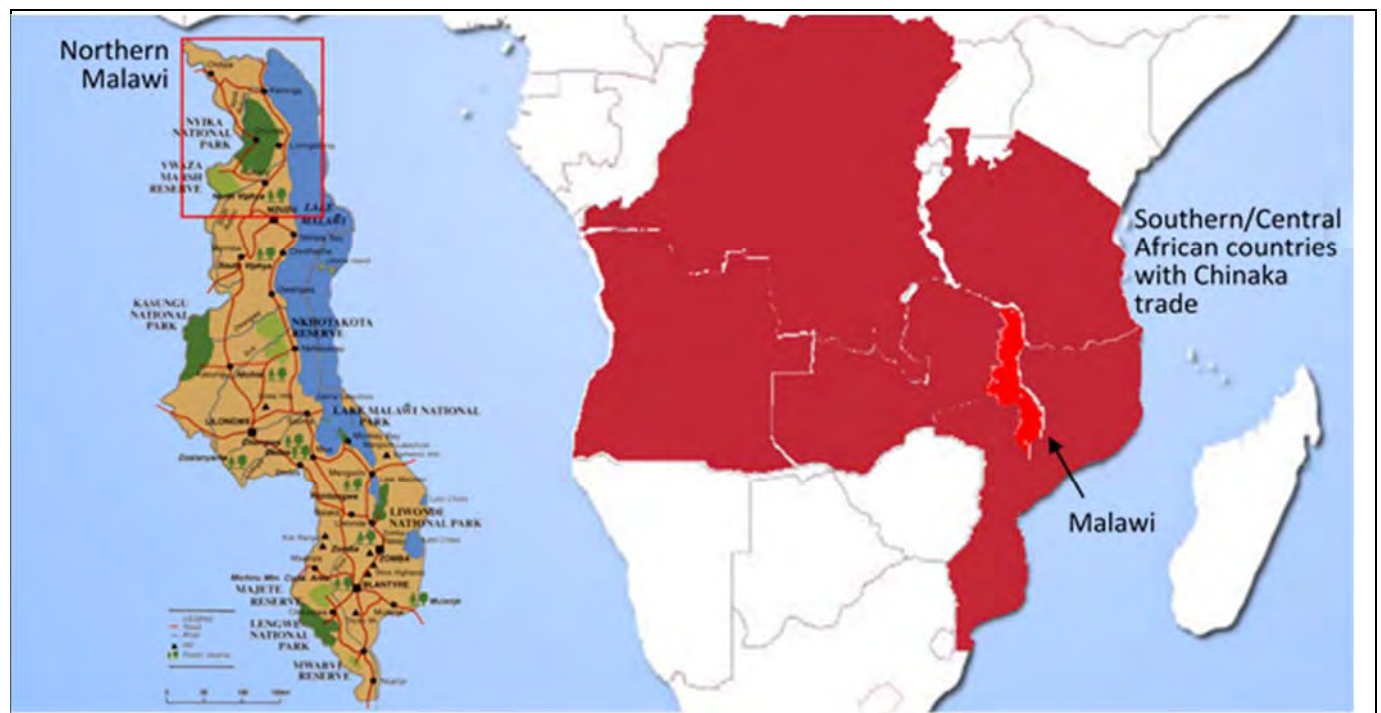
The consumption and trade of wild-harvested edible orchid tubers have reportedly increased and expanded over several countries in southern-central Africa (Veldman et al 2014; Hinsley et al 2017). In some areas, the commercialized scale of the tuber market for making of a dish called Chinaka¹ has decimated some local stocks

¹ For English conversations, *Chinaka* or *Chikanda* (Zambia and Tanzania) can be used to refer to the dish. But in vernacular language - other terms would likely be used. Different words for the different species of edible orchids, raw tubers, and the final dish. In this study, the term *Chinaka* is used throughout as a general term. There are studies in northern Malawi identifying

(Davenport and Ndangalasi 2003; Bingham 2004). The use and consumption of orchid tubers are not only found in southern-central Africa; in the middle east Salep, a drink and ice cream, uses certain orchid species for specific texture (Ghorbani et al 2014; de Boer et al 2016; Hinsley et al 2017). With more than 30,000 orchid species estimated to exist globally (Joppa et al 2010) in a rich geographic and taxonomic diversity, their use and trade are also diverse, some with procedures for sustainable and legal production (Fay 2018). Striving for sustainable use often involves propagation and cultivation technologies, but also coordination in harvesting methods and governance. Complexity increases if the plants are traded across national boundaries with different regulatory environment -- as is the case with Chinaka orchids from northern Malawi, which are traded across borders of Zambia and Tanzania.

For the conservation of the Chinaka orchids, several stakeholders with conflicting interests must cooperate. The Department of National Park and Wildlife, with primary mandate to protect and conserve and secondary mandate to ensure sustainable use - is the manager of the Park also enforcing park-protection laws and working with communities for sustainable use of natural resources. The communities, some of whose ancestors - or even themselves - had lived inside the Park, seek to maximize the use of the natural resources of the Park to the extent possible (legal or not) to generate cash income. The consumers of Chinaka, largely unaware of the value chain and its sustainability, drive the demand for even illegal harvesting of the orchids. The question of how to balance these interests to ensure sustainability in the plants and the livelihood is at the base of the issue of conserving edible orchids.

Box 1: Location of Southern / Central Africa, Malawi, and Northern Malawi



*The colored countries are those known to have regions that trade in Chinaka orchids.

the edible species by their scientific names and vernacular names (Simkoko, 2012; Namoto, forthcoming) - but the researchers note the non-standardized vernacular names across villages.

The Orchids and Their Protection in Malawi

Malawi as a whole has high diversity compared to other countries in the region (Table 1). Orchids have a fairly high level of protection in regulations. *De jure*, there is effectively a “blanket ban” in Malawi - making any use of any orchid species illegal. This may be a result of adopting the treatment of orchids by the Convention on International Trade of Endangered Species (CITES)², which in 1970s adopted ‘precautionary approach’ creating a blanket treatment for the orchids due to the difficulty of identifying species (Hinsley et al 2017). Malawi, a signatory to the Convention, most likely adopted these provisions in a wholesale approach into the *2017 National Parks and Wildlife Order: Protected, Endangered, Listed Species*. Following the prevailing international policy is understandable and natural, especially when lacking comprehensive surveys and studies on the different orchid species’ level of endangerment. *De facto*, law enforcement is different from the books, and there are variances among public officials on the interpretation of the law. For some, wild orchids found on any type of land are subject to protection; for some, this protection is only applicable to State lands - and for some more specifically on State Protected Areas. While the interpretation and the enforcement of the law has been inconsistent and sporadic, its practice has been on the rise with increased attention to orchids protection. In 2018, at least seven cases of conviction for entering the park and disturbing wild orchids are recorded in Nyika.

Table 1: Species richness - comparing Malawi, Mozambique, Zambia and Zimbabwe

Country	Number of orchid species	Land Area (km ²)	Species richness per 1000 km ²
Malawi	420	118 484	3,54
Mozambique	228	801 590	0,28
Zambia	406	752 618	0,54
Zimbabwe	356	390 757	0,91

Source: Melki et al 2018.

Box 2: (A) Current Regulations to Protect Orchids in Malawi and (B) Possibilities for Improvement

(A) Current Status: All orchid species are declared endangered and all uses are prohibited, whether they are occurring inside or outside protected areas.

- All orchid species are included in the Endangered list (National Parks and Wildlife Protected, Endangered, Listed Species **Order 2017**).
- Being part of the *Endangered Species* list subjects the species to the following: **article 86** of National Parks and Wildlife Act on prohibition of ... endangered species, which makes anyone who possesses, buys, sells, transfers or receives in transfer (or attempt to) endangered species as committing an offence.
- According to the definition under National Parks and Wildlife Act, “endangered species” are those occurring *within or outside* a protected area.

(B) Possibilities: Refining endangered species provisions, and/or prescribing controlled use regulation.

- **Refining endangered species provisions:** The ministerial regulation that specifies the list of protected, endangered, and listed species can refine the scope. **Article 43A** of National Parks and Wildlife Act in fact stipulates that this list can designate the (geographical) areas in which such regulation will apply, or with

²Currently, 2 genera and 7 species are under Appendix I, the highest of protection requiring both export and import permit, and the rest of Orchidaceae family is in Appendix II, the next level of protection that requires export permit.

designation on certain species or certain sex/age groups. This can fix the ‘blanket’ treatment - possibly designating that only those occurring inside protected areas shall be in the Endangered Species list.

- **Allowing use of endangered species:** Furthermore, a ministerial regulation can allow use of endangered species (**Article 87B** of National Parks and Wildlife Act stipulates that a ministerial regulation could be made for controlling trade or dealing in ... endangered species).

Background on Communities around Nyika: Human and Physical Geography

This section introduces general information on human and physical geography in the communities around Nyika. It draws from literature, information collected from the relevant offices and from interaction with the community members and key informants.

Human settlement close to high-biodiversity areas come with specific rights and duties: close access to rich diversity of natural resources, fertile soil and good sources of water are accompanied by the responsibilities of safeguarding them - sometimes including resettlement as was the case of some communities surrounding Nyika. Conservation efforts - e.g. gazetting protected areas or instituting resource use rules - lead to beneficial outcomes in the long-term but not without short-term constraints in natural resource use that may lead to hardships to households who struggle to adapt to new ways of subsistence or other competitive niche markets. Many communities around Nyika are remote; hence accessing basic services, markets, and even wielding political influence are difficult and costly.

With this challenged background, orchid tubers arose as an attractive niche commodity in the communities surrounding Nyika. Bordering Zambia with historically, culturally and socially inter-woven with communities in Zambia where *Chinaka* cooking and consumption was more widespread earlier on, communities surrounding Nyika came to be introduced to *Chinaka* by relatives and friends more familiar with the Bemba tribe’s Chikanda. Hence history of small-scale baking and consumption may go back several decades. But with increased demand from traders seeking raw *Chinaka* tubers around in the past decade or so, the edible orchids became a commercial product that the Nyika communities could uniquely supply. Indeed, Nyika holds great abundance and species richness of orchids, especially in the high-altitude montane grasslands of Nyika Plateau with 283 species (Hyde et al 2019). With such diversity, orchids are significant tourist attraction in the Nyika National Park.

Most of the villages have members of the communities or their recent ancestors who used to be living inside what is now the National Park. This resettlement took place in late 1970s, when the Park expanded from its original 940sq.km. plateau as first designated as reserve in 1936 - officially expanded its boundaries to a size of 3,142sq.km. These memories and facts are frequent points in discussion among the villagers (this point will be elaborated in the findings section on knowledge, perception and willingness).

While most are Tumbuka people and Chitumbuka speakers, dialects vary across the communities surrounding Nyika. Furthermore, oftentimes villagers refer to different villages in exclusive ways - i.e., ‘us’ versus ‘them’ - highlighting the distinct differences. Such habits attributable to family ties but also the absence/presence of certain activities in the villages. For example, whether or not a village is involved in *Chinaka*, or coffee, or development projects, etc.

The villages are in hilly areas with elevation of roughly between 1,100m and 1,450m with temperate climate of mean annual temperature around 13-15 degrees Celsius. Nyika being an important catchment area for water - four major rivers and many streams are of great importance for the Northern region of Malawi. Rainfall with annual mean above 1,500mm is mainly between December to April. Many villages grow maize, cassava, sweet potato, groundnuts, and more occasionally millet, beans, tobacco, and coffee. Local variations in the climate and soil conditions create differences among villages to determine what crops are feasible to grow economically.

In terms of access (i.e. road conditions), there is a notable difference between this study's villages: the western side (Chitipa District, TA Nthalire) of the National Park versus those on the eastern side (Rumphi District, TA Kachuru). For the villages on the western, Nthalire, side are accessed by an unpaved dirt road that connects from Kaprekhezi gate to the Chitipa District Capital (DC). From Chitipa DC, the access is then open to Tunduma (Tanzania) where markets converge for Zambians, Tanzanians, and Malawians. This access, although difficult in the rain season, is an important enabler for the Chinaka value chain. The weekly market days held in several larger towns along this stretch of 100km dirt road attract sellers and buyers from many villages including those from the neighbouring country Zambia. Across the Malawi-Zambia border are same ethnic group sharing close history and families by intermarriages and also sharing basic services such as schools, markets, and even agriculture lands. From the main road, most villages are accessed by feeder roads, some of which are accessed only by foot or two-wheel vehicles and often made inaccessible during the rainy season.

For the villages on the Kachuru side, the situation is changing. Around 2016, auspicious circumstances with a strong political power launched a road improvement project. For the villages under TA Kachuru, the "Phoka people" who are a subgroup of the Tumbuka (van der Merwe & Avery 1987), will have all-weather access road connecting to Livingstonia to the North and to connecting to Rumphi District Capital to the South. Still, the feeder roads from this road, going up 300m in elevation on the mountain slopes, are dirt roads. Such road conditions can have a significant hindrance on the villages' access to basic health services and education.

Box 3: Summary Description of Access to Basic Services around Nyika (roads, electricity, network)

Improvement in roads and having services built and instituted closer to access points can affect trade and people's livelihood to a great extent. Major road improvements are also associated with longer term urbanization and demographic changes, and link to market influences. One example is the M1 road that was improved between Chitipa District Capital (DC) and Karonga DC in the late 2000s. Before this improvement, Chitipa district and the DC had a bottleneck to access the M1 road, the conduit to the rest of the country to the south. Once this improvement was completed, the communities on the eastern side of the Nyika National Park are also able to supply the much larger Chinaka market in Tunduma via Chitipa DC. Likewise, Chitipa DC interview revealed that a preference to seek supplies from Phoka side is due to the good M1 road, compared to the poor conditions of the dirt road connecting to Nthalire communities.

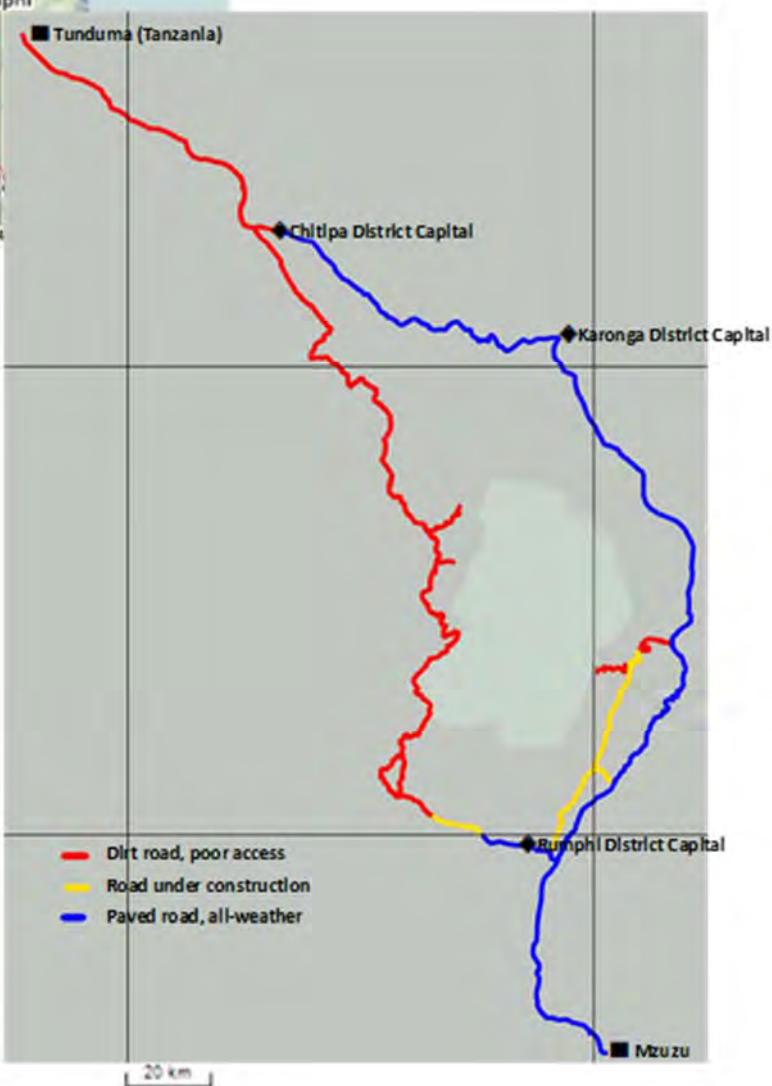
Another example is the road improvement that has brought drastic change to the mountainous community of Misuku in northern Chitipa district. The road branching off from M1 to Misuku - a windy road climbing mountain hills - was completed with its improvement around 2017. People interviewed have attested to the changes and conveniences of people and goods traveling to Chitipa DC. In terms of Chinaka, this has led to more easily accessing the Chitipa DC market to buy raw Chinaka orchid tubers.

The dirt road connecting Nthalire to Chitipa DC may be a matter of time and one that has been a high priority for a generation's time. With close proximity and relations shared with Zambia and Tanzania, residents in

Nthalire trading center observe that active trade is increasing with growing population of Tanzanian traders in the area. In terms of power grid and mobile phone network, the western side until April 2019 did not have grid electricity and still remains with limited phone network as of August 2019.



Northern Malawi, with main trading centers, weekly markets, District Capitals and Cities shown.



Road conditions shown. Eastern side of Nyika is much better connected than the Western side. Similarly, electricity and mobile phone network is weaker and patchier on the Western side of Nyika.

II. The Study

Objectives

Within this wider context, this study tries to *understand how people living around the Nyika National Park have come to be a part of the growing regional Chinaka value chain and to explore how to ensure the survival of orchids population and the communities' sustainable livelihood*. It does so by organizing the inquiry and findings in three ways, which is reflected in the structure of section [III. Fieldwork Findings](#):

- 1) [The Snapshot](#): Piece together a broad picture of how the system currently works and has come to the current status;
- 2) [Profiles of Actors in the Value Chain](#): Profile the group of involved individuals according to their conditions of opportunity, empowerment, and security. What conditions make people enter and transition in the system?
- 3) [Knowledge-Perception-Willingness](#): Collect individual knowledge, perception and willingness around 3 topics: orchids, trade, and governance.

Conceptual Framework and Method

The conceptual framework for “profiling” individuals endeavors to capture the multi-dimensional status of an individual. While there are several frameworks available to assess the status of livelihood, specifically for communities living around protected areas (Schreckenberget al 2010), one employed here is the Opportunity-Empowerment-Security Framework (OESF). The OESF facilitates a more dynamic portrayal of the individual’s means to improve their livelihood than other frameworks³. After the first round of fieldwork in select villages, specific indicators were identified for Opportunity, Empowerment, and Security dimensions (see Box 4).

The third section of the study - collecting the knowledge, perception, and willingness in three topics on orchids, trade, and governance - is approached with semi-structured interviews. The interviews try to gauge what knowledge is missing or skewed, what perceptions are prevailing on what basis, and what level of willingness exist with what hurdles. The discussions may reveal how knowledge are transferred, perceptions are formed, and why certain willingness exists or not and thus help to inform intervention design.

³ Those frameworks, such as for example the Sustainable Livelihood Framework, tend to be more static in terms of capturing simply an individual’s existing conditions about the physical, financial, social, natural dimensions of their livelihood. A livelihood can be considered sustainable when it ‘can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base’ (Chambers and Conway, 1992).

Box 4: (A) Opportunity-Empowerment-Security Framework and (B) Relevant Indicators around Nyika

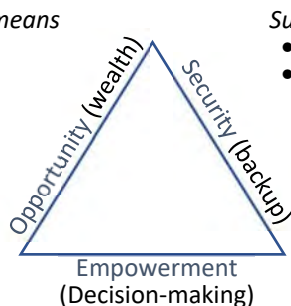
(A) Opportunity-Empowerment-Security Framework summarized.

- **Opportunity:** Expanding economic opportunity by building assets such as land and education.
- **Empowerment:** Strengthening the ability to shape life-affecting decisions and removing discrimination.
- **Security:** Reducing vulnerability to sickness, economic/natural shocks, etc. and increasing means to cope.

(B) Relevant indicators in communities around Nyika

Economic assets and means

- land,
- fertilizer,
- food supply,
- goods assets
- market frequency,
- hiring labor



Substitute/support during needy and urgent times

- sickness,
- bride price

Position and access to information

- volunteering,
- NRC position,
- governance

Fieldwork Overview

Preparation and Consulted Institutions

The fieldwork was planned for and carried out from November 2018 to January 2019. Given that these months were in the rain season and the Chinaka tubers were out-of-season, a second phase fieldwork was soon planned and carried out from June to July 2019. In preparing and conducting the fieldwork, consulted offices and their personnel are the following: (1) from Lilongwe - Department of National Parks and Wildlife (DNPW), Department of Forest (DOF), and the Lilongwe Wildlife Trust (LWT). The DNPW at central level issued the research permit; the Science and Research division was the focal point linking to the regional office, the Nyika Park Management team, and the Trans-frontier Conservation Area Project Management (TFCA) team; and finally, the Director General was met at the end of the fieldwork to be briefed on the findings. The DOF was met to understand the forest department's understanding of the orchid protection / use rules; this was relevant particularly given that some orchids are found in State protected forests and community forests. The LWT - with headquarter located in Lilongwe and branch office in Rumphi - were consulted as the NGO works closely with DNPW on improving regulations and are carrying out conservation activities in the Nyika-Vwaza landscape including community education and awareness building. (2) from Mzuzu and Rumphi - respective subnational offices of DNPW, DOF, LWT, and NGO Total Land Care (TLC) were consulted; as well as the Nyika-Vwaza Association (NVA), Mzuzu University's faculty and student researchers, and the relevant District Commissioners' offices. Nyika Vwaza Association executive members who are in charge of NRC organizations were facilitators and gatekeepers (see Box 5 on NRC and NVA). Mzuzu University Department of Forest provided substantive feedback on the study plans and the University's Director of Research reviewed the study's approach to collecting information from communities with free and prior informed consent; no written signatures were collected (See Appendix III - FPIC information sheet).

Site Selection

Site selection was conducted through key informant discussions park officers (gaining law-enforcement records), community outreach officers, project officers and researchers who were knowledgeable of the orchid harvesting and trade. The information and input gathered helped to narrow down to the villages in two districts (Rumphi and Chitipa) under two Traditional Authorities (Nthalire and Kachuru). After initial round of fieldwork, four villages became the focus: 2 in Chitipa District under TA Nthalire, and 2 in Rumphi District under TA Kachuru⁴.

Box 5: (A) Natural Resource Committees, NRC and (B) Nyika-Vwaza Association, NVA

(A) Natural Resource Committee, NRC. The Natural Resource Committees (NRC) are formed at village levels for the eligible villages around protected areas. They are mandated to enable community-based natural resource management and to operationalize benefit-sharing and support the DNPW community outreach and extension activities. Each village creates an NRC of its own, and NRCs are grouped into NRC Zones (each NRC Zone comprises roughly 3 to 5 NRCs). Finally, Zones are further clustered into Groups. By the virtue of a village being part of the NVA and establishing an NRC, all villagers are “NRC members”. There are 10 elected personnel who hold positions for each NRC - for an indefinite number of years unless removed or relinquished by agreement.

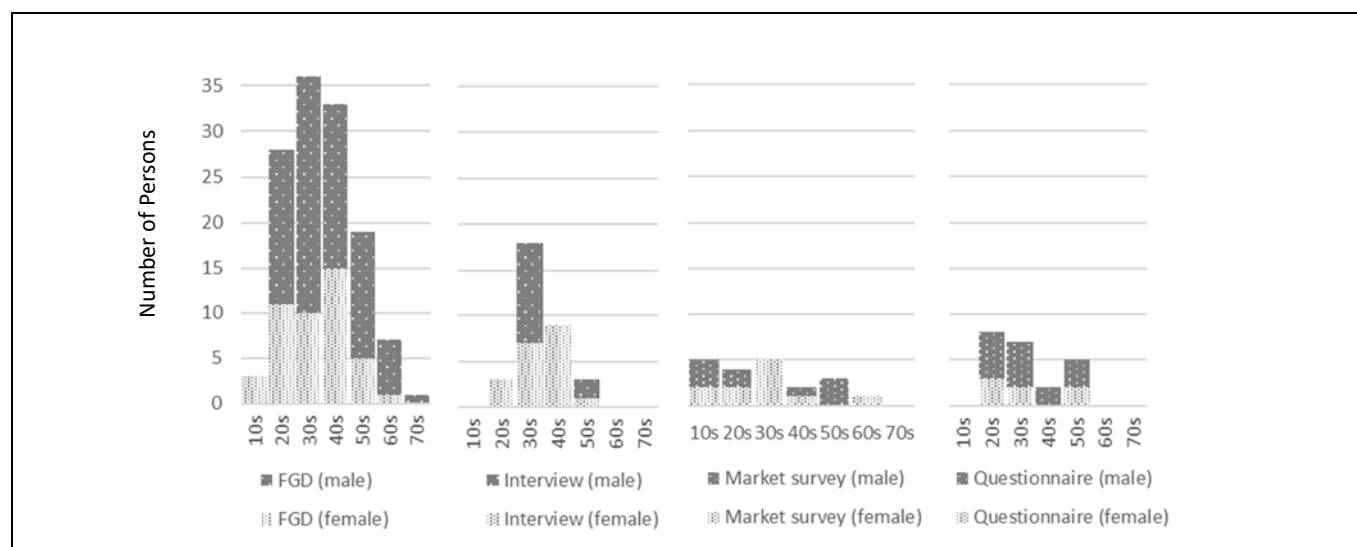
(B) Nyika-Vwaza Association, NVA. In the case of Nyika and Vwaza NRCs, the Nyika-Vwaza Association (NVA) has been incorporated as the umbrella institution and a legal entity to support the NRCs. NVA was incorporated in 2000 after the completion of KfW-funded border community development project in order to retain the community structure, and it became a legal entity in 2003. All villages within 5km of the boundary of the protected areas are eligible to create an NRC and become part of the NVA. Around Nyika, the NRCs and NRC Zones were mainly functioning in information dissemination and in permit-system facilitation to harvest resources from inside the protected areas. The NVA system in the communities and among the T/A were often characterized as the “bridge” between the communities and the DNPW (DNPW, 2003).

Focus Group Discussions, Key Informants, Interviews

Information was collected in several formats. (1) Focus group discussions (FGD) were convened upon prior announcement by the NVA personnel. Participants were self-selected and by convenience (total of 12 FGD were held with total 127 participants - each group ranging from 5 to 21 persons, average 10.6 persons per group). (2) Semi-structured interviews were conducted with certain individuals - some selected from the focus group discussions and some by snow-balling (total 32 interviews conducted). (3) Questionnaire was administered with 3 groups in the second field visit (total 22 questionnaires collected). (4) A market survey was conducted with consumers in the third field visit when Chinaka was in season and available at the market (total 20 respondents). Demographics of participants are presented in Box 6.

⁴ Names of the villages will not be disclosed.

Box 6: Demographics of participants in the study.



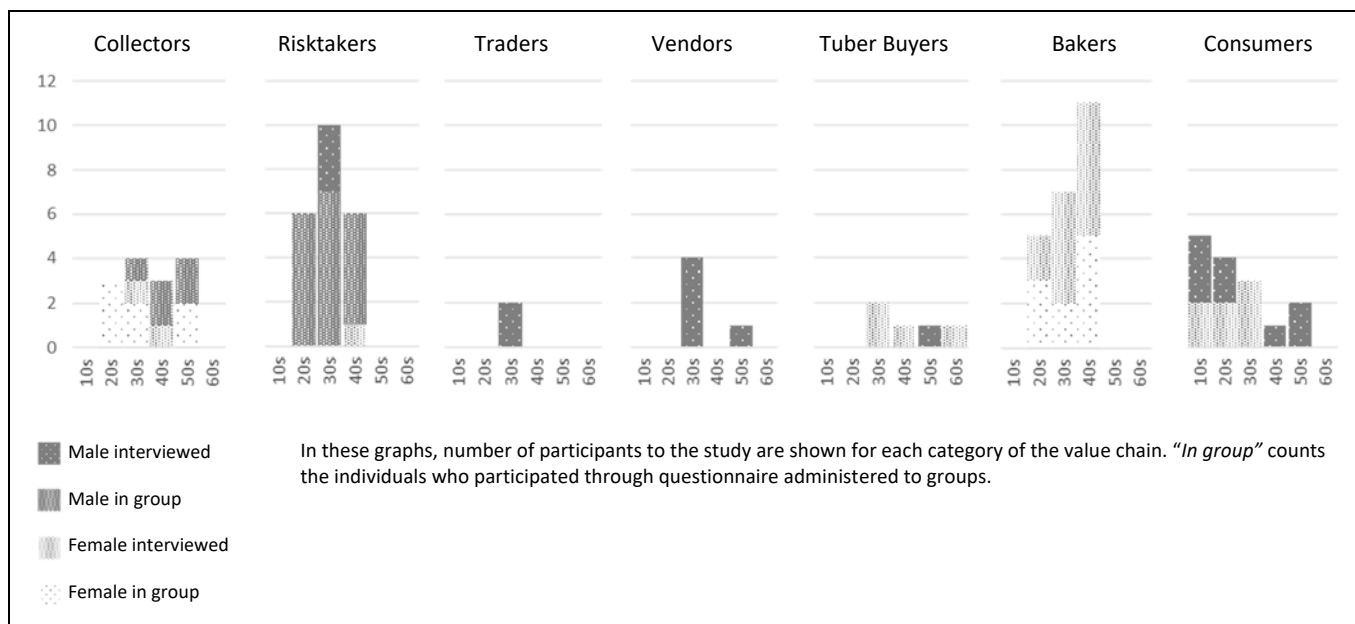
In all cases, the participants were briefed on free, prior informed consent for their participation. As for the interviews and focus group discussions, almost all were conducted in sequential interpretation through the field assistants. Oftentimes the participants had varying levels of understanding of English; and in some cases, the participants directly responded to a question without translation - sometimes using English. As for the questionnaire, it was administered as a trial during the second round of field visit with just 3 groups and was not carried out comprehensively with all participants. The questionnaire was translated into Chitumbuka and administered with instruction in English and Chitumbuka through the field assistants - going through question by question.

During the rainy season (e.g., Chinaka not yet in season), the very first fieldwork was conducted, interacting with 12 villages - holding mainly focus group discussions to gain better sense of the community's involvement in the Chinaka value chain. The second round of field visit involved more selective group of villages that were more active - where interviews with individuals were conducted and a questionnaire was administered to some groups as a pilot. During these fieldwork people involved in the value chain - collection (including in the National Park), trading, and baking-to-sell - were covered. Through permission of the Police and the Rumphi Prison Office, group interview was made possible with those serving prison sentences with charges under the Wildlife Act including those for collecting Chinaka inside the Nyika National Park.

During the dry season (e.g., Chinaka in season), the 3rd and 4th rounds of fieldwork were carried out. It consisted of revisiting the same villages to observe the collection and the trade of orchid tubers, and the baking-and-selling of Chinaka cake. These visits resulted in more interviews and group discussions, in particular towards possible solutions to tackle the situation of declining orchid population and increasing apprehension of "orchid poachers". In addition, two new groups of the value chain were encountered: the vendors of the raw tubers at the market were interviewed, and the buyers / consumers of the raw tubers and Chinaka cake were briefly surveyed at the market with a set of fixed questions. These were new actors of the value chain that were made available as the Chinaka tubers and baked cakes were in season.

Involvement in Chinaka value-chain was not always acknowledged candidly. Because the law enforcement and awareness-raising activities had more recently increased, perception of Chinaka activities being illegal was pervasive. While most villages and individuals talked to required building some level of trust to break the barriers for open discussion, their responses became fluid and have been taken with these cautious attitudes in mind and been cross-checked to the extent possible with key informants and previous researchers with some knowledge about the area.

Box 7: Demographics of interviewees along the value chain.



III. Fieldwork Findings

The findings section is organized into three subsections: 1) *snapshot* description of the current Chinaka value chain, 2) *profiles* of individuals involved in Chinaka value chain, and 3) *knowledge-perception-willingness* in the communities about the orchids, the market, and the governance.

1) The Snapshot

- Chitipa District Capital (DC) is currently the main hub for Chinaka tuber trade and consumption. As Chitipa is the thoroughfare to/from Tunduma where trade among Zambia, Tanzania, and Malawi happens - the Tunduma demand for Chinaka tubers likely led to Chitipa traders to seek Chinaka source areas around Nyika reaching eastern side around mid-2000s and the western side around 2010. Indeed, most respondents to the question of who introduced them to Chinaka pointed to either Chitipa people or Zambians. The Eastern side was likely reached first because of better access from Chitipa DC. In contrast, Western side still has difficult access road and perhaps more stringent law enforcement; hence, the western side's supply of tubers to Chitipa DC is said to be much less compared to the eastern side.
- In terms of eating, in the western side of Nyika National Park, which abuts Zambia and shares markets with Zambian communities, had population who were eating and selling Chinaka cake (69% of this study's participants). Here, as early as the beginning of 1990s is when some villagers were learning about Chinaka from relatives and visitors from Zambia; and the eating habit seem to have been known to certain population - especially those with closer kinship with Chinaka-eating groups of Zambia. On the contrary, the eastern side villages visited had almost no population eating (13% of this study's participants and these were eating were migrants from the western side). But some other villages and weekly markets on the eastern side not covered by this study are also known to have Chinaka trade and cake-and-selling.
- While some orchid collectors mentioned 2008 to be the time people started going inside Nyika National Park for tubers, 2013 is when a larger group of people started going into the Park. Orchids still do occur outside the park and near the villages, but collection of these are limited for use by local villagers who bake-and-sell with in the village vicinity and not for the supply chain going to Chitipa DC. Some years of extensive collection around the customary lands have reduced abundance and left only the less-preferred species. Inside the park, while the prevailing perception is that there is a decline in the orchids (i.e., it takes a longer time to collect a 20-L pail compared to previous years), there are also views that there are still unexplored areas in the Park.
- Large-scale collection of preferred species inside Nyika National Park became a niche for mainly male-dominant group of collectors, while Chinaka orchids found around the communities were collected by women and children either to sell on small-scale directly to bake-and-sellers or to the traders in the village who would accumulate to sell to a larger market.
- In terms of profitability, what is appealing for the collectors is the relatively fast lump of cash without requirement of skills or equipment. For the traders it is a market of relatively high value commodity; hence the margin of profit is greater than trading in other farmed produce. For the vendors, the limited supply and the increasing demand places them into positions where they can have a high level of control of price-setting and

therefore reap high profit. Both for the trader and vendors - the personal network they establish among one another allows them to maintain some level of exclusivity for the value chain and thereby control the niche. For bake-and-sellers, the cash income can be sizeable where there is a market and steady supply (which limits commercial-scale viability only to certain markets); but their profit margin is highly subject to the price of tubers. The seasonality of Chinaka makes the “in-season” months very busy and productive with Chinaka cakes while the “off-season” rather idling. The prohibitive prices of tubers at peak season leaves some bake-and-seller groups to face unreliable income-generation from Chinaka.

1-1 Spatial Scale of Trade - Crossing-Borders

In Northern Malawi, the Chinaka trade is not only domestic but also crosses international borders. Some parts of these borders are quite porous and the lives on each side are deeply intertwined: kinship and shared history, schools, medical facilities, and markets. In fact, some participants in this study were Zambian (8 total: 3 in imprisonment for illegal activities in the Park, 1 buyer at weekly market buying Chinaka tubers, 4 bake-and-sellers at weekly markets) or of Zambian origin/relation (e.g., married into Malawi, grown up partly in Zambia, etc. - very common).

The trade seems to be established partly because the seasonality of Chinaka harvest slightly varies across the region. Hence the market gets supplied with Chinaka from wherever the tubers are available - for example some Zambian Chinaka are first supplied to the market in February before the Malawian. The Chitipa vendors go to Tunduma market to both buy and sell, but more often to sell than to buy. In any case, the decision to take the trip to Tunduma is weighed carefully given the 8000 MWK (about 9 GBP or 11 USD) one-way transport cost, hassles of the border checkpoint - although a free and simple process, and opportunity costs - e.g., in most cases a vendor in Chitipa DC would sell at retail price but at Tunduma retail buyers are likely rare and most buyers would be for wholesale).

1-2 Volume of Trade

A seasonal variation for Chinaka value chain (in volume and price) exists over a course of roughly 8 months starting in mid-April (Box 8). Seasonal variation of value chain “intensity” entails fluctuation in three dimensions: (1) number of people who engage in Chinaka activity, (2) frequency of trips per month per person, and (3) amount of Chinaka that would be collected per trip. All these would be determined by the plants’ abundance in the field, as well as the seasonality of other farming and livelihood activities to weigh the costs and benefits of engagement in Chinaka value chain. These fluctuations affect the volume of Chinaka tubers supply in the market, which then determines the unit price. At the market, the price of Chinaka tubers changes on a daily basis set by the vendors who gauge the available supply and the expected demand from the bakers. Assuming a rough “intensity rate” affected by the seasonal variation in Chinaka, estimates are made with the information gathered from interviews to fathom how much volume of raw Chinaka tubers might be extracted from Nyika region (Table 2).

This quantity is also changing *over the years*. The general trend is a decline (no participant in the study mentions increase); however, people still find “pools” of abundant Chinaka inside the Park. Collectors both inside and outside Nyika, traders, bake-and-sellers - all hold the view is that “it takes longer to collect 1 pail” or that “end-of-season” comes earlier (August a few years ago to now as early as June).

Box 8: Monthly Variation of Value Chain Intensity

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Intensity	80%	100%	100%	80%	60%	40%	40%	20%
<p>APR Some describe “people are flocking in Nyika”. Some say people wait, especially because of low prices.</p> <p>MAY People are seriously into Chinaka collection due to its abundance now. Price is also increasing, but not at its peak.</p> <p>JUN People continue to be dedicated to Chinaka collection. Price is still not at its peak. Groundnuts - the other key ingredient for Chinaka cake is now in season; more bakers.</p> <p>JUL People are still heavily dedicating their labor to Chinaka collection, but already finding collection challenging. Price is reaching peak.</p> <p>AUG Price is at the peak, but less people are collecting due to decreased Chinaka availability.</p> <p>SEP Price is still at its peak, and still less people are collecting due to difficulties of finding Chinaka.</p> <p>OCT Chinaka is now getting rare, only those trying to fetch cash from still good price of Chinaka are going into Nyika. It is also time of higher risk of apprehension.</p> <p>NOV Chinaka is very hard to find, and even the price is decreasing now because groundnut season is also over. Very few will go collecting Chinaka.</p>								
Price of 20L pail from collector to trader	15,000	15,000	23,000	30,000	30,000	30,000	23,000	15,000
<p>Beginning of the season - April - there is a rush of people, although some described this is not the ideal time to dedicate labor due to low prices (abundant supply and little demand, main Chinaka cake ingredient groundnuts are not yet available). In May and June - there is high intensity because demand increases and it is still easy to collect a large amount in short time (harvesting efficiency). But this efficiency decreases fast, making July and August fairly hard to collect the standard amount (40L) in one trip to the plateau. In September and October, despite high unit prices, many collectors drop out because the efficiency falls so low and the risk inside the park increases from the longer stay required in the park. By November, not only does the collection become so inefficient and high-risk, but also demand falls because groundnuts go out of season.</p> <p>Standard units of Chinaka tubers: The 20L-pail is the standard unit of measurement in Chinaka tuber trade. Smaller units in cups (500mL or 300mL) are typical retail sale to bake-and-sellers. Different orchid species can be mixed and sold together; but the preferred are larger tubers with black soil and a center ring (e.g. “Nyika species”). These have lower water content and give better cooking qualities; hence many be sold at a higher price.</p>								

Table 2: Estimated Volumes of Trade

Estimated from...	Qty of pail in 1 activity-cycle, per person	# of activity-cycle in a season, per person	# of people involved *	Total qty of pail in a season	Note about estimations
Bake-and-Seller (Chitipa DC)	1	15	100	1,486	# of people involved is a ballpark figure obtained from a reliable informant for Chitipa DC area; market observation would estimate a high variation in their level of activity. There would be more markets outside.
Vendor (Chitipa DC)	3 to 4	31	15	1,638	# of vendors only are for Chitipa DC; there would be more from Zambia/Tanzania who may buy directly from the traders.
Trader	5 to 20	31	15	5,850	# of traders has been provided by both a trader and vendor operating mainly through Chitipa DC market; there would be more in other minor routes and markets.
Collector (Risktaker)	1 to 3	11	220	4,903	# of collectors may be much greater; it assumes 100 from Chitipa DC (which may be an overestimate), 100 from a village group, and 10 each from 2 villages. There are more villages involved (from the apprehension record), albeit with less number of collectors.

*The # of people involved is the most uncertain figure; they have been obtained from interviewees and hardly cross-checked.

1-3 Source Areas: Where and Who is Involved

Which villages collect?






Considering the entire northern Malawi, and more specifically those close to Nyika, there are villages that are involved and those not involved in the Chinaka value chain. From the apprehension records, “orchid poachers” come from villages even much farther away than the 5km buffer zone of Nyika National Park. Even the Chitipa DC had individuals traveling directly to the park to collect orchids. Still, the most intensive activity is likely from the communities surrounding Nyika, although with varying degree of involvement. Some villages, even if within the 5km buffer, their *travel* distance (as opposed to Euclidean distance) to the Park are more than 5km and therefore less likely to be involved. Similarly, villages closer to the main road may have many other alternatives that draws their attention and labor. The villages with collectors are supplying Chinaka tubers in two ways: selling to fellow villagers who act as the “trader” to transport the goods to the larger market (i.e., trading centers and Chitipa DC), or selling to traders who come from trading centers or the DC to buy tubers.

Interesting to note that on the eastern side, the women were not cooking; a noticeable difference from the western side. In the eastern side, the areas covered in this study was quite specific and limited in scope. Here, despite the active Chinaka tuber collection and involvement in their trade, there were no Chinaka cakes found in the market days and no one had the habit of eating them. One lady who knew how to cook and was making it for family consumption was in fact from the western side. The difference in the culture and knowledge about Chinaka on the two sides of Nyika seems attributable to the fact that the western side is much more integrated with Zambians compared to those of eastern side. However, other villages and weekly markets on the eastern side especially towards the south are known to have Chinaka tubers and cakes. That region’s Chinaka activity may be coming from the demands in the west through the southern side of Nyika.

Who are involved in the value chain?

The fieldwork came to quickly categorize study participants into categories: 1) collectors -- with a subset of “risk-takers” who go to the park to harvest, 2) traders. Those farther away from Nyika were not at the center of this research, but the findings from interaction with them are also summarized. These groups are bake-and-sellers, vendors, and consumers. Box 9 briefly presents the category and their profiles in order to orient the readers. Each category is further described using the Opportunity-Empowerment-Security framework in the following section [2\) Profiles of Actors in the Value Chain](#).

Box 9: Profiles of Actors in the Value Chain

Nonchalant collector	Risktaking collector	Village trader	Town vendor	Bake-and-seller ⁵	Consumers
					
Mix of male and female	Mainly male, some female (spouse)	Predominantly male (e.g. no female in this study)	Mainly male, some female	Predominantly female (e.g. no male in this study)	Mix (male, female, wide age group)
<p>1 trip of 1 day nearby collects 3-4 cups⁶</p> <p>2- days in a month during high season.</p> <p>Sell to traders, bake-and-sell, or eat.</p> <p>Avg earning in MWK 1 trip/1cake: 1,500 Month⁷: 3,000 Season: 14,000</p> <p>Petty cash to buy household goods; negligible earning.</p>	<p>1 trip of 7 days collects 2-3 pails</p> <p>2-5 trips in a month during high season; as need arises.</p> <p>Sell to traders.</p> <p>Avg earning in MWK 1 trip: 40,000 Month: 86,000 Season: 445,700</p> <p>Buy fertilizer; pay school fees; improve home.</p>	<p>1 trip of 1-3 days to DC, trades minimum 5, typically 15-20 pails per trip.</p> <p>3-8 trips in a month during high season.</p> <p>Sell to other traders.</p> <p>Avg earning in MWK 1 trip: 131,250 Month: 787,500 Season: 3.7mn</p> <p>Buy equipment, land, hire labor, improve home.</p>	<p>Buy from traders opportunistically (connected via phone)</p> <p>3 trades per week during high season.</p> <p>Sell to bake-and-sellers⁸</p> <p>Avg earning in MWK 1 pail: 18,500⁹ Month: 388,500 Season: 2.0mn</p> <p>Build/improve home, pay school fees.</p>	<p>1 cake bakes for 4-6hrs; 1 cake sold per day; up to 3 cakes sold on market days.</p> <p>Bakes and sells about 30 cakes / month</p> <p>Sell at market / weekly markets or around the neighborhoods</p> <p>Avg earning in MWK¹⁰ 1 cake: 3,600 Month: 61,400 Season: 319,200</p> <p>Buy fertilizer; pay (private) school fees; support the ill in family; improve home.</p>	<p>Purchase in units of 10MWK (village) 50MWK (DC)</p> <p>Buy from bake-and-seller¹¹</p> <p>Typical purchases in MWK 10-50 for snacking, 100-500 for making relish.</p>

10GBP (or 12USD) is about 9,000 MWK

⁵ Bake-and-sellers operating in the District Capital (DC) market and at weekly markets

⁶ Volumes: Cup is 500mL; Pail is 20L

⁷ The high season month

⁸ Sells at permanent market, market days, and by moving through neighborhoods.

⁹ In high season: buy 1 pail at 45-50,000 MWK, sell by cup at 1,600-2,000 MWK, with roughly 30 to 40 x 500mL cups per pail.

¹⁰ For bake-and-sellers, the earning is the net income after accounting for cost of buying raw tubers.

¹¹ Buys at market day or opportunistically when mobile bake-and-seller pass by.

1-4 Chinaka and Income-Generation

Different category of value-chain actors' estimated income (net profit) from Chinaka activities are compared in Table 3. A trader in village makes the most profit from Chinaka activities. Within traders there is a wide variance in terms of how much trade they manage in a season. Those with more network of suppliers and buyers have more opportunities to trade. Those with ability and help to maintain labor in the farm and other livelihoods are able to more frequently make the trading trips. An average estimation leads to roughly 4 million MWK (about 4,415 GBP or 5,500 USD) during the entire season. This figure is followed by the vendor group in the Chitipa District Capital. There, the estimation is an average 2 million MWK per season. The vendors too have great variance depending on how much network of suppliers and fellow vendors one has to gain the opportunities for trading.

The categories of bake-and-sellers and collectors have a big range and is difficult to generalize; hence, the estimations are best taken as an illustrative ball-park figure. Compared to what traders and vendors make over the season, collectors and bake-and-sellers are estimated to make roughly 10%: 450,000 MWK (about 500 GBP or 615 USD) and 312,000 MWK (about 344 GBP or 426 USD) respectively. But collectors and bake-and-sellers' net profit will highly vary depending on how frequently they engage in their activities, or put in another way, how frequently their activity-cycle is renewed. The average income for a collector's trip can be estimated at 40,000 MWK (about 44 GBP or 55 USD). With this income per unit of activity-cycle, a collector's total seasonal income would vary depending on the frequency. For a bake-and-seller, a relevant unit of income is the daily revenue from the sales of the cake. Typically, 2 cakes are made per day and each leaving a net profit of 2,000 MWK. The net profit is after buying the next batch of Chinaka tubers for the next cake (in the range of 2,400-6,000 MWK). For this group, the profit could be much higher if there is a household member to collect tubers directly from Nyika.

Except for the collector category, the revenue from Chinaka activity for any trader, vendor, and bake-and-sellers was used to purchase the next batch of Chinaka. The remainder - the net profit - was in most cases deemed as part of household income, used for basic and recurrent needs such as household goods, fertilizer, food, school fees; but as profit increased some used for home improvement and investment into other livelihood activities. A vendor at the DC has said that Chinaka is "very important" to the livelihood and got to build a house. To put into perspective the Chinaka income, Box 10 describes various livelihood activities found from questionnaire and discussion and Box 11 describes some of the acute needs for cash. Especially for collectors, an important attraction for Chinaka collection other than the amount of income generated are the facts that a relatively large sum of cash is obtainable at the end of each 4-7 days trip, and that it does not require refined skills or equipment.

Table 3: Comparison of estimated size of annual net income from Chinaka activity for an individual of each category

	1-Pail Net Profit (MWK)			Qty (20L-Pail)	Typical Profit per "Activity" (MWK)	"Activity"	Cycle of "Activity" in a season	Note	Season Net Profit (MWK) ¹²
	min	max	average						
Bake-and-Seller (DC)	Buy 28,000 ¹³ Sell 40,000 ¹⁴ Profit 12,000	Buy 70,000 Sell 100,000 Profit 30,000	21,000	1	21,000	Selling 10 cakes from 1 pail	7-14 days cycle - in the DC it is all throughout the season but some months with longer cycle due to supply scarcity and prohibitive price, which also affect the number of bake-and-sellers.	1 pail makes about 10 cakes and can last up to 2 weeks. But buying a pail is affordable only at the beginning of the Chinaka season. A common single-purchase quantity is 4 cups or about 1/10 of a pail, which makes a typical size cake.	312,000
Vendor (DC)	Buy 16,000 Sell 28,000 Profit 12,000	Buy 45,000 Sell 70,000 Profit 25,000	18,500	3 to 4	64,750	Selling tubers bought from 1 trader	1-3 days cycle in the high season (a vendor buys from a trader 3-4 pails); while 7 or more days cycle in the low season.	The cycle is heavily affected by ▸the supply available, ▸how expansive is a vendor's trader-network, and ▸how much cash a vendor has at hand.	2,020,200
Trader	Buy 10,000 Sell 16,000 Profit 6,000	Buy 30,000 Sell 45,000 Profit 15,000	10,500	5 to 20	131,250	1-3 days trip to District Capital	(highly varies per person) 3-7 days cycle at high months bring goods, minimum 5 - but typically 15 to 20 - pails per trip to the DC. Some trade less, with 1-3 months cycle.	The cycle is affected by factors at different levels. On individual level, more expansive network with suppliers and buyers and more familiar with trips will shorten trip cycles. On system level, supply availability and law enforcement risks affect cycle (e.g., Rumphu traders more frequent than Nthalire)	4,095,000

¹² The Season Net Profit accounts for the reduced "intensity" as introduced in [Assuming a rough "intensity rate"](#) affected by the seasonal variation in Chinaka, estimates are made with the information gathered from interviews to fathom how much volume of raw Chinaka tubers might be extracted from Nyika region (Table 2).

This quantity is also changing *over the years*. The general trend is a decline (no participant in the study mentions increase); however, people still find "pools" of abundant Chinaka inside the Park. Collectors both inside and outside Nyika, traders, bake-and-sellers - all hold the view is that "it takes longer to collect 1 pail" or that "end-of-season" comes earlier (August a few years ago to now as early as June).

Box 8: Monthly Variation of Value Chain Intensity, applying 65% overall intensity rate against 8-month full intensity. Hence formula is: [Season Net Profit] = [Typical Profit per "Activity" (MWK)] x [30 Days / Average Cycle Days of "Activity"] x 8 months x 65% overall intensity

¹³ 800MWK/cup (Minimum), 2000MWK/cup (Maximum), 35 cups per pail.

¹⁴ 35 cups make 10 cakes, 1 cake sold for total 7,000 MWK(Minimum), 10,000MWK(Maximum).

Collector (Risktaker)	Buy n/a Sell 10,000 Profit 10,000	Buy n/a Sell 30,000 Profit 30,000	20,000	1 to 3	40,000	7-day trip to Nyika National Park	(highly varies per person) as short as 7-day cycle in high months; but typical is 14-21 days cycle (1-2 trips per month). Some go only when need cash (0-3 trips in the season).	Cycle varies widely. Some go regularly while some only when there is a cash problem. Those going with a regular cycle also depend on how much cash- needs they face. Rare 7-day cycle - e.g., no break between trips, would be for the “desperate”.	445,714
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10GBP (or 12USD) is about 9,000 MWK

Box 10: Common livelihood activities for communities around Nyika (drawing mostly from pilot questionnaire)

<p>In the questionnaire, 26 livelihood activities were:</p> <p>Farming maize, millet, cassava, groundnuts, beans, sweet potato, Irish potato, vegetables, tobacco, coffee</p> <p>Collecting from Nyika honey, mushroom, medicinal herbs, flying ants, reeds, thatching grass, fish;</p> <p>Rearing cattle, pig, goat, chicken, pigeon;</p> <p>Doing piecework, beer, transporting, shop-keeping</p> <p>On average, people have 16 different means of livelihood, mode 15, range from 5 to 17. But some livelihoods may have been omitted; for example, people did not mention mining before asked.</p> <p>Some villages seem to be more active about selling the produce that they farm. Going to the market: There are equal number of respondents (3 each) for going every week, going less than 1 per month, and not going to the market at all. The rest, 12 responded they are going to the market in between - 1 to 3 times per month.</p>	<p>Farming (and having fertilizers) 10GBP (or 12USD) is about 9,000 MWK</p> <p>For 49 respondents (Questionnaire + oral)</p> <ul style="list-style-type: none"> - Average acreage is 2.2, mode 1, range from 0.5 to 15. - Average fertilizer required is 6.6 bags, on average only 46% of that need is met. - 7 of the 49 persons can manage 100% of fertilizer needs. 2 of them said, if they did not go to the park, they would only manage 50% of their needs. - (all except 3 “own” the land) <p>Fertilizer: The need for fertilizer is very pervasive in everyone’s mind. The prevalent view is “lack of fertilizer means going hungry faster,” as food shortage normally begins around December. The amount required is difficult to standardize because of different soil fertility and crop types; most common units in talking about fertilizer is in 50kg bag and 20L pail. An exceptional few have mentioned use of organic manure. A bag of fertilizer (50kg) is 26,000 MWK. There is usually also a transport cost. A lottery coupon (fertilizer subsidy) can reduce the price to 9,000-11,000MWK, but some cannot afford even this amount and will resort to selling the coupon for cash.</p> <p>Tobacco: Most people had farmed it previously but have quit altogether or reduced to negligible level due to fertilizer need and price fluctuations.</p>		
<p>Nyika natural resources using DNPW/NRC Permit</p> <p>Permits are issued by DNPW/Natural Resource Committee (NRC) to harvest designated Non-Timber-Forest-Products (NTFP) within 5km inside the Park. Each village has an NRC that interacts with DNPW to monitored the scheme. Many villagers use the scheme, but many don’t: some say the same NTFPs can be found outside the park, some fear the authorities despite the permit. Most collected NTFPs are for consumed for household use and little for sale.</p>	<p>Mushroom: Permit system allows collecting wild mushroom. Although it makes a good price (200 MWK in Gamba on market day) - it has a short season, rots quickly, and takes long to find. Hence wild mushroom is oftentimes not seen as a steady source of income.</p>	<p>Reed mats: Permit system allows harvesting reeds. People can make mats to sell for 1500-2000 MWK (a 1-week labor). It is a relatively popular activity because reeds are abundant and easy to harvest.</p>	<p>Honey: Permit system allows harvesting honey. It is special that with presence of DNPW extension officer, beekeeping is allowed even beyond the 5km limit. All villages have some individuals practicing beekeeping inside Nyika, but activeness varies. Phoka side is more active due to the coffee-buyers also buying honey.</p>
<p>Wage and salary employment: Piecework ‘Ganyu’ is common in all villages, and for most households. Piecework could be paid with cash or with food. Finding piecework is not an easy task, although it may vary across villages and amongst individuals. Individuals with better connections may more easily find piecework.</p> <p>Contract-based jobs are rare. One case is in Phoka, where people work at the Kazivizivi mine as wage workers. One-year contracts hire villagers for various labor such as sorting, drilling, handling trammel, etc. For a 6-day-per week work, monthly pay is 40,000 MWK.</p>			

Hunting *discussed in a coffee-growing village

(On why people hunt):

“People still hunt because it's their norm. Most ex-hunters have changed because it's illegal, but not all can change at the same time. Some have understood that it's illegal, so they stopped. Some understand wild animals are important to the country, so they stopped. But some look at it as a good thing, even though it is illegal, so they still go.”

“It's not hereditary, but it's because of poverty (*ukavu*). Even though they know they can get arrested, they still go because of poverty.” In Village C, about 4 people per year are arrested for hunting illegally.

(Comparing hunting vs. coffee):

“It is more than coffee. Money from poaching is large money. Hunters sell within village, at markets, etc. at 1,500-2,000 MWK per piece. In a year, the hunter will make 3 times more from hunting than from coffee. Coffee is seasonal, hunting is not (some go twice a month). There is a lot of cost associated with growing coffee, at the end there is only a small amount.

Coffee is limited to Village C, and a few in Village G. Price is 260 MWK for 1 kg of undried and shelled beans (700 MWK for dried). In a season, 1 acre produces about 10,000 kg, which would be 2.6 million MWK - but various upfront cost items are deducted (fertilizer, seeds, others?).

Three persons had 0.25, 0.5, 0.5 acres respectively. *Coffee farming is under *individual* management, as opposed to *household* - i.e., husband and wife have their separate acres for growing coffee.

Other enterprises

Beer is common and all year-round. Mostly run by women, an individual can do the business (making 1-2 drums per week), but also several women can work together taking turns to make drums of beer and selling it at a common point. A cup of beer (500ml) sells for 50~200 MWK, but a cup of beer is often bought on credit and not paid at all. Women who make 1-2 drums (30-60 cups) estimate weekly profit is about 2000-3000 MWK. For those who are buying millet, the profit will be smaller.

Mandazi (dough fritter) is said to be quite profitable, but the consumer base is mainly children and is not as big as beer.

Timber is also an option for some villages on the Phoka side of Nyika National Park. Here, people purchase (in some cases with the help of the NGO Total Land Care) trees to plant and grow. Mostly pines, one tree seedling can be purchased for 4,000. After planting and growing for X years, a tree would typically produce about 9 planks (bigger trees such as growing to 15 feet would produce 15-30 planks). Each plank would sell for 4,000~7,000 MWK. But there are also other costs than buying seedlings: harvesting and basic processing into planks require labor and/or proper machine (some interviewee saying required amount is 2 million MWK).

Box 11: Suzgo! What “problems” do people have - what cash needs?

Problems “Suzgo!”

Often in conversations people shouted “Suzgo!”, which means *problems*. Suzgo was always at the center of describing hardships, often linked to people's decision to take the risk of going to the Park illegally.

Questionnaire that asked about ranking different Suzgo: **Fertilizer** is #1 problem in nearly all cases. Then comes **food shortage** is closely matched by **school fees**. The last in the ranking were cash needs for **clothes** and **household goods**.

What cash needs? 10GBP (or 12USD) is about 9,000 MWK

School fees: Secondary schools fees are 8,000 MWK per term, but this is often accompanied by additional boarding fees because most students cannot commute. The number of students proceeding onto secondary school seems low. For example, with about 50HH in one village, numbers proceeding to secondary were: 0 (2018), 2 (2017), and 3 (2016). For the 32 participants to this study who responded - average number of children was 5 and schooling was 3.

Transport: Car ride to Trading Centers on market days costs about 300 MWK one way (14km). Nthalire trading center to Rumphi - 7,000MWK, 50kg *kathundu* - 7,000MWK, bail of sugar 5,000MWK.

Hospital bill: When someone is ill with malaria or other serious ailments, making a trip to the hospital is not an easy decision. “It costs us 25,000 MWK for the hospital, 12,000 MWK for an ambulance (Phoka to Livingstonia) or 3,000 MWK to hire a motorbike. Most times we ignore the hospital and buy medicine at market. This keeps us sick longer.”

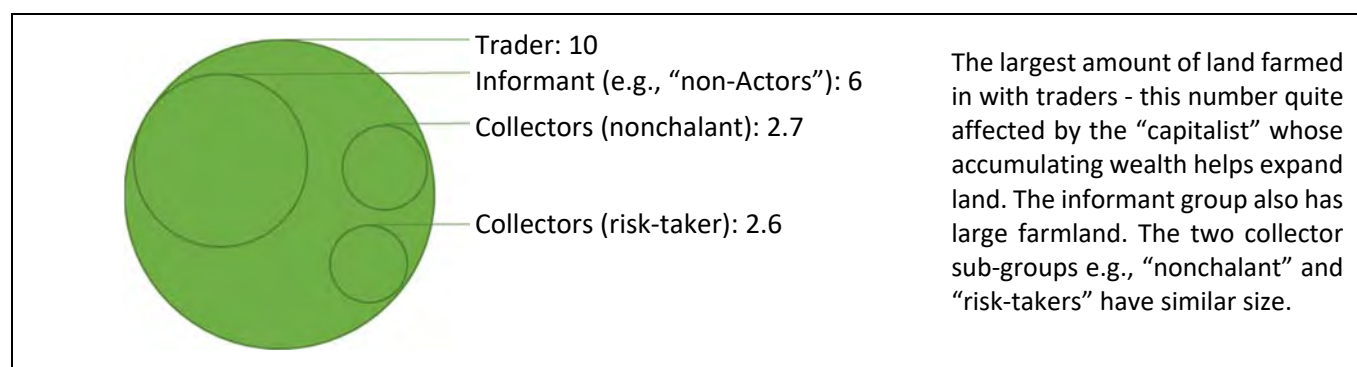
2) Profiles of Actors in the Value Chain

This section is on the findings from profiling the individuals who engage in Chinaka value chain. The Opportunity-Empowerment-Security Framework (OESF) is used to describe the category of actors along the value chain. Certain generalizations are sure to not fit all individuals, but these categorization and descriptions are an attempt to establish a frame through which the value chain and its actors’ involvement can be more systemically and thoroughly examined. Table 4 first puts together the OESF for the trader and the collector groups, which are the actors the closest to the National Park. The rest of the section (2-1 to 2-4) proceeds to describe more category of actors in the value chain.

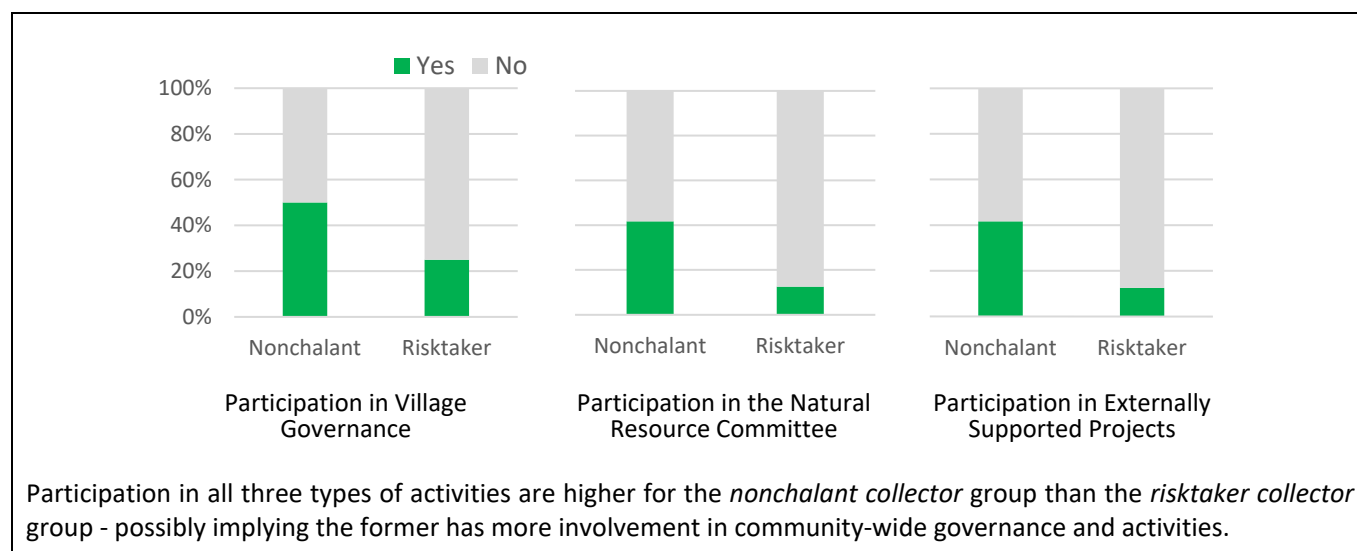
Table 4: Category of people and their Opportunity-Empowerment-Security framework.

	Opportunity Wealth	Empowerment Decision-Making	Security Backup
Collector - Nonchalant	<ul style="list-style-type: none"> Other means of livelihood keep opportunity costs high; hence only engage when there is a low-cost, low-risk environment. 	<ul style="list-style-type: none"> Tend to have relatively active role in community activities and programs (Box 13 shows more participation rate for nonchalant collectors). 	<ul style="list-style-type: none"> Tend to have relatively better security - in terms of family and other social networks.
Collector - Risktaker	<ul style="list-style-type: none"> Habitual risk-taking (e.g., going into the Park) to supplement other stable income; Chinaka activity as premium to further base livelihood. Sporadic risk-taking when acute cash need arises and lack other opportunities. 	<ul style="list-style-type: none"> The ‘Habitual’ risk-taking collectors are likely to have familiarity and skills inside the Park, and this gives them some leverage with traders. The ‘Sporadic’ lack alternatives for finding cash; such position disempowers them to take otherwise unwanted risks. 	<ul style="list-style-type: none"> Security is undermined for all risktakers, but especially those unfamiliar with Park. Sporadic risktakers will likely lack backup / insurance schemes or family and social connections to have alternatives.
Trader	<ul style="list-style-type: none"> Accrued great wealth (Box 12 shows more acreage in land farmed). Greater network to suppliers and buyers enables more trading opportunities. 	<ul style="list-style-type: none"> Maintaining some exclusivity with the suppliers and buyers relates to economic power. Exclusivity also relates to power over others as in allowing others to join; personal wealth also wields power in sharing his wealth (hiring piecework). 	<ul style="list-style-type: none"> The trader is able to take more frequent trips to the DC when having backup labor to look after livelihoods and family. Wealth and assets gained from Chinaka business increase the security against personal or household calamities

Box 12: Average Acres Farmed by Category of Actors in the Chinaka Value Chain



Box 13: Comparing 2 Collector Subgroups of Their Participation Rate in Community Governance



2-1 The Collectors - Nonchalant

The collectors who engage in Chinaka collection only intermittently and without entering into the protected area are identified as the “nonchalant” collectors. The group is diverse: men, women, children, and elders. They would invest relatively little time and accept to collect the less-preferred species of Chinaka orchid tubers that are found around the villages (see Box 14 for collection around villages). Typically, this group of people are willing to spend 1-day in 2-weeks in the early part of the season when Chinaka tubers are abundant and easy to identify (April and May). They would collect just one to two 500ml cup(s) during each day of collection, either selling the tubers to traders or cooking to eat or sell at weekly markets - although the latter is limited to the western side of Nyika.

In examine their opportunity, empowerment, and security dimensions, this group does not have strong characteristics that stand out. The group is diverse, and most people can be identified in this group because they opportunistically engage in Chinaka as non-primary livelihood. But notably, participants identified as this group seemed to be more vocal and active in the community, with greater level of participation in village governance, natural resource committees, or external projects (Box 13). Such involvement can help diversify livelihood and stay up to date with the latest opportunities and information. Furthermore, greater involvement in communal activities would also likely imply greater social connectedness, which is particularly useful in seeking piecework opportunities. Indeed, participants in this group were busy in activities ranging from farming subsistence and cash crops, livestock, piecework, making beer or *chitumbwa*. Some exceptional few would have assets such as a grinding mill or a motorcycle that aides in greater income generation.

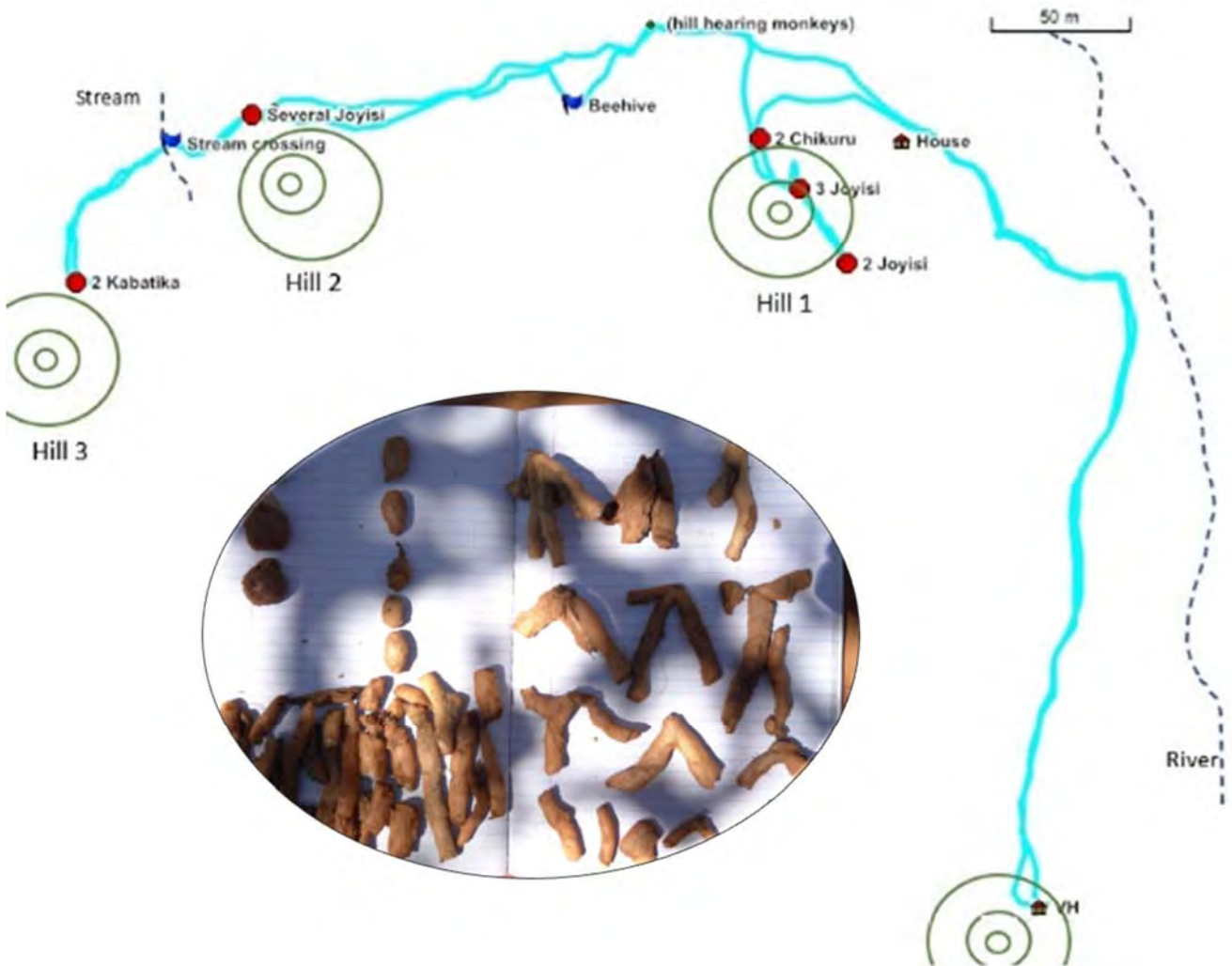
The predominant determinants for this group to engage in Chinaka collection seems to be the *efficiency* and *opportunity cost*. Efficiency is in terms of how much Chinaka can be collected in a given time and level of efforts, and opportunity cost is in terms of what other means of income-generation activities are available. Many said that due to decline in Chinaka found around the villages, Chinaka collection is seldom worth the efforts. Some in this group prefer to “concentrate on farming” for greater reliability, while the increasing risks of arrest “helps to ignore the high profits” of Chinaka (01-22).

Box 14: Collecting in the Community Hills

During the dry season fieldwork when the Chinaka were in season, there were four sites visited with villagers in the customary lands to see Chinaka growing in the hills.

Village 1, Site 1

A one-hour trip was taken to hills behind a house near the edge of the village. Just on those hills, a bag (many joyisi, 5 kabatika, 4 Chikuru) was collected in roughly 45 minutes with 3 persons having hoes. The collection was enough to make 2 small cakes. One cake was made for demonstration, and the other was sold around the village making 1500 MWK.



Village 1, Site 2

Near Village 1, a bake-and-seller collected near her home in the dambo enough to make 1 cake. The collection took 4 hours for her and her 2 children. It was a group of 33 tubers, including some Chikuru and joyisi.



Village 2, Site 3

In Village 2, a hill close to the main road (dirt) was visited. Pine trees were planted at top in 2006 and now more were planted down the slope. About 10 meters from the foot of the hill with 5 minutes of looking, we began to find Chinaka orchids: 4 small Chikuru in about 10 minutes of active search.



Village 2, Site 4

Near Village 2, another hill very close to the road was visited, led by a lady who learned about Chinaka from her sister-in-law. Here we counted many; around a single shrub at least 21 *joyisi* plants. In 5 minutes with one hoe we were able to collect roughly 500g (10 Joyisi). The digging is haphazard, with soil and even breaking tubers and collecting. The overall vegetative habitat on the hill is like miombo woodland with short grasses like a fountain.



2-2 The Collectors - Risktakers

The Risktakers are collectors who go into the National Park and harvest wild edible orchid tubers against the odds of being apprehended by DNPW rangers. The apprehension list indicates that villages farther away from the boundary of the Park are also involved. This group's size is not clearly known, and it may vary largely across villages. Interviews indicate that in one village, there may be five, in another - twenty, and in another - even around a hundred people can be in this group.

The group can be further divided into *Habitual* and *Sporadic* - those who go to Nyika for Chinaka tubers regularly and those who go only when the need for cash arises. Starting as a sporadic risk-taker introduced by the more experienced collectors, the sporadic venture could become habitual. But people who are new to the park are at greater chance of apprehension; in the case, such even would likely terminate the person's future ventures as risk-taking collector.

For a risk-taker collector, the average income per activity (e.g., 7-day trip to Nyika) can be estimated 40,000 MWK. The income will be affected by the price of Chinaka and on how much volume a collector is able to get in the 3-4 days of collection. A common comparison is, "a 20L tin of Chinaka is like one bag of 50kg fertilizer". Oftentimes an advance payment is paid to the risk-taker collectors by the traders. It can go towards buying food for the 7-day trip

and also as cash for the family remaining at home. The advance payments can be indicative of the traders competing for collectors, to guarantee that their expected supply is met.

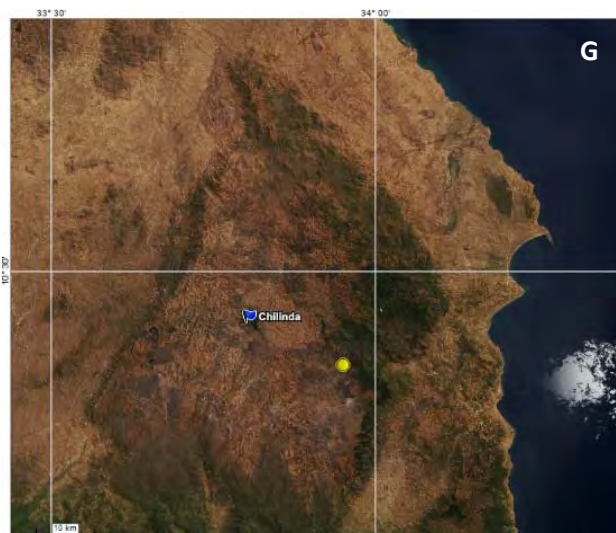
Box 15: Chinaka Orchids Found Inside Nyika National Park

Two trips in Nyika during the dry season allowed visiting select sites known by the scouts and the research officer to have Chinaka orchids close to Chilinda camp and to sites known to have made encounter/apprehension of orchid collectors. The scouts had some knowledge of Chinaka orchids and their habitat from the accumulation of 3-5 years of experience, and their level of interest seemed to have heightened in the recent years given greater initiative to protect the orchids. Throughout the two trips by vehicle and one walk, we encountered 1 group of orchid diggers in action. Many sites of digging, with the scouts leading to these places where.



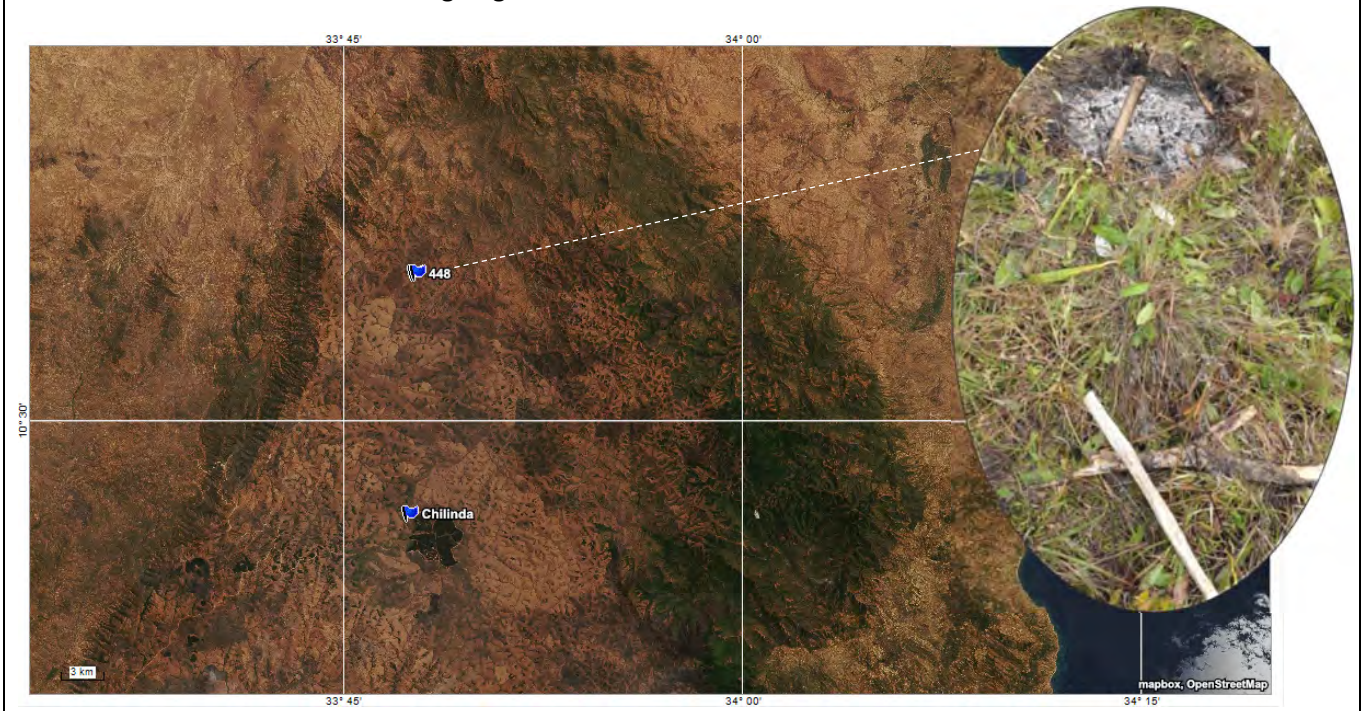
Tubers found in the park, both showing the ring.
 Top row (A, B, C): 7 July 2019, near Dam 3 in Chilinda, at 2268m elevation.
 Bottom row (D, E, F): 21 July 2019, only approximate location (below map "G", yellow dot at 2335m asl). Once heated, the grains became adhesive and more elastic, which are the properties that give gelatinous texture to the

Chinaka cake.





7 July 2019, grassland 2.5km north from Chilinda northern boundary of the ring road at 2337m elevation. 250m walk going west from the road found 13 Chinaka orchids.



23 July 2019, a makeshift campsite found at 2272m asl, soon after sighting 3 persons on hillsides.

Opportunity and wealth. Some habitual risktakers were observed to have a good level of wealth and means for livelihood, while some sporadic risktakers could be observed in poverty-stricken conditions. In fact, the habitual risk-takers are more similar to the nonchalant collectors who have a diversified range of income-generation and can make the choice when to prioritize Chinaka collection. Such different levels of opportunity and wealth affects the risk-taking collector's cycle of activity. Among the habitual, a common frequency was said to be 2-3 trips per month in the high season, while others go more frequently even 5 times per month. One of the responses illustrated, "if you are more desperate, then you go more often" (01-25). But such frequent trips are only possible when the family has the means to subsist without the collector in the family (relates to the Security dimension discussed below). For the sporadic risk-takers, their trips can be from zero to three per year, as need arises. The poverty conditions of some of the sporadic risk-takers was the family even struggling to find piecework for maize.

Empowerment and participation in decision-making. The risk-takers' participation rate in community decision-making schemes or other collective groups were only half or one-third of the nonchalant collector group. Views from others of the risk-takers was that they were irresponsible to take the risks of being apprehensive and leaving their family without support. Hence the risk-takers' sense of empowerment in the formal community setting is likely undermined by their illegal activities. On the other hand, there is another dimension of empowerment within the Chinaka value chain: some habitual risk-takers who become known to be reliable collectors gain a leverage by being a supplier of the highly sought-after commodity. The sporadic risk-takers do not acquire such leverage.

Security and backup. This dimension is particularly important for the *Sporadic* risk-takers. Individuals in this subgroup being pushed into taking risks of going to Nyika highlight that they lack social support that can help with acute needs. Often, the individual has weak connection to the family, relatives, and community networks; and Chinaka can be a relatively easy outlet when faced with financial needs and life events such as marriage, funeral, school fees, illness in the family. On the contrary, for habitual risk-takers, having other members of the family who generate cash income or having extended family support means the collector would be able to more frequently go to the Park. Furthermore, instances of complacency have been mentioned in the interviews. This has an important implication that again - those risktakers who are better off have a better chance of getting out of an apprehension either through social connections or bribery. Those sporadic risktakers who are collecting for urgent need of cash has little to no chance of seeking complacency through the system.

One example case of a *Sporadic* collector was a man in early 20s, studying in secondary school and recently married. He became the head of household, family comprising the pregnant wife and his single mother (father lives in the same village but with his second wife). To make cash for bride price and school fee, he followed a crowd of Chinaka collectors into the Park. Because of his inexperience inside the Park, he was caught by the rangers while others in the group escaped. After he was released, he was back home, doing piecework in brickmaking for return in maize; he said piecework was difficult to find. Another interviewee (07162) had commented, "those who are "poor", and don't want to work piecework will go to Nyika". Many participants in this study expressed that piecework opportunities are rare and can at times be exclusive to people with relationship to the hiring person.

Box 16: Chinaka Collectors inside Nyika National Park and Their Vulnerability

This group is predominantly male. Some pointed to the reason to be the rigorous hiking and harsh conditions of staying in the plateau during dry cold season for 4+ days; while some female participants claimed otherwise and there are actually women who do go into the Park. Another reason could be that females have more responsibilities at home that makes it harder to be absent from home for few days at a time. This is in contrast to situation in other areas and regions that collect Chinaka/Chikanda, where not only do women and also children participate but are also often the predominant collectors. In the case of Nyika, the exclusivity of Chinaka collection inside Nyika for only those who can withstand the physical rigor of hiking and camping creates distinct groups: “those who can collect Chinaka inside Nyika” versus “those who cannot”. It has a significant implication for internal governance. Different from areas where anyone and everyone is able to and is benefitting from collection of Chinaka, communities around Nyika have groups within the community who are unable and thus may be interested in imposing governance rules on the resource extraction and use.

One notable aspect of the current situation is that the risk-taking collectors - at the lowest level of the value chain - face the highest (in fact, the ‘only’) risk of arrest and jailtime. For now, there is no control or law enforcement in the markets or other ladders of the value chain. Although according to the Malawi law any activities without permit involving endangered species are illegal, the partial enforcement seems to be due to the relatively recent strengthening of enforcement efforts after the amendment of the Wildlife Act in 2017, and because general coordination across sectors to holistically address the Chinaka issue has yet been galvanized. For example, the District Commissioner, Police, Department of Forestry are not well-aware of the regulations under the Wildlife Act and the protected status of orchid species even outside the protected areas.

Law enforcement on “orchid poachers” has increased along with the increase in orchid collection in the park over the years. From 2016 to 2018 - over three Chinaka seasons, the number of arrests made increased from 4, 5, to 15 in 2018. The first court charges were made in 2018 for 6 persons. This increasing law enforcement has affected the psyche of the communities that the rules are now strict.



Photo from DNPW/Police 2019

2-3 The Traders - “Capitalist”

This group of traders are villagers who will buy tubers from the collector group and sell onto a vendor in a bigger market. This a rather exclusive group with only two traders were interviewed, while other participants also provided information about them. About 10-15 persons were operating as traders in one of the study villages.

Traders buy Chinaka tubers from collectors in the village either through informal agreement, sometimes with an advance deposit payment, or from collectors with tubers who are looking for buyers. Once enough volume is gathered, the trader takes them to the bigger market. The minimum volume economic for a trip is said to be 5 pails, but usually the stock is between 15-20 pails. Prior to making the trip, the trader also ensures by phone communication with market vendors that there are enough buyers for all of the goods. Hence several vendors will

divide a trader's 15-20 pails, as only 3-4 pails are typically afforded by a single vendor. One very active trader informed that he can make up to 3 trips per month, for 6 months of the year (April to September); but some traders were known to make 2 trips per week in peak times. On the other hand, a less-active trader said he can manage only 3 trips per year and wishes to increase this.

Opportunity and wealth. Traders are already in a quite exclusive zone in terms of having the unique capacity to be a trader - e.g., having motor vehicles, having access to and connections in the value chain. They also have well-established other means of livelihood, such as extensive farmland, stable supply of fertilizers and cash crop starters, capacity to hire labor, and various equipment and machinery to increase productivity and income. A trader explaining that he does not need to take the rigorous and risky job of going into the National Park, he said "I am a *capitalist*" (1218). A trader is estimated to make about 131,250 MWK net profit per trip, delivering 15-20 pails. Over the season, a trader may be profiting 10 times more than a risk-taking collector.

Empowerment and participation in decision-making. In the scope of Chinaka value chain, the trader group has a significant leverage or power. To the vendors who buy from them, the traders are empowered by the network and linkage they have to the collectors in their village. Although traders have to some extent "compete" with other traders who will want to buy from the collectors, the traders in the village are likely able to exercise some level of influence by having other positions of power that are relevant for the collectors. For example, a trader with village maize mill, motorbikes, extensive farmland with opportunities to hire piecework - may use access to these services and opportunities as a leverage to ensure the fellow villagers who collect Chinaka sell their goods to him. Because the value chain works largely on an established network between the collectors - traders - vendors, such network enables an exclusivity that can wield power over who gets to join the value chain.

Security and backup. Comparing two traders revealed that more frequent trips are a luxury to those who 1) have the greater network of collectors and buyers, and 2) have family and other backup labor to allow the trader's prolonged absence from other livelihood activities and family needs. Surely the wealth and assets gained from Chinaka business in turn increase the security against personal or household calamities. And despite the larger wealth and their significant role in mobilizing the illegal extraction of the goods, ironically the trader group remains relatively safe from law enforcement with the current law enforcement focusing more on *inside the Park*.

Box 17: Gaining Wealth

How people start gaining wealth: Inheritance from family is a rather exclusive because of the number of children in the family, which is furthered by polygamy that leaves a sizable portion of the children to be raised under attenuated family ties. Hence the "self-made" wealth and status are found in communities.

One example of such case was an individual who also dealt in the trade of Chinaka tubers collected from the village and transported to trading center. Self-identifying as a "capitalist", the wealth was now accumulating through the power of the capital that had bought goods such as equipment (telephone, solar panels, motorbike - which allow to connect to the market), which then became exclusive capabilities (network and relationship established in the value chain). Such conditions allowed building a status and to some extent perhaps even an authority (acting as gatekeeper to the value chain). In the meantime, gaining such goods, services, and power also benefited other common subsistence and livelihood activities: more land, seeds, fertilizers, hired labor, etc.

The further application and mobilization of the wealth, connection, and power into expanded areas seemed to require individual energy and entrepreneurship.

This specific individual was born as the first son of the third wife, educated to Form 2 including outside the village in District Center, and received an endowment of 0.5-hectare land area from the father. On that piece of land, he farmed cash crops (tomato and onions) and maize while in school; and found market in Rumphu District Capital. He was also farming on other people's land, which helped him mainly with buying fertilizers. There was a year of luck when many other places in the district experienced drought while his village did not. That year the price for his yields were high and allowed him to then invest in livestock. In the meanwhile, he had also purchased pine trees to grow for timber business helping to buy fertilizers and pay school fees. At the age of 21 he had bought 2 hectares of land, 3 cattle, and 20 pine trees. Now more than a decade later he has managed a small car, 3 motorbikes, maize mill, phone and solar panels which allow his businesses to reach a larger scale.

2-4 Outside the Nyika-Communities: Vendors, Bake-and-Sellers, and Consumers

How about in the trading-centers? There are largely three groups: vendors - buying tubers from the traders and selling at market to the bake-and-seller group; bake-and-sellers - buying tubers from vendors to cook Chinaka cake and sell at the market or in neighborhoods); and consumers (who buy the tubers or cooked Chinaka). As the focus was more on the communities living in the vicinity of Nyika National Park, these groups were interviewed more briefly and opportunistically at the site of their activities in the marketplace.

Vendors

Vendors are the people who sell the raw tuber to end users - e.g., those who will cook the tubers either to sell or to eat at home. In this study they are limited to those operating within Malawi - more specifically those based in Chitipa boma, which is really the only *District Capital* in northern Malawi (and perhaps in the entire country) to have a vibrant Chinaka market. All five vendors briefly interviewed were male, although two female vendors were observed. Three said they had begun Chinaka business in 2016; while another one in 2003, and another just in 2019. All of them were selling Chinaka as one of the many commodities they trade in. Other commodities included beans, groundnuts, maize, etc.

Vendors essentially need to have connections with traders. Such network is established for telephoning each other to make a trade happen. One vendor boasted having contacts to 10-15 traders; while a vendor who had just entered this business said that such connection was exclusive and the fellow vendors do not help in terms of sharing their contacts. Vendors from Chitipa DC also sell at weekly market. The advantages of these markets are that the weekly markets attract a high concentration of buyers in a short amount of time. Hence the sale ends within hours, as opposed to at the DC market where buyers come seldomly throughout the day.

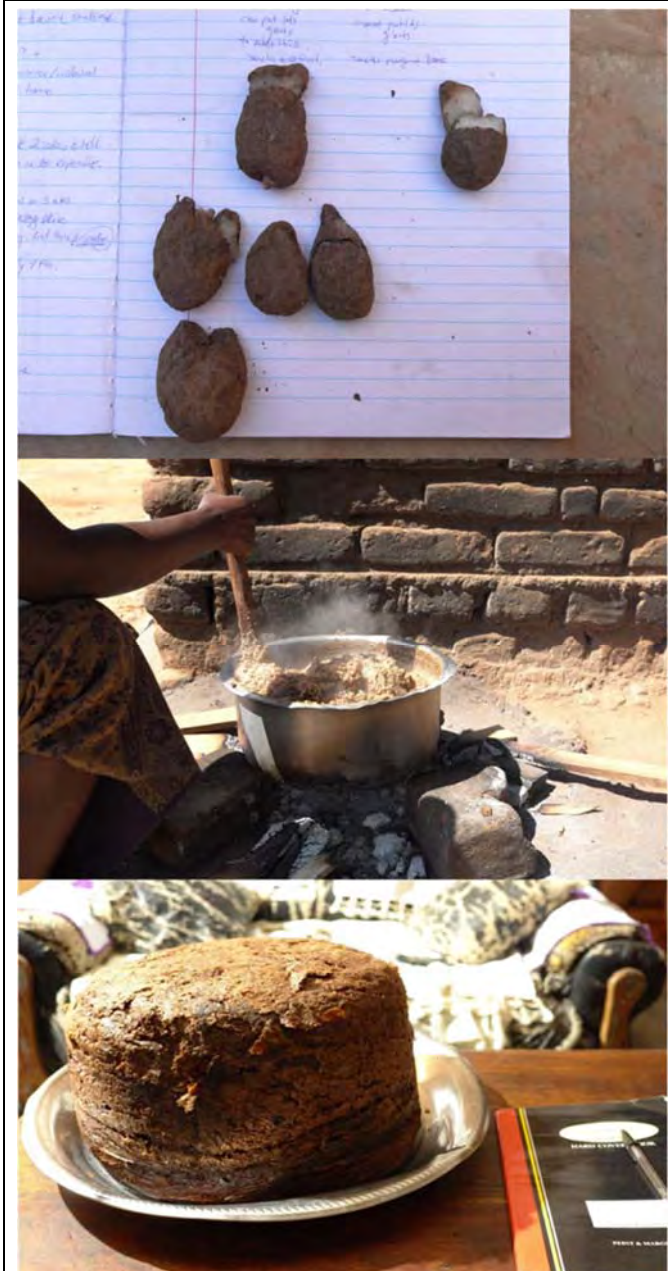
Bake-and-Sellers

This group cooks and sells Chinaka cake for earning cash income. Bake-and-sellers were encountered and interviewed in Chitipa DC market and in weekly markets on the western side of Nyika. By estimation, a Chinaka baker - "who does nothing but Chinaka baking and selling" during the season from April to September - makes a net profit of roughly 312,000MWK over the season. But the profit margin for the bake-and-seller depend heavily on 2 factors: 1) the unit cost of Chinaka tubers, and 2) more immediately controlled by them but with small margin

- the unit size of the Chinaka cake for the standard unit cost. As for the first factor (cost of Chinaka tubers), if a family member goes to collect directly from the National Park or has direct link to the collectors, the net profit could be increased up to double.

Getting supply of raw tubers is a volatile business. The price tends to fluctuate arbitrarily; and there are also access problems with stock that is likely to increase with scarcity. Some assert that higher price at Tunduma market incentivizes the vendors to prioritize the supply to be sold in Tunduma, making access more difficult or unaffordable. Hence some women even pay vendors up front; or their spouses or family members go to collect Chinaka in the National Park. Although it would significantly increase their marginal profit, they are aware that it is at a greater labor and risk-taking. In this sense, the family who heavily depends on Chinaka even in towns is also in a precarious situation with high stakes. Although the bakers' level of involvement in Chinaka varies, the sheer number of bake-and-sellers is said to have soared over the last decade up to "hundreds", with the increase in Chinaka consumers.

Box 18: Chinaka Cake Baking in Chitipa DC, Weekly Market, and in the Village



<Chitipa District Capital Market> The baker's day during high season is "too busy with Chinaka". For example, the cooking will take about 3-5 hours to cook depending on the size of the cake; and the selling will happen throughout the day as a mobile seller and in the late afternoon and evening at the market. The bake-and-sellers who are experienced and committed to make many cakes can spend time from 3am to 8am to bake, start selling on foot from 10am to 4pm, and finish the day by selling at the market from 5pm to 8pm - indeed an all-day occupation that requires supporting labor at home. This one case, we ran into an interviewee in the evening who said she is retiring for the day early while her Chinaka isn't finished because there were just too many ladies selling.

Top: the tubers preferred for baking are large in size and small grains that are less watery.

Middle: baking takes 3-5 hours depending on cake size.

Bottom: a cake that took 5 hours. It used 7 (300mL) cups of whole Chinaka tubers, 13 cups of groundnut. The cake would be sold in the neighborhood, and at the market (4-8pm), to finish in 1-1.5 day.

<Weekly Market> Weekly market are held in certain locations. There are about 2-3 such markets, which attracts many bake-and-sellers - including ones from Zambia. Each bake-and-seller will have 2-3 cakes. The seller can travel the day before or early in the morning to get to the market depending on distance, and spend the entire day selling 2-3 cakes.

<Village> Then there are the “nonchalant” groups who make cake opportunistically and sell within the village - to make petty cash in the order of 1500MWK. This is in most part pure profit other than the labor and opportunity cost in the search of Chinaka (an entire morning helped by a few children) around the village in customary lands.

Top: Chinaka at a weekly market. Basin on the left has 2 cakes - each with 3 cups (300mL) of unground Chinaka; both cakes are expected to finish sales in 1 day and make net profit of about 8,000MWK.

Middle & Bottom: a completed cake in the village using 1.5 cups of unground Chinaka. If sold around the village, it would earn about 1,500 MWK.



Box 19: Baking Chinaka

Delicacy in baking Chinaka: The subtle adjustment in temperature control, volumes, timing, and ingredient quality are supposed to make difference in taste and texture of Chinaka cake. For this reason, consumers have their favorite Chinaka-cake bakers from whom they prefer to buy the Vegetarian Bologna Sausage. Basic steps in making Chinaka cake: (1) pounding and drying Chinaka and groundnut powders (used in 1:5 ratio but this ratio may vary per baker), (2) making porridge with groundnut powder in boiling water, salt, and baking soda (people use different baking soda and add at different points in cooking), (3) adding Chinaka powder to the porridge and stirring to thickness, and (4) baking with hot ash on bottom and top of the pot. Below photos are from demonstration in Nthalire.



Chinaka tubers cleaned; pounded; and dried



Pounding groundnuts; ingredients (soda, Chinaka powder, salt, groundnut powder); first stirring groundnut powder

Groundnut porridge thickens in water with salt and baking soda; Chinaka powder added; stirred to thicken

Baking on top and bottom

Consumers

Consumer groups were surveyed at the market in June-July during the dry season when Chinaka cakes were being sold at the market. But outside of Northern Malawi - and really outside of the very few selective locations where Chinaka cake was actually eaten - most people did not know about Chinaka. A small number who knew did not have the experience of eating it. Most notable about the consumers is that the range of people are very diverse: young, old, men, women were buying Chinaka to eat on the spot and/or buying in larger quantities to take home for making relish.

Only Chitipa DC market consumers were surveyed. The weekly markets also had consumers to be surveyed, but no survey was conducted there. Of the 15 consumers that were buying Chinaka cake and surveyed (7 female and 8 male), 12 had consumed Chinaka cake since childhood; the 3 who did not (all male) were from farther away (e.g., Mzimba and Karonga). For these men, they first encountered Chinaka in their teens in Rumphu DC, Chitipa DC, and Mzuzu. Again, 12 knew about the Chinaka as ingredient in the cake, while 11 were aware of regulations on Chinaka (all 4 who were unaware were men). Also 11 people were aware that Chinaka orchids was scarce; but only 2 knew the reason (e.g. Chinaka orchids cannot be farmed or grow easily) while the rest had deduced it from the little availability at market and the high price.

Box 20: Possibilities for a Viable Substitute

Because there were many sellers of Chinaka cake, a question was asked about the consumer's preference: 2 attributed to the texture - one woman saying that when she chews, she can know whether Nyika Chinaka have been used. Twelve persons attributed to the taste (groundnuts and pepper) - 2 specifically point to ground nuts, another 2 to pepper, no one connected any specific taste to Chinaka. Indeed, Chinaka itself has almost no taste and its contribution to making Chinaka is largely the gelatinous texture it gives. This implicates possibility to find a substitute substance that would give the gelatinous property and retain consumer acceptance. Indeed, many bake-and-sellers indicated that while the tubers most abundantly found in Nyika were preferred for the cooking to give firm elasticity whereas others made the cake more watery. Some bakers were mixing in different ratio so that they economize on the better tubers. In the baking demonstrations, the less preferred Chinaka tubers that were found in the villages cooked well - although if making a larger cake the outcome may be more affected. Back in Mzuzu a trial to mimic a Chinaka cake with irish potato was conducted, and while the cake would not hold firm when cut in pieces, the taste was almost exactly the same.

3) Knowledge-Perception-Willingness

- To gauge what interventions could help relieve the pressure on Chinaka orchids and “orchid poachers”, semi-structured interview and questionnaire were designed to understand what people knew, perceived, and were willing to do about three subjects: the orchids, the trade, and the governance.
- Some notable findings on *knowledge* is that the majority people do not have much knowledge related to techniques for digging, storing, and cooking¹⁵. With trade, while people keep track of the rough net profit of their Chinaka activity, the calculation does not go beyond the cash income (e.g., does not take into account comparison over longer period of time with other livelihoods and risks). Knowledge about regulations was abundant but not always accurate. DNPW outreach efforts raised awareness in communities, but because it focuses on the ban *inside* the NP - what was banned *outside* the NP was vague. This was the case even among some government officers.
- On *perception* about the supply of Chinaka orchids, people perceive that overharvesting has led to a decline. But going into Nyika persists, driven by the perception that there are “orchid pools”¹⁶. For the collectors, the appeal of “fast cash” is strong but the perceived risk of apprehension is also on the rise. Nonetheless, a prevailing perception in anyone spoken to - villagers and others - is that people will continue to harvest.
- On *willingness*, many community members express strong willingness to change their behavior in order to sustain orchids population. This stems from the desire to continue Chinaka activities into the future. But, exploring options for changing behavior is not straightforward among the villagers. Existing sentiments of unfairness in the currently ongoing resource governance schemes are expressed and portends future concerns around organized resource use. Community members are also willing to protect orchids against the outside exploiters but expressed their lack of authority and practical means to do so.

¹⁵ This is in contrast to the Zambian rural communities, where people often spoke confidently of various techniques that they apply to ensure optimal outcomes. Chikanda is known to be originated from the Bemba tribe of Zambia.

¹⁶ A comprehensive survey inside the Park for the actual baseline of orchids population and also a better understanding of orchid ecology would help mitigate this drive and strengthen the justification in dissuading people from illegal collection.

Table 5: Study Participants' Knowledge-Perception-Willingness about orchids, market, and governance

	Orchids	Market	Governance
Knowledge	<ul style="list-style-type: none"> • Little traditional knowledge; observations over recent years • Transfer of knowledge from Zambia/Tanzania 	<ul style="list-style-type: none"> • Little knowledge about the market outside people's own scope; much less about the trade outside Malawi (e.g. Tunduma) 	<ul style="list-style-type: none"> • Regulations are better known where DNPW is active and where arrests are made; hence limits knowledge to communities near NP • Regulations on selling cake is unclear
Perception	<ul style="list-style-type: none"> • Laborious, but "fast cash" • Declining in general but there are undiscovered pools in Nyika 	<ul style="list-style-type: none"> • Infinite demand and supply • Chitipa DC: ending Chinaka will be devastating 	<ul style="list-style-type: none"> • Mix of rejection and acceptance about conservation rules • NRC permit system is not equitable • Sustainable harvest is desired but not easy
Willingness	<ul style="list-style-type: none"> • Eager to learn to conserve and cultivate • Some willing to "forget" and concentrate of alternatives 	<ul style="list-style-type: none"> • Some aspire changing role in the value chain 	<ul style="list-style-type: none"> • Willing to govern the resource collaboratively (NRC permit system shows inequitable use) • Willing to prevent exploitation by outsiders (but no practical means or authority)

3-1 Orchids

Knowledge about the orchids

In this study's village participants who were engaged in Chinaka value chain, most people did not have indigenous knowledge / technique to harvest sustainably (90%), nor how to store the raw tubers (86%). Participants could recognize a number of edible species according to physical traits and some phenology such as when they flower, what type of habitat they occur in, and when the tubers mature. Some collectors made speculations about the orchids from the years of collecting orchids such as field burning is believed to be conducive for orchids growth (07181). The vernacular names were not standardized throughout the region; local names such as "Chikuru" are generic descriptions similar to "big" and therefore several species share a vernacular name. Some people have experimented to cultivate by planting residual tubers but without success of growing another tuber.

Perception about Chinaka orchids and their meaning to people's lives

Importance to livelihood. Perceptions about Chinaka value as a source of livelihood and wealth varied. For those well established in other means of livelihood and especially high-value commodity such as coffee deprioritized Chinaka. Meanwhile, the most heavily reliant on Chinaka income was found in Chitipa District Capital - a married couple who were involved in Chinaka (collection, bake-and-sell) and said they would be devastated without Chinaka.

"Rights to harvest Chinaka orchids". Such perception of claiming "rights to harvest Chinaka" was not too strong, most attributable to the fact that Chinaka is a relatively new food and commodity that was introduced from external sources. This perception related to the willingness to give up and ignore Chinaka activities if alternative livelihoods were viable.

Declining in general but there are undiscovered pools in Nyika. Most participants alluded to the general decline in Chinaka orchids - e.g., it took more time to collect and the scarcity months came earlier. At the same time, people imagined Nyika to be a place where plenty of orchids were still growing. The perception was that the places within Nyika that risk-taking collectors have been going may be declining in orchids, but there are untouched places abundant inside the national park that is only a matter of access.

Willingness about orchids

Eager to learn about ways to conserve and cultivate. The participants were very willing to discuss about possibilities for sustainable harvesting and cultivation. Everyone was in the interest of sustaining the Chinaka orchids population and avoiding its depletion. Specific harvesting and planting techniques were in high demand. There were extensive discussions on hopes for Chinaka cultivation. For risk-taking collectors, *farming* was ideal to avoid the laborious and risky venture and were even willing to accept lower prices for the farmed Chinaka (1216). Even the traders and bake-and-sellers wanted to be able to farm Chinaka and reduce their costs. Vendors were the least enthusiastic, as their views on farming was that it would lead to a rise in abundance and lead to plummeting prices.

Willing to “forget” and concentrate of alternatives. On the contrary, there were also willingness to forget Chinaka altogether and turn to other cash crops. These responses are not mutually exclusive with the eagerness to learn about sustainable harvesting. Particularly because people do not have a ubiquitous habit of eating Chinaka cake and Chinaka is largely for the outside market, people are happy to replace their commodity with one that is possible to cultivate. Bake-and-seller group was divided, those with successful business was not much interested in alternative livelihoods, and even said they would be devastated if Chinaka business was gone.

3-2 Market

Knowledge about Chinaka trade

There is little knowledge about the market outside people’s own scope; much less about the trade outside Malawi (e.g. Tunduma) There was relatively scant knowledge about the prices along the value chain, i.e., people only can talk about the prices that they sell at. This was the same in Chitipa Boma - they did not know how much the tubers were sold at Tunduma market. Still, everyone thinks that the price is higher up the value chain and know that their buyers are profiting more than themselves.

Perception about the market

Perception of infinite supply and demand. Perception of the traders, vendors, and bake-and-sellers on the demand for Chinaka tubers were often as if the demand was infinite. However, given that there is only a select group of villages that are accustomed to eating Chinaka - such perception is likely not well-informed. Two bake-and-sellers for example talked of the market becoming saturated, e.g., too many bake-and-sellers to compete with for the Chinaka cake buyers. One bake-and-seller said she now only bakes 1 cake whereas years ago she baked 3 cakes per day (0123). Another bake-and-seller was carrying back home leftover Chinaka cake, saying that “there are too many bake-and-sellers tonight” (06251).

Willingness about their role in the value chain

Changing roles. There were two categories in the value chain who had participants expressing a changed role. First, several risk-taking collectors expressed desire to move up the value chain to become a trader. This is most likely the wish to avoid the laborious and risky work of going into the National Park. Their limitation was the lack of resources needed for trading, such as affordable access to transport and also the network and a basic level of

influence to ensure that collectors will sell their Chinaka tubers to him/her. Second, a bake-and-seller in Chitipa DC expressed desire to start supplying tubers to Tunduma market as a wholesale trader. The limitation was the heightened law enforcement risks in the Park that deterred her and her family member to collect in Nyika.

3-3 Governance

Knowledge of the regulations

Rules and loopholes: People know about the rules, but it does not always change behavior. Most people know the rules and the risks, mainly from the arrests that have been made as well as awareness raising activities by the DNPW. However, they also know of the people who go and make profits. These affect most to be unaffected by the rules, thinking that it's a matter of chance to be caught. There are also people's awareness of instances of complacency in the law enforcement, which affects perception about the risks. Rumors that people have bypassed roadblocks or avoided apprehension were pervasive and likely factored into decision-making about illegal activities.

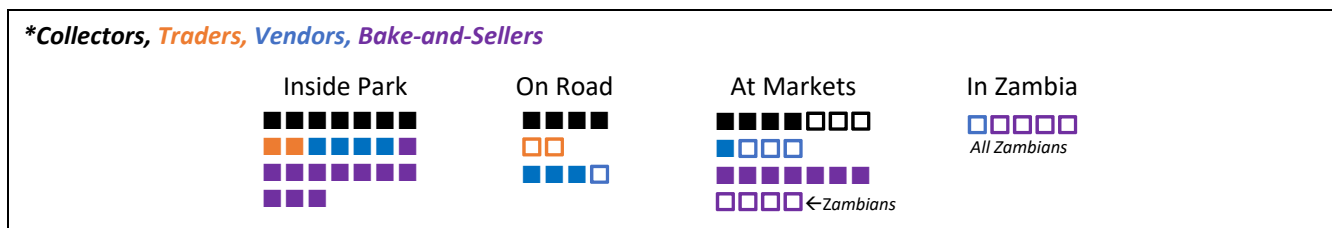
Legality in Zambia: Knowledge about the legality in the neighboring communities of Zambia had an influence in Malawian communities. All but one showed their knowledge that Chinaka is legal in Zambia, including the Zambian participants in this study. An important implication is in the weekly markets on the western side of Nyika. This is where the Zambian bake-and-sellers - despite knowing the different rules of Chinaka in Malawi - are unabated and continue to sell Chinaka cake. It is likely having an effect of undermining the DNPW initiative to raise awareness in the communities about Chinaka. This is an issue that the Malawi-Zambia TFCA initiative could help by mitigating the difference through coordinated regulations, messaging, and actions.

Perception about the regulations and their implications

West, East, and Chitipa District Capital: On the Western side of Nyika, the sense of wariness for law enforcement was especially acute. It could be the influence of recent apprehensions prior to the time of the fieldwork in June/July. In comparison, the Eastern side of Nyika was less deterred or disturbed by the fear of law enforcement; the sentiments were different on the west side - one participant saying, "to be arrested is by accident" (07-162). This had an outcome that on the Western side there were less active trade to Chitipa DC as the community members avoided transporting tubers themselves and only sold to vendors who would come to their village. In contrast, on the Eastern side there are groups of traders from the village who take the goods to Chitipa DC market. In Chitipa DC, people are aware that there is restriction and said it is a *secretive* business, but they had no fear of the law enforcement reaching them in town. As for the people around Nyika, their view was that "there is fear among the people, but it's their income. No matter how the government restricts, people will go to collect."

Perception by value chain category. As per category of the value chain actors, a tendency is that individuals are less fearful of the areas that they operate in. For example, while the collectors and vendors at market pointed to the risks on the road to transport the goods, the traders responded the road has no risks. Likewise, while some traders were fearful of trading in the open market, the vendors had less fear. Finally, while entering the park illegally was universally feared, the risk-takers who go into the park described the risks as "like any other dangers" (12-16).

Box 21: Perception about Law Enforcement Risks in Different Areas, Responses by Each Category of Actors



Perception about conservation efforts. The NRC permit system that allows communities within the 5km buffer zone to extract certain NTFPs from the 5km limits of the Park was deemed not equitable in 3 of 4 villages. The unfairness was related to favoritism in access to opportunities and benefits from the system. Many people were uninterested in improving the system, because of the strong perception that entering the park itself meant trouble. Sentiments about the history of resettlement associated with Nyika National Park was also frequently mentioned. The desire to go back into the park for farmland or adjusting the boundaries were brought up in all villages. Reasons were due to infertile soil where they live and farm, issues with flooding, land shortage with population growth, etc.

Box 22: Discontent on Resettlement

Still a sizeable amount of discontent regarding land that was gazetted as national park. From the perspectives of the villagers including NRC members and the Traditional Authority - the desire for more effective communication and discussion on land boundaries with the DNPW was expressed. Although not with animosity that can be found elsewhere, sense of complaint was explicit and there were conflicts. For example, the instances of DNPW demarcation being enforced in an unfair or rather brutal ways (destroying crops and planted trees on the encroaching farmland). The efforts to negotiate with the government through the Member of the Parliament has also been tried, with the answers coming back that de-gazetting at the request of the constituency would trigger a series of similar attempts and significantly lose the portions of land. More often the lack of fluid communication with the DNPW through the PWAs were points of frustration; it could also be that the communication within the villages were not fluid.

Willingness to change for governance improvement

Legalization of Chinaka. All respondents except 3 (all vendors) were favorable to a legalized Chinaka value chain. The three vendors opposing legalized Chinaka value chain were concerned that it would not be as profitable if this was legal. Those with favorable views were willing to cooperate if there are provisions such as technical guidance and quota. Even the traders, who are making similar if not more profit than the vendors, responded that they want a legal system to facilitate the trade. And one of their rationales was that a proper management helps the orchids survive and not vanish. This was echoed by many, saying that a good governance system is in their interest to keep Chinaka as part of their livelihood. For the risktakers, they favored a legal market not only to eliminate the risk of arrest but also to mitigate the sheer labor of searching and collecting in the park in secrecy.

Traceability. Legalizing Chinaka requires addressing the issue of traceability - e.g., ability to identify whether the goods have been supplied from permitted sources and through sustainable methods. A discussion in Village 2 raised the concern around the possibility that DNPW may penalize people unfairly due to unclear traceability. The community members emphasized the importance of having a workable operational procedure for the community

and the PWA to incontrovertibly identify traceability. One member of the community suggested controlled harvesting together with park authorities, similar with beekeeping.

Sustainable wild harvesting. Discussion around harvesting from the wild was held - both in the scenarios of inside the Nyika NP, and from outside in the customary lands. While all were willing to manage Chinaka activities to ensure sustainability, there were disputes about realistic implementation of such controlled use and management. The concerns of the people about having an internal monitoring and management system consisted of the following:

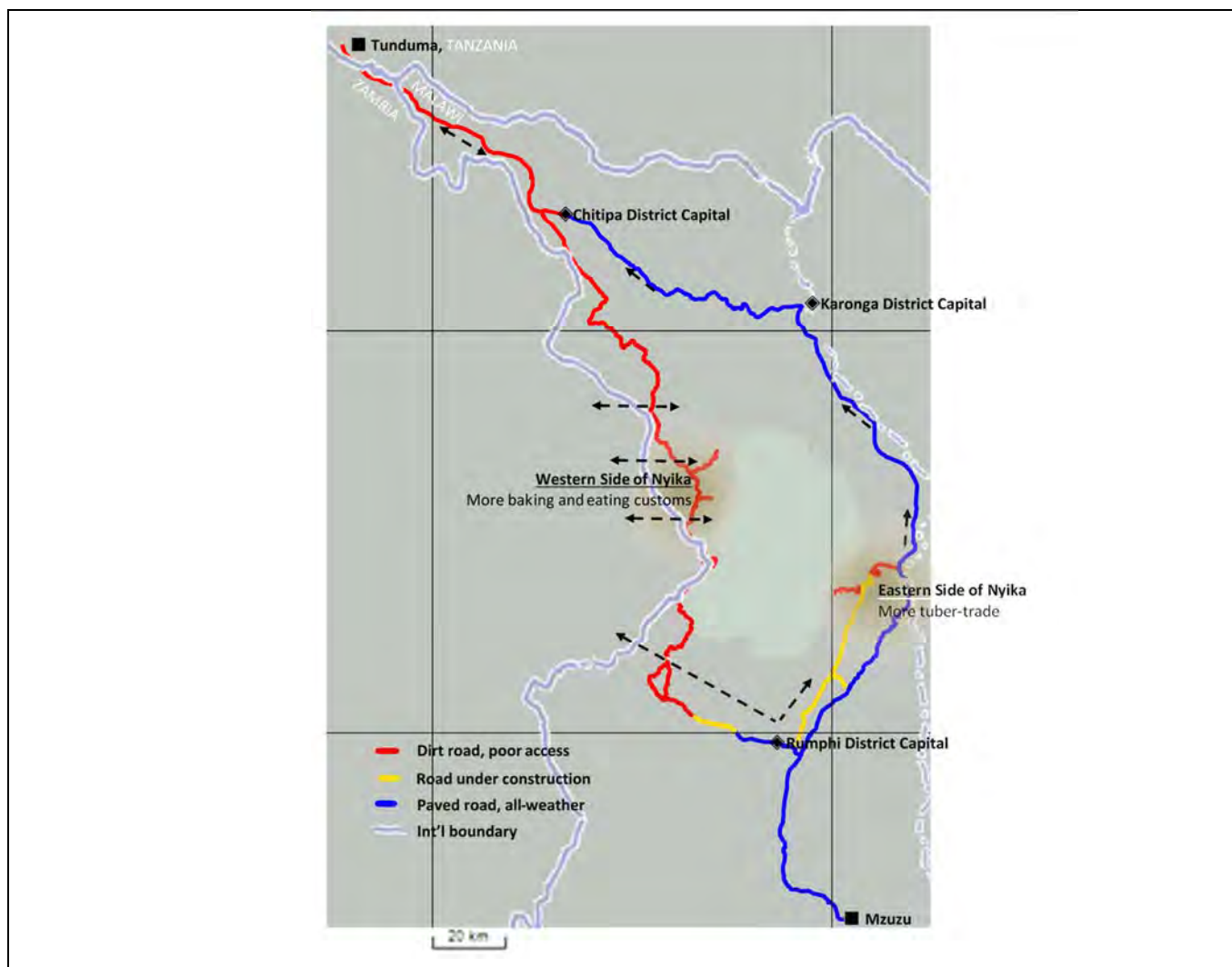
- 1) People have tendency to indiscriminately collect and not abide by the quota. The concern aligns with some risktakers and collectors' observation that people usually do not wait until October when the tubers are most mature because other people will finish harvesting early on (07192).
- 2) Collectors from the outside may come in and collect not according to the set rules of sustainable harvesting. While all communities around Nyika wished to prevent outsiders from accessing Nyika for resources, 70% of the participants expressed it would be difficult to prevent outsiders without clear mandate nor practical means.
- 3) Women were concerned that women may not benefit so much from such collection scheme in Nyika, because the laborious hike and camping would deter women.
- 3) In a collective system like a cooperative, ones handling finances may not be transparent.
- 4) In the case of wild harvesting from areas within the customary lands, people were concerned about ensuring that a communal land that becomes a value-ridden "Chinaka hill" is protected from personal use such as swidden agriculture or being claimed as a private land.

IV. Conclusion

[General trend] On scale of Chinaka trade in around Nyika and northern Malawi: demand is increasing, and supply is decreasing. All respondents are consistent about increasing trend of demand. Some trends in villages demonstrate that eating Chinaka can be habituated and therefore increase the consumer base. All collectors agree that the harvesting time is getting longer. But, findings of “jackpots” inside Nyika continue to entice people; and the previous research in the region finding that not all edible species are yet recognized is a cause for caution. Interviewees themselves have expressed that once a species is nearly depleted, people begin to test other types to see their suitability for baking Chinaka cake.

[Geographical pattern] Eating habits and the practice of trading Chinaka was linked to geographical characteristics to some extent. For example, communities closer to Zambia were introduced to Chinaka as food earlier than the communities on the other side of Nyika farther away from Zambia. In the Eastern side, Chinaka was first introduced as a commodity with commercial value rather than food. Hence eating habit never was really introduced nor adopted. The commercial Chinaka traders reached the eastern side area more easily than the western side mainly because of better access (M1 highway proximity). For these remote and isolated communities, trade in commercial products is highly sensitive to infrastructure development and network connectivity.

Box 23: Chinaka Activities and their Flows in Northern Malawi



[Perceptions and behavior] Most people involved in Chinaka activities desire a way for ‘legitimate’ use and trade. It is not only for the risks of arrest, but people desire a secure, stable, safe, and reliable niche market to improve their livelihood. Decline in Chinaka orchids is not in the interests of the people, and they are willing to be part of conservation efforts. Furthermore, the sense of “secrecy” may be intensifying the disruptiveness of how collection is done (indiscriminate collection of “get everything one can collect as fast as they can”). Such tendency may also appear in the trade if/once law enforcement increases on the trade as well.

[Risks and returns] Chinaka collection is low capital cost, high-risk, and high-return business for many of the rural households. The upfront costs are minimal: no capital cost (no cash needed), no equipment needed, no skills needed, and no extensive social connection needed. Comparing to hunting, it is relatively more open for anyone who is willing to put labor into searching and digging and carrying orchids. Hunting involves a much higher level of risk, skills, that is exclusive to a few who are equipped and knowledgeable and connected to the chain. Comparatively, orchids harvesting is more open to those who are willing to simply risk the illegal entering and the demands of labor. The high-risk runs similarly to other activities that enter into the park. The return also has a distinction in that it fetches purely cash; while hunting is primarily for sustenance and then is bartered.

[Gender-related pattern] Gender implications are manifold. Bake-and-sellers are exclusively female, while traders and vendors are *almost* exclusively male. Collectors can be mixed although the majority going into the park are male, given the physical demand in the hike and carrying heavy loads. Such physical limitations were acute, and some women pointed out that this would limit their future opportunities. Not only the physical demand but also the need for extensive network to suppliers and buyers is also likely an area that presents extra hurdles for females, who will need to build her network among male-dominated crowd. Beer, Chinaka and other baked goods are the typical cash-income activities exclusive for females. It is perhaps in this sense of earning cash that a person - male or female - is deemed “active”. Several times during a focus group discussion, comments came up associating women with “lazy” or “idle” and the need to be empowered with business activities. Since English words were used, it is possible that they carry different connotations. A person’s industriousness and laziness are attached to cash-income while neglecting the labor in the house for family subsistence and well-being.

Please see [Appendix IV. A Blueprint of Proposed Interventions](#) for a schematic that shows a comprehensive set of potential and necessary interventions for gaining sustainability in the Chinaka orchids and livelihood.

V. Recommendations

Equipped with a better understanding of the Chinaka value chain in Malawi, its actors and perspectives, has enabled to formulate 8 recommendations:

1. For now: Clarify regulation among stakeholders and enforce regulations along the whole supply chain

The current regulations need to be clear to all key stakeholders - communities, traders, consumers, as well as regulators - in order to eliminate confusions about what is and is not allowed. Clarifying the existing law and regulation is also important for sending the message to the general public (traders and consumers) that Chinaka-

related activities are actually offences, not only to the collectors inside Nyika but also to traders. This may help deter the relentless demand along the whole supply chain. Currently, the traders and baker-seller in towns do not face significant law enforcement, because the law protecting the endangered species on the road and at the market is not (yet) being enforced. Many in this group, especially those in sales and consumption are not very well aware of the illegality associated. As long as the demand is there, the collectors will continue taking risks of arrests to go inside the protected areas to collect the Chinaka. Such awareness-raising and through clarification of the regulations will need to be followed by enforcement of those regulations.

2. Consider changes in regulations towards formalizing and regulating commercial Chinaka activities

The current regulatory framework is a blanket ban on all species of orchids - inside or outside the protected area. The blanket ban reflects the approach taken by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)¹⁷. For any serious efforts to explore controlled use in Malawi, a change in the regulatory system is needed.

One possible adjustment is to add a special provision in the *endangered species list* to allow use of orchids that are outside the protected areas, which is the case in Zambia. Expectedly, this brings the challenge of identifying whether a specimen is from inside or outside a protected area.

Another possible adjustment is to take advantage of a specific Wildlife Act provision, which can enable controlled use of endangered species by creating a defined user scheme. It would be an attempt to better manage these endangered species by supporting its users to exploit it in a sustainable way rather than by completely banning all uses. This is under the Act, Article 87 *Regulations for controlling trade or dealing in protected species, endangered species or listed species* subsection (1) states:

The Minister may from time to time, on the recommendation of the Board, make regulations providing for [...] (b) the control of industry engaged in the manufacturing of articles derived from protected species, endangered species or listed species.

This brings up the questions - how such scheme can be designed, and also be cost-effective for the regulators to support the scheme?

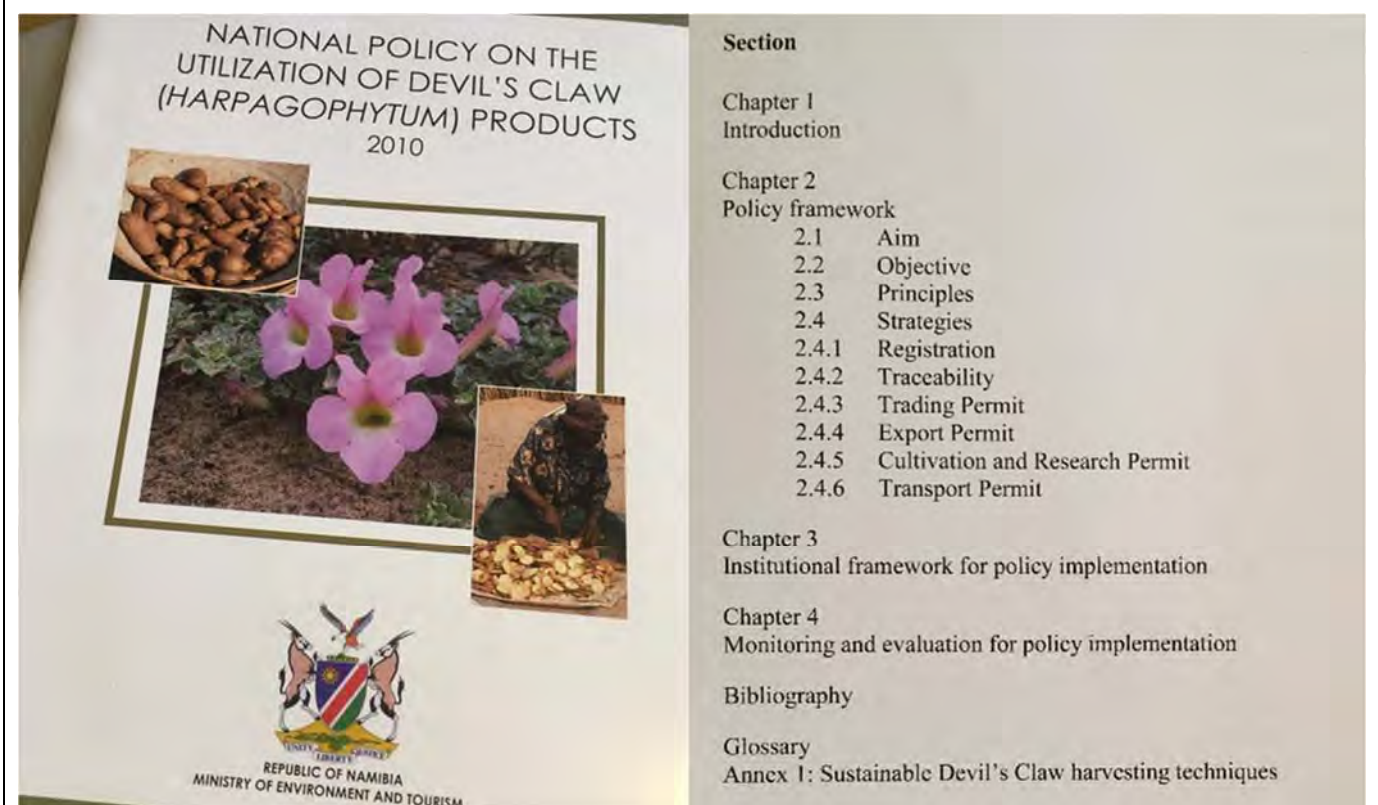
Box 24: Case of Namibia's Devil's Claw (Harpagophytum, known as Grapple Plant in English)

Devil's Claw is an indigenous geophyte much like edible orchids, whose tubers have medicinal value. The case of how Devil's Claw use went through a history of banning, permitted use, and now communal conservancies having enterprises around its harvest could be an interesting case to examine and study further.

- Seems to have been more successfully organized thanks to its value as medicine. The plant was confirmed for medicinal value by a German University in 1950s and thereafter registered as herbal medicine in France and Germany, food supplements in the US, UK, Holland, far east. So commercial value is higher than the case of edible orchids which is predominantly local food.

¹⁷ CITES itself adopted the 'precautionary approach' in the 1970s not because all species are known to be vulnerable, but because of the difficulty in species identification.

- “Grapple Plant” (*Harpagophytum procumbens* and *H. zeyheri*) is geophyte with a main taproot with secondary storage tubers that contain compounds with analgesic and anti-inflammatory properties.
- Permit system has been tried, failed, reintroduced (Further details in [Appendix I 4\) Namibia Permit System for Devil’s Claw](#)). Organization improved with 2014 launch of a Trust for the Namibia Devil’s Claw Exporter Association (legal and technical assistance was provided by “Millennium Challenge Account (MCA) Namibia”). The Association is mostly overseeing the industry in whole
- Sustainably Harvested Devil’s Claw (SHDC) model organizes harvesters into groups, supported by NGOs and through project such as Indigenous Natural Product Activity implemented under Millennium Challenge Account. SHDC model basically is about:
 - Setting quotas
 - Monitoring harvesting techniques (which have been researched for 5 years)
 - ❖ Extracting from mature plants only
 - ❖ Taking only secondary tubers
 - ❖ Harvesting few tubers from one plant over 2-3 years, or harvesting most tubers from one plant and not disturbing for 3-4 years
 - ❖ Refilling the dug hole with soil and not disturbing for at least 2-3 years
 - Coordinating and organizing harvesters
 - Helping collectively sell to the exporters directly
 - Helping on the trade side: selling directly to exporters, supporting on meeting the administrative requirements for sales/export of processed product
- As of 2009, 8+ Communal Conservancies had established an enterprise around devil’s claw harvesting.
- There has also been some downside to this: introducing cultivated products that require specific conditions that need considerable capital and human resource investment has ostracized some traditional communities. The processing, which adds much value to the product, also has patented technologies that are out of reach for the local communities.



3. Explore protecting wild orchids with support of community members for some exclusive rights to use.

[Permitted use under monitoring] While the cultivation agenda takes its course, wild species need to be protected. A possible approach could be to galvanize the surrounding communities' support in safeguarding the habitat and access. Although the communities do not have any legal ownership about the resources inside the protected areas, there is sense of exclusivity and desire to prohibit others from exploiting the resources. Some have described their own community as carrying the 'burden' and 'privilege' of living around the National Park, and regard any outsiders extracting natural resources from the Park as unfairly reaping benefits. Supporting the communities to have more concrete and exclusive access rights and delegating some level of to control access may be a practical way to safeguard the Chinaka in protected areas.

Ideas have also emerged from the communities that a permit system could allow some members of the communities to collect wild orchids in the protected areas under the guardianship of the rangers. This would be similar to the beekeeping scheme whereby beekeepers would be assisted inside the park even beyond the typical 5km limit of access with a ranger.

[Supporting other livelihoods and the cash-needs] To still reduce the pressure on wild orchids, especially from inside the protected areas, other livelihood activities that generate cash income could be reviewed. It can include improvements in alternative livelihoods to deliver similar level of income as Chinaka. Also, considering that Chinaka has an appeal for "fast cash" - improvement in people's access to financial services could also be reviewed.

4. Build common and agreeable justification for action, improve trust relations among stakeholders

Chinaka issue has a caveat that scientific data on the level of threat for individual species are largely inadequate. Having many edible species without knowing their individual threat levels makes justifying, enforcing rules, and monitoring compliance difficult. Given such circumstances, establishing an environment of trust relation and where the stakeholder all genuinely desire and share a common outcome is essential.

Where there is distrust and disappointment against DNPW for unfulfilled promises and for lack of effective communication - finding improved protocols and mode of operation could alleviate and amend trust relationship. For examples, some communities with especially weak relation with DNPW simply assume the regulators will penalize them for any interaction with the Park hence reject the permit system that allows villagers to enter the park to collect certain NTFPs. Such antagonistic views are due to weak trust relationships that need to be untangled and strengthened in order to make governance schemes operational and effective.

Internally as well, doubts are cast in some villagers' minds. Some believe that there are partial treatments to individuals closer to decision-makers to benefit more from various opportunities offered. Improving internal equity among villagers through transparent (resource) governance will be important to build confidence in the fairness of any governance schemes.

5. Inter-sectoral and inter-(local/national) governmental coordination for harmonization of policies

More effective law enforcement (and management of sustainable Chinaka use, should that be pursued) will require coordination across departments and across administrative boundaries within Malawi, and eventually across international boundaries. For example, regulators with mandates on roadblock inventories, custom officers at border crossings, scientific and management authorities for CITES permit systems will need to become aware of and define their roles in the management of Chinaka circulation.

In the communities near Chinaka, agriculture offices will need to support rural livelihoods - or sustainable harvest/cultivation of Chinaka orchids, should that be permitted/become possible. On a broader level, district and regional level development offices will need to integrate into planning and development about the existence of the market and people's livelihood related to Chinaka - whether this will be a ban on Chinaka or to support sustainable commercialization of Chinaka.

6. Bring about concerted regional approach to understanding and managing Chinaka market

[Research on current market] A starting point could be collaborated research. Research at regional level is needed to broadly scope the market - collect and review the knowledge, information, and data that are available and missing. Another research area for collaboration is for domestication and sustainable use techniques.

The collaborated research could also be in the areas of domestication/cultivation of Chinaka orchids. Collective interest would support continued progress in the science and attract researchers. Cultivating edible orchids is desired by all collectors and traders, to ensure sustainability and for greater volume. There are areas outside the Park that would be viable for cultivation, as some of these areas used to have orchids before they were depleted. The collectors wish to domesticate wild edible orchids because of physical labor in traveling to Chinaka habitat, the long search, and the risk of apprehension in the park. The communities have even attempted on their own to cultivate but failed. Ongoing studies in molecular biology, reproductive biology, ecology, and even engineering could be supported through more collective efforts in the research.

[Aligning basic principles and steps towards Chinaka management] The three countries could establish an agreement for the basic principles for the direction of managing Chinaka protection, trade, and community livelihood support. In the longer term, more specificity for compatible regulations could be envisioned: 1) defining permitted use framework at wild plants collection (access area, seasonality, user group, quota), 2) provenance tracking methods, 3) coordination for law enforcement and sanctions, and 4) support towards domestication and cultivation of Chinaka. The countries in the region could also take advantage of existing frameworks under the Southern African Development Community (SADC). Various aspects of a formal market will need to be studied and considered into regulatory design. For example, will a complete and coordinated ban across all trading countries trigger development of a black market?

7. Design social campaign to raise awareness on the potential threat and appreciation for the unique dish

[Chinaka eaters don't know about orchids] A social campaign is needed to spread the story of Chinaka: how the food is sourced, how some communities and individuals take risks, and how the orchids and their habitats are

impacted. Most are not aware the illegality of Chinaka collection, trade, and sales. A change in the consumer base to better appreciate and support orchid harvesters and conservation efforts could have an influence on the market. (Sustainable consumption and production campaign examples) (Other examples of awareness raising for non-luxury edible goods).

[Unique signature dish for the region] The Vegetarian Bologna Sausage is a dish of unique gastronomy, one with a rather fascinating behind story of its key ingredient. It deserves a concerted effort from the broad consumer base in the southern African region to help nurture it as such. Chinaka is also a potential positive conservation story: once-threatened and once-secretive wild product food galvanizes the rural communities for its sustainable use, the wider consumer base to better appreciate wild products, and all to support this to become a unique cultural dish special to the region.

[It doesn't have to be wild!] Having a more convenient option for obtaining the tuber could suffice to divert pressure on wild plants. This is because Chinaka is not a food of long tradition nor a high-value delicacy associated with status pride. It opens up avenues for finding substitutes or even alter Chinaka gastronomy. Communities have not acquired eating habits for long, and some communities never acquired eating habit. In fact, there is a commercial interest to identify alternative substrates. Furthermore, there is no association with high-status of 'luxury delicacy' of eating the wild species or any specific species for that matter. This is also the reason why most collectors wished to learn how to cultivate and stop the laborious and risky trips to the National Park.

8. Carry out additional research to validate some of the present conclusions

Previous/ongoing activities include propagation, sustainable harvesting, value-chain investigation. Gaps are in awareness raising and addressing regional trade. On the production side, concentration has been on plant science: artificial propagation for domesticating the wild orchids (by Kew and Copperbelt University in Zambia). Future plans include exploring hybridization (same group) and finding substitute substrates (a commercial group). Zambia is also piloting with a community to grow a group of seedlings that were artificially propagated, using a management plan to harvest sustainably. If and once domesticated orchids tubers become viable and sustainable wild harvesting is in place, proper governance for provenance will be an important dimension. This is to ensure that wild species are not continued to be harvested unsustainably. Furthermore, there are no interventions on the supply chain management - hence a holistic approach to working with diverse actors in the chain is lacking. For example, the consumers are not aware of the sourcing of wild orchids and therefore no curtailment of demand from the perspective of responsible consumption. Below is a list of possible research questions that could be further pursued.

- Ecology and Habitat
 - ✓ Habitat: comprehensive survey inside and surrounding Nyika (as well as other lands)
 - ✓ How much habitat is available - inside and outside the park?
 - ✓ How does orchids help the ecosystem and play a functional part?
 - ✓ How "destructive" is the harvesting to the habitat?
 - ✓ At what point of Chinaka occurrence will harvesting become "not worthwhile" for the collectors?
- Biology and Reproduction
 - ✓ Species reproduction methods and artificial propagation

- ✓ Hybridization? E.g., species with “large and few tubers” X “small and numerous tubers”
- ✓ How long does it take from seed to mature flowering plant? How do they vary per species?
- ✓ Is there a need for “soil seed bank”? Are mycorrhizal fungi safe?
- ✓ How specific are mycorrhizal fungi to the species?
- ✓ What will be the rate of recovery for different species if disturbance is eliminated?
- ☐ Current system
 - ✓ Full value chain, focus on consumers and traders at higher ends of the value chain (rural and urban)
 - ✓ Cross-border trade and tying together the 3-countries’ respective pictures of domestic trade and use
 - ✓ Effects of infrastructure improvement (road and connectivity) to trade?
- ☐ Imagining future system
 - ✓ How would the market be affected by co-existence of multiple supplies (“sustainably-harvested” vs “not”) -- deplete the ungoverned? Increase demand? Distort price?
 - ✓ Study on challenges and possible solutions for **internal governance** of sustainable collection, cultivation, and trade of Chinaka at producer level, and equitable benefit-sharing in the value chain
 - ✓ Study on challenges and solutions for governing a **market where tracking provenance** is critical for managing coexistence of certified vs. non-certified (wild vs. cultivated) products
 - ✓ Study on managing **cross-border trade** with compatible regulations, enforcement and coordination
- ☐ Gastronomy
 - ✓ Nutritional value of Chinaka
 - ✓ Substitute substrates for making Chinaka with species that are more easily cultivated

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Appendix I. Summary of Fieldwork Data

1) Collecting Chinaka Inside the Park

	Village Group 1	Village Group 2	Village Trader Group 1	Village Collector Group 1	Village Collector Group 2	Outside Village Group
Community Size	3 villages (500 pop.) Typical 3 wives, each wife 3-4 children	64 HH, 98 HH (540 pop.), 44 HH respectively	Trader is operating in a group village	Speaking to a group of 13 men	Speaking to a group of 8 men	6 from Chitipa and Rumphi Districts
The history and current trends						
When did Chinaka activity begin for the community?		1997-1998 when some Zambian relatives introduced	2000 is when people first discover that Chinaka is money			
When did people stop collecting Chinaka outside Nyika due to its depletion?		2013 is when Chikuru (large tubers) finished; small ones are still around but scarce, small cup: 12hrs 2018	(2008 is when people started going into Nyika)		2015-2016 (2013 is when people started going into Nyika)	
Trend in demand for Chinaka	Increasing		Demand is just too high and is increasing.	It's there.		
Participation of women in collection	Women don't go, but they can if allowed.	Yes there are women, but exceptional.	No	2013: 0 women 2018: 10 women	No.	No
Collection of Raw Tubers (inside Nyika)						
Duration for collecting 20L (past)		(small cup: 0.5hr 1998 vs. 12hr 2018), outside Nyika	2000: 2 days	2013: 1 day (can even collect 2 pails)	(2010) 1 day	
Duration for collecting 20L (now)	(1 week outside Nyika)	Can be as little as 3 days (esp. if husband & wife. If lucky, can be 1 day	2018: 5 days (inside Nyika)	3-7 days (inside Nyika)	Start of season: 2 days End of season: 4 days	Sometimes just 1 day 10: 2 wks
Collected in 1 week (past)		20L (decline started in 2016)				
Collected in 1 week (now)		April: 20L May: 10L June-Aug: 5L				Oct: 10L
How many people are involved, by month?	"There is no one who is not involved".	April: ? May: declines	7 traders operate	2013: 20 people 2018: May-Jul: 70-100 Aug-Sept: 10		"So many. It's just that they haven't been caught".

	Village Group 1	Village Group 2	Village Trader Group 1	Village Collector Group 1	Village Collector Group 2	Outside Village Group
		Jun-Aug: less people because it is too scarce and higher risk of arrest.		Those with coffee don't go because we are busy.		
How often do people go, by month?	2 times a month	April: several times May: decreases		May-June: 5 times/mo July: 2 times/mo	2 times a month	
Collection amount from Nyika NP				Min: 1 pail in a trip Max: 3 pails (otherwise too heavy to carry)	In a whole year, one man can collect 20 pails	
Price of Raw Tubers						
Price of 20L (past)			(2000) 2000	8,000-10,000	(2008) 4000-9000	
Price of 20L (now)	Low: 5,000 High: 12,000 Cup: 200 MWK (non-Nyika)	Low (Apr-May): 15,000 High (Jul-Aug): 28,000 Cup: 200 MWK (non-Nyika Chikuru) Cup: 80-100 MWK (Joyisi and Kabatika)	Apr: 10,000 (DC 16,000) Sep: 30,000 (DC 45,000) 15,000	30,000-40,000 Whole year: 250,000 per man	Low (Apr-Jul, Oct-Nov): 15,000 to 30,000 High (Aug-Sep): 30,000 Cup: 850 MWK	
Vendors from outside						
Volume purchased by vendor/trader to take to DC market?			15-20 pails then go to DC: motorbike trips from Phoka, then from Muchenga. Vehicle trip to DC. (1 pail from 1 person)	(5 pails from 1 person)		20-30 pails
When did vendors first arrive (point of commercialization)	2015-2016	2010 / 2013		2013		2010 (Nthalire)
Frequency of vendor visit to village			3 trips per month to DC			Everyday in season (between 3-11)
Are there advance payments made to the collectors?		Yes/No	Yes, deposit of 2000 MWK		Yes	Yes

	Village Group 1	Village Group 2	Village Trader Group 1	Village Collector Group 1	Village Collector Group 2	Outside Village Group
Sentiments about the vendors?		We are not very happy, they led us to deplete our source of relish; We can tell vendors there aren't anymore.			They make a lot of money from our goods	We struggle, they are free
Livelihood and Willingness for alternatives						
What do you buy?		Food, salt, soap, school fees, clothes		Maize, sugar, school fees	"It's fast cash. Once you bring, there is the money."	"1 pail = 1 fertilizer"
What else do you do for cash income?	Beer, cassava, millet	Ganyu, cash crop	Chinaka <u>beats</u> hunting	Coffee #1, honey #2.	Chinaka <u>beats</u> Coffee and bear	
Willing to give up Chinaka collection for other activities? Willing to cultivate?	Eagerly willing; there are areas nearby for growing.	Would be happy; substitute species are needed because we have tried and failed to cultivate.	But the soil outside Nyika cannot grow Chinaka.	Very welcome; there are areas where we can grow.	We want alternatives - we can do something concentrated here.	

2) Baking and Selling Chinaka

	Village 1	DC 1	Village 2 (not Nyika)
Start when, learn from who?	? From her daughter	2002 From her mother	1997 / 2011 Outsiders, Zambian
Buy what with the cash income from Chinaka cake sale?	Soap, clothes, food	Iron sheet roofs	Pay loan + interest, buy the next Chinaka, Soap and small things
Other cash income?	Mandasi and beer	Tomato, piecework	Nothing
Making of Chinaka cake			
Size of cake	1 smaller pot	1 big pot	?
Amount of raw Chinaka in a cake	1 pot (ground)	2 big cups	1 small cup (250g) or 1000 MWK
G'nuts in one cake	3 small cups (whole)	10 big cups	600 MWK
Soda in one cake	2 teaspoons	One whole pack of soda	150 MWK
Salt in one cake			100 MWK
Sabola in one cake			???
Water in one cake		15 cups of water	
Prices of Chinaka *price does not vary according to season, but the grams per price unit may change			
Price of piece	20-30 MWK *5-20, says others	50 MWK	50 MWK
Pieces in a cake	50-70	? (200-220)	? (50)
Total price from cake by selling pieces	1500 MWK *500, says others	10,000-11,000 MWK	2500 MWK
Price for whole cake	1200 MWK	6000-7000 MWK	
Selling of Chinaka cake			
Sell where?	Kapirinkhonde, Gamba	Chitipa DC	Trading Center market, at Church
How many cakes	1 market day, 2 cakes	1 cake per day	1 cake for 2 days
How many cakes	April: 5-10; September: <30		
Selling season	April to September	March to ?	May to ?
How many more like her?	Only 2 of us	More than 100	Only 10 of us
Demand trend?		It is increasing	People can forget if it's not there
Acquiring raw Chinaka tubers			
Acquiring Chinaka	Collects from around village w/ family	Buy / Husband gets from inside Nyika	Buy / Husband gets from Chitipa DC
Price of Chinaka Low	-	(20L) 16,000-20,000 At Nyika: 13,000	(20L) 26,000, (cup) 1000 In 2017: 500
Price of Chinaka High	-	(20L) 50,000+; (At Nyika: 30,000) buys in cups when price is high	(20L) 45,000-50,000 (cup) 1800-2000 (In 2017: 800)
Purchase frequency	3 times a month to collect	20L lasts 2 weeks	2 cups last 3 days

3) Questionnaire Responses

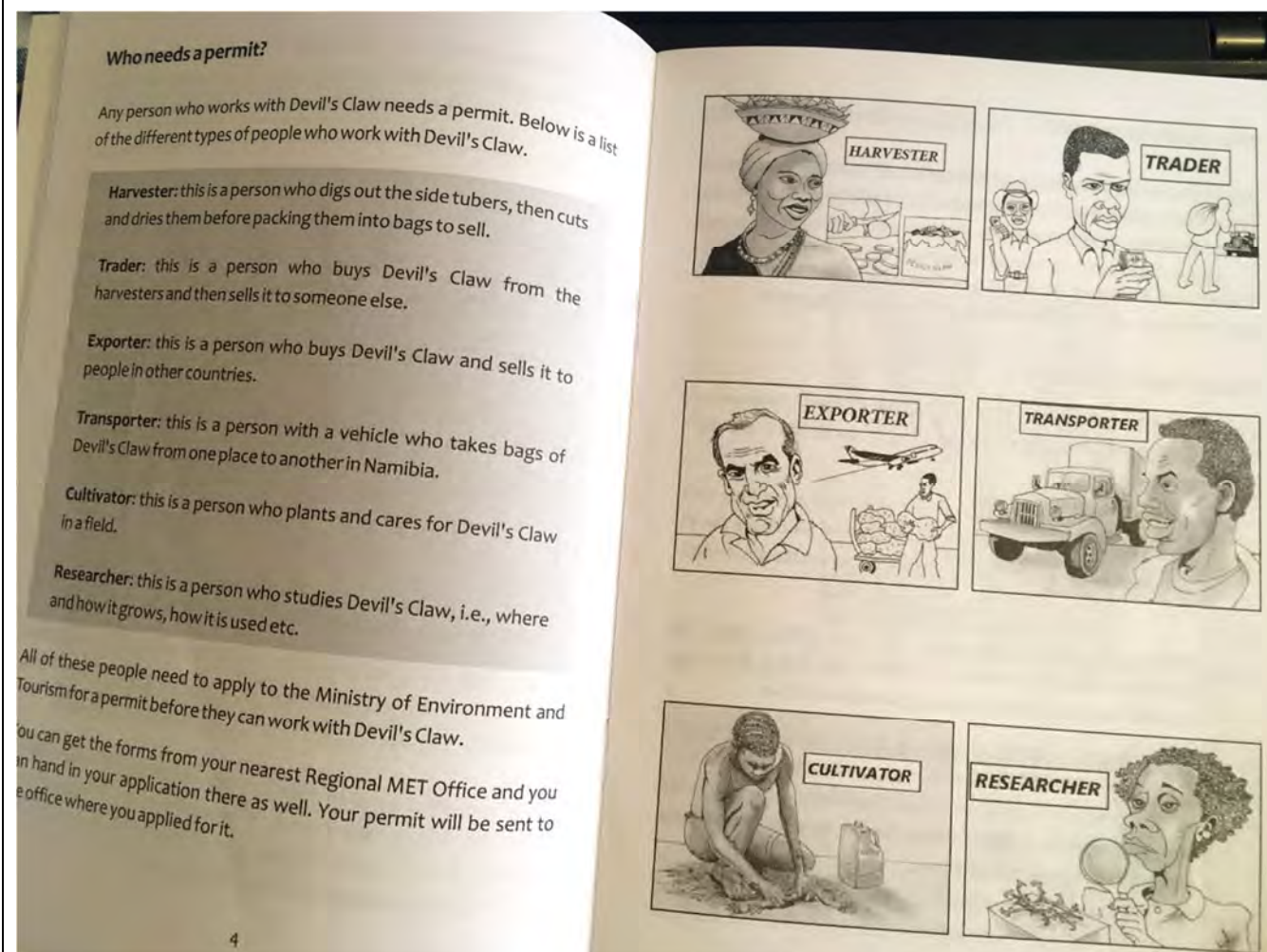
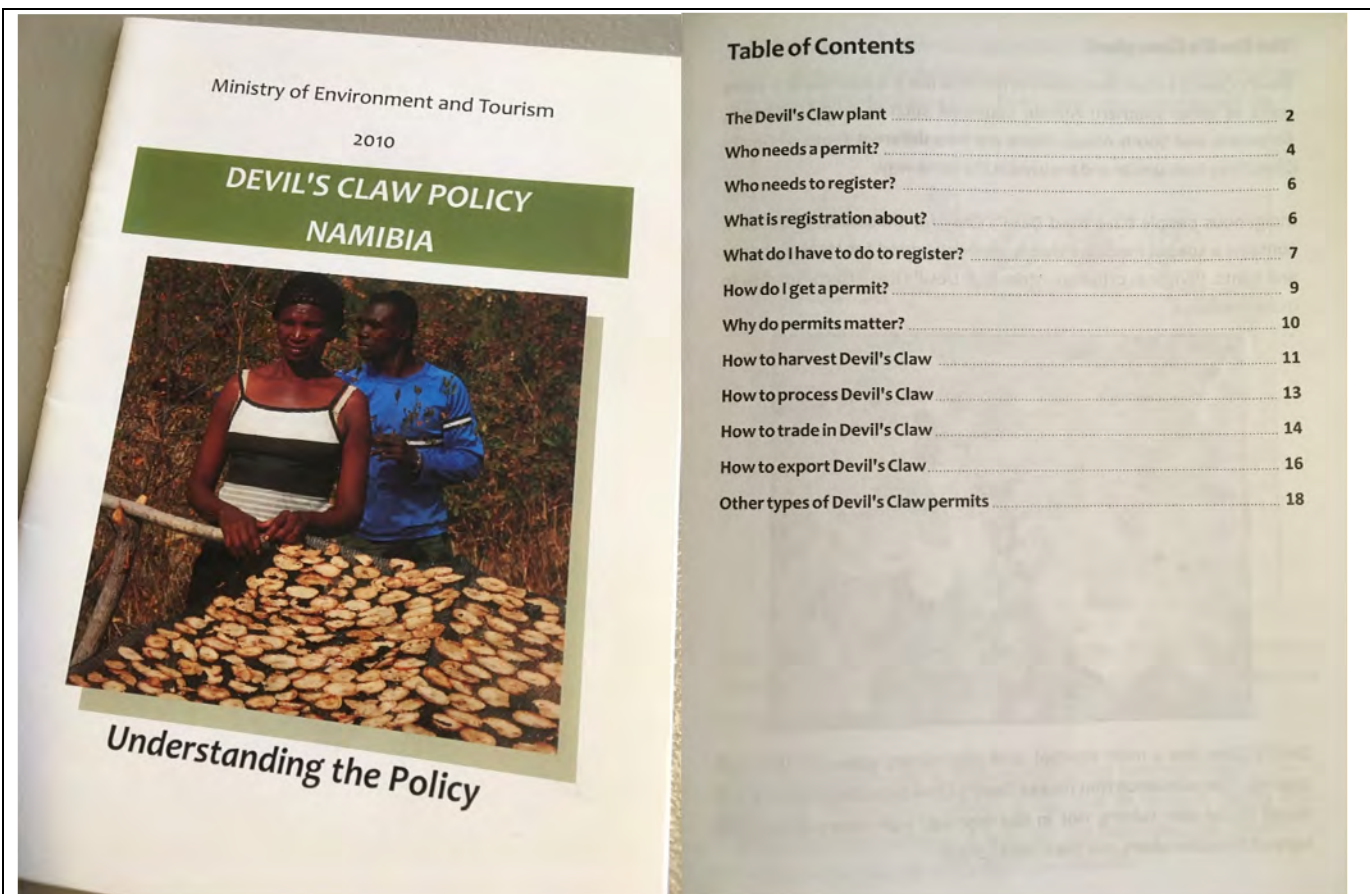
<Knowledge>

Q.#	Question	Yes	No	Don't Know	Notes
1	Do you have technique for careful harvesting?	2	0	19	Most don't know technique to harvest sustainably
2	Do you know how to store the tubers?	3	0	18	Most don't know how to store raw tubers
3	Do you know how to bake Chinaka?	5	0	16	Most don't know how to bake. Those who know includes men
4	When does the orchid flower?	14	0	7	Much more knowledge in western side than east
5	Where are orchids found outside Nyika?	13	0	8	Much more knowledge in western side than east
6	Why are orchids protected?	13	0	8	Much more knowledge in western side than east
8	How much are the tubers in Boma markets?	8	0	13	Much more knowledge in Village 1 than in Villages 2 and 3
9	Where do your tuber buyers come from?	17	0	4	Most know with exception of few in Village 3
10	Where do your buyers sell your tubers?	14	0	7	Most know in Villages 1 and 2, Few in Village 3 know
11	Harvesting tubers outside Nyika is okay	7	9	5	Mixed, confused ideas
12	Selling raw tubers at the market is okay	6	10	5	Half knows correctly, quarter wrongly, quarter doesn't know
13	Selling Chinaka cake at the market is okay	12	6	3	Majority knows wrongly
14	How many years of jail for killing bushmeat?	3	0	18	Most don't know
15	Can be jailed for buying bushmeat?	11	5	5	Better knowledge in Villages 1,2,3 - either don't know or no wrong
16	NRC Permit allows wood collection?	2	15	4	Majority know correctly
23	Was resettlement done with compensation?	11	6	4	Village 1 knows wrong; Village 2 knows okay (but was influenced); Village 3 - half knows

<Perception>

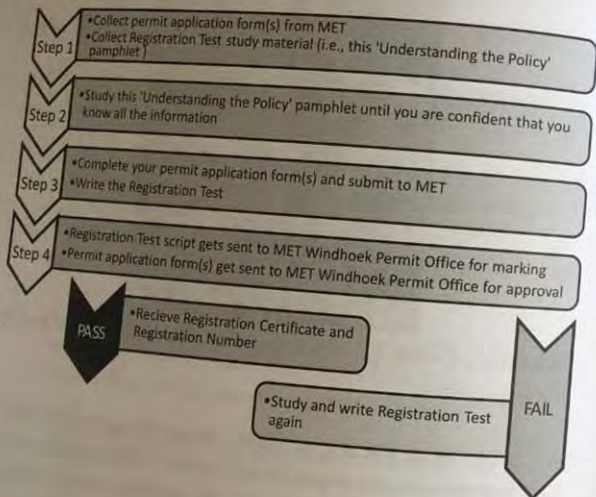
Q.#	Question	Yes	No	Don't Know	Notes
17	Is the NRC Permit system fair?	13	6	2	Most in Village 3 says no (none are NRC-committee members)
20	Is the land shortage a problem?	20	1	0	Majority yes
21	Is the forest being degraded?	18	0	3	Majority yes
22	Would you support forest management plans?	18	2	1	Majority yes
24	Would you support "internal court"?	11	6	4	Varies: 4 in village 1, 2 in village 2, 5 in village 3,
25	If someone from outside village uses the resources, would you allow them?	3	15	3	Majority no; 1 in each village said they would allow.

4) Namibia Permit System for Devil's Claw



If you pass the test you will be given a piece of paper that says you are registered and gives your registration number. This will be sent back to the Regional Office along with your permit.

If you do not pass the test and need to rewrite it, the MET will send you a letter to tell you this. You will need to study and then go and write the test again.



How do I get a permit?

Step 1: Get a form for a permit from the nearest MET office. There are different forms for harvesters, traders and exporters.

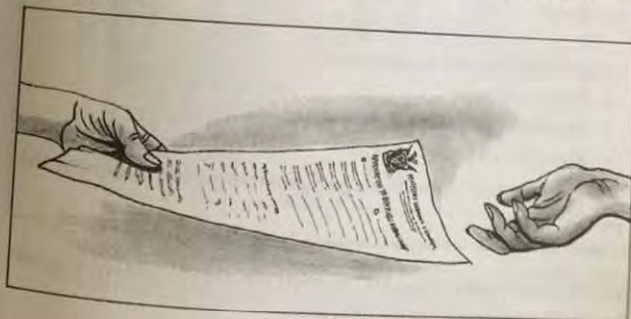
Step 2: Fill in all the information on the form and sign the form. Take the form to the MET office. You will need a copy of your ID.

Step 3: Pay for your permit. Keep the receipt with you.

Step 4: Go back to the permit office to find out whether your permit has been approved. Take your receipt with you.

Step 5: Keep your permit with you whenever you are working with Devil's Claw.

Step 6: Give your 'Report Back' form to the MET office before the date shown on the permit. If you do not do this, you will not be able to get a permit in the next year.



The Devil's Claw plant

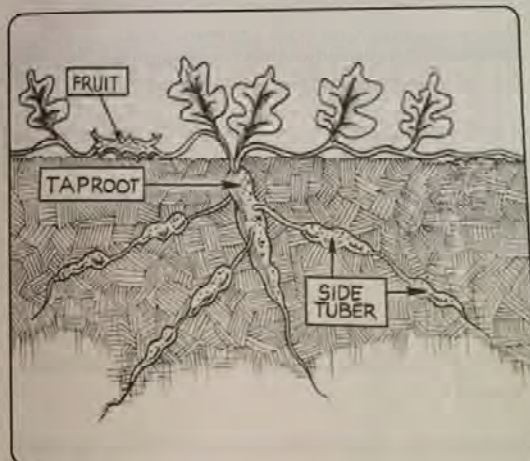
Devil's Claw is a plant that grows in Namibia but it is also found in some parts of other southern African countries such as Angola, Zambia, Botswana and South Africa. There are two different types of Devil's Claw. They look similar and are used in the same way.

Indigenous people have used Devil's Claw for thousands of years. It contains a special medicine that is especially good for treating bones and joints. People in other countries buy Devil's Claw from Namibia to make medicine.



Devil's Claw has a main taproot and side tubers grow off this main taproot. The substance that makes Devil's Claw a good medicine is only found in the side tubers, **not in the taproot**. Harvesters should only harvest the side tubers, not the main taproot.

The side tubers are important to the plant. They store water and food for the plant to survive during the dry season. This is why only half of the side tubers should be harvested. If they are all taken the plant will die.



Because people in other countries want to buy Devil's Claw, Namibians can earn money by harvesting and processing it. We must be careful not to harvest too much.

The Government wants to make sure that not too much Devil's Claw is harvested. This is why nobody is allowed to harvest Devil's Claw without a permit or in such a way that the plant dies. It is possible to harvest Devil's Claw and still protect the resource.

How to harvest Devil's Claw

- Devil's Claw may only be harvested between 1st March and 31st October each year. Devil's Claw is a protected plant so all harvesters need to get a permit from the MET before starting to harvest. Individuals or groups can apply for a permit.
- Harvesters must have permission to harvest from either the private landowner or from the traditional authority, the regional or local government, or the conservancy or community forest in the case of communal area harvesting.
- Harvesters should choose the older plants to harvest. These usually have longer stems and leaves. The young plants should be left alone. A plant that still has flowers should not be harvested. It is best to wait until the plant has seeds.

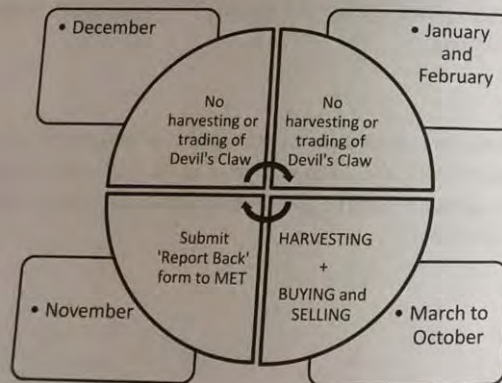


- It is best if the harvester uses a sharpened stick or flattened crowbar to dig with. The hole should be about 20cm away from the plant and should only be on one side of the plant.

How to trade in Devil's Claw

You can only apply for a 'Buy and Sell' permit if you have passed the registration test and are registered with the MET.

- Fill in an application form and hand it in to your nearest MET office. You must fill in all the information on the form including where you want to buy from. You will need a copy of your ID card and Registration Certificate, and money to pay for your permit.
- Your application will be sent to the Windhoek Permit Office. If you had a 'Buy and Sell' permit last year, they will check that you submitted your 'Report Back' form before the end of November last year.



Appendix II. Questionnaire Piloted in January 2019

Name _____

Age _____

Village _____

Education _____

Year started
on Chinaka _____

2018 activity _____

FAMILY

Number of wife / husband _____

Marriage year(s) _____

Number of children _____ (biological) _____ (others)

Age of oldest / youngest child _____ (oldest) _____ (youngest)

Number of children in school _____

Level in school _____

Primary school name _____

Secondary school name _____

Other school name _____

Village of birth _____

Year moved to current village _____

Number of relatives _____

Number of sick in the family _____

Land farmed _____ Acres _____ Hectares _____

Own this land? Yes No _____

Shifting agriculture Yes No _____

No. of 50kg fertilizer needed _____

No. of 50kg fertilizer applied _____ (in last farming season)

Last time of fertilizer voucher _____ (year)

Used the voucher? Yes No _____

	Yes	Sell
Maize		
Millet		
Cassava		
Groundnuts		
Beans		
Sweet Potato		
Irish Potato		
Vegetables		
Other		

Nyika	Yes	Sell
Honey		
Mushroom		
Medicinal herb		
Flying ants		
Reeds		
Thatch grass		
Fish		
Other		

	(How Many)
Cattle	
Pig	
Goat	
Chicken	
Pigeon	
Other	
	(Buyer)
Tobacco	
Coffee	

	(Earnings)
Ganyu	
Beer sales	
Transporting	
Shop keeping	
Others	
	(For what)
Hire labor	

Going to market Every week / 2-3 per month / 1 per month / Less

Which markets _____

Transport _____

PROBLEMS

Fertilizer _____

Food _____

School fees _____

Clothes _____

Household goods _____

Others _____

ASSETS

	How many	Year bought
Car	_____	_____
Motorbike	_____	_____
Bicycle	_____	_____
Maize mill	_____	_____
Phone	_____	_____
Solar panel	_____	_____
Iron sheet roof	_____	_____

PARTICIPATION

Village governance Yes No _____ (position)

NRC Committee Yes No _____ (position)

Benefitting in project Yes No _____

Year met T/A _____

Do you have technique for careful harvesting? Yes No _____

Do you know how to store the tubers? Yes No _____

Do you know how to bake Chinaka? Yes No _____

When does the orchid flower? Yes No _____

Where are orchids found outside Nyika? _____

Why are orchids protected? _____

At what price do you sell the tubers? _____ (when highest)
_____ (when lowest)

How much are the tubers in Boma markets? _____ (when highest)
_____ (when lowest)

Where do your tuber buyers come from? _____

Where do your buyers sell your tubers? _____

Harvesting tubers outside Nyika is okay Yes No Don't know _____

Selling raw tubers at the market is okay Yes No Don't know _____

Selling Chinaka cake at the market is okay Yes No Don't know _____

How many years of jail for killing bushmeat? Yes No Don't know _____

Can be jailed for buying bushmeat? Yes No Don't know _____

NRC Permit allows wood collection? Yes No Don't know _____

Is the NRC Permit system fair? Yes No Don't know _____

Do you know who hunts / sells orchids? Yes No Don't know _____

Do you know how much they make? Yes No Don't know _____

Is the land shortage a problem? Yes No Don't know _____

Is the forest being degraded? Yes No Don't know _____

Would you support forest management plans? Yes No Don't know _____

Was resettlement done with compensation? Yes No Don't know _____

Would you support "internal court"? Yes No Don't know _____

If someone from outside village uses the resources, would you allow? Yes No Don't know _____

Zina _____
 Zaka _____
 Kukaya _____
 Masambiro _____
 Chaka chakuyambira Chinaka _____
 2018 ntchito Chinaka _____

BANJA

Nambala ya wanakanzi / wanalume _____
 Chaka chakunjilira mubanja _____

Nambala ya wana _____
 (wenecho)
 (wanyake)

Chaka chamulala / muchoko _____
 (mulala)
 (muchoko)

Nambala ya wana wa kusukulu _____
 Chaka chakalasi _____
 Zina lapulayimale sukulu _____
 Zina lasecondale sukulu _____
 Mazina wanyake sukulu _____

Kukaya kwakubabikira _____
 Chaka chakukhalira kukaya uko wali _____
 Nambala yawabale _____
 Nambala yawaluwali mubanja _____

Malo wakulima _____ ekala _____ Hectares _____

Malo awo mbinu? Enya Yayi _____

(Shifting agriculture) Enya Yayi _____

Nambala ya Feteleza(50kg) wakukhumbika _____

Nambala ya Feteleza (50kg) wathira _____ (chaka chamala)

Chaka uli icho mukapokera makoponi? _____ (Chaka)

Mukagwiliska ntchito makoponi? Enya Yayi _____

	Enya	Kuguliska
Chingoma		
Lipoko		
Vikhawu		
Skawa		
Nchunga		
Mboholi		
Mbambayira		
Mphangwe		
Zinyake		

	Nyika	Enya	Kuguliska
Uchi			
Nkhowani			
Mankwala wamuthengere			
Vibenene			
matete			
mawuchani			
nsomba			
Zinyake			

	(nambala)
Ng'ombe	
nkhumba	
mbuzi	
nkhuku	
nkhunda	
zinyake	
	(wagula)
Hona	
Khofi	

	(mukusanga zilinga)
Ganyu	
Wakuguliska mowa	
mayendelo	
Wakuguliska mugulosale	
zinyake	
	(vavichi)
Ganyu	

Kuluta ku msika sabata iliyonse / 2-3 pa mwezi / 1 pa mwezi / kuchepera apo

Msika _____

Mayendelo _____

SUZGO

Feteleza _____

Chakurwa _____

Sukulu fizi _____

Vakuvwala _____

Vakukumbikira pa umoyo _____

zinyake _____

	Nambala	Chaka chakugulira
Galimoto	_____	_____
Honda	_____	_____
Njinga	_____	_____
Chigayo	_____	_____
Foni (Lamya)	_____	_____
Sola panelo	_____	_____
Nyumba ya malata	_____	_____

KUTOLAPO RWANDE

Ufumu Enya Yayi _____ (udindo)

NRC bungwe Enya Yayi _____ (udindo)

Kamukuphindulamo mu bungwe? Enya Yayi _____

Kamukakumana nawo chaka chini a T/A? _____

1. amunanthowa yiwemi yakukololera? Enya Yayi
2. Kamukumanya kasungiro kachinaka? Enya Yayi
3. Kamukumanya kuphika Chinaka? Enya Yayi
4. Kachinaka chipangamaluwa nyengo mbuni? Enya Yayi
5. Kachinaka chikusangika nkhuni kupatula kunyika? _____
6. Chifukwa uli Chinaka chikusamalika? _____
7. Kachinaka chikuguliskika pamutengo uli? _____
(wakudula)
(wakuchipa)
8. Kachinaka chilipazilinga ku musika wa boma? _____
(wakudula)
(wakuchipa)
9. Kawakuwoda chinaka wakufumakhu? _____
10. Kawakuwoda winu wakuguliskakhu? _____
11. Kakugima Chinaka kuwalo kwa Nyika khwakuzomeleka? Enya Yayi Khumanyayayi
12. Kakuguliska Chinaka ku musika khwakuzomeleka? Enya Yayi Khumanyayayi
13. Kakuguliska Chinaka chakuphika khwakuzomeleka? Enya Yayi Khumanyayayi
14. Kamuthu wakukhala vyaka vilinga palawamangika palawakoma nyama kuthondo? Enya Yayi Khumanyayayi
15. Kamuthu wakumangikanga pala wagula nyama yakuthondo? Enya Yayi Khumanyayayi
16. Ka NRC iyikuzomelezga kutola nkhuni? Enya Yayi Khumanyayayi
17. Kachizomelezgo cha NRC? Enya Yayi Khumanyayayi
18. Kamukuwamanya awo wakusaka nyama kuthondo / wakuguliska chinaka? Enya Yayi Khumanyayayi
19. Kamulimanya phindu ilo wakusangapo? Enya Yayi Khumanyayayi
20. Kakuchepa kwamalo nisuzgo? Enya Yayi Khumanyayayi
21. Kanthondo likunangikanga? Enya Yayi Khumanyayayi
22. Kangati chikaya mungawawovyila awo wakuwonela nthondo? Enya Yayi Khumanyayayi
23. Kakasamukiro kakufuma munyika kakawa nachapachanya? Enya Yayi Khumanyayayi
24. kamungakolelanako nalamulo lakuti muweluzyanenge mwekhamwekha? Enya Yayi Khumanyayayi
25. Kapala munthu wakufuma kunyanye wakunangiska vinthu muthondo mungamuzomelezga? Enya Yayi Khumanyayayi

Appendix III. Introduction to Research and Seeking Consent

Study on edible orchids activities in the Nyika National Park and the surrounding communities, with focus on drivers and consequences to find entry points for action
- Introduction and Seeking Consent -

Introduction of each member: Self-introduction by team members. Local host institution is Mzuzu University, Dept of Forestry. The researcher is independent.

Purpose: The research aims to find information for helping to 1) improve people's livelihood, and 2) ensure orchids' population survives and thrives – concept of sustainability.

With fast increase in orchids demand, previous research from Zambia and Tanzania have found orchids population in some places are declining, which then brings hardship to people (hard to find orchids, price competitions). Also possible arrests can put people at further risk.

It hopes to contribute to finding approaches to improve people's livelihood and orchid's population.

Research objective: Objective is to better understand how different people in the villages have come to participate in edible orchids related activities ("ORA"), especially since the fast increase in demand.

It's to find out how people started ORA (harvest, bake/sell, trade); what they gain and lose from ORA (economically/socially). Those who don't participate in ORA – why they don't?

Another objective is to better understand what people know and think about orchids, orchid-trade, and cooperation in natural resources management.

One dimension is also on interaction with Zambia and Tanzania, due to border proximity and Zambia-Malawi cooperation around Nyika area for supporting nature conservation and livelihood.

How the interviews will be used: The findings will be used to assess the current ORA – "is it helping or hurting livelihood and orchid population"?

Secondly, findings on what conditions make people engage in ORA - especially in ways that involve risks - will be used to identify what support could improve people's livelihood and orchid population.

Such findings would be then later discussed with the communities, traditional authorities, and partners such as NGOs and Government who can help devise and facilitate such support.

Potential positive outcome of the research: it can facilitate stakeholders' discussion towards solution, and even lessen the tension between community members whose livelihood depend on orchids and the conservationists/regulators.

Potential risks in the research: One risk is that participants may be wary about law enforcement around Nyika national park and have reservations to discuss. This research will treat all identifications with confidentiality to not reveal key and sensitive information. The participants are invited to answer only if they are comfortable but requested to answer with sincerity and their true knowledge.

Another risk could be that the progress in bringing stakeholders to discussion will be slow, which may lead to disappointment and degraded good-faith to find collaborative solution. The researcher will try to gather support of stakeholders. The participants are asked to understand that stakeholder mobilization may not be immediate and not in power of researcher.

Approach: The expected duration of interview is about 1-1.5 hours. The interaction will be in sequential interpretation. Participants are invited to engage in conversation-like discussion. In the household, those who engage in ORA are all invited. We will collect information about the household as a whole, and also as individual. Children who do ORA are also invited.

Questions: There are questions to understand the household level of livelihood, engagement in decision-makings, and social relations. Questions specifically about ORA seek people's knowledge, perception, and willingness to change or improve ORA. For no-ORA people, these questions will centre around their main income-earning activity. Questions will include overall ORA - general description, trends over time, price variations, cross-border trades.

Confidentiality: Identifications will be confidential; data will be limited to the use of this study only.

Participation voluntariness: Participation is voluntary and there is no penalty for declining to participate. The participant is free to not answer any question and may discontinue at any time without penalty.

Contacts for information: Principal researcher will provide contact information.

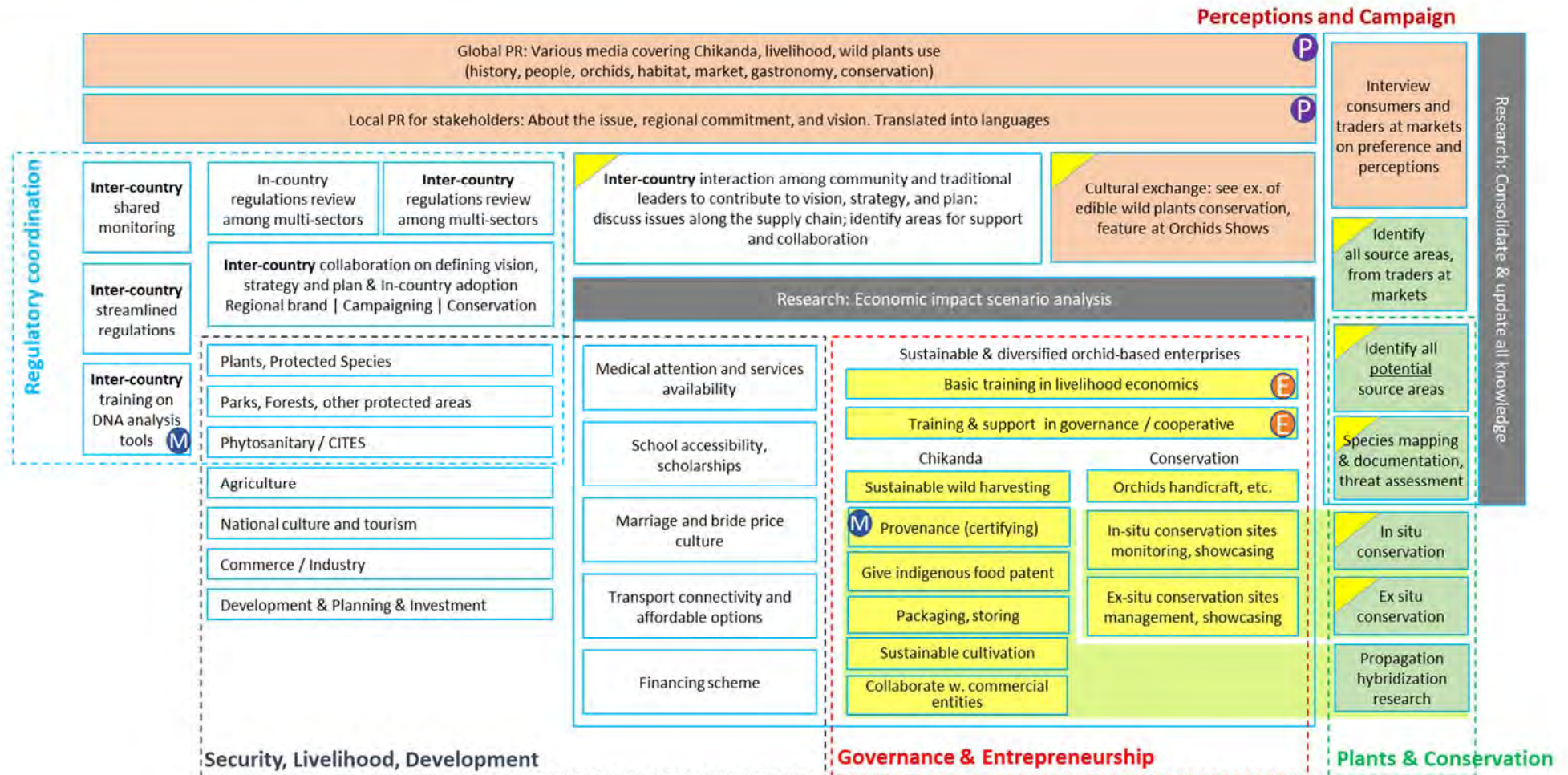
Inviting questions and consent: Participants are encouraged to ask any questions or seek clarifications about this introduction. Upon consent, participants are invited to give consent (oral or written) to participate with acknowledgement that he/she has been informed and given the chance to ask questions regarding the research titled *Study on edible orchids activities in the Nyika National Park and the surrounding communities, with focus on drivers and consequences to find entry points for action.*

Appendix IV. A Blueprint of Proposed Interventions

Led by / involving : Media specialist Communities Researchers Government Botanists

Facilitated by : M DNA tool specialist P Media producer E Enterprise specialist

<Interventions Specified>



Intervention on Southern/Central Africa's Edible Wild Orchid Tuber Harvesting and Trade

WHAT	INVOLVING...
<p>Research foundation</p> <ul style="list-style-type: none"> - Get an up-to-date scale of ongoing trend in the region (scale, hotspots, extent, patterns). - Economic impact scenario analyses on actors in supply chain affected by 1) reduction of demand through social campaign / increased price, 2) reduction of trade due to regulatory control - Species mapping and documenting & Red List assessments 	<p>On the ground investigators, economists, botanist</p>
<p>Working with outside factors - regulators and consumers</p> <ul style="list-style-type: none"> - Regulators: coordinate for improved supply-chain management <ul style="list-style-type: none"> o Create stakeholder map of what relevant regulatory bodies are involved - domestically and regionally. o Take account of current actors' approaches, readiness, gap, resource to manage Chikanda trade o Identify priority regulatory action to implement (ex: monitoring roadblocks and border-crossings, certifying producers/products) 	<p>Regulating bodies in: plant management, phytosanitary, CITES, trade, commerce</p>
<ul style="list-style-type: none"> - Consumers/Public: improve awareness about Chikanda issues <ul style="list-style-type: none"> o Conduct consumer survey (preferences to substitutes, variance in willingness-to-pay) o Devise appropriate campaign strategy, theory of change o Implement campaign and monitor change 	<p>Social campaign experts</p>
<p>Working with communities involved in supply chain</p> <ul style="list-style-type: none"> - Systems: improve living conditions and security to reduce overall pressure for relying on wildlife collection <ul style="list-style-type: none"> o Support alternative livelihoods for improved income o Improve basic services to reduce acute needs for cash (health, transport, food, marriage, education) o Diversify financing schemes for cash needs 	<p>Development Partners, District commissioner, Chiefs</p>
<ul style="list-style-type: none"> - Individual / communities: enhance understanding of the plants and improve governance schemes <ul style="list-style-type: none"> o Share knowledge about orchids population viability, sustainable harvesting techniques o Facilitate governance on wild plants harvesting (and cultivation) o Share knowledge about the economics of (other) livelihood and orchid income 	<p>Communities Livelihood support NGOs</p>
<p>Working on plants and building "insurance pool"</p> <ul style="list-style-type: none"> - In situ conservation of orchids <ul style="list-style-type: none"> o Plant seeds and protect habitat o Curb unsustainable harvesting and introduce sustainable harvesting - Ex-situ conservation of orchids <ul style="list-style-type: none"> o Collect seeds o Propagate and plant in suitable areas 	<p>Botanists/ Ecologists</p>