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for better Nutrition in rural Zambia**

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Wien, Oktober 2019

Acronyms and Abbreviations

BCC	Behaviour Change Communications
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit
CRS	Catholic Relief Services
FANSER	Food and Nutrition Security, Enhanced Resilience
FGD	Focus Group Discussion
GIZ	Gesellschaft für internationale Zusammenarbeit GmbH
ICT	Information- and Communication Technologies
SUN	Scaling Up Nutrition

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Abstract

Information is a human right. To reach one's optimal health potential, one needs to have enough access to specific health information and knowledge. As technologies develop, their use becomes more relevant in public health. By now many development projects already recognized their potential and are integrating them into their communication strategies.

This thesis constitutes an assessment of the use of Information and Communication Technologies (ICTs) within the project "Food and Nutrition Security, Enhanced Resilience" (FANSER) in Zambia's Eastern Province and aims at giving recommendations for designing a future intervention, while pointing out possible challenges. FANSER is currently using a communication strategy based on inter-personal communication. By reaching beneficiaries through more channels (i.e. ICT channels), their knowledge shall be strengthened.

A quantitative and qualitative assessment were conducted in 12 FANSER villages, selected through multi-stage sampling, considering various criteria like distance to town and network connectivity. In order to be able to make gender and inter-generational comparisons, an equal distribution between adult men (n=26), adult women (n=26) and adolescents (n=28) was intended. The assessment, among other topics, regarded the owning of and access to each ICT (basic mobile phone, smartphone, radio, TV and laptop), barriers to their use and preferred sources of nutrition information.

A gender disparity was observed. Females significantly owned and used less ICTs than males. Females were also significantly less literate than males. The level of education played a big role in the current and future use of ICTs.

The ICTs used the most (in decreasing order) were basic mobile phones (88.8%), radios (56.3%), laptops (38.8%), TVs (35.0%) and smartphones (23.8%). Most surprising was the fact that laptops were the third most used ICTs even though they were hardly owned by anyone.

Participants reported to access laptops, when in town, to transfer audio and video files. One recommendation would therefore be to produce audio recordings or video recordings on nutritional topics and to spread them through SD-cards, USB-drives or direct phone transfers. The replication would be easy and one would not depend on limiting factors like network connectivity or any broadcasting time. Due to low literacy rates (53.8%) most people would benefit from these kinds of recordings, as they present a non-written intervention.

The radio was a very popular source of information and entertainment. 85.0% stated to listen to the radio. Another recommendation would therefore be the production of radio shows with the possibility to call in and ask questions. These shows could be recorded and spread through the same ways as audio recordings.

For further interventions the awareness and engagement of men should be raised as men could be regarded as agents of information and have the main decision making power.

However to better understand the use of a specific ICT, more research is needed, especially more investigations into inter-household dynamics and sharing.

Zusammenfassung

Information ist ein Menschenrecht. Um sein optimales Gesundheitspotential zu erreichen, benötigt man ausreichendes Gesundheitswissen. Je mehr sich Technologien weiterentwickeln, desto relevanter werden sie auch für den Public Health Bereich. Viele Entwicklungsprojekte haben bereits ihr Potential erkannt und integrieren Technologien in ihre Kommunikationsstrategien.

Diese Abschlussarbeit untersucht die Verwendung von Informations- und Kommunikationstechnologien (IKTs) in den ländlichen Zielregionen des Projektes „Food And Nutrition Security, Enhanced Resilience“ (FANSER) in der Ostprovinz von Sambia. Auf dieser Basis sollen Empfehlungen für die Erweiterung der Kommunikationsstrategie gegeben werden- unter Berücksichtigung möglicher Herausforderungen. Derzeit basiert das Projekt auf inter-personeller Kommunikation. Durch den Einbezug von IKTs sollen mehr Personen erreicht und ihr Wissen gestärkt werden.

Eine quantitative und qualitative Untersuchung wurde in 12 FANSER Dörfern, die durch multi-stage sampling ausgewählt wurden, durchgeführt. Bei der Auswahl wurden einige Kriterien berücksichtigt, wie zum Beispiel die Distanz zur nächsten Stadt und die Netzwerkverbindung. Um Unterschiede zwischen den Geschlechtern und Generationen zu finden, wurde auf eine gleiche Verteilung von männlichen (n=26) und weiblichen (n=26), sowie jugendlichen (n=28) Teilnehmern geachtet. Es wurden u.a. der Besitz von und Zugang zu IKTs (einfaches Handy, Smartphone, Radio, TV und Laptop), Hindernisse und Probleme bei ihrer Verwendung und bevorzugte Informationsquellen für Ernährungswissen erfasst.

Ein Geschlechterunterschied konnte beobachtet werden. Frauen besaßen und benutzten deutlich weniger IKTs. Frauen waren auch weniger schriftkundig als Männer. Allgemein hatte das Bildungsniveau großen Einfluss auf die (zukünftige) Verwendung von IKTs.

Die am meisten verwendeten IKTs waren (in absteigender Reihenfolge) einfache Handys (88,8%), Radios (56,3%), Laptops (38,8%), TVs (35,0%) und Smartphones (23,8%). Überraschend war, dass Laptops an dritter Stelle standen, obwohl fast niemand angab einen zu besitzen.

Teilnehmer hatten den Zugang zu Laptops in der Stadt und nutzten diese, um Audio- und Video-Dateien zu übertragen. Deshalb ist es eine Empfehlung Audio- und Video-Dateien über Ernährungsthemen zu produzieren und diese auf SD-Karten, USB-Sticks oder direkt auf das Zielgerät (Mobiltelefon) zu spielen. Die Dateien können einfach weitergegeben werden (z.B. über Bluetooth). Des Weiteren sind Zielpersonen somit nicht abhängig von einschränkenden Faktoren wie einer schlechten Netzwerkverbindung oder unpassende

Ausstrahlungszeiten (wie im Falle von Radiosendungen). Aufgrund der niedrigen Alphabetisierungsrate (53,8%) würden diese Maßnahmen effizienter sein als Schrift-bezogene Interventionen.

Das Radio war eine beliebte Informations- und Unterhaltungs-Quelle. 85,0% gaben an regelmäßig Radio zu hören. Deshalb wäre eine weitere Empfehlung die Produktion und Ausstrahlung von Radiosendungen mit der Möglichkeit während der Sendezeit beim Sender anzurufen und Fragen zu stellen. Diese Sendungen könnten dann aufgezeichnet und genau so wie Audio- und Video-Dateien verbreitet werden.

Da Männer eine wichtige Rolle bei der Verbreitung von Informationen und der Entscheidungsfindung auf Haushaltsebene in Bezug auf IKTs spielen, sollte diesen ein besonderer Fokus zukommen.

Um weiterhin das Konsumverhalten einzelner IKTs und die Dynamik derer Verwendung in den einzelnen Haushalten im Detail nachvollziehen zu können, sind weitere Untersuchungen notwendig.

1. Introduction

In order to address the challenge of hunger and malnutrition, the German Federal Ministry of Economic Cooperation and Development (BMZ) has made food and nutrition security, together with rural development, a priority area of its work. Under the Special Initiative “ONE WORLD- No Hunger” the GIZ, Deutsche Gesellschaft für Internationale Zusammenarbeit, has been commissioned to implement the global programme „Food and Nutrition Security, Enhanced Resilience” (FANSER) in several countries, one of them being Zambia. It aims for improving the nutritional situation of people living in food-insecure households in Katete and Petauke districts in the Eastern Province, especially of women of reproductive age and children under the age of two years and therefore works with its implementing partner Catholic Relief Services (CRS).

To ensure long lasting change towards reducing stunting, FANSER applies the Care Group Model to mobilize a network of Health Promoters and Nutrition Volunteers. Through this inter-personal communication strategy the beneficiaries’ knowledge is improved, eventually leading to better choices and behaviour change related to nutrition at the household level.

As the presence and use of Information and Communications Technologies (ICTs) increase worldwide, their potential role in public health becomes more relevant. ICTs propose an easy and efficient way to reach target groups and to transmit health messages through already established channels.

This study provides a first assessment of the use of ICTs within in the FANSER camps of Katete and Petauke districts. Based on these findings, possible interventions could be designed to further extend the communication strategy. By combining the already effective inter-personal communication with the use of ICTs, the promotion of better nutrition will be accelerated. Furthermore reaching the target group by more information channels, knowledge can be strengthened and expanded. The additional communication channel can serve as reminders for better nutritional behaviours and encourage beneficiaries on a daily basis. Another advantage of using technologies to reach the target group with nutrition messages directly is the avoidance of information distortion that might come with the cascade model of passing information personally.

This study assessed the available ICTs in FANSER villages and analysed their use as well as information seeking behaviour of beneficiaries in order to give recommendations on how to efficiently use ICT channels to reach the target group with nutrition messages. The

methods used could be interesting in other formative research in the same field. The study also contributes to existing investigations regarding ICTs in developmental projects.

2. Background

2.1 Regional context and malnutrition

When talking about nutrition on a global level, one cannot leave out the term “malnutrition”. The work of many international organizations is focused on the different forms of malnutrition in all parts of the world. In 2015 the United Nations set up new goals to strive after, the 17 Sustainable Development Goals. One of them is to eradicate hunger in the world, a goal which has been set as part of the previous “Millennium Development Goals”, but failed to be achieved before. Various publications regularly report on the progress for achieving zero hunger. In the past years most of them emphasized the severe situations in countries located in Sub-Saharan Africa, like “The State of Food Security and Nutrition in the World” Report (formerly “SOFI”)[FAO, 2018].

Most projects are focused on the reduction of undernutrition. According to the last Demographic and Health Study in Zambia, 12.0% of the rural and 8.3% of the urban population suffers from underweight. On the other side a growing amount of inhabitants was overweight or obese, with 14.6% in rural and 31.9% in urban areas. As the country develops further, signs of this double burden of malnutrition will increase [CSO, MOH, ICF International, 2014].

The Republic of Zambia is a landlocked country in south eastern Africa and one of the above-mentioned 46 sub-Saharan countries. It shares borders with the United Republic of Tanzania (to the north-east), Malawi and Mozambique (to the east), Zimbabwe, Botswana and Namibia (to the south), Angola (to the west) and the Democratic Republic of Congo (to the north). Zambia is ranking 144 out of 189 countries according to the 2018 Human Development Report. Even though categorized at “medium human development”, 54% of the population is multi-dimensionally poor, meaning that such households suffer overlapping deprivation in education, health and living standards[UNDP, 2018].

The country consists of about 743,000 km² of land and 9,220 km² of water. The many rivers make Zambia one of the most water rich countries in Africa. The three main rivers are Luangwa River in the east starting near the border of Malawi and going to Mozambique, and

Kafue River coming from Congo, crossing the central and western parts of the country and then joining Zambezi River in Zimbabwe. They play a role in energy and food security and can stimulate economic opportunities for the people living in these regions, not just in Zambia but also in the other riparian countries[World Bank, 2015].

Zambia divides itself into ten provinces, out of which only two are predominantly urban, namely Lusaka (the capital) and Copperbelt. Through mining the latter makes the second largest contribution to the country's economy [Zamstats, 2015]. The "Big Four" mining companies in Zambia accounting for around 80% of Zambia's annual copper production are owned by foreigners or have a major foreign shareholding (from Canada, India, Switzerland, China)[Zambia Chamber of Mines, 2016]. It is estimated that the copper reserves last for approximately 20 more years, which is why the government is pursuing an economic diversification program to reduce its reliance on the copper industry[GIZ, 2016; KPMG, 2013].

Zambia is home to 17 Mio. people and has a population growth rate of 3.0%. Therefore its population is estimated to reach 25 Mio. by the year 2030. Life expectancy at birth is 60 years for men and 65 years for women. Generally the country's population can be described as rural, young and sparsely spread, with an estimated 43% of the population living in urban areas [UNDP, 2018]. Poverty rates are much higher in rural than in urban areas. With a majority of the population depending on subsistence agriculture, rural poverty makes 77% [Zamstats, 2018].

The country has a tropical climate and vegetation with three distinct seasons: the cool dry winter from May to August, a hot dry season during September and October, and a warm wet season from November to April [IPA, 2015]. Another "season" called "the hungry season" is an expression for the months before the harvest, which takes place in April/May. During this period financial resources and farm produce for household consumption are scarce, leading to restricted diets.

The nutrition problems of a given country are often intertwined with its agriculture. For Zambia it was stated that food security could also be referred to as "maize security" as the production of maize is heavily promoted in governmental policies and programmes and is the predominant cash and subsistence crop[Smale and Jayne, 2009]. The main commodities agriculturally produced are maize, cassava, wheat and groundnuts. They proportionally contribute to the national daily per capita calorie-intake[FAOSTAT 2017, FAOSTAT 2013]. Due to Zambia's reliance on rain-fed agriculture, poor production years are typically caused by poor or excessive rainfall. In 2018, for example, the maize production was predicted to be reduced by up to 50% due to an excessive dry spell[Reuters, 2018]. Also crop pests,

livestock diseases and poor soils are frequent constraints to production in some areas of the country. Especially poor rural households are extremely vulnerable to price shocks [FEWS NET, 2013]. A large number of Zambia's rural poor are small-scale farmers, who rely almost entirely on subsistence farming. Because of the strong focus on staple food production and rather poor access to markets, rural Zambian diets are generally monotonous and lack the diversity required for good nutrition [Kumar et al., 2018].

In times of food insecurity women and children can be the most vulnerable to malnutrition resulting from unbalanced diets. Some fundamental nutrition-related problems were observed in developing countries with high rates of malnutrition. Inadequate knowledge for better food choices regarding appropriate combinations of foods, as well as of childcare and good feeding practices, hindered households to benefit from available nutrient-rich foods. Other challenges could be inappropriate skills and access to technologies for food preparation, preservation and storage, resulting in decreased quantity and quality of available food [UNICEF, 1998].

In addition to these factors, diseases, poor water and inappropriate sanitation and hygiene practices worsen the nutritional status. Any shock in food availability and illnesses can trigger an increase in the already existing problem of malnutrition. These assumptions are based on a conceptual framework designed by UNICEF in 1990 and adjusted in 2015 (Figure 1) with the intention to visualize impact pathways leading to malnutrition. Internal stability in a given country is a premise for this framework. Many projects aiming for nutrition security use this framework as a starting point in conception, as it also shows what areas need to be influenced for optimal change.

UNICEF CONCEPTUAL FRAMEWORK OF THE DETERMINANTS OF CHILD UNDERNUTRITION

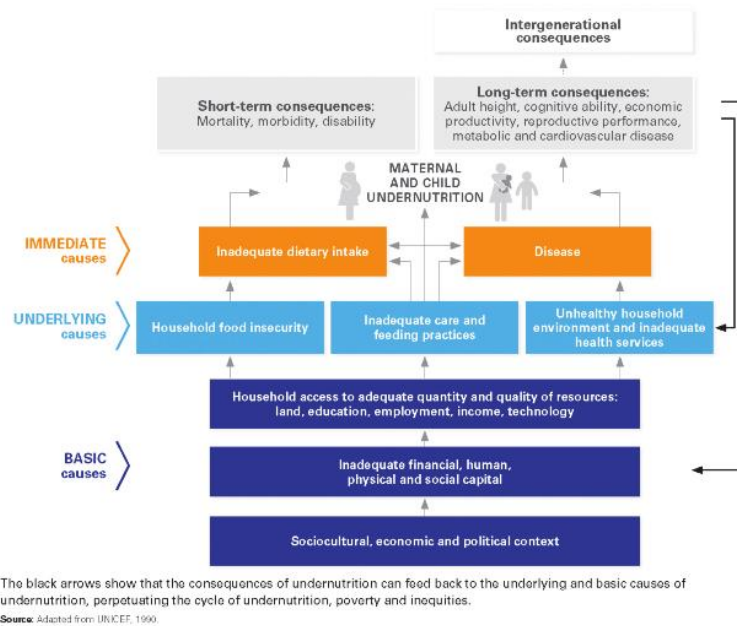


Figure 1: UNICEF Conceptual Framework of the Determinants of Child Undernutrition [UNICEF, 2015]

The Global Hunger Index identified Zambia as one of six countries suffering from an “alarming” level of hunger. The score calculated for Zambia shows an improvement, by decreasing from 52.0 in 2000 to 37.6 in 2018. However, the indicators leading to its calculation are still at high levels. 44.5 % of Zambia’s population is undernourished. In children under five years of age 6.3 % were observed to be wasted and 40.0 % to be stunted. The mortality rate for children under five years is at 6.3 %. [GHI, 2018] 37.8 % of the population does not have access to improved drinking water and 68.9 % are lacking improved sanitation facilities. 33.7 % of women of reproductive age (15-49 years) are anaemic. Nationally the rate of breastfeeding is at 72.5 % for infants from 0 to 5 months [UNDP, 2018].

These figures show the need to tackle problems associated with the chronic form of malnutrition (stunting). The Zambian government already prioritizes nutrition as an essential cross cutting issue in its “Seventh National Development Plan” and “Nutrition Advocacy Plan” for achieving socio-economic development.

The conceptual framework from the Cost of Hunger in Africa Study (COHA Study) shows the impact of chronic malnutrition on a country’s development through the life cycle (Figure 2).

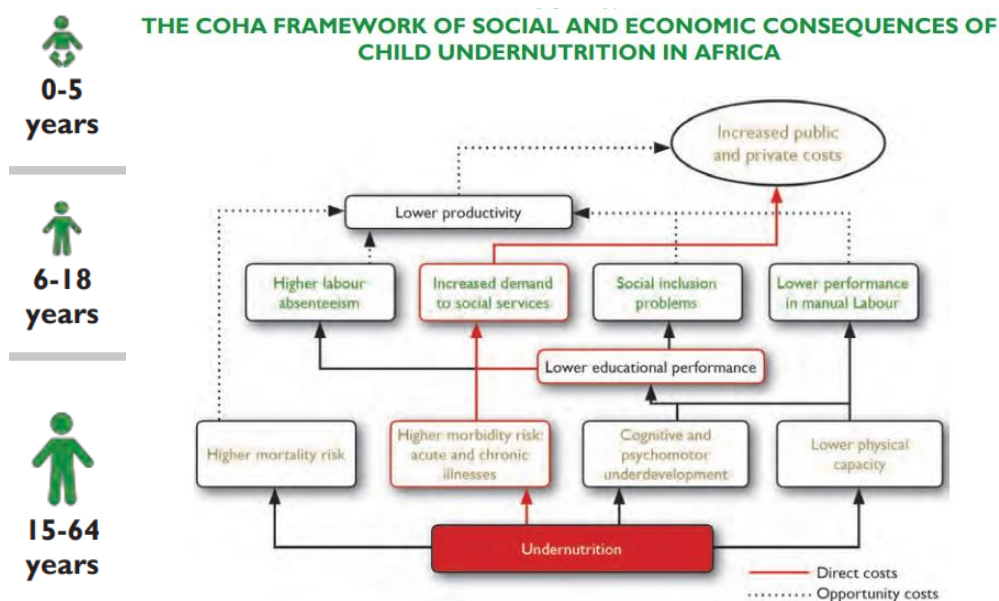


Figure 2: The COHA framework of social and economic consequences of child undernutrition in Africa.
[UNECA, 2014]

Starting with infants, higher risks of anaemia, diarrhoea, fever and respiratory infections were observed in an undernourished child. Every additional case of illness is costly to the health system and to families. Furthermore, a stunted child is at higher risk of repeating grades and dropping out of school. In the study around 12 % of repetitions were associated with stunting. Grade repetitions, if being affordable at all, are costly to families and the education system. Growing up, as a child who has dropped out of school early with less school education and has then entered the workforce, this person may be less productive. It was estimated that 57% of economic activities in Africa are contributed by the agricultural sector. If engaged in manual labour (like farming) he or she is likely to have reduced physical capacity. These factors lead to reduced economic productivity of a country. Another factor that should not be forgotten is the lost productivity resulting from the absence of people from the workforce who could never contribute to it due to undernutrition-related child mortality. About 50 % of working-age populations in Africa suffered from stunting as a child. This is why eliminating stunting is a necessary step for inclusive development in a country like Zambia [UNECA, 2014].

2.2 Definition of ICTs

In its Universal Declaration of Human Rights from 1948 the United Nations General Assembly proclaimed that the access to information is a human right. It is stated Article 19 that the right to freedom of opinion and expression, includes freedom to seek, receive and impart information and ideas through any media [UN General Assembly, 1948].

In modern times, apart from print media, information is also transmitted through Information- and Communication Technologies. ICTs do not only transmit information, but also store, create, share or exchange them. These technological tools and resources include computers, the Internet (websites, blogs and emails), live broadcasting technologies (radio, television and webcasting), recorded broadcasting technologies (podcasting, audio and video players and storage devices) and telephony (fixed or mobile, satellite, visio/video-conferencing, etc.) [UNESCO, 2019].

In the last decade mostly interpersonal communication channels helped rural women in Africa to satisfy their information needs. Primarily government officials were the key sources of practical and technical information on topics like farming or health. The second mostly used information sources were print supplements like brochures and leaflets [Rodriguez et al., 2015].

However, ICTs are receiving greater importance nowadays. Even though the African region has made slower progress in comparison to other regions worldwide, Africa has witnessed success of ICT-initiatives regarding mobile cellular communications and internet access in the last decade and half. Many African countries have the vision of employing the transformative power of ICTs to accelerate development through entrepreneurship and innovation[Alliance 54, 2016].

2.3. Project Context and Target Population (FANSER)

With its special initiative “One World- No Hunger. Future of the rural world.” the German Federal Ministry for Economic Cooperation and Development (BMZ “Bundesministerium für wirtschaftliche Zusammenarbeit”) has set the goal to contribute to eradicating poverty and hunger by supporting the agriculture and food sector in rural areas of developing countries, for them to become more productive, sustainable and innovative [BMZ, 2017].

The German Agency for International Cooperation (GIZ “Gesellschaft für Internationale Zusammenarbeit GmbH”) has been working in Zambia since 1966. Its work is divided into four major areas: rural development, sustainable infrastructure, social development and governance and democracy. In the category “rural development” GIZ supports agricultural innovation and nutrition security. Parts of this effort are various Global Projects addressing challenges in these fields[GIZ, 2019]. This thesis is based on a study conducted for the Global Project “Food and Nutrition Security, Enhanced Resilience (FANSER)”.FANSER is funded by BMZ and coordinated by GIZ. The Global Project cooperates with various national and international non-governmental organizations for efficient implementation, but also plays a key role in exchanging experiences and developing guidelines in international dialogue processes. Currently the Global Project is working in 12 countries worldwide [BMZ, 2019].

The county package Zambia of the FANSER project is based in the Eastern Province. The target group consists of women of reproductive age and children under 2 years of age. Thereby the project focuses on the first 1000 day window of opportunity in the development of young children. The objective of the project is to ensure that food and nutrition insecure people in the two districts of Katete and Petauke have access to sufficient and healthy food at all times, including times of food crisis. As Zambia is one of the countries whose agricultural produce is projected to be affected by climate change, the synergies and coordination of interventions between FANSER and other German or international projects concerning small scale farmers are of great importance. The work of FANSER consists of directly targeting people in villages based on the “Care-Group-Model” in which trained nutrition volunteers on village level educate other households in their surroundings on nutrition and nutrition-related health topics. Some examples for these are: dietary diversity, breastfeeding and complementary feeding, pregnancy and lactation, food hygiene and preparation of food. Therefore FANSER collaborates with the NGO Catholic Relief Services (CRS). In 2018 30,000 households could benefit from trainings. FANSER also consults national nutrition committees on district level to implement governmental nutrition programmes, one of them being the “First 1,000 Most Critical Days” Programme of the Zambian Ministry of Health. Generally it supports the national efforts to political prioritization of nutrition security. The duration of the project is February 2015 to September 2022[GIZ, 2017].

Other organizations active in the target areas are SUN (Scaling Up Nutrition) donors (DFID, SIDA, Irish Aid, INCEF, WHO, USAID), World Food Programme (with the national NGO “Rural Initiative for Child Hope” as its implementing partner), World Vision and Latter-Day Saint Charities (with its implementing partner CARE International Zambia)[GIZ, 2019].

For 2019 one of the new objectives of FANSER project should be the use of innovative behaviour change communication applied through ICTs to extend the project's communication strategy.

2.4. National Policy Framework

As mentioned above nutrition security is a driver of a country's development. The topic is officially recognized and integrated in essential policy documents of the Zambian government. Some will be presented below. The Zambian Development Plan grounds the path for reaching goals holistically. The 1000 Most Critical Days Programme II (MCDP II) and the National Food and Nutrition Strategic Plan depict Zambia's commitment to nutrition security.

In the 7th National Development Plan (2017-2021) Zambia also focuses on maternal and child health care. It aims at better education of adolescents in HIV and reproductive health. Regarding mothers, teenage pregnancies should be reduced and the antenatal care and postnatal check-ups increased. Future results should be improved water supply and sanitation services to all segments of the population. ICTs are mentioned in the plan. They should be used for implanting an integrated agriculture information system. Also public ICT institutions should be strengthened and established, innovation should be facilitated and high speed internet access allowed. For proper use, ICT skills should be promoted in staff of public and private institutions (i.e. ICT mainstreaming in schools) [Ministry of National Development Planning, 2017].

Currently Zambia is enrolling its second Programme with focus on the first 1000 most critical days of a child's life, the MCDP II. The first one was initiated in 2013 when Zambia joined the global network "Scaling Up Nutrition". The MCDP II recognizes the long term effects of stunting throughout the life cycle on different environments. It mentions the health effects like the increased risk to suffer non-communicable diseases (i.e. hypertension and diabetes) later in life as well as the irreversible growth failure and lifelong poor health and cognitive development outcomes. MCDP II shall reach out to women of reproductive age (15-49 years), including adolescent girls (10-19 years), pregnant and lactating women and caregivers of children under 5 years of age (0-59 months), with emphasis on children under 2 years of age (0-23 months). At the same time male participation in various interventions shall be reinforced. Hereby the target group is the same as in the FANSER project. The programme shall continue to advance a multi-sector approach to implement recommended high impact nutrition interventions, efficiently coordinating efforts made by all stakeholders.

Continuous lessons and research shall facilitate collective learning. Interventions shall be harnessed for i) an increase in production and consumption of diverse diets, ii) enhanced emergency preparedness for food support and livelihoods, iii) affordable food prices and reliable markets, iv) improved income, resilience and women empowerment, v) strengthened health care systems and capacity, vi) improved care seeking and care practices and vii) increased access to safe water, hygiene and sanitation and clean environments. ICTs can help to achieve these goals. It is stated that an agricultural extension service knowledge network platform through ICTs should be supported and mainstreamed. With the second phase of the MCDP 86 additional districts joined it. Led and coordinated by the National Food and Nutrition Commission, the planned interventions will be delivered through 7 ministries, supported by the SUN network and cooperating partners. A decentralized system shall be used to converge interventions and services at community level [National Food and Nutrition Commission of Zambia, 2017]. All these intentions are in line with strategies in FANSER.

For efficient communication to reach the goals of the MCDP, the NFNC developed a communication strategy and implementation plan in which ICTs play a special role. Stages at which ICTs in mass communication can be useful to achieve human behaviour change are for “raising awareness” and “motivation actions”. Interpersonal communication strategies should be used for more complex stages of a behaviour change process. By addressing all stages by interpersonal and mass media communication and letting both reinforce each other optimal results could be achieved. The use of ICTs shall include internet, mobile phone communication and other old and emerging ICTs. An advantage of ICTs is their cost effectiveness of reaching a large audience within a short period of time. Possible interventions could be based on (live) national and community radio shows (which could be recorded and spread as CDs), videos and documentaries, SMS platforms, web portals and social media [National Food and Nutrition Commission of Zambia, 2014] .

The National Food and Nutrition Strategic Plan 2017-2021 is aligned to Zambia’s Vision 2030 of becoming a prosperous middle-income country and of eradicating all forms of malnutrition in the Zambian population by 2030. It articulates the importance of nutrition and is a central role in social and economic development of the country. The Plan’s overall goal is to create a diversified and resilient economy for sustained growth and socio-economic transformation driven, among others, by agriculture, tourism, manufacturing and mining. The key development outcomes include: reducing poverty and vulnerability through job-creating industrialization and economic diversification, reducing development inequalities and enhancing human development through food and nutrition security and enhanced governance environments for a diversified and inclusive economy.

In regards to nutrition security strategies will be undertaken to prevent micronutrient deficiency, which is recognized as a major contributor to childhood morbidity and mortality. Programmes shall include supplementary feeding and safe nutritious food education programmes, which shall ensure that people have access to the right nutrition for their daily needs. Other interventions will include legislation reforms and research will be promoted to meet national food and nutrition standards. The nutrition information system shall be further developed. ICT platforms (e.g. websites and social media) and properly tailored nutrition messages for different groups to promote better nutrition shall be used adequately.

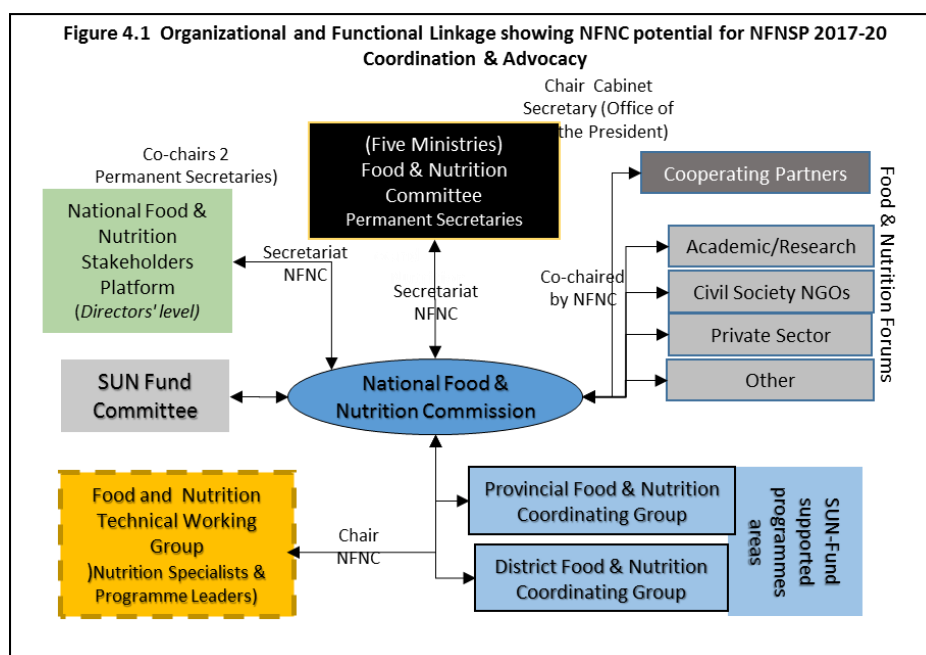


Figure 3: The Position of the National Food and Nutrition Commission [NFNC, 2017]

The document also explores the multiple roles of the National Food and Nutrition Commission (Figure 3). The NFNC has central roles in support of decisions, multi-sector coordination, programme design and implementation, senior-level advocacy and programme guidance. It is primarily responsible for coordinating, providing technical assistance and monitoring SUN Fund resources[National Food and Nutrition Commission of Zambia, 2017].

Zambia is recognizing the power of technologies for its development. The future use of ICTs is implemented through the national policies. The main authority responsible for ICT development, the Zambian Information and Communications Technology Authority (ZICTA), is the sector regulator for electronic communications, deriving its mandate from the

Information and Communication Technologies Act No. 15 of 2009, the Postal Services Act of 2009 and the Electronic Communications and Transactions Act of 2009. The current ICT policy was adopted in 2006, with its three core areas being capacity building, a competitive and efficient ICT sector and an effective legal and regulatory framework. In 2015 the president launched the SMART Zambia initiative aiming at advancing the country into a digital and knowledge-based society[ITU, 2017].

The SMART Zambia National Information and Communication Technology Masterplan for 2017-2030 is an essential document. It is in line with the 7th National Development Plan (7NDP). Technical assistance for the realization is provided by the Chinese government, China Electronics Technology Group Corporation (CETC) and Huawei [Bantu News, 2018]. Huawei is not only the lead partner for planning and implementing the Smart Zambia ICT Masterplan over the next 50 years, but also provided the Smart Zambia Initiative in its first and second phase[Huawei, 2019].

The Smart Zambia initiative has the vision of a prosperous and globally competitive knowledge-based developed country by 2064. It strategically aims at building an extensive network and ICT infrastructure, implementing ICT applications in all sectors of the economy, improving social welfare, stability and prosperity in Zambia and supporting local industry development through industrial parks. The 7 main pillars are smart education, smart health care, smart agriculture, smart government, smart economy, smart environment and smart infrastructure[Research ICT Africa, 2018].

The National ICT Policy from 2006 sets the goal of improving quality health care close to households, irrespective of time, distance and location, through the deployment and exploitation of ICTs and other modern technologies. It aims to facilitate the development and implementation of a national telemedicine programme and supports partnerships with the private sector and civil society. In this ICT policy the potential roles of women and youth in the society and their marginalization so far have been underlined. ICTs shall be used as empowerment tools in daily activities. These should strive to counter gender imbalances affecting women's participation and their benefit from the information society. ICTs shall be promoted as a career for youth and women in the education system to encourage creativity and innovation around ICTs, leading to entrepreneurship development. ICT training programmes and literacy programmes shall be promoted. A bigger aim is using ICTs as a way to eliminate inequalities between sexes. A proper infrastructure and affordable access to ICT tools and services in rural and urban areas shall be provided. Another commitment is to make it mandatory for telephone service providers to provide toll-free services to support special non-profit-organizations targeting their services at women and youth[Ministry of Communications and Transport, 2006].

2.5. Current ICT Use in Zambia

Although there has been progress in the provision of ICT services, the ICT infrastructure still tends to be underdeveloped and there are many challenges to be faced. Some of these are the limited access to information especially in rural areas (including electricity provision issues), resource mobilization for sustained investments in infrastructure and skills capacity, and the high cost of service provision. As a landlocked country it is more expensive and difficult to connect to the global cable system, which leads to high bandwidth costs. Low quality of services was recorded and there is little protection against unsatisfactory performance by operators. A relatively inflexible regulatory regime is said to also be a challenge with long administrative procedures slowing down recent technology implementations. Concerning mobile phone subscriptions and internet users, Zambia is around the average of sub-Saharan countries. ZICTA plans to provide and expand communication and information facilities to improve the rural Zambian's quality of life. Therefore multi-purpose community tele-centres and Internet Points of Presence are being established, shared passive infrastructure (i.e. communication towers) are constructed [African Leadership in ICT, 2017].

In 2017 Zambia ranked 146 out of 176 in the International ICT Development Index. Figure 4 shows the different dimensions that lead to a country's ranking and compares the Zambian scores with the Austrian ones to provide a better understanding. The IDI indicators can be divided into three main categories, being the access to, use of and skills for ICT. In regards to the access, 75 out 100 inhabitants have a mobile-cellular subscription. Only 8% of households have a computer but 14% have internet access. For the use of ICT it can be said that 25% of individuals use the internet. Comparing fixed (wired) broadband and active mobile broadband per 100 inhabitants, 0.2 und 32.2 subscriptions are the respective numbers. ICT skills are represented as by years of schooling and the level of enrolment. In Zambia 7 years of schooling are the mean. 45% of Zambians have a secondary school education, however only for 2% enrol tertiary education (university level) [International Telecommunication Union, 2017]. However, these figures seem to increase rapidly. According to a short statistical update by the Zambian Information and Communications Technology Authority (ZICTA) in 2018 already 92 out of 100 inhabitants were calculated for mobile penetration and 58 out of 100 users for mobile broadband penetration [ZICTA, 2018].

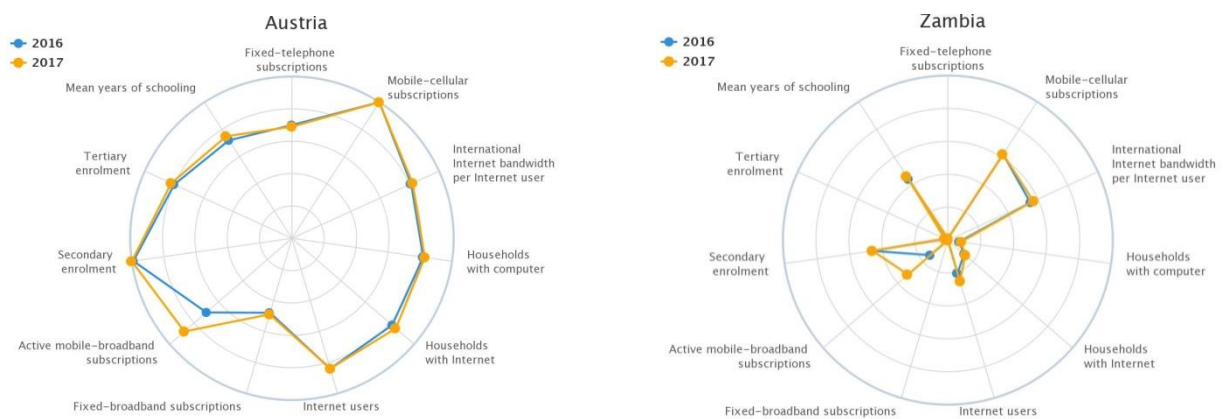


Figure 4: Comparison of 2017 IDI of Austria and Zambia [ITU, 2017]

The World Economic Forum as part of its Global Information Technology Report ranked Zambia 116 out of 139 countries in its Network Readiness Index in 2016. Table 1 presents its dimensions and Zambia's ranking in the categories. A development could be observed from past rankings as well as the relevant measures, which are environment, readiness, usage and impact [World Economic Forum, 2016].

	Rank (out of 139)	Value (1-7)
Network Readiness Index	116	3.2
Network Readiness Index 2015 (out of 143)	114	3.2
Network Readiness Index 2014 (out of 148)	110	3.3
Network Readiness Index 2013 (out of 144)	115	3.2
A. Environment Subindex	46	4.3
1 st Pillar: Political and Regulatory Environment	61	3.9
2 nd Pillar: Business and Innovation Environment	39	4.8
B. Readiness Subindex	127	2.7
3 rd Pillar: Infrastructure	129	2.0
4 th Pillar: Affordability	129	2.5
5 th Pillar:	114	3.6
C. Usage Subindex	113	3.0
6 th Pillar: Individual Usage	126	2.0
7 th Pillar: Business Usage	71	3.6
8 th Pillar: Government Usage	104	3.3
D. Impact Subindex	113	3.0
9 th Pillar: Economic Impacts	115	2.7
10 th Pillar: Social Impacts	111	3.3

Table 1: 2016 Network Readiness Index for Zambia [World Economic Forum, 2016]

2.6. Behaviour Change Communications (BCC)

Behaviour Change Communication (BCC) is a strategy and part of the Communication for Development approach (C4D). It strengthens and enables media and communication environments in specific contexts. Based on the spheres of a society's day to day life, Figure 5 shows that BCC is primarily applicable to the individual and interpersonal level, thereby directly influencing individuals, households, circles of friends or social networks and social support systems. Some of the characteristics of the individual level, which need to be

considered, are mentioned in the figure below, others are gender, religious and ethnic identity and values, economic status and literacy.

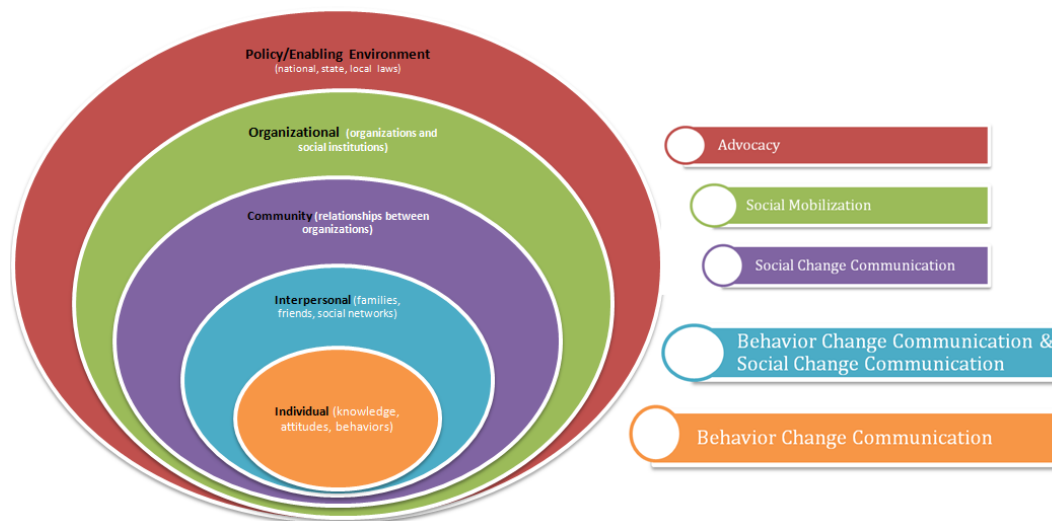


Figure 5: C4D approaches on different social levels [UNICEF, 2019]

C4D is a systematic and evidence-based approach to promote positive and measurable change. It engages communities and decision-makers from local to national settings and aims at developing and implementing policies and programmes. The four approaches of advocacy, social mobilization, social change communication and behaviour change communication should be strategically combined to produce a synergetic effect. Multi-level approaches are able to eventually change social, cultural and institutional norms, which enables behaviour change and therefore leads to sustained behaviour change in the course of time[UNICEF, 2019]. This approach can be seen as part of the efforts made in global health communications in international contexts and works through interpersonal communication and mass media campaigns.

2.6.1. Objectives of Behaviour Change Communications

In a publication about global health communications Waisbord and Obregon highlighted that communication is not merely the human process of transmission and reception of information. Furthermore, changes in information are not always directly mirrored in

transformations in health behaviours. The “knowledge behaviour gap” is an issue often faced in interventions. It is based on the assumption that if individuals were aware and properly informed, they would act “rationally” and maximise individual benefits and practice better health behaviours. However, „individual rationality” needs to be contextualized. Rationality is culturally defined, according to social expectations and attitudes, as well as social norms. It should be aimed for exchange of ideas, participation in public life and development of critical consciousness. How people talk and make sense of issues related to health, disease and well-being should be brought forth, as well as the active identification of challenges and solutions and determination of courses of action. Another point is the perception of an individual as a self-efficient and mostly independent part of its society. Different parts of the world have different concepts of personhood, which can also be subsumed under a broad set of group identities. Therefore community and cultural context should not be considered another set of behavioural determinants that affect individual decisions and practices. Instead they should be foregrounded in analysis, as well as issues surrounding power, such as the influence of political-economic forces on health and gender inequity. Out of these critical reasons qualitative, in depth- methods should be applied in the creation of interventions to make sure a proper understanding of a society’s relationship with health issues [Waisbord and Obregon, 2012].

BCC programmes target to stimulate the most immediate preventive actions among individuals, families and communities. It basically requires shifting people’s paradigms about what they perceive to be right or true and people’s expectations regarding normative behaviours. An example for a place to implement behaviour change communication actions would be a mother’s support group. These actions should aim at promoting positive health outcomes and help to increase knowledge (i.e. about the importance of exclusive breastfeeding) and also to reduce stigma, promote attitude change and improve skills and the sense of self-efficacy (i.e. by teaching mothers how to react in case of a child’s illness). Another important fundament for possible behaviour change is an environment that is perceived as supporting and should therefore be addressed too[UNICEF, 2019].

2.6.2. Examples of ICT use in BCC

One example for the use of ICT for behaviour change in a nutritional development project would be the mNutrition programme of UK Aid. It was funded by the United Kingdom’s Department for International Development (DFID) and worked with African mobile network operators and other mobile and health sector stakeholders across eight sub-Saharan

countries (Malawi, Ghana, Tanzania, Kenya, Nigeria, Zambia, Uganda and Mozambique). In order to extend the reach of healthcare and to reach people who lack access to essential healthcare and nutrition information, subscribers to the service were sent free text messages. In Tanzania pregnant women, mothers with new-borns and their supporters were targeted. The SMS messages were sent in Swahili to women up to 16 weeks post-partum, on a range of pregnancy and early childhood issues, timed to the stage of pregnancy or the age of the child. The aim was to improve nutrition knowledge levels among users and empowering them to adopt beneficial nutrition practices. Knowledge that was already available could be reinforced by repetition. Through sharing information with family, friends and other community members, nutrition messages were further spread[IDS, IFPRI, Gamos, 2019]. The theory of change was based on the hypothesis that users exposed to the information available acquired new or reinforced old knowledge and by implementing the suggested practices in their households would see improved health outcomes and thereby be more motivated to further use the service. The importance of easy understandable and interactive services was underlined in an assessment. Another important finding was that it is crucial to promote the service working with mass-media channels (i.e. radio advertisements) and already trusted health personal on the ground[GSMA, 2018].

Another example would be the community-based hotline and voice messaging service in Malawi. It was developed by Village Reach, Population and the Ministry of Health with financial support from various donors, aiming at providing information and advice on reproductive, maternal and child health (including healthy nutrition and hygiene) and decreasing unnecessary visits to health facilities. In remote areas this can be very beneficial. The hotline is based at a district hospital and staffed by workers trained at a similar level to a community health worker, supported by nurse supervisors. Hotline workers are guided through protocols on a touchscreen-device that prompts them to ask a series of questions to identify clients' symptoms and information needs [Village Reach, 2019].

The use of radio was another way to teach people about nutrition, as realised in Cambodia. The production of one-hour radio talk shows was funded by the GIZ Global Project Food and Nutrition Security, Enhanced Resilience. They served to broaden listener's knowledge on topics like complementary feeding, exclusive breastfeeding and WASH. The audience was also provided the opportunity to call in and ask questions in case of doubt. The radio channel advertised the nutrition talk show several times a day through entertaining jingles and dialogues and talk shows were repeated after being originally broadcasted, trying to reach as many people possible.

3. Methodology

The main objective of this study was to assess the use of ICTs in the FANSER districts, Petauke and Katete in the Eastern Province of Zambia. The study should not only provide an overview of the availability of different ICTs within the villages, but also give a rough insight into their use.

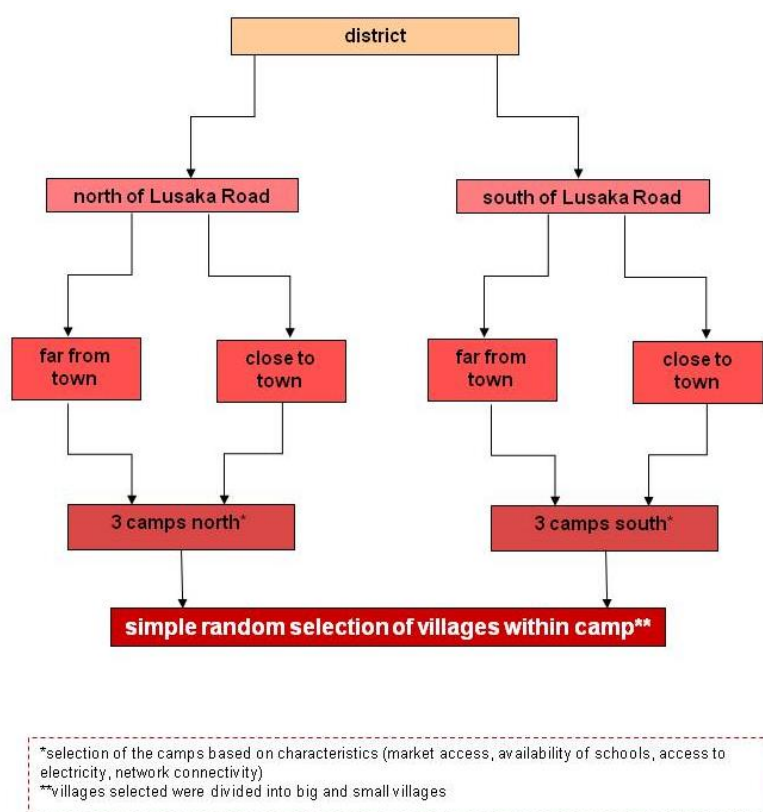


Figure 6: Flow Chart of the Sampling Process

In order to investigate various factors affecting it, the assessment paid special attention to gender and generational differences. By presenting a better understanding of the preferred channels for gaining information and knowledge and possible challenges regarding their use, the investigation eventually constitutes a basis for the development of a new communication intervention in the FASER project.

3.1 Sampling

For the selection of study sites multi-stage sampling method was used. As presented in Figure 6, each district was divided into two strata, namely north and south of Lusaka Road. This was done due to known economic and infrastructural differences. South of Lusaka Road (near Mozambique border) more inter-tribal marriages are found and the FANSER camps tend to be further away from the main economic centres (presented by the town). Furthermore, these areas have the possibility of cross-border trade. Less lingual diversity is observed as well as less network providers. These strata were further split into camps by their distance to town (Katete Town, Petauke Town in the respective district). Special criteria were then analysed leading to a final selection of 6 camps. Within in each camp one village was visited, making 6 villages per district and a total of 12 villages. In Katete 6 out of 16 FANSER camps and in Petauke 6 out of 12 FANSER camps were visited. A bigger picture on ward-level is provided by Figure 7. Unfortunately, no map of the camps was available.

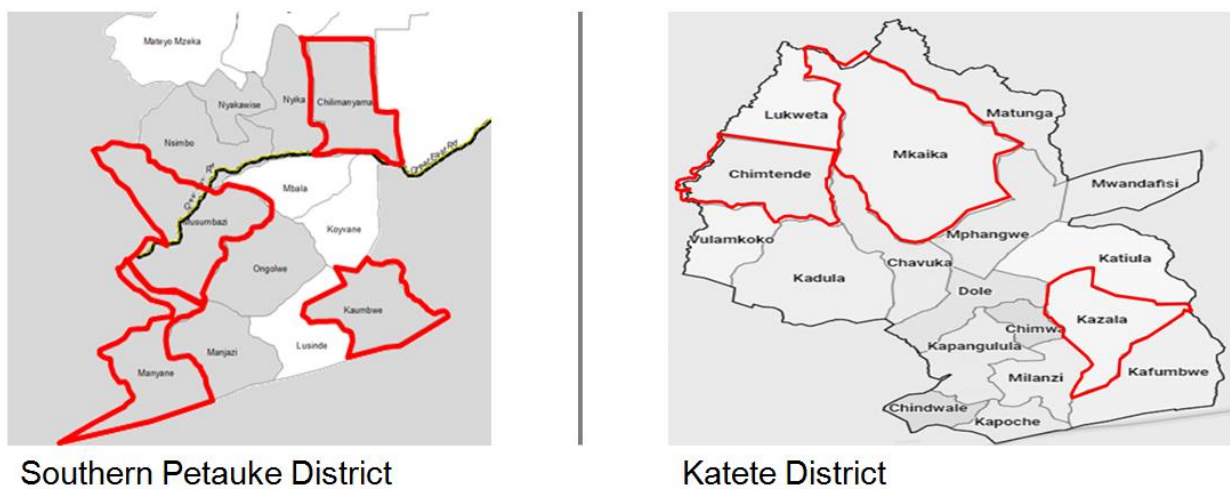


Figure 7: Marked Wards visited during Assessment
(Wards are further divided into Camps)

3.2 Quantitative Assessment

To get an in depth-insight into an individual's use of ICTs quantitative and qualitative assessment methods were applied. For the quantitative part, a questionnaire was developed

including single and multiple answers, after reviewing available questionnaires used in similar assessments.

The interviews were conducted using tablets with Kobotool software. Beside socio-demographic variables, the questions regarded the owning of and access to each ICT (basic mobile phone, smartphone, radio, TV, and laptop), decision-making power regarding their use and preferred sources of nutrition information. The length of the interview depended on the individual access to ICTs. After asking for socio-demographics the interviewers went through every ICT, asking whether it was owned by or accessed (i.e. through borrowing it from the neighbour) by the participant. Due to the high number of conditional questions, interviews could last about an hour. The more ICTs someone used, the longer the interview took. Due to the limited time frame of the study and the structure of the questionnaire, only a low number of interviews could be achieved. This could be a limitation of the study. However, one should keep in mind, that this formative study had the thorough investigation into the availability and use of ICTs in the target population as its main objective. It was more important to give recommendations based on a well-understood behaviour than fulfilling the author's scientific endeavour. Bigger and more in-depth investigations should be conducted in the future, when a specific ICT is chosen for the communication strategy.

Quantitative data was analysed using IBM SPSS Version 20. The study aimed at presenting current availability and habits in regard to ICTs, therefore statistically being of descriptive nature. In order to understand and explain some of the patterns of ICT use, differences between the sexes and generations were analysed (men and women, adults and adolescents). Due to the small sample size, most metric variables were not normally distributed. For the few metric variables analysed, the Mann-Whitney-U-Test was used and for categorical variables Chi-Square Test and Fisher's Exact Test were chosen. Correlations were tested for the metric numbers of ICTs used and owned and other metric socio-demographic variables with Pearson's correlation coefficient.



Figure 8: Pre-Testing of the Quantitative Questionnaire

Approximately two days were spent in each village, depending on time frame and distance, and at least 6 interviews were conducted in each village. In the villages participants were randomly selected (not only FANSER beneficiaries), fulfilling the criteria of being at least 13 years of age and falling into one of three defined categories. Participants were recruited by stating to own one of following roles: head of household, spouse/partner or adolescent child (unmarried and living in the parent's household). All participants took part in the study voluntarily and anonymously and signed written informed consent. Adolescents would be between 13 and 19 years old. For Adults no age limit was set.

3.3 Qualitative Assessment

To get a better understanding of the barriers and future use of ICTs during a possible intervention, focus group discussions (FGDs) were conducted for men, women and adolescents in each district.

FGDs can be used to gather views representative of a whole community. They often complement other surveys and provide a range of views instead of only one individual's opinion [FAO, 2016].

Participants are able to comment on each other's statements and discuss opinions. Knowledge can be exchanged, and the interaction can produce a better picture of reality, which all the participants might agree on. FGDs serve to find out collective views and the meanings lying behind them, thereby generating a richer understanding of the target group's experiences and beliefs. They are one of the most common methods of data collection used in qualitative healthcare research [Gill et al., 2008].

In the pre-test a group of mixed adults (women together with men) showed that on some sensitive topics arguments would arise and that women might not always speak up to the men in the group, which led to the decision to talk to the two sexes separately. However, for younger participants this was not the case and they could be mixed in an only adolescent group. The purpose of the separation was to find different patterns of use of ICTs between generations or barriers, which might be connected to elders or partners. In a group of only adolescents, children could speak freely about their parents and in a female group women could speak freely about their husbands. The groups consisted of 8 to 10 participants. A representation of all categories of ages was aimed for, so that also elders would be able to contribute with their possibly different point of view.



Figure 9: Conducting a Focus Group in Katete

A structured guide was used to lead the focus group through the discussion. It consisted of four questions and followed logic. Through the first two questions participants were explained the definition of ICTs by the facilitator and then were asked to talk about their private use and the associated advantages and disadvantages, followed by the centrepiece, namely the barriers and problems of their use. With the last questions participants were asked to imagine their future use of ICTs and to think of how their lives would be influenced by them and then in what way ICTs could be used to teach others about nutrition. Understanding the perspectives of the target group before an intervention is essential for designing it and determines its success. What importance and potential is seen within technologies could vary greatly in the eyes of remote villagers and the ones of the creator of a communication strategy. The FGDs conducted cost a large amount of time, which also was a reason for the smaller sample size (number of quantitative interviews). However the study team saw great value in understanding fundamental dynamics of the individual use of ICTs for the development of an adequate concept for the future intervention. Thereby it was made sure that no barrier was overseen.

The discussions took place in Nyanja, the common language in Eastern Province and were documented using a paper-printed guide (with blank spaces to take notes) and an audio recorder. Transcriptions were computerised after going through the recordings and then analysed with Atlas.it software using the summarising content analysis method.

Both materials, the quantitative questionnaire and the FGD guide, were tested in a pre-testing phase and adapted to the challenges faced. For example, a scale used to rate the barriers to the use of ICTs and thereby a method to measure the weight of the statements, was taken out of the FGD guide, because it was not easily understood and too time-consuming.

4. Results

The sample consists of 80 participants for the quantitative assessment. In the 6 conducted FGDs eight participants took part respectively. 51.3% of quantitative interviews took place in Katete district and 48.7% in Petauke district.

4.1 Findings from the Quantitative Assessment

4.1.1 Demographic and Socio-Economic Characteristics

Demographic and socio-economic characteristics need to be considered in investigations as they can potentially influence access and usage of ICTs among households and individuals.

As discussed before, one of the first questions asked was about the role of the participant in the household. Out of 80 participants, 30 were the heads of their households. Eight of these were led by women, whereas 22 were headed by men (73.3%). This number is similar to the nationwide estimation of 74.6% [ZICTA, 2018]. All female headed households were led by divorced or widowed women. 20.0% had the role of the spouses/partners. 26.3% of participants were adolescent children, 6.3% other adolescent relatives living the household and 7.5% adult children. This differentiation is important because the role might determine if a person has decision making power on the purchase of ICTs and their use.

The age of participants ranged from 13 to 57 years, with the mean age being 28 years (SD = 11.3 years). Participants were grouped as adolescents when they were between 13 and 19 years old, in line with the Zambian standard. In the boxplots of Figure 10 it can be seen that the distribution of ages were very similar between men and women and that 50.0% of people were between 18 to 26 years old.

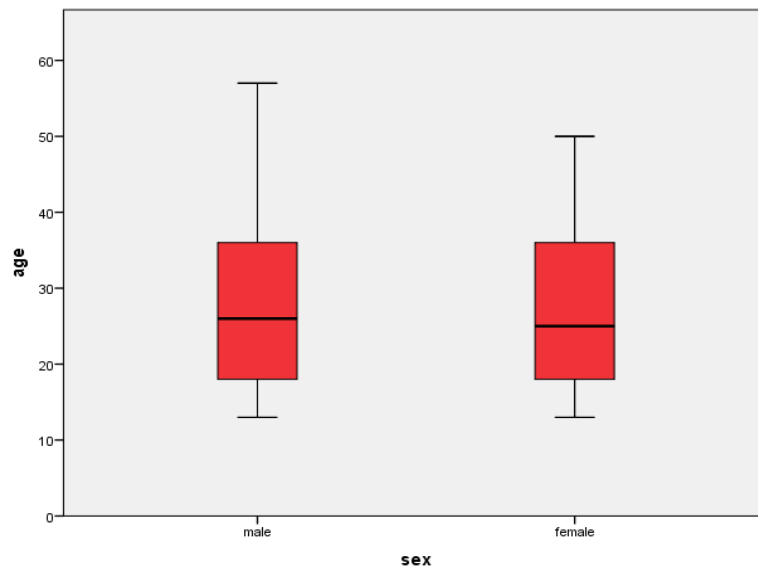


Figure 10: Distribution of Age by Sex

51.3% of the study sample was female and 48.8% male. It was intended to interview an equal number of female adults, male adults and adolescents, also giving importance to the adolescent's equal gender distribution. The sample consists of 26 female, 26 male adults and 28 adolescents. Slightly more female adolescents ($n=15$) than male adolescents ($n=13$) participated (Figure 11).

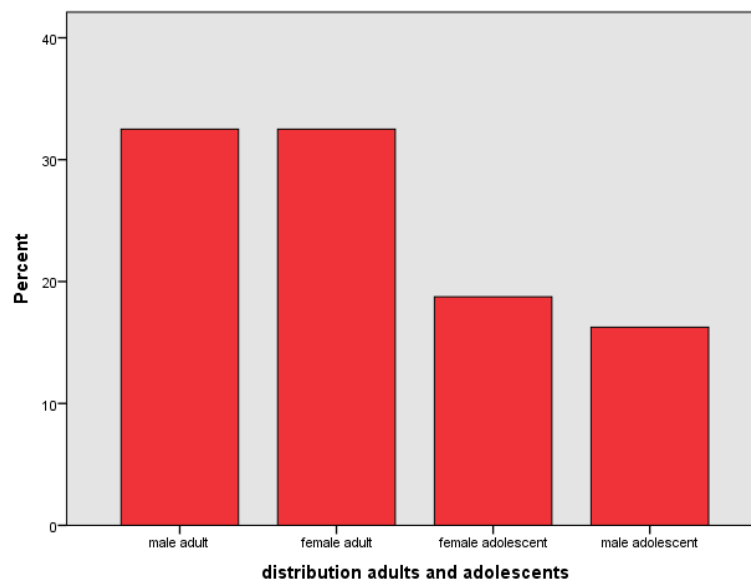


Figure 11: Distribution of Adults and Adolescents

The average household size was 6.6 and thereby lying above the national average for rural areas of 5.1 members [ZICTA, 2018].

In Katete district 90.2% of participants reported to belong to the Chewa tribe. Other tribes mentioned in the district were Ngoni and Kunda. In Petauke district 92.3% reported Nsenga as their tribe with others being Chewa, Tumbuka and Lozi. After Nyanja the languages spoken were therefore Chewa and Nsenga, followed by English. For this reason, the preferred language for any kind of communication strategy in Eastern Province should be Nyanja.

	total	total ZICTA 2018	total DHS 2018
no education	8.8%	8.3%	6.0%
primary	76.2%	49.0%	41.3%
secondary	15.0%	37.2%	45.9%

	male	male ZICTA 2018	male DHS 2018	female	female ZICTA 2018	female DHS 2018
no education	7.7%	6.3%	4.0%	9.8%	10.1%	7.7%
primary	71.8%	46.2%	37.6%	80.5%	51.5%	44.3%
secondary	20.5%	41.2%	50.6%	9.8%	33.6%	42.5%

Table 2: Distribution of Sample by Educational Attainment Level in Comparison to National Levels
[ZICTA, 2018; CSO, MOH, ICF International 2018]

The average level of schooling was up to grade 6 for men and grade 5 for women. 76.3% of participants reported to have attended primary school. Only 15.0% went to secondary school. 8.8% reported no schooling at all. There was no significant difference between the sexes nor generations in regards to better education, $X^2(1) = 7.63$, $p > .05$. Only two participants reported to have completed secondary education. No participant stated to have attained tertiary education. Table 2 shows a comparison to the 2018 ICT Survey conducted by ZICTA and the 2018 DHS Study. However, these numbers were calculated nationwide, which could explain the difference. Urban regions, especially Lusaka and Copperbelt Provinces, are far more than rural areas of other provinces.

Only slightly more than half of the participants were literate. 57.5% reported to have reading skills and 55.0% to be able to write. Looking at the distribution of literacy one can see that adult men were the most literate, followed by the adolescents. Within the adolescents, boys were more often literate than girls. The women, being the target group of FANSER project, are the least literate ones in this comparison. Only 34.2% of all females of reproductive age (15 – 49 years) reported to be able to read and write.

The households in the sample had up to 7 sources of income. Most households were subsistence farmers, meaning that the agricultural production served to primarily satisfy the household's needs and only secondarily to provide income. In line with this the most common sources of income were the sale of farm produce (90.0%) at a small scale, casual daily work (77.5%), small businesses (76.2%) and the sale of animals or animal products (41.2%). On average the households had 4 sources of income ($SD=1.3$). The educational level did not influence the number of income sources significantly, $U=345.0$, $z= - 0.32$, ns, $r= -.03$. However, a relationship between attending secondary school and having a savings group as a source of income was observed, $p=.031$ (Fisher's Exact Test).

4.1.2 Ownership and Use of ICTs

Before looking at the data it is important to highlight the difference between “owning ICTs” and “using ICTs”. One could not afford to own a single ICT, but still be using them through borrowing or paying a fee. A participant might have stated to own a basic mobile phone but because he or she was able to access a radio (i.e. at a neighbour's house) and a laptop (i.e. in town) this would mean that three different ICTs were used. Consequently during the interview, the use of all three ICTs was assessed through different sets of questions.

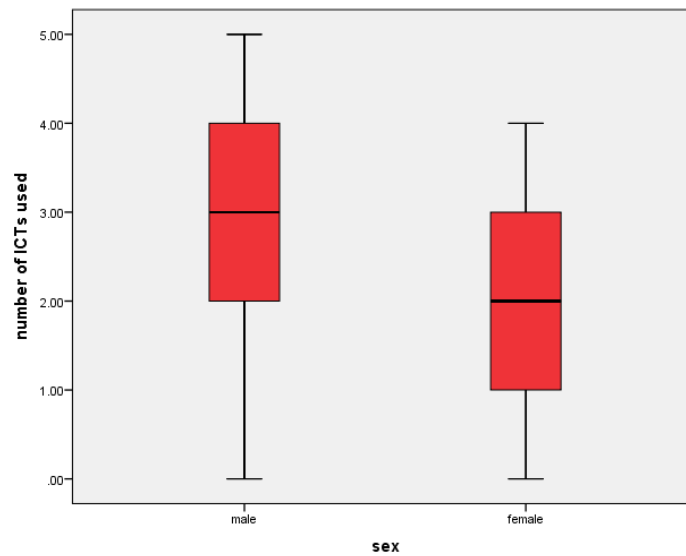


Figure 12: Number of ICTs used by Sex

Comparing the two sexes, it was possible to observe a gender disparity regarding owning and using ICTs. Females significantly owned less ICTs (Mdn=0) than males (Mdn=1), $U=527.00$, $Z= -2.86$, $p=.004$, $r= -.32$. They also used significantly less ICTs (Mdn=2) than males (Mdn=3), $U=432.59$, $Z= -3.67$, $p<.001$, $r= -.41$, as seen in Figure 12.

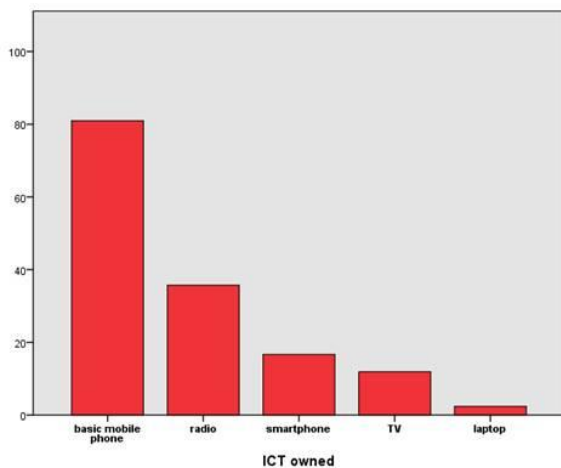


Figure 13: Most owned ICTs

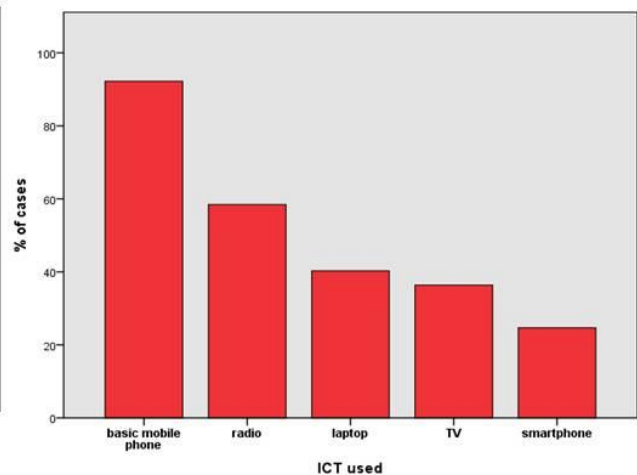


Figure 14: Most used ICTs

When identifying the most popular ICT within the sample, a difference could be observed between the most owned ICTs and the most used ICTs. As shown in the Figures 13 and 14.

	Use	Ownership	Access
Basic Mobile Phone	71 (88.8%)	34 (42.5%)	37 (46.3%)
Smartphone	19 (23.8%)	7 (8.8%)	12 (15.0%)
Radio	68 (85.0%)*	15 (18.8%)	30 (37.5%)
Laptop	31 (38.8%)	1 (1.2%)	30 (37.5%)
TV	28 (35.0%)	5 (6.2%)	23 (28.7%)
Audio Recordings	71 (88.8%)	-	-
Video Recordings	61 (76.3%)	-	-
Internet	13 (16.3%)	-	-

*61 (81.3%) reported to listen to the radio using their phones and are included in this number of use

Table 3: Overview of quant. Results in Use, Ownership and Access

ICTs owned by most people were basic mobile phones (42.5%), radios (18.8%), smartphones (8.8%), TVs (6.2%) and at last laptops (1.2%). However ICTs used the most were basic mobile phones (88.8%), radios (85.0%), laptops (38.8%), TVs (35.0%) and smartphones (23.8%). The number of people i.e. using a basic mobile phone is obtained by adding up the number of people owning one and the number of people accessing someone else's basic mobile phone. This shows that even though hardly anyone owned a laptop, a large number still accessed and therefore used them somewhere else. Surprisingly smartphones are the least used ICTs. They are owned only by a few people in the villages but might not be as often used and shared like other devices, due to some barriers like lack of electricity at the household for example. More details into the use of each ICT are displayed in the corresponding chapter.

In the assessment 47.5% of participants reported to own none of the mentioned ICTs. However, 55.0% stated to be using two ICTs. 45.1% used three or more ICTs. The high number of "non-owners" could be explained by the adolescent participants. These figures also point out the high sharing rates of ICTs.

Between the generations of parents and adolescent children, there was a significant difference in owning ICTs, ($U=408.00$, $Z= -3.51$, $p<.001$, $r= -0.39$), but none in the use of

ICTs. Thinking of the monetary possibilities of the adolescents in the villages it does not seem surprising that they do not own as many ICTs as their parents. This however highlights that even though this is the case, adolescents do have access to many ICTs and therefore also various sources of information. The way they can be reached does not differ to their older family members.

To test what kind of determinants, except for gender, were related to the ownership and use of ICTs, correlations were tested for various variables: Level of schooling ($r=.29$, $p=.015$), especially the attendance of secondary school ($U= 230.00$, $Z= -2.19$, $p=.028$, $r= -.26$) and age (as described before as the difference between adults and adolescents) ($r=.37$, $p=.001$) correlated with the number of ICTs owned. For the number of ICTs used, correlations with the level of schooling ($r=.32$, $p=.006$) and number of income sources ($r=.32$, $p=.004$) were observed.

Mobility can play a role in the use of ICTs. The distance to the next town and the time to get there could be vital determinants and were therefore also assessed in the quantitative questionnaire.

In total it took 27.5% participants 60-90 min. and 17.5% 45-60min. to get to the next town. 41.3% of all participants stated to need over 2 hours. The types of transport mostly used are bicycles (41.3%) and motorcars (42.5%) as shown in Table 4. In the camps south of Lusaka Road villagers needed significantly more time to get to town ($p=.023$, FET) and therefore more often used motor vehicles ($p=.027$, FET). Comparing the two districts however no significant difference was found.

	0-15 min.	15-30 min.	30-45 min.	45-60 min.	60-90 min.
Katete	2.4%	2.4%	4.9%	12.2%	34.1%
Petauke	10.3%	5.1%	2.6%	23.1%	20.5%
	2 hours	2h 30 min.	3 hours	> 3 hours	
Katete	14.6%	2.4%	4.9%	22.0%	
Petauke	10.3%	12.8%	5.1%	10.3%	
	walking	bicycle	motorbike	car/motor vehicle	
Katete	14.6%	53.7%	2.4%	29.3%	
Petauke	7.7%	28.2%	7.7%	56.4%	

Table 4: Time and Way of Mobility

4.1.3 Use of Mobile Phones

88.8% of all participants used basic mobile phones and 23.8% stated to use smartphones. Looking at mobile-phone owners and “accessers” (Table 5) following numbers could be observed.

	n, %
use of a basic mobile phone	71 (88.8%)
ownership of a basic mobile phone	34 (42.5%)
access to a basic mobile phone	37 (46.3%)
use of a smartphone	19 (23.8%)
ownership of a smartphone	7 (8.8%)
access to a smartphone	12 (15.0%)

Table 5: Use of Basic Mobile Phones and Smartphones by Ownership and Access

Comparing the numbers for males and females it was observed that men owned significantly more basic mobile phones than women $X^2(1)= 6.03$, $p=.014$. Men also owned smartphones more often, however the difference was not significant $X^2(1)= 4.19$, $p>.05$.

Talking about the use of mobile phones, in contrast to the ownership no significant difference could be observed between the sexes. Females did not own as many mobile phones as males did, but used them as much as males. This can be explained by their essential opportunity to access someone else's phone.

Crucial to using a mobile phone is the network connectivity. To assess its availability for the main Zambian service providers (Zamtel, Airtel and MTN) four questions were asked. These regarded network quality, the use of their services and the place of access.

The most used network providers differed throughout all study sites. However, in each area the providers with the best reception were also the ones mostly used. Therefore, the choice of service providers was linked to the quality of network.

Furthermore 88.0% reported to be using more than one SIM card. This is due to network and financial benefits, as calling across various networks results to be more costly than within only one network. Overall the most used network providers (in decreasing order) were Airtel, MTN and Zamtel. These results differ from the reported providers for the whole of Eastern Province in the ZICTA ICT Survey, where MTN was the most popular one, followed by Zamtel and Airtel [ZICTA, 2018]. Apparently network connectivity is very different in the other districts.

Zamtel was the preferred provider in Katete, and Airtel and MTN in Petauke. As these differ within the districts it would be a challenge to reach people through one single network provider in the two FANSER districts (Table 6).

In the sample 94.7% of participants stated to receive mobile network at their homes. For those not getting network coverage at the place of residence, a network point in their village was the solution. The walking distance was within 10 to 30 min. for 75.0% of the participants. This is in line with the ZICTA ICT Survey findings, which reported that 93.0% of participants in Eastern Province walked less than 30 min. when not having network available at their place of residence. Participants in Katete had network access at home more often than in Petauke, however this difference was not significant ($p>.05$, FET).

	Katete North	Katete South	Petauke North	Petauke South	Total
good reception, n (%)					
Zamtel	14 (31.8%)	13 (29.5%)	7 (15.9%)	10 (22.7%)	44 (100%)
Airtel	9 (23.7%)	6 (15.8%)	9 (23.7%)	14 (36.8%)	38 (100%)
MTN	9 (19.1%)	13 (27.7%)	10 (21.3%)	15 (31.9%)	47 (100%)
network providers used, n (%)					
Zamtel	13 (34.2%)	12 (31.6%)	2 (5.3%)	11 (28.9%)	38 (100%)
Airtel	16 (29.1%)	9 (16.4%)	10 (18.2%)	20 (36.4%)	55 (100%)
MTN	8 (15.1%)	16 (30.2%)	11 (20.8%)	18 (34.0%)	53 (100%)

Table 6: Reception and Use of Network Providers by Districts

Most participants can buy airtime in a nearby village (33.6%) or in their own village (30.1%). In some places it was a common business to buy airtime in bulk from town and to resell it in the own village. However, if a seller ran out of airtime vouchers, the clients would try to buy airtime in another (nearby) village. In 18.9% of cases participants stated that they went to town regularly and bought airtime directly there.

Even though the frequency of recharging airtime was quite high, only 10.9% of participants had airtime at any time of the week. During these days people might still be able to receive calls and text messages. This fact shows that there are limitations in the use of mobile phones. 59.4% stated to buy airtime several times a week and 21.9% once a week. The time spent without airtime was two to three days a week in 60.9% of cases. 15.2% spent four to five days without airtime.

On average participants spent about 25 Kwacha (SD=23.9, IQR=30) per month on airtime.

Whenever “mobile phones” are mentioned in the section below, both basic mobile phones and smartphones together are referred to.

Of the participants owning a mobile phone 85.6% said to be sharing it. Mostly it was shared with friends (60.6%), partners (57.6%) and other family members (51.5%).

Mobile phones were shared weekly in 63.6% of cases and even daily in 27.3%. This underlines the fact that people have significantly more access to ICTs than they own themselves. Of the 36 participants having access to a mobile phone (in the case they did not own one) 19.4% reported to own their own SIM card. 42.9% of these had more than one SIM-card. 63.9% of mobile phone accessers, bought airtime to use it in the borrowed phone. 44.4% had access two to three days a week, 22.2% four to six days a week and 19.4% reported to be able to use someone else's phone every day. It is important to note that a shared mobile phone does also constitute a possibility to reach someone or being reached out to, even though individual access can vary.

In regards to the frequency of use, owners of mobile phones reported to use them every day in 87.2% of cases. This means that batteries are charged and mobile phones used throughout the majority of a week (Figure 15). Phone-owners who also had access to another mobile phone stated to be able to use those on two to three days in a week in most cases.

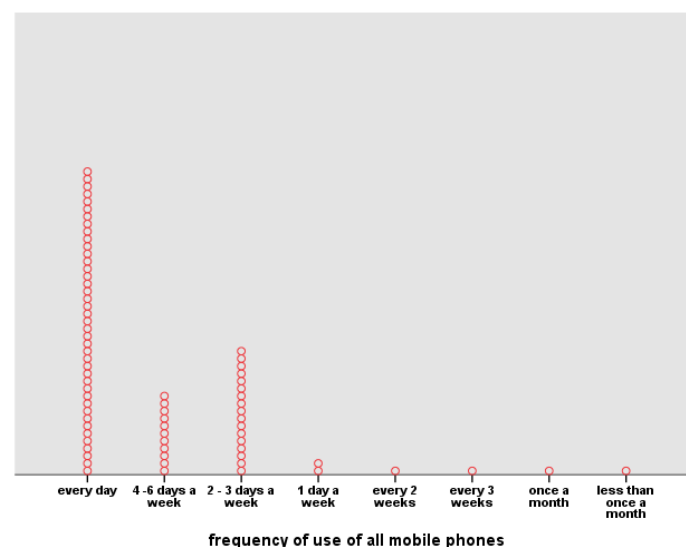


Figure 15: Frequency of use of mobile phones (including owned and accessed basic mobile phones and smartphones)

Relatively cheap and easy ways to get information are USSD codes. There already is a code (*667#) for nutrition and health information in Zambia. The use of USSD codes were assessed in the questionnaire, however many did not know about them and a lot of time was spent on explanations during the interviews. Only 18.7% of phone-users used USSD codes.

The majority used them for mobile money transactions (66.7%) and 33.3% for entertainment purposes (i.e. the results of a football match or for listening to music for free).

Other functions of the mobile phones were assessed. 16.0% of participants accessed the internet. 81.3% listened to the radio with the phone. Out of the users of smartphones 25% watched television through mobile TV (e.g. MTN TV).

4.1.4 Use of Radios

85.0% of all participants reported to listen to the radio (including listening with a mobile phone) (Table 7). In the national comparison, ZICTA reported that 40.0% of Zambian households owned a radio device [ZICTA, 2018].

	n, %
use of radios	68 (85.0%)
ownership of a radio	15 (18.8%)
access to a radio	30 (37.5%)
radio listening through phones	61 (81.3%)

Table 7: Use of the Radio by Ownership and Access

In this study, out of the participants owning a radio (18.8%) all of them also shared it. Mainly the radio was shared with partners (36.1%), children (30.6%) and other family members (13.9%). As seen with the mobile phones, even though few people owned an actual radio device, a great amount reported to listen to the radio regularly. This can be explained by the habit of sharing one's radio device, but also by the fact that many people listen to the radio, using their basic mobile phones. This finding proves the fact that it was necessary to also ask specific questions on the use of the radio and not only about the availability of radio devices in the villages.

It was a habit to share the radio daily in 57.1% and weekly in 42.9% of cases.

In total the top three radio channels were: Radio Maria (62.7%), Radio Mphangwe (47.8%) and Radio Explorers (32.8%).

	Katete North	Katete South	Petauke North	Petauke South	total
favourite radio stations, n (%)					
Breeze	7 (53.8%)	6 (46.2%)	0	0	13 (100%)
Maria	12 (28.6%)	17 (14.5%)	1 (2.4%)	12 (28.6%)	42 (100%)
Explorer	0	0	8 (36.4%)	14 (63.6%)	22 (100%)
Pasme	0	0	8 (47.1%)	9 (52.9%)	17 (100%)
Mphangwe	14 (43.8%)	17 (53.1%)	1 (3.1%)	0	32 (100%)
BBC	0	0	0	0	0
Feel Free	5 (83.3%)	0	0	1 (16.7%)	6 (100%)
Radio One	1 (12.5%)	0	0	7 (87.5%)	8 (100%)
Radio Two	0	0	0	2 (100%)	2 (100%)

Table 8: Favourite Radio Stations by North and South of Districts

Also in the case of the radio, the radio stations with the best reception were the ones mostly listened to (favourite stations, Table 8). These, however, differ between the two districts. In Katete the favourite station was Radio Mphangwe, whereas in Petauke it was Radio Explorer.

There was no big difference between the northern and the southern part of the districts. These findings are in line with the ones from a recent Second Rapid Assessment by FANSER.

Figure 16: Boy Listening to Audio with Borrowed Radio Device using a USB Drive and Connecting it to a Car Battery



radio listening time n (%)		place n, (%)	
6 to 10 a.m.	28 (41.8%)	at home	59 (88.1%)
10 a.m. to 1 p.m.	14 (20.9%)	at friend's/neighbour's	31 (46.3%)
1 to 3 p.m.	15 (22.4%)	in the field	5 (7.5%)
3 to 6 p.m.	20 (29.9%)	on the way	1 (1.5%)
6 to 9 p.m.	52 (77.6%)	frequency, n (%)	
9 to 12 p.m.	15 (22.4%)	daily	36 (53.7%)
any time possible	11 (16.4%)	weekly	31 (46.3%)

Table 9: Time, Place and Frequency of Use of Radio

The most frequent time to listen to the radio was from 6 to 9 p.m. for 77.6% of participants. 41.8% liked to listen from 6 to 10 a.m. The majority (88.1%) named the house as the main place of use of the radio. Almost half (46.3%) mentioned a friend's/relative's/neighbour's house (Table 9).

83.6% of radio-listeners reported to listen to the radio in company. When listening together, the decision what to listen to was made as a compromise in 40.0% of cases. If not, a female person decided in 23.8% and a male person in 15.0% of cases. Even though in the majority of cases women were part of the decision-making-process, it will be important to raise awareness about informative nutrition programmes on the radio within men.

The main purposes of listening to the radio were entertainment (100.0%), receiving information on current news (92.5%), religious topics (88.1%), new topics like health (74.6%) and advertisement/business information (68.7%). Religious topics, for example, were preaches, other religious talks and gospel music.

More than half the participants listened to the radio daily (53.7%) and 46.3% weekly. The radio therefore seemed to be a frequently used source of information and entertainment for participants.

4.1.5 Use of Laptops

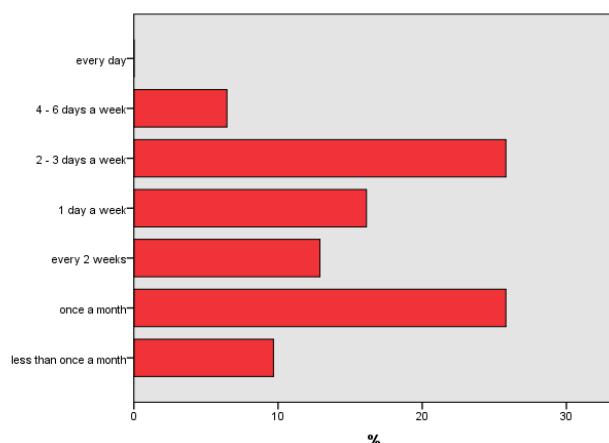
31 participants in the sample (38.8%) reported to use a laptop (Table 10). Out of these only one person (3.2%) owned a laptop. This participant used it as a business to transfer music (within his village). The rest only had access and used the laptop at a commercial access point (86.7%) and at a friend's/relative's/neighbour's home (13.3%). Nationwide the average number of rural households, which own laptops, was 2.7% in 2018 and thereby comparably low [ZICTA, 2018].

	n, %
use of laptops	31 (38.8%)
ownership of a laptop	1 (1.2%)
access to a laptop	30 (37.5%)

Table 10: Use of Laptops by Ownership and Access

Most people explained that they would access the laptop at shops in town where they could choose songs, other audio files (i.e. religious audios) and music videos, which were then transferred to their phones or SD-cards/USB-drives directly for a small fee. People, for example, go there whenever they are in town for business. 25.8% accessed the laptops two to three days a week and once a month respectively (Figure 17). Summing up all percentages, one can see that 51.6% had access to laptops weekly and a total 90.3% of participants accessed laptops at least once a month (Table 11).

frequency of access to laptops



People from villages far away from town accessed laptops to the same extent as the ones from villages close to town; no significant difference was observed between these two categories, $p > .05$, FET. However there was a difference in the access to laptops between the two sexes. Women had significantly less access ($\chi^2(1)=16.65$, $p < .001$).

Figure 17: Frequency of Access to Laptops

This could possibly be explained by the fact that women might travel to town less than men.

On average the majority of laptop-users were male, 27 years old and had a higher level of education (in comparison to non-users).

This indicates that transfers through laptops onto mediums like mobile phones and SD-cards are a common and widely spread practice. Through these channels topics like religious teachings are already spread and able to reach people in remote villages. As people tend to also share their devices and invite others to listen together with them, this information is able to reach more listeners. Therefore, this seems to be an interesting channel to spread information on health and nutrition.

frequency of use N=31, n (%)		purpose of use, n (%)	
every day	1 (3.2%)	transfers/downloads	
1 day a week	5 (16.1%)	(e.g. music)	27 (65.9%)
2 – 3 days a week	8 (25.8%)	entertainment	9 (22.0%)
4 – 6 days a week	2 (6.5%)	religion	3 (7.3%)
every 2 weeks	4 (12.9%)	curiosity about topics	1 (2.4%)
once a month	8 (25.8%)	for business	1 (2.4%)
< than once a month	3 (9.7%)		

Table 11: Frequency and Purpose of Use of Laptops

96.8% of laptop-users reported that the accessed devices had a SD-card-slot. All laptops had a USB-slot. Audios and videos were thereby transferred onto SD-cards / USB-drives, which were then put into radio-devices and phones. 41.9% said that the accessed laptop also had a CD-port. This information could be valuable for spreading information through files.

4.1.6 Use of TVs

35.0% of all participants reported to watch TV, however only 5 participants in the sample owned one (Table 12). The number of households owning a working television set in Eastern Province is 5.0% according to the nation-wide assessment by ZICTA [ZICTA, 2018].

	n, %
use of TVs	28 (35.0%)
ownership of a TV	5 (6.3%)
access to a TV	23 (28.7%)

Table 12: Use of TV by Ownership and Access

Most participants used the TV to watch videos and films (41.9%). This was either done with DVDs or files on USB-drives. Participants watching TV channels named ZNBC TV 1 (16.3%), international channels (14.0%) and ZNBC TV 2 (11.6%) as their favourites.

The time of day that most participants watched TV was from 6 to 9 p.m. in the evening when people finished the daily work (38.8%), or even later during the night from 9 to 12 p.m. (16.3%), as shown in Table 13.

TV watching time, n (%) N=49		place n, (%)	
6 to 10 a.m.	2 (4.1%)	at friend's/neighbour's	18 (66.7%)
10 a.m. to 1 p.m.	3 (6.1%)	at home	6 (22.2%)
1 to 3 p.m.	7 (14.3%)	public place	2 (7.4%)
3 to 6 p.m.	7 (14.3%)	anywhere with mobile TV	1 (3.7%)
6 to 9 p.m.	19 (38.8%)	frequency, n (%)	
9 to 12 p.m.	8 (16.3%)	weekly 20 (71.4%)	daily 3 (3.8%)
any time possible	3 (6.1%)	monthly 3 (3.8%)	< monthly 2 (2.5%)

Table 13: Time, Place and Frequency of Use of TVs

Almost all participants watched TV in company (96.4%). This can be explained by the fact that most of them had to go to a place where others gathered to watch TV together. Depending on where this place was either the owner (male in 28.6% of cases, and female in 14.3%) or the whole group as a compromise (57.1%) decided what was being watched.

When comparing the two sexes, it could be observed that females significantly used TVs less than men ($X^2(1)=4.16$, $p=.041$).

All participants named “entertainment” as one of the purposes of using a television. 20.4% reported to use it for religious purposes (i.e. watching or listening to preaches). 13.0% liked to learn about current news and 9.3% about new topics (i.e. nutrition). One girl explained how she got DVDs with videos made in Katete Town of people talking about good nutrition. This depicts how people can be reached through this channel. However this was a unique encounter, because the majority of people tended to watch films for entertainment.

Most people used TVs on a weekly basis (71.4%). That would be at a friend's/relative's/neighbour's place in 66.7% of cases.

85.7% of the televisions were equipped with a DVD-player and also 85.7% could access a video file through a USB-drive (either through a TV device directly or through a USB-slot in the DVD-player), which is also a valuable information when designing an intervention.

4.1.7 Use of Audio and Video Recordings

In the questionnaire the use of audio and video recordings was assessed separately, as they can be accessed through different channels and are a way to reach people that should be given special attention. In total 88.8% of participants reported to listen to audio recordings.

More than half (53.5%) listened to them on a weekly basis and 43.7% daily. The recordings were accessed through basic mobile phones by 87.3%.

Other devices used by 22.5% respectively are smartphones and Mp3-players (with SD-card-slots or USB-drive). Mostly the devices classified as “MP3-players” were radios, which had a slot for SD-cards or USB-drives. The way of access for 71.8% was the transfer through Bluetooth (phone to phone), for 64.8% the transfer from a laptop directly to a phone/SD-card/USB-drive. 20.8% of people also listened to audio recordings on CDs. These were in most cases put into DVD-players and played through TVs.

More than half of the audios served to entertain (98.6%) and 80.3% of recordings were about religion. These two were the main purposes for the use of audio recordings.

76.3% of participants stated to watch video recordings.

As for video recordings the frequency of use in most cases (70.5%) was weekly and for 26.2% daily. 83.6% watched videos on basic mobile phones and 39.3% on a TV. 27.9% used smartphones.

The most common ways of video access were through Bluetooth (67.2%), laptop transfers (60.7%) and DVDs (67.2%) as for audio recordings. The most popular topics were also with entertainment (for 98.4%) and religion (for 77.0%).

4.1.8 Use of Internet

The use of the internet was assessed in a separate set of questions. Only 16.3% of participants reported to use the internet regularly. In comparison to only 5.9% of rural people in Eastern Province reported by ZICTA, the use of internet within in the sample is much higher.

As shown in Table 14, most participants used it on two to three days in a week (38.5%). Half the internet-users went online at home (84.6%). Participants used the internet for social media (84.6%, i.e. Facebook) and downloading (61.5%).

More than half the internet-users accessed the web through a smartphone (61.5%). All the participants who reported to own a smartphone also used the internet with it. 46.2% used a basic mobile phone for internet-access and 7.7% used a laptop. When asked on one occasion why a participant, who reported to access a laptop, did not access the internet with it (knowing that there was a connection), he replied that he simply had no interest or did not know how he how he could use it or what his purpose or benefit would be.

place, n (%)		frequency of use N=13, n (%)	
at home	11 (84.6%)	every day	1 (7.7%)
at	4 (30.8%)	1 day a week	2 (15.4%)
anywhere (mobile	4 (30.8%)	2 – 3 days a week	5 (38.5%)
at a network point	2 (15.4%)	4 – 6 days a week	3 (23.1%)
commercial access	1 (7.7%)	every 2 weeks	1 (7.7%)
		once a month	1 (7.7%)
purpose use, n (%)			
social media	11 (84.6%)	downloads	8 (61.5%)
communication	6 (46.2%)	entertainment	5 (38.5%)
health information	1 (7.7%)	news	1 (7.7%)

Table 14: Place, Frequency and Purpose of Use of Internet

There were significant relationships between the use of the internet and the number of ICTs owned, the number of ICTs used and the level of schooling (Table 15). Also having attended secondary school significantly influenced whether someone used the internet or not ($p=.005$, FET, OR=7.7).

variables	U statistic	Z value	r	p
schooling level	126.50	- 3.84	- .45	< .001
nr. of ICTs used	207.00	- 3.10	- .34	.002
nr. of ICTs owned	245.50	- 2.69	- .30	.007

Table 15: Statistics of Factors associated with the Use of Internet

4.2 Findings from the Qualitative Assessment

Relevant issues that presented themselves during the analysis and focus group discussions were selected and will be discussed here. They are vital and should be considered when

designing an intervention. Even though not all of them are possible to influence or change by FANSER, they should still be held in mind.

4.2.1 The Importance of Education for ICT use

Figure 18 shows the above-mentioned fact that only 53.8% of participants were literate. Women and girls were the least literate. Education was strongly linked to the use of ICTs.

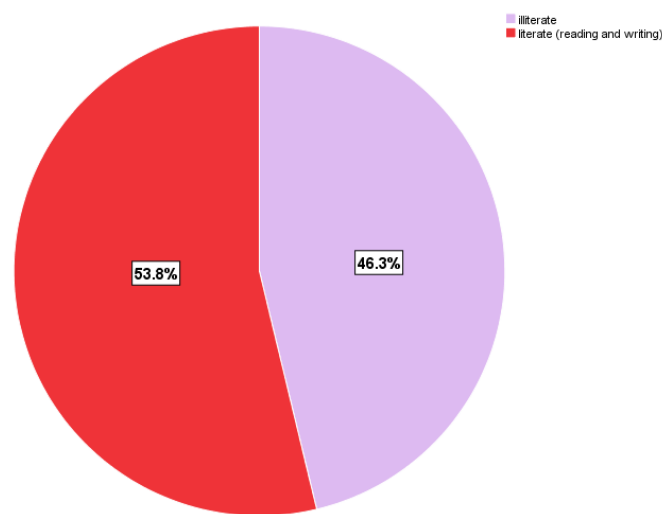


Figure 18: Literacy Rate of Sample

The educational level did not only influence the current use of ICTs but also the future use. One open question asked during the interviews was “How will ICTs change your life in the next 5 years?”. 40.0% of participants did not know how to answer this question. Dividing them into responders and non-responders (“I don’t know.”), it was observed that the people who could imagine their future use of ICTs had a significantly higher level of schooling ($U=432.5$, $Z= -2.27$, $p=.024$, $r= -.25$), as shown in Figure 19. They were also slightly older and already used more ICTs than non-responders, however these differences were not significant (age $U= 673.00$, $Z=- 0.93$, ns, $r= -.10$; number of ICTs used $U= 652.50$, $Z= -1.18$, ns, $r=-.13$).

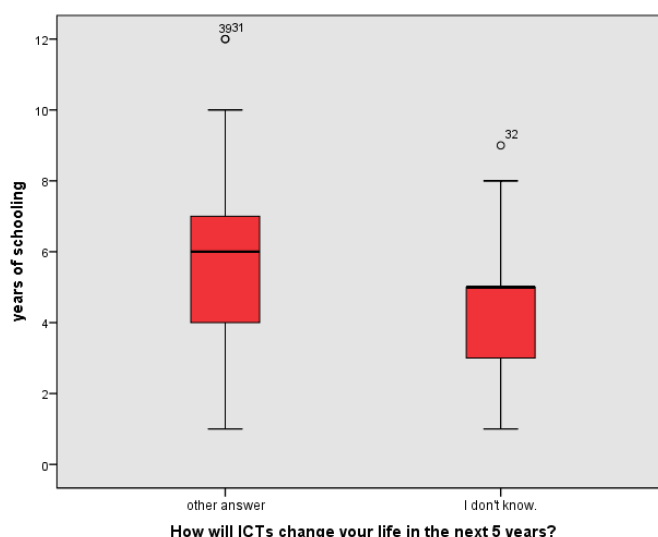


Figure 19: Responders and Non-Responders by Level of Schooling

The answers, which were provided though, showed that villagers could see the potential of ICTs in helping them to educate themselves on various topics (i.e. health, food security), to make use of the benefits of the internet and to learn about happenings and news. 37.0% mentioned the radio as the device for that purpose. 19.6% attributed the change to mobile phones in general and another 17.4% to smartphones specifically. 17.4% named TVs and 8.7% laptops.

The interconnection is not surprising. Looking through the data, it is easy to see that a higher level of schooling leads to a higher ownership and usage of ICTs and with that comes the capability of imagining a future beneficial use.

Another finding of the study was the perceived challenge for participants to imagine ways of using ICTs to spread information. In the FGDs they were asked to get creative and to think of an intervention, including any ICT, to teach as many people as possible about nutrition. Very frequently, answers were not in line with the question, as shown by following quotes from the FGDs: *“We can agree on the time and day to meet as a group for drama sessions. We can write a letter to the headman about the lessons so that he can help us to inform the people about the time and day when they will take place.”* and *“I can personally teach them, for example, if some of my family members/children are in another village far away, I can send them a message through the phone so that they can come home and I can inform/teach them what I know.”*

Many participants were automatically thinking of teaching others personally. As this kept coming up very frequently, it can be assumed that inter-personal communication is the most

relevant way of learning. To learn about a topic by using ICTs however seemed to be not yet something that is established in people's lives.

4.2.2 The importance of Inter-personal Communication

In order to get an understanding of the current information seeking behaviours two questions were asked. "In case you had a question about nutrition, where would you go to get the answer?". Participants were asked to name five places or people. In the following question they were asked to rank the top three out of these five.

The results show that all three most trusted sources of nutrition information were people. They included nutrition volunteers, medical staff at the hospital or health workers living nearby. Only around 10% said that they would turn to ICTs to find an answer to their question.

The top three nutritional topics of interest were complementary feeding, exclusive breastfeeding and food hygiene and safety. All of the topics are addressed by the FANSER project.

4.2.3 The Gender Gap

Comparing the sexes, it was found that females owned and used less ICTs than males (Figure 20). This was especially true for the access to laptops, as discussed above.

Males were tendentially better educated than females, constituting a possible explanation. Better education might lead to more use of ICTs, which would influence a person striving to use even more ICTs in the future.

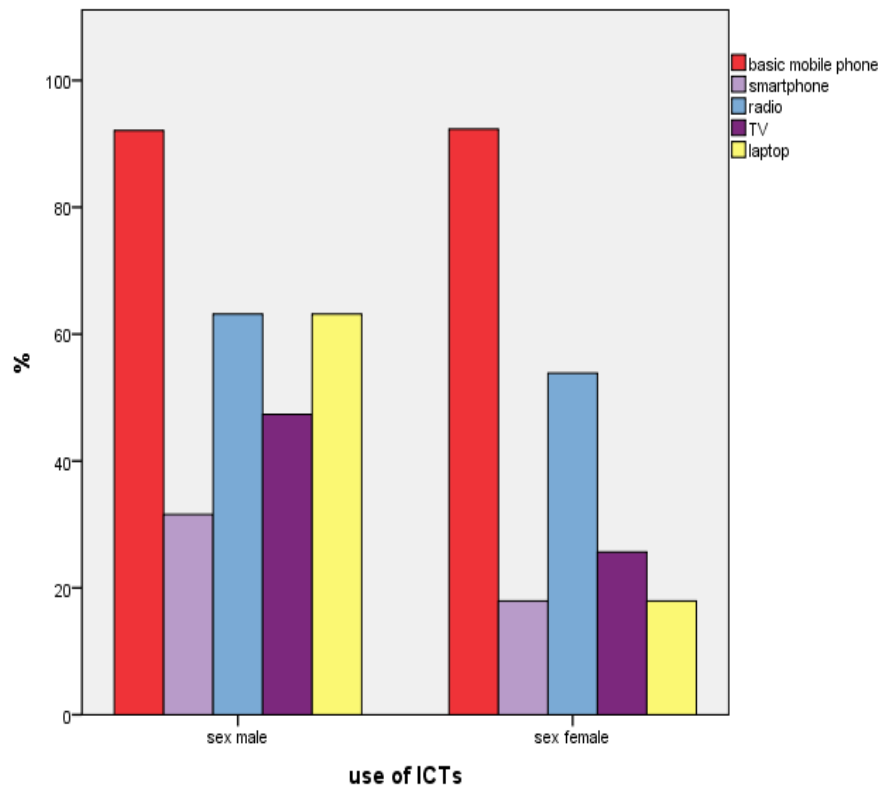


Figure 20: The Use of each ICT by Sex

To examine gender differences at household level a question was asked about the primary decision maker (on household level) on purchasing ICTs during the quantitative assessment. 38.8% of participants reported that a male head of the household was the primary decision maker. In 33.8% of cases it was both partners together to decide.

Participants were asked to reflect upon the use of ICTs and attitudes of different family members. In regards to adolescents, parents often were worried about the bad influence that mobile phones would have on their children's achievements in school. Parents also feared that romantic relationships would be reinforced by the use of mobile phones and thereby lead to unwanted teenage pregnancies for their daughters. Within the adult participants however other topics raised attention. Jealousy was reported to be an issue in marriages. As an example men would not want to share their mobile phones with their wives because they were afraid that she would find out about an affair. Or in the case of a man having the solemn decision-making power on the purchase of ICTs in the household, he would not want to buy a mobile phone for his wife due to doubts about her loyalty.

4.2.4 Barriers in the Use of ICTs

The major objective of conducting FGDs was to find barriers in the current use of ICTs and to identify possible challenges for the development of an ICT-based intervention.

Six dimensions were identified through the analysis.

The first issue, which came up in all the discussions, was electricity. As none of the villages were connected to the grid, alternative sources of power were used. These were mostly solar panels and (car) batteries, both leading to specific problems. In order to charge car batteries participants reported to have to travel to town. In remote areas the distance was perceived as a problem. When using solar panels, one depends on appropriate weather conditions. This source of power would therefore not always be accessible. Furthermore, even though people mostly used solar panels to charge phone batteries, “boosting” them by overcharging them (i.e. with big panels transmitting a lot of power at once) regularly would lead to their damage in the long run.



Figure 21: A Big Solar Panel Being Used to Charge a Basic Mobile Phone Battery

A major finding was the seasonality of use. Although participants owned various devices, it did not mean that they were always used. Many reported that the lack of money in the lean season would also mean less money for batteries, airtime, repairs of damaged devices or new ICTs and less money for travelling to town. All these restrict the daily use of ICTs.

For using mobile phones, the connectivity to network was named as a problem. Remote villages having only erratic network are especially affected. Long distances to network points are the main issue. There is not always time to reach them. In one village participants reported to not use their phones during dark hours, due to their fear of being attacked by wild animals on their way to the network point. In regards to the radio and TV poor frequencies limit the range of channels one has access to.

For participants who mainly accessed someone else's ICT, their dependence on them would be a problem. If the person borrowing the phone to others was gone or his or her device was damaged, the use would be restricted for more than one person.

Literacy was another issue mentioned in the FGDs. People who are illiterate and have very few e-skills would depend on others to help them with using ICTs, i.e. a mobile phone. In that case someone who is trusted needs to be found, which is not always possible.

All these challenges and their degree of restriction should be given special attention in specific investigations into the use of an ICT chosen for an intervention.

4.3 Overview and Rating of Possible Interventions

When thinking about different ways and channels to use ICTs to spread information, various ideas might come up, out of which many might seem innovative and efficient. However the characteristics of a given target group should always be at the forefront. Introducing a new behaviour might not be as useful as using channels, which already are established and used.

One theme, which kept coming up and surprised the author, was the role of religion in the villager's lives. In the most remote villages people could be found listening to preaches and gospel music on their basic mobile phones or old radio devices. Not only through technologies were these reaching the villagers; a big amount of participants stated to be part of groups, which met once or in some cases even several times a week to discuss religious topics and practice religion. Nutrition and nutrition-related health topics should strive to be as present in people's everyday lives. This should be achieved through the already existing and appreciated (information) channels, as well as key people in the communities.

The following chart explains selected ICT interventions and rates them based on the findings of this study. In this rating 5 is the best and 1 the lowest score.

Generally it could be said that interventions based on written messages or requiring advanced technical ICT skills, cannot be recommended. Under this category USSD codes,

SMS messages or smartphone applications are placed, even though they might seem to be cost-efficient and innovative.

Intervention	Rating	Device	Explanation of Intervention	Advantages, Disadvantages and Challenges	Numbers
Audio Recordings	5	mobile phones, Mp3-Players	recording audios on nutrition and nutrition-related FANSEK topics and spreading them on SD-cards/ USB drives/ CDs; they can also be transferred to phones directly in the “laptop-shops” (where most people accessed laptops)	+ : easy replication, economic (i.e. Bluetooth), can be listened to during chores, illiterates benefit - : women access laptops in town less → awareness in men as agents!	88.8% listened to audio recordings (97.5% at least once a week)
Radio Shows	5	mobile phones, radios, Mp3-players	recording and broadcasting radio shows, providing the opportunity to call in and ask questions, recording shows and spreading them (SD/USB/...), use SMS messages for advertisement	+ : few e-skills needed for radio device, listening in groups and high sharing rates exist - : frequent power cuts at radio stations (as reported in FGDs)	85.0% listened to the radio weekly, 100% share their radios, 88.8% listen to audio recordings
Video Recordings	4	mobile phones, TVs	recording videos (i.e. drama, instructions of how to build a keyhole garden, cooking show)	+ : easy to understand, easy replication, watching in groups	76.3% watched video recordings

			and spreading them on SD-cards/ USB drives/ CDs or through phone transfers (in “laptop shops”)		(96.7% at least once a week),35.0% watched TV
Voice messages/ recordings to Mailbox	3	mobile phones	recording audio messages and sending them to mailboxes	+ : no additional cost for beneficiary - : at least basic e-skills needed to handle mailbox, dependency on network, dependency on borrowed phone (true for all interventions using a mobile phone and network), issue of privacy	48.8% owned mobile phones (women owned half the amount of men: 31.7% vs. 66.7%); however 84.6% said to share their phones (and the majority on a weekly basis)
SMS service	3	mobile phones	sending (weekly) SMS messages including tips/reminders/recipes/ short teachings in cooperation with service providers	- : low literacy rate, SMS could be perceived as spam message (as these are generally received frequently by providers)	same as voice messages
Hotline	2	mobile phone	providing a hotline to call in case of nutrition/health questions	- : expensive to install, trained staff needed, airtime required, dependency on network	only 10.9% of mobile phone users had airtime at any time of week
USSD	2	mobile	creating a USSD code	+ :	only 18.7%

Codes		phones	for providing information on nutrition/ recipes free of charge for participants	no cost for beneficiary - : requires e-skills and literacy, USSD codes are not well known	used USSD codes (only for mobile money transactions and entertainment)
TV shows	2	TV	producing shows and broadcasting them on Zambian channel (ZNBC1 & 2)	+ : watching in groups - : big issue of electricity (if affordable car batteries and solar are used)	only 6.3% owned working TVs, 9.3% watched TV to learn about new topics
Smart-phone Apps	1	Smart-phones	creating an applications or using existing one (i.e. social media) to communicate in groups	+ : sensible for educated health promoters/nutrition volunteers to communicate and discuss problems (but not for beneficiaries) - : requires e-skills and literacy, airtime and data bundles required, battery does not last as long	8.8% owned smartphones and used them to access the internet

5 Discussion

The objectives of the FANSER project among others are to reduce stunting and to increase dietary diversity in the target group. This is done through efficient behaviour change communications, which are based on the cascade model of inter-personal communication. As seen above, information transmission through key people in the villages is the right way to address health topics, as fellow people are regarded the most important and trusted sources of information.

However, as ICTs become more relevant worldwide, they could present a new component of communication strategies. The goal would be to combine the already effective inter-personal communication with the use of ICTs, for the promotion of better nutrition. Therefore, this study aimed at assessing the current use of ICTs in the target group and deducing recommendations for designing a future extension of the communication strategy of the FANSER project.

5.1 Limitations

The sample size for the quantitative assessment was rather small. Due to time constraints regarding administrative issues (i.e. contracts), the study team was not able to spend more time in the field. With the precision put into the sampling method a high representativity, however, was supposed to be achieved. On this basis generalizations might not be valid. The study provides a rough overview of the availability and use of ICTs in the FANSER villages, which is enough for the project to decide on the possibility and direction the new communication component.

During the interviews some problems occurred with the Kobotool software on the tablets. At times selected answers disappeared from the questionnaire. Fortunately, this was recognized early and it was possible to reconstruct the questionnaire; however it could also have lead to a great amount of missing data. Therefore, tablets and softwares should be more thoroughly tested before working in the field.

The study team collaborated with the implementing NGO of FANSER, Catholic Relief Services (CRS), which was partly responsible for the sampling and the preparation of the contact people in the villages. Communication with CRS was not always easy, especially given the short time frame. Therefore, already before starting the assessment, all the needed information should be provided and revised by the lead investigator. Making appointments

prior to visits proved to be crucial. It was hard to find male participants, which could be explained by the fact that it was the harvesting season. Especially in one very remote village it would have been preferable to fix appointments. During one discussion the adolescent participants were very skeptic about the research matter, which disturbed the flow of the assessment. This could have been avoided by informing contact people, parents and participants in advance.

The broad assessment tried to provide a range of information on all relevant ICTs in the villages. When creating a specific intervention however more time should be spent on the investigation of the use of the specific ICT, as some details might not have come up during this study.

5.2 Adolescents and Generational Differences

The assessment tried to give special attention to the subgroup of adolescents and possible generational differences. Differences in the use of ICTs between the two generations of adult parents and adolescents might lead to different ways to reach these two groups.

At the moment adolescents are the world's largest generation in history (considering 10 to 19 year olds). Adolescence is a time of great physical development and social changes. One of the key steps of reaching SDG 2, Zero Hunger, is addressing the nutritional needs of adolescent girls. Understanding how to effectively reach adolescents with nutrition-sensitive interventions is essential for addressing this population group. Technology platforms were in some countries perceived as promising ways to engage adolescents (i.e. mobile phones, social media and television) [WFP, Anthrologica, 2018].

In this assessment it was tested whether adolescents were better educated than their adult counterparts and (therefore) owned and used more ICTs. None of these hypotheses were true. During the interviews younger adolescents were shy and hardly talked; most of them did not seem very interested in the topic of technologies either. There were no significant differences between the educational level or literacy rates of adolescents and adults. Adolescents used ICTs to the same amount, but owned significantly less ICTs, which can be explained by their financial dependency and low participation in the decision making on household level. They did not have a greater desire for more use in the future. As an answer to the question how ICTs might change their lives in the next 5 years, adolescents responded equally as often with "I don't know" as adults. This fact again proves the fact that the use of

ICTs was not bound to the age and of the participants but clearly to the educational level and already higher use and knowledge of ICTs. This finding seems to be in contrast to the situation in other, maybe more developed countries, where a special interest or keenness of adolescents to ICTs can be observed, and therefore could constitute a novel way to reach them. In regards to the nutrition information seeking behavior, adolescents, just as adults, stated to trust fellow villagers like the FANSER nutrition volunteers, family and friends or health care workers, more than any kind of media or ICT as information sources.

Adolescents in this assessment did not show any different patterns in the use of ICTs or information seeking behaviour to adults and therefore no special recommendation can be given in regards to this subgroup. It can be assumed that they could be reached in just the same way as the broad target group of any ICT intervention.

5.3 Gender Issues and Differences

Because women of reproductive age are the target group of FANSER, their role in the households and the community needs to be well understood. Gender issues could propose a big challenge in many developmental projects. They should be considered in any nutrition intervention, which aims for behaviour change on behalf of women, who are primary caregivers. Not all women might be encouraged by their partners to introduce new health behaviours, because these might be regarded as conflicting with their daily tasks.

An ICT intervention should be accessible for a broad audience. Not only females but also males should equally learn about the intervention and its intentions. In regards to ICTs men should be able to realize what benefits they could have for their families.

The issue of women sharing or owning ICTs should be discussed. Particularly the sensitive topic of jealousy needs special attention. The advantages of better knowledge need to be given more importance than jealous ideas. Key people in villages should be approached for this cause, as they are trusted authorities (i.e. religious and traditional leaders). The existence of the ICT intervention should be advertised by fellow villagers, so that everyone on household level is aware of its content. It needs to be understood that raising women's access to ICTs could be beneficial to gathering health information. Furthermore it should be discussed whether women are able to put into action, what they learned through ICTs. ICTs propose a novel way to reach participants, however, in executing new behaviours participants might be faced with already known barriers, including gender-related conflicts.

According to DHS data on women's empowerment, only 35% of women earning cash are able to decide solely how to invest it. 49% of decisions are made jointly between the partners. These numbers might not reflect reality correctly. How exactly dynamics function in households, might not be shown. Domestic violence could be a factor hindering intended behaviour change. 31% of women in Zambia experienced physical, sexual or emotional violence in the last 12 months prior to the survey. How regular and severe their abuse was is hard to obtain in the survey, due to the sensitivity of the topic. [CSO, MOH, ICF International, 2014]

It was found that in this assessment the main decision making power of purchasing ICTs was held by men. Even though this was the case, women still used ICTs to some extent. The question of how much (nutrition) behaviour change could be influenced by gender issues in the households needs to be constantly held in mind when designing and evaluating an intervention. As in line with the declaration of human rights, everyone should be able to decide when and where to access information. The freedom to learn about and exercise behaviours should be present.

In this assessment special attention was given to differences between the sexes regarding the use of ICTs and socio-demographic factors. Females were significantly less literate than males. Furthermore females owned and used less ICTs. Better education might lead to more use of ICTs, which would influence a person striving to use even more ICTs in the future. Including women in this cascade is essential for reaching equity in the future use of ICTs. When trying to identify specific ICTs for reaching women it could be seen that women used TVs and laptops significantly less than males.

When choosing a specific ICT channel for an intervention it should be considered that women might have restricted access. Time could also play an essential role. Workloads of women are already high and their role in the household often determined. Therefore the new ICT intervention should ideally not imply additional time constraints.

Furthermore more in-depth research needs to be done to assess gender issues that might hinder the use of a specific ICT on household level.

5.4 Considerations for Future ICT-Interventions

Due to the low literacy rates no written interventions could be recommended. As presented in the theoretical part of this thesis, other development projects used SMS messages and USSD codes to reach beneficiaries with health information. These interventions might be

successful in their settings, with i.e. better network connectivity and higher educational levels. However, in this Zambian target group, they do not seem apt.

Existing channels of information-gathering and entertainment like radio channels, audio and video recordings present a simple and sensible way to reach beneficiaries.

The two districts had different service providers and radio channels as their top choices. Therefore in the conception of an ICT intervention based on mobile phones and radio, a collaboration with only one partner would not be as efficient as choosing various ones.

For the promotion of an intervention trusted people in the villages could be key. They are often the main reference persons when it comes to nutrition and other health related questions in the villages and could help and advice target groups during the implementation phase.

In the assessment the importance of inter-personal communication was highlighted several times. People tended to rather ask someone for help than to use media as a source of information. Group meetings might constitute a useful platform to spread information. Almost all participants stated to be part of at least one group that meets regularly. More than half were in a religious group, which met several times a week and could be utilized as a platform to advertise the availability of ICT-based nutrition interventions or as a place to spread and discuss them (i.e. as radio listening groups).

6 Conclusion

This assessment of ICT use within in the FANSER target districts of the Zambian Eastern Province revealed that the most used ICTs were mobile phones, radios and laptops. These, however, were not equivalent to the most owned ICTs, because the number of ICTs used was determined by the number of ICTs owned added to the number of ICTs accessed (i.e. borrowed regularly from a neighbour). Basic mobile phones were the number one ICT used and owned by most people, followed by the radio. People do not only listen to the radio to entertain themselves, but also to learn about new topics. It could be observed that even though villagers hardly owned laptops, they would access them in town. There they would transfer audio and video files to SD-cards, USB-drives or straight to their phones and then use and spread them in the villages. It was mostly men going to town and accessing laptops. This could be observed in villages far away from town as well as close to town. The assessment of the information seeking behaviour in regards to nutrition revealed the

importance of interpersonal communication and the inclusion of key contact persons for health topics within villages for the future intervention.

A gender disparity was observed. Females significantly owned and used ICTs less than males. They were also less literate. The level of education had a great influence on the current and future use of ICTs. Better educated participants owned and used more ICTs and were rather able to think into the future and imagine how ICTs could be used to improve their daily lives and increase their knowledge.

Literacy was reported to be one of the major barriers in the use of ICTs. The low literacy rate in the sample suggests using non-written ways to reach people using ICTs. Therefore audio recordings and radio shows on nutritional topics are recommended. Also video recordings could be spread in the same way, with the advantage of visibility (i.e. to depict the construction of a keyhole garden or a cooking demonstration). By using the already established structures in the use of ICTs it can be assumed to effectively reach the target group.

When designing a future intervention special attention should therefore be given to the household dynamics of the use of a specific ICT. In order for the whole household (especially women) to benefit from it, the awareness of the importance of sharing ICTs and thereby sharing the information should be raised within men. As this study only provides an overview of the availability and use of five different ICTs, it is necessary to further look closely into the use of the ICT, which will be chosen for the future communication strategy.

7 Recommendations

This chapter presents the three final recommendations of the study

.

7.1 Recommended Intervention I: Audio Recordings

A cost-effective way to reach beneficiaries would be to use already existing listening habits. It was found that participants access laptops (in town) to transfer files to their SD-cards, USB-drives and phones directly. These audios are taken to the villages and frequently transmitted through



Figure 22: Girl Presenting Radio Device with Slots for SD cards and USB drives (classified as MP3 players)

Bluetooth or by borrowing the SD-card or USB-drive. These audio recordings could be listened to through phones and Mp3-players (i.e. radio device + USB).

In general the auditive channel should be preferred as literacy rates were rather low within the sample (53.8% and only 34.2% within adult women). Audios are also easy to listen to while doing chores at home.

As no dependency on broadcasting time or frequency exists with audios, beneficiaries could listen to them at any time preferred and in groups (i.e. FANSER group).

To spread the audios the “laptop shops” in town could be targeted but also trusted sources of information like health promoters or nutrition volunteers in the villages could actively spread the files.

7.2 Recommended Intervention II: Radio Shows

As 85.0% of participants listened to the radio (including listening through the phone) this media channel would be the best to use. 100% reported to listen to the radio at least once a week and the radio was the most prominent channel (mentioned by 74.6%) in regards to gathering new knowledge (i.e. learning about health).

Entertaining and informative radio shows could therefore be recorded and broadcasted by the most popular radio channels (“Radio Mphangwe” in Katete and “Radio Explorers” in Petauke). Already existing songs on nutrition and nutrition-related health topics in the local language could also be broadcasted. They could be repeated on the channel but also transferred on to storage mediums like in the case of audio recordings (SD-cards and USB drives) and thereby be spread within the villages. The most reported listening hours were from 6 – 9 p.m. (77.6%) and 6 – 10 a.m. (41.8%).

In order to raise awareness of the existence of this intervention, except for advertisement on the radio channel itself, reminder SMS could be sent out through the most used service providers. The recipients could then inform others in their surroundings, like their family members and neighbours.

Less e-skills are required to use a radio. All participants reported to share their radio and 83.6% listened to the radio in company.

A problem frequently reported in the FGDs were power cuts at the broadcasting radio station. In the case of collaboration, the issue of power supply should be looked at in detail.



Figure 23: Small Basic Mobile Phone with SD card slot, which can also be used to listen to the radio

7.3 Recommended Intervention III: Video Recordings

Through the same ways as audio recordings, video recordings could be used.

76.3% of participants reported to watch video recordings. 35.0% watched TV regularly. (41.9% mostly watch DVDs with it), 92.3% had a USB-slot, and 85.7% were connected to a DVD-player.

An advantage of video recordings is the visual component, which could be more useful for demonstrations (i.e. cooking demonstration, construction of a keyhole garden).

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ANNEX

Quantitative Questionnaire

Quantitative Questionnaire	
Thank the participants for their time and explain the connection of Survey to the FANSEER project. The aim of the assessment is to gather more insights into the use of ICT (Information- and Communication Technologies) in the FANSEER camps. These can be used to get information on health and nutrition more easily. The study will be a first step towards the development of a new communication method using ICT, complementing the already existing inter-personal communication by nutrition volunteers. Explain that everything they say will be treated as confidential, will not be shared with other people in their village and that you will not use their real names. Also ask all participants to keep the content of the discussion confidential. Explain that participation is voluntary, and everyone can stop any time. Also make clear that their opinions do not in any way influence their benefits/participation from FANSEER. Check if this is accepted. Ask whether there are any questions.	
0: Recruiting Questions	
O1	Are you the head of the household?
	0=no
	1=yes
	If no- What is your relation to the head of the household?
	1=spouse/partner
	2= adolescent child
	3= adult child
	4= other adolescent relative
	5=other adult relative
	6=other
A: Interview Setting	
A1	Date:
A2	Time:
A3	Number of HH interviewed in total assessment:
A4	District:
A5	Village:
A6	Ward:
A7	Camp:
B: Participant Information	
B1	Sex
	1=male
	2= female
B2	Age [years]
	If 6 to 18- Are you currently in school?
	0=no
	1=yes
B3	Marital Status
	Go through all options!
	1=married monogamous
	2=married polygamously
	3=single
	4=widowed
	5= divorced
	6= separated
	7=other
B4	How many people live in this household?
B5	What is your tribe?
	1= chewa

	Go through all options!	2= nsenga
		3= ngonj
		4= tumbuka
		5= bemba
		6= tonga
		7= lozi
		8= kunda
		9=other
B6	What language(s) do you speak?	1=nyanja
		2=english
		3= chewa
		4= nsenga
		5= ngonj
		6= tumbuka
		7= bemba
		8= tonga
		9= lozi
		10= kunda
		11=other
B7	Are you able to read?	0=no
		1=yes
	if yes- In what language(s)?	1=nyanja
		2=english
		3= chewa
		4= nsenga
		5= ngonj
		6= tumbuka
		7= bemba
		8= tonga
		9= lozi
		10= kunda
		11=other
B8	Are you able to write?	0=no
		1=yes
	if yes- In what language(s)?	1=nyanja
		2=english
		3= chewa
		4= nsenga
		5= ngonj
		6= tumbuka
		7= bemba
		8= tonga
		9= lozi
		10= kunda

		11=other
B9	What is your highest level of schooling completed ?	1=grade 1
	Go through all options!	2=grade 2
		3=grade 3
		4=grade 4
		5=grade 5
		6=grade 6
		7=grade 7
		8=grade 8
		9=grade 9
		10=grade 10
		11=grade 11
		12=grade 12
		13=diploma/certificate
		14=University degree BSc/BA
		15=University Degree Master's
		16= University degree PhD
		17=no schooling at all
B10	What are the sources of income of this household?	1=sale of farm produce
	Go through all options!	2= sale of produced animal products/animals
	(multiple answers possible!)	3= sale of garden produce
		4=small business (e.g.sale of other produced/gathered crafts/goods)
		5=employment by government
		6=employment by NGO/private organization
		7= employment by other farmer
		8= employment by other individual
		9= casual daily work
		10= remittances/ financial support (cash donations from family/friends)
		11 = saving group
		12=other
C: Household and ICT Information		
C1	Means of transport- How do you usually get to town from home?	1=on foot
	(multiple answers possible if necessary!)	2=by bike
	Go through all options!	3=by motor bike
		4=by car/motor vehicle
		5=other
	How long does it take you to get to the closest town?	1= 0-15 min.
		2= 15-30 min.
		3= 30-45 min.
		4= 45-60 min.
		5= 60-90 min.
		6= 2 hours
		7= 2h 30 min.
		8= 3 hours

		9= longer than 3 hours
C3	Are you part of any group that meets regularly?	0=no
		1=yes
	if yes- What kind of group are you part of? (multiple answers possible!)	1=religious group
		2=youth group
		3= farming group / farmer's cooperatives
		4= women's group
		5= savings groups
		6= FANSEER group
		7= sports group
		8=other
		if other- What kind of group are you in?:
	if yes- How often do you meet?	1=daily
	(in tablet: should appear for each group)	2= once a week
		3= several times a week
		4= every two weeks
		5= once a month
		6=every 2 -3 months
		7=less than every 3 months
C4	Do you listen to voice/audio recordings of any kind? (e.g. Whatsapp, USSD codes,...)?	0=no
		1=yes
	How do you access voice recordings?	1= with internet through smartphone apps (e.g. Whatsapp, etc.)
		2= with internet by downloading
		3= through USSD codes
		4= with SD cards/ USB sticks
		5= through transfer from a laptop to SD card/USB stick/phone
		6= with CDs
		7=with mp3 player (non-SD card/USB stick)
		8= with cassettes
		9=through Bluetooth (not laptop)
		10=I don't know.
		11=other: What other way?:
	On what device(s) do you listen to voice recordings?	1=basic mobile phone
		2= smart phone
		3= mp3 player (SD-card/USB/USB cable)
		4= CD player
		5= tablet
		6= laptop/computer
		7= TV
		8= other
	What topics are these voice recordings about?	1=news and politics
		2= educational topics (e.g. history, arts,...)
		3= health/nutrition

		4= entertainment (stories, music,...)
		5= work related information
		6= religion/ religious topics
		7= other
	How often do you listen to voice recordings?	1=daily
		2= weekly
		3= monthly
		4= less than once a month
C5	Do you watch video recordings of any kind? (e.g. Whatsapp, DVDs, SD cards, USSD codes,...)	0=no
		1=yes
	How do you access video recordings?	1= with internet through smartphone apps (e.g. Whatsapp, etc.)
		2= with internet by downloading
		3= through USSD codes
		4= with SD cards/ USB sticks
		5= through transfer from a laptop to SD card/USB stick/phone
		6= with CDs/DVDs
		7= through Bluetooth (not laptop)
		8=I don't know.
		9=other: What other way?
	On what device(s) do you watch video recordings?	1= basic mobile phone
		2= smart phone
		3= tablet
		4= laptop/computer
		5= TV
		6=other
	What topics are these video recordings about?	1= news and politics
		2= educational topics (e.g. history, arts,...)
		3= health/nutrition
		4= entertainment (stories, music,...)
		5= work related information
		6= religion/ religious topics
		7= other
	How often do you watch video recordings?	1= daily
		2= weekly
		3=monthly
		4= less than once a month
C6	What of the following ICT are there in your household? (multiple answers possible!)	0=none
	Go through all options!	1= basic mobile phone
		2=smart phone
		3= radio
		4= TV
		5= laptop /computer
		6= tablet

	How many of those (working) ICT do you have in your HH?	basic mobile phone: smart phone: radio: TV: laptop /computer: tablet:
C5.0	What is true for you about the ownership of/access to these ICT? (Go through all options! If someone owns an ICT, skip the following question about its access!)	1= I own a basic mobile phone. 2= I have access to a basic mobile phone. 3= I own a smart phone. 4= I have access to a smart phone. 5= I own a radio. 6= I have access to a radio. 7= I own a TV. 8= I have access to a TV. 9= I own a laptop/computer. 10= I have access to a laptop/computer. 11= I own a tablet. 12= I have access to a tablet. 13= I neither own nor have access to any ICT.
	<i>If someone owns a phone, only the questions from the ownership section will be asked. Likewise only access questions will be asked if someone states he does not own a phone, but has access to one.</i>	
C5	What is true for you about the ownership of/access to these ICT? (Go through all options! If someone owns an ICT, skip the following question about its access!)	
	Skip the access-question, if the ownership-question was already true.	
	1=I own a basic mobile phone. same for 2= I own a smart phone.	
	if yes- Do you share it with anyone?	0=no 1=yes
	if yes- With who? (Go through all options!)	1=spouse/partner 2=parents 3=children 4=other family members 5=friends 6=neighbours 7=others
	(multiple answers possible!)	
	is yes- How often do you share your phone? (Go through all options!)	1=daily 2=weekly 3=monthly 4=less than monthly 5=don't know
	if yes- Which network providers have good reception in your area?	0=don't know 1=Zamtel

		2=Airtel 3= MTN 4= Zamtel (at network point/erratic) 5= Airtel (at network point/ erratic) 6= MTN (at network point/ erratic)
	if yes- Do you use more than one SIM card?	0=no 1=yes
	if yes- Which SIM card provider(s) do you have? (multiple answers possible!)	0=don't know 1=Zamtel 2=Airtel 3= MTN
	if yes- Where do you get airtime?	1=in my village 2=in a village nearby 3= in a village/market place further away (not town) 4= in town 5=anywhere with mobile money 6=other
	if yes- In an typical week/month: How often do you get airtime?	1=once a week 2=several times a week 3=every second week 4=every third week 5=once a month 6= fewer times than once a month
	if yes- How much time do you usually spend without airtime? (Go through all options!)	0=No time. I always have enough airtime. 1=one day a week 2= 2 - 3 days a week 3= 4 - 5 days a week 4=one week 5=two weeks 6= three weeks 7=one month 8=more than a month
	In a typical month: How much money do you spend on airtime? [KW]	
	if yes- How often do you usually use your phone in a week/month? (Go through all options!)	0=never 1=every day 2=one day in a week 3= 2 - 3 days a week 4= 4 - 6 days a week 5=every two weeks 6=every three weeks 7=once a month 8= less than once a month
	if yes- Where do you usually get network coverage?	1=at house 2=outside of my house

		1= at a network point in my village
		2=next main road
		3=next town
		4= in another village nearby
		5=other
	How long do you walk to get network coverage?	0= 0 min.
		1= 1 - 15 min.
		2= 15 - 30 min.
		3=30 - 45 min.
		4= 45 - 60 min.
		5= more than 1 hour
	if yes- Do you use USSD Codes ?	0=no
		1=yes
	if yes- What do you use USSD Codes for (except for recharging airtime and mobile data)	1=banking
	(Go through all options!)	2= mobile money transaction (e.g. paying bills (electricity/ water/ ...))
	(multiple answers possible!)	3=Health service
		4=Facebook and other social media websites
		5= Emails
		6= to gather information
		7= news
		8= entertainment
		9=other
	if gather information- What kind of information?	1= agricultural information
		2= health information
		3= nutrition information
		4= other- What kind of information?
	if yes- Do you access the internet with your phone?	0=no
		1=yes
	if yes- Do you listen to the radio with your phone?	0=no
		1=yes --> GO TO RADIO QUESTIONS
	if yes to smartphone- Do you use the phone to watch TV? (e.g. MTN TV,...)	0=no
		1=yes --> GO TO TV QUESTIONS
	if yes to owning a basic mobile phone but also having access to smartphone- How often do you have access to the smartphone?	1=every day
		2=one day in a week
		3= 2 - 3 days a week
		4= 4 - 5 days a week
		5=every two weeks
		6=every three weeks
		7=once a month
		8= less than once a month
	if yes to owning a smartphone but also having access to a basic mobile phone- How often do you have access to the basic mobile phone?	1=every day
		2=one day in a week

		3= 2 - 3 days a week
		4= 4 - 5 days a week
		5=every two weeks
		6=every three weeks
		7=once a month
		8= less than once a month
	2= I have access to a basic mobile phone.	
	same as 3 = I have access to a smartphone.	
	if yes- Which network providers have good reception in your area?	0=don't know
		1=Zamtel
		2=Airtel
		3= MTN
		4= Zamtel (at network point/erratic)
		5= Airtel (at network point/ erratic)
		6= MTN (at network point/ erratic)
	if yes- Where do you usually get network coverage?	1=at house
		2= outside of my house
	if outside of home- Where?	1= at a network point in my village
	(multiple answers possible!)	2=next main road
		3=next town
		4= in another village nearby
		5=other
	How long do you walk to get network coverage?	0= 0 min.
		1= 1 - 15 min.
		2= 15 - 30 min.
		3=30 - 45 min.
		4= 45 - 60 min.
		5= more than 1 hour
	if yes- Which SIM card provider(s) does the owner have?	0=don't know
	(multiple answers possible!)	1=Zamtel
		2=Airtel
		3= MTN
	if yes- Does the owner use more than one SIM card?	0=no
		1=yes
		2= I don't know.
	if yes- Do you have your own SIM Card(s)?	0=no
		1=yes
	if yes- Do you use more than one SIM card?	0=no
		1=yes
	if yes- Which provider(s) do you have?	0=don't know
	(multiple answers possible!)	1=Zamtel
		2=Airtel
		3= MTN
	if yes- Do you ever buy airtime to use in another person's phone?	0=no

	1=yes
if yes to own sim card or buying airtime- Where do you get airtime?	1=in my village
	2=in a village nearby
	3= in a village/market place further away (not town)
	4= in town
	5=anywhere with mobile money
	6=other
if yes to own sim card or buying airtime- In an typical week/month: How often do you get airtime?	1=once a week
	2=several times a week
	3=every second week
	4=every third week
	5=once a month
	6= fewer times than once a month
if yes- How much time do you usually spend without airtime?	0=No time. I always have enough airtime.
(Go through all options!)	1=one day a week
	2= 2 - 3 days a week
	3= 4 - 6 days a week
	4=one week
	5=two weeks
	6= three weeks
	7=one month
	8=more than a month
if yes-In a typical month: How much money do you spend on airtime? (KW)	0=never
if yes- How often do you usually use the phone in a week/month?	1=every day
(Go through all options!)	2=one day in a week
	3= 2 - 3 days a week
	4= 4 - 5 days a week
	5=every two weeks
	6=every three weeks
	7=once a month
	8= less than once a month
if yes- Do you use USSD Codes ?	0=no
	1=yes
if yes- What do you use USSD Codes for (except for recharging airtime and mobile data)?	1=banking
(Go through all options!)	2= mobile money transaction (e.g. paying bills (electricity/ water/...))
(multiple answers possible!)	3=Health service
	4=Facebook and other social media websites
	5= Emails
	6= to gather information
	7= news
	8= entertainment

	9=other
if gather information- What kind of information?	1= agricultural information
	2= health information
	3= nutrition information
	4= other- What kind of information?
if yes- Who is the owner? (if multiple owners --> ask for most accessed person)	1=male family member/friend/neighbour
	2=female family member/friend/neighbour
if yes- Do you access the internet with the phone?	0=no
	1=yes
if yes- Do you listen to the radio with the phone?	0=no
	1=yes-> GO TO RADIO QUESTIONS
if yes to smartphone- Do you use the phone to watch TV? (e.g. MTN TV,...)	0=no
	1=yes-> GO TO TV QUESTIONS
5= I own a radio.	
same as 6 = I have access to a radio.	
if yes- Do you share it with anyone?	0=no
	1=yes
if yes- With who?	1=spouse/partner
(Go through all options!)	2=parents
	3=children
(multiple answers possible!)	4=other family members
	5=friends
	6=neighbours
	7=others
is yes- How often do you share your radio?	1=daily
(Go through all options!)	2=weekly
	3=monthly
	4=less than monthly
	5=don't know
if yes- What are the names of the stations you listen to the most?	1= Breeze
	2= Maria
	3= Explorers
	4= Pasme
	5= Mphangwe
	6= BBC World Services
	7= Feel Free
	8= Radio One
	9= Radio Two
	10=other
if yes- Which ones are the channels with good reception in your area?	1= Breeze
	2= Maria
	3= Explorers
	4= Pasme
	5= Mphangwe

	6= BBC World Services
	7= Feel Free
	8= Radio One
	9= Radio Two
	10=other
if yes- At what time of day to you mostly use it?	1= from 6 to 10 a.m.
(multiple answers possible!)	2= from 10 a.m. to 1 p.m.
(Go through all options!)	3= from 1 to 3 p.m.
	4= from 3 to 6 p.m.
	5= from 6 to 9 p.m.
	6= from 9 to 12 p.m.
	7=any time possible
if yes- Do you usually listen to the radio in company or alone?	1= alone
	2= in company
	3=both equally
if in company or both- Who decides on what to listen to?	0=all together (as a compromise)
	1=male person
	2=female person
if yes- Why do you listen to the radio? What is your purpose of use?	1=entertainment
	2=news
(Go through all options!)	3= advertisement / business information
	4= learn about topics (e.g. agriculture, health/nutrition,...)
	5= out of curiosity about random topics
	6= religion/ religious topics
	7=other
if yes- Where do you use it?	1=at home
(Go through all options!)	2=at a group meeting
(multiple answers possible!)	3=at community meetings
	4=at a friends/relatives/neighbours home
	5=on the farm
	6=at work/ school
	7=public places (health care facility, shop,...)
	8= on the way (walking, bus, motorcycle,...)
	9=other
if yes-How often do you listen to the radio?	1=daily
	2=weekly
	3=monthly
	4=less than once a moth
7=I own a TV.	
same as for 6= I have access to a TV.	
if yes- What (local channels) do you watch the most?	1= ZNBC TV 1
(multiple answers possible!)	2= ZNBC TV 2
(Go through all options!)	3= Chipata TV
	4= Zambezi Magic

	5= Diamond TV
	6=Muvu TV
	7= None of the mentioned channels. (only international channels)
	8= Use of DVDs/USB/other.
	9= other- Which one?:
if yes- At what time of day to you mostly watch TV?	1= from 6 to 10 a.m.
(multiple answers possible!)	2= from 10 a.m. to 1 p.m.
(Go through all options!)	3= from 1 to 3 p.m.
	4= from 3 to 6 p.m.
	5= from 6 to 9 p.m.
	6= from 9 to 12 p.m.
	7=any time possible
if yes- Do you usually watch TV in company or alone?	1= alone
	2= in company
	3=both equally
if in company or both- Who decides on what to watch?	0=all together (as a compromise)
	1=male person
	2=female person
if yes- Why do you use it? What is your purpose of use?	1=entertainment
(Go through all options!)	2=news
	3= advertisement / business information
	4= learn about topics (e.g. agriculture, health/nutrition,...)
	5= out of curiosity about random topics
	6= religion/ religious topics
	7=other
if yes-How often do you use it?	1=daily
	2=weekly
	3=monthly
	4=less than once a moth
if yes- Does it have a USB slot?	0=no
	1=yes
	2=I don't know.
if yes- Do you have a DVD player?	0=no
	1=yes
	2= I don't know.
if yes to DVD player- Does it have a USB slot?	0=no
	1=yes
	2= I don't know.
if 8=I have access to a TV then add the following question:	
if yes- Where do you watch TV?	1= at community entertainment place
(Go through all options!)	2=at friends/relatives/neighbours home
	3=public places (health care facilities, bar, ...)
	4= at home
	5= anywhere possible with MTN TV (where good network)

	6=other
9=I own a computer/laptop.	
same as for 10= I have access to a laptop/computer.	
if yes- Does it have a CD-port?	0=no
	1=yes
	2= I don't know.
if yes- Does it have SD-card-slot?	0=no
	1=yes
	2= I don't know.
if yes-Do you access the internet with the laptop/computer?	0=no
	1=yes
if yes- How often do you usually use it in a week/month?	
(Go through all options!)	1=every day
	2=one day in a week
	3=two to three days a week
	4=four to six days a week
	5=every two weeks
	6=every three weeks
	7=once a month
	8=less than once a month
if yes- What do you use the laptop/computer for? What is your purpose of use?	1=entertainment
(Go through all options!)	2=need for specific information
(multiple answers possible!)	3=curiosity (to learn about new things)
	4=social media
	5= news
	6=online banking
	7= work
	8= studying
	9= religion/religious topics
	10= for downloading and transferring music/files
	11= as a business downloading and transferring music/files
	12= other
if yes- Do you share it with anyone?	0=no
	1=yes
if yes- With who?	1=spouse
	2= parents
(multiple answers possible!)	3=children
	4=other family members
	5=friends
	6=neighbours
	7=others
is yes- How often do you share your laptop/computer?	1=daily
	2=weekly
	3=monthly

	4=less than monthly
	5=can't say
if 10=I have access to a computer/laptop then add the following question:	
if yes- Where do you have access?	1=work
(multiple answers possible!)	2=school/university
(Go through all options!)	3=library
	4=community internet facility (low cost or free)
	5=community entertainment place
	6=commercial internet access (e.g. internet café, telecenters)
	7=friend's/relative's/neighbour's home
	8=other
11= I own a tablet.	0= no
same as for 12= I have access to a tablet.	1= yes
if yes- How often do you usually use it in a week/month?	0=never
(Go through all options!)	1=every day
	2=one day in a week
	3=two to three days a week
	4=four to six days a week
	5=every two weeks
	6=every three weeks
	7=once a month
if yes- Do you access the internet with it?	0=no
	1=yes
if yes- What do you use it for?	1= entertainment
(Go through all options!)	2= need for specific information
(multiple answers possible!)	3= curiosity (to learn about new things)
	4= social media
	5= news
	6= online banking
	7= work
	8= studying
	9= other
if yes- Do you share it with anyone?	0=no
	1=yes
if yes- With who?	1=spouse
	2= parents
(multiple answers possible!)	3=children
	4=other family members
	5=friends
	6=neighbours
	7=others
is yes- How often do you share your tablet?	1=daily
	2=weekly
	3=monthly

		4=less than monthly
		5=can't say
	if 12= I have access to a tablet then add the following question:	
	if yes- Who is the owner? (if multiple owners --> ask for most accessed person)	1= male family member/friend/neighbour
		2=female family member/friend/neighbour
	if yes- Where do you have access to the tablet?	1=work
	(multiple answers possible!)	2=school/university
	(Go through all options!)	3=library
		4=community facility (low cost or free)
		5=commercial access (e.g. internet café, telecenters)
		6=friend's/relative's/neighbour's home
		7=other
C6	Do you usually use the internet?	0=no
		1=yes
	if yes- How often do you usually use it in a week/month?	0=never
	(Go through all options!)	1=every day
		2=one day in a week
		3=two to three days a week
		4=four to six days a week
		5=every two weeks
		6=every three weeks
		7=once a month
	if yes- What do you use the internet for?	1=education
	(Go through all options!)	2=social media (Facebook, Twitter, Instagram etc.)
	(multiple answers possible!)	3=work related information need/for work
		4=health related information need
		5=other specific information need
		6=communication with family/friends/others
		7=curiosity (to learn about new things)
		8=entertainment
		9=news
		10=online banking
		11= for downloads (audio/video/docs/pics,...)
		12= other
	if yes- Where do you mostly use the internet?	1=at home
	(Go through all options!)	2= friend's/ relative's/ neighbour's home
	(multiple answers possible!)	3= work/ school/ university
		4=library
		5= community facility (low cost or free)
		6= commercial access (e.g. internet cafe, telecenters)
		7= anywhere with my mobile data/ portable internet cube
		8= at a network point
		9=other

	if yes- On what device do you access the internet?	1= basic mobile phone
		2= smartphone
		3= tablet
		4= computer / laptop
C9	Who is the primary decision maker on purchasing new ICT in the HH?	1=male head of household
		2= female head of household
		3= male partner
		4= female partner
		5= other male adult
		6= other female adult
		7= the whole family together
		8= both partners together
		9= I don't know.
		10= other
D: Information Seeking Behaviour and Future ICT Intervention		
D1	Generally: Did you ever get help/counseling when you had a nutrition question?	0=no
		1=yes
		2= I never had a nutrition question.
D2	In case you have questions about nutrition: Where would you go to get this information?	1=health care facility
	(If no or slow answer, go through all options! Choose up to 5 !)	2=family member/relative
	(multiple answers possible!)	3=friends
		4=neighbours
		5=nutrition volunteer (FANSEER)
		6=other voluntary and private organizations
		7= government health worker (not in the facility)/government volunteer
		8= traditional doctors
		9= religious leader or group
		10=print media like posters, brochures, newspapers
		12=books, library
		13=radio or TV
		12=internet
		14=other --> Which?
D3	Which of these do you trust the most?	1=health care facility
	(Go through all options! And choose Top 3 !)	2=family member/relative
	(multiple answers possible!)	3=friends
		4=neighbours
		5=nutrition volunteer (FANSEER)
		6=other voluntary and private organizations
		7= government health worker (not in the facility)/government volunteer
		8= traditional doctors

		9= religious leader or group
		10=print media like posters, brochures, newspapers
		11=books, library
		12=radio or TV
		13=internet
		14=other
D2	What are the nutrition topics you are most interested in? (Go through all options!) (multiple answers possible!)	1= how nutrition works (amounts, diversity, ...)
		2=breastfeeding
		3=weaning/complementary feeding
		4= pregnancy/ lactation and nutrition
		5= adolescent girl's nutrition
		6=food hygiene and safety
		7=cooking/food preparation/food conservation and storage
		8= prevention/treatment of malnutrition/nutrition-related diseases
		9= none
		10=other- What?
Z1	How will ICT change your life in the next 5 years?	
	End Time:	

Focus Group Discussion Guide

FGD Guide ICT Study
District:
Village:
Ward:
Camp:
Date:
Start Time:
End Time:
Number of Participants:
Ages of every Participant (<i>ask everyone to name their age</i>): male: female:
Thank the participants for their time and explain the connection of the Focus Group Discussion to the FANSER project. The aim of the discussion is to gather more insights into a possible use of ICT (Information- and Communication Technologies) in the FANSER villages. The study will be a first step towards the development of a new FANSER communication method using ICT, complementing the already existing inter-personal communication by nutrition volunteers. Explain that everything they say will be treated as confidential will not be shared with other people in their village and that you will not use their real names. Also ask all participants to keep the content of the discussion confidential. Explain that participation is voluntary, and everyone can stop any time. Also make clear that their opinions do not in any way influence their benefits/participation from FANSER. The discussion will be about 60 min. long. Check if this is okay with everyone. Ask whether there are any questions.
10 min. : What kind of ICT are common in your village? What do you use them for? Advantages vs. disadvantages!
20 min. : When using ICT available in your area: What are possible barriers for people? (e.g.: no electricity, no time, extra money for electricity (batteries, charging phones, buying radio,...), literacy, attitude of another household member (young vs. old), sharing ICT with partners...)
10 min. : How do you think ICT will change your lives within the next 5 years?
20 min. : Do you think that ICTs can improve someone's health and nutrition? (<i>rhetorical question</i>) FANSER already spreads nutrition knowledge through inter-personal communication. Now think of the ICT you and your friends have available: How would you use[ICT] to teach as many people as possible about nutrition?