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Nawiri Desk Study: Gender Gap Analysis on Isiolo and Marsabit Counties, Kenya

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Nawiri

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Executive Summary

This desk study is part of a series of papers that addresses each level of the conceptual framework for drives of malnutrition in drylands with a focus on Kenya's Arid and Semi-Arid Lands (ASALs) and specifically Marsabit and Isiolo Counties. The production of these desk reviews comprise part of the first phase of the Nutrition in ASALs within Integrated Resilient Institutions (Nawiri) project, funded by USAID/BHA and implemented by a consortium led by Catholic Relief Services (CRS).

This desk study consists of a literature synthesis on the intersection between gender and the transformation and evolution of livelihood systems in the ASALs. We focus on four thematic areas where evidence on gender dynamics is lacking and which have potential relevance to child malnutrition in the region. We reviewed existing peer-reviewed and grey literature on the Kenyan ASALS and comparable areas, identify the knowledge gaps, and point to areas for further primary research.

Theme 1: Sedentarisation, Gender and Nutritional Implications

Sedentarisation in the Kenyan ASALs can either take the form of people moving closer to or into towns or of people settling to focus more on cultivation and less on mobile animal husbandry. While both strategies can be a form of livelihood diversification, wealth largely influences the motivations for and outcomes of sedentarisation. Poorer households may settle after losing livestock, whereas better-off households may settle some household members to take advantage of emerging opportunities and to spread risk. The literature highlights the difficulty of poor households that have stepped out of pastoralism in finding sustainable livelihoods in pastoral areas (Catley and Aklilu 2013).

As with most livelihood strategies, patterns and drivers of urbanisation, sedentarisation and diversification are gender-specific. Pastoral men who move to towns on a permanent or temporary basis often engage in casual wage labour (Stites 2020), whereas women who settle in or near towns are more likely to engage in small-scale income-generation activities such as dairy-farming, shop-keeping, petty trade, wage labour or group collectives (E Fratkin and Smith 1995; Smith 1997). Women who begin to engage more in town-based labour or cultivation may find that they have more control over their income streams. Women may use these funds to increase schooling for children; these patterns change the ways in which households function (E Fratkin and Smith 1995; Giles 2001; Smith 1997). However, a number of authors find that while women may control proceeds from low-value activities, such as firewood sales, men are likely to take control of activities if and when they increase in value, with examples from the region including dairy marketing, cash crops, and poultry production (Anderson et al. 2012; Tavenner and Crane 2018; Dolan 2001; Smith 1997)

Findings are mixed as to whether shifting away from mobile pastoral production and to a more settled lifestyle improves or worsens nutrition; outcomes likely depend on wealth. A study on the Maasai found that entry into the cash economy didn't improve dietary diversity for women or children (Nestel 1989); a study of settled Turkana women showed nutritional deficiencies in protein intake and elsewhere (Campbell et al. 1999); and a study of the Rendille showed declines in nutritional indicators for children who settled compared to those who did not (E. M. Fratkin, Roth, and Nathan 1999; Nathan, Fratkin, and Roth 1996; Shell-Duncan and Obiero 2000). On the other hand, data on settled Rendille in Marsabit town found that—regardless of wealth—child nutrition improved when milk was regularly sold in local markets to

buy maize (E Fratkin and Smith 1995). Importantly, this market strategy was only possible for those households able to retain a milking herd and to remain in close proximity to towns. In addition, the potential protein loss from the sale of dairy products can have a negative impact, especially if the pressing need for cash causes women to sell too much from their dairy stocks (E Fratkin and Smith 1995; Fujita et al. 2004). This is supported by a finding of high rates of anemia among Ariaal mothers (Miller 2010; Corbitt, Ruvalcaba, and Fujita 2019), and evidence that mothers in communities more reliant on pastoralism had lower rates of anemia than those in settled communities, regardless of number of animals owned (Miller 2010). Overall, while there is a strong evidence base on sedentarisation, much of the data are several decades old and point to mixed outcomes. Further research is needed on how these patterns have evolved and the implications for gender dynamics, food security and nutrition.

Theme 2 Mobility, Gender and Nutrition

The mobility of pastoralists in the Kenyan ASALs has drastically decreased compared to preceding generations (Markakis 2004), yet mobility remains essential for herd management and risk mitigation. Decision-making around mobility lies largely with men, and herders move to take advantage of fluctuations in pasture, water availability, in response to seasonal shifts, and based on information on diseases and security gleaned through their social networks. Movement follows patterns established by previous generations and relies on social linkages which may cut across ethnic, territorial and international boundaries (Dyson-Hudson 1966; Gulliver 1955).

Although men are making most of the decisions around transhumance, pastoral women and children are also moving (IFAD 2020). Some accompany the herds and engage in gender-specific duties, such as hut construction, food preparation, and animal care. Evidence from Karamoja, Uganda shows that communities traditionally used movement with the herds to manage food security and mitigate nutritional vulnerability (Stites et al. 2007). Young women and young men may travel between mobile and

settled locations with food, supplies, and livestock, which can help to smooth consumption and take advantage of variations in market access. These mechanisms require freedom of movement within and across borders and security.

Mobility is both central and essential to pastoral and agro-pastoral livelihoods, and child nutrition suffers when access to animals lessens or is cut off (Sadler and Catley 2009; Sadler et al. 2009; Stites and Mitchard 2011). However, we do not know how these patterns of mobility and access play out in the Kenyan ASALs, by season, by gender and age, or by population or wealth group. Similarly, the migration of one household member can positively or negatively impact the larger household (Rao et al. 2020), but there is a lack of data on this dynamic in Isiolo and Marsabit and/or the gendered and nutritional impacts. Additional research is also needed on the longer-term nutritional impacts of settling as well as on the nutritional outcomes arising from different forms of diversification.

Theme 3: Changing generational and gender roles and possible impacts on nutrition and livelihoods

Male age-sets are part of the traditional system of governance of numerous pastoral groups in the Greater Horn of Africa (Gulliver, P.H. 1953; P Spencer 1976), but modernization has brought changes to this system, including a weakening of the strict hierarchical order and growing tensions between male generations (Stites 2013). In addition, the erosion of pastoral livelihoods and increased sedentarisation has reduced the importance of young men as raiders, herders and defenders (Smith 1997). Although females do not inhabit age-sets in the same way as men in East African societies, their roles are also changing due to modernization, greater financial autonomy, and increased access to education (Pike 2019; Roth et al. 2001; Giles 2001).

Changes in gender and generational roles have important implications for the management of nutrition and food security. One area of visible change is in decision-making and income-

generation, with women becoming increasingly responsible for providing for their households as livestock-based livelihoods—traditionally male controlled—evolve and erode. Women in the Kenyan ASALs are experiencing more financial inclusion and market access, with a greater likelihood of keeping separate control of earnings (Smith 1997). A number of studies point to better nutritional outcomes for children when women control economic resources (Caldwell 2010; Caldwell and Caldwell 1993; Hindin 2000; Koenen, Lincoln, and Appleton 2006; Shen and Williamson 1999), while others suggest negative or negligible effects (Aden et al. 1997; Bradley 1995). However, women's greater involvement in the market economy comes at a cost to women's time and may negatively affecting care-giving practices, as women engage in income generation on top of their existing domestic and reproductive duties (Waithanji 2008; E Fratkin and Smith 1995).

Overall, many of the societies in northern Kenya are witnessing a shift in control over financial and social assets. Traditional authority systems relied on the control of male elders over livestock (Paul Spencer 1968; Giles 2001). Today, women and younger men can more readily access cash and are increasingly making decisions outside the purview of the elders. These shifts certainly remain contested (Smith 1997), but little is known how these myriad gender, generational and power shifts may have affected the underlying factors that influence food security and nutrition.

Theme 4: Customary and kin-based social safety nets and implications for nutrition and food security

Customary safety nets in pastoral societies entail the redistribution of resources from wealthier to poorer kin which can diminish dietary differences (Fujita et al. 2004; Elliot Fratkin 1998; Homewood 1992; Grandin 1983; Talle 1988). However, such systems can also be exclusionary and can leave out the poorest or most marginalised (Rao et al. 2020). These models are also highly gendered, with men participating in a reciprocal horizontal system based largely upon the exchange of cattle and women relying on their marital male relatives,

natal kin, and informal networks of other women (Nduma, Kristjanson, and McPeak 2001). While female-headed households may be marginalized from community-wide safety nets, some literature focuses on the role of female-specific social networks separate from kin or marital-based systems (Khalif and Oba 2018; Aregu and Belete 2007; Shetler 2007). These accounts detail women's reliance on the gift economy and informal systems of distribution of labour and food.

The traditional social safety nets found in pastoral and agro-pastoral systems do not seem to exist in the same extent in more settled communities in northern Kenya. Giving up pastoral mobility appears to increase wealth differences and up-end existing social systems (Smith 1997; Waithanji 2008), weakening redistribution and reciprocal mechanisms. In addition, poorer pastoral families are more likely to settle (Nduma, Kristjanson, and McPeak 2001; E Fratkin and Smith 1995), resulting in a higher proportion of poor households in sedentarised communities.

Overall, we do not know how migration, diversification, and growing inequity have affected customary safety nets and, in particular, how these changes play out by gender and affect nutritional status. What are the impacts on community cooperation, systems of reciprocity, and support to those in need? Writing in 1997, Smith speculated that individualism would increase along with market integration, and that intra-community bonds would suffer (Smith 1997). Twenty-plus years later, the outcome remains a gap in our knowledge.

Introduction

This desk study is part of the Nutrition in ASALs within Integrated Resilient Institutions (Nawiri) project, funded by USAID/BHA with the support of the American people, and implemented by a consortium led by Catholic Relief Services (CRS).¹ Nawiri is operational in Isiolo and Marsabit Counties of northern Kenya, which are part of Kenya's Arid and Semi-Arid Lands, or ASALs. The goal of Nawiri is to sustainably reduce persistent acute malnutrition by designing and implementing an approach for supporting, strengthening and protecting systems and institutions. The first phase of this study includes primary data collection which is informed by a series of desk studies. This desk study focuses on the gaps in our knowledge on gender and livelihoods in Marsabit and Isiolo Counties specifically and the Kenyan ASALs more generally.

Nawiri has adapted an amended framework of the 1990's UNICEF conceptual framework on the causes of malnutrition (UNICEF 1990) specific to dryland environments (Figure 1). The framework lays out the immediate (inadequate dietary intake and disease) and underlying (food security, social and care environment, and health services and health environment) drivers of acute malnutrition, unchanged from the original UNICEF framework. The amended framework expands on the basic drivers: livelihood systems; systems, formal and informal institutions; and seasonality and environment. This desk study is part of a Nawiri desk study series that seeks to address each level of the conceptual framework for drivers of malnutrition in drylands, including:

- Acute Malnutrition: Hotspot Analysis in Marsabit and Isiolo (Ochola, 2021a & b)).
- Immediate and underlying drivers: The immediate and underlying drivers of child malnutrition in the Kenya ASALs (Marshak, 2021).

- Basic causes:
 - Gender Gap Analysis (this study);
 - Livelihoods and Nutrition - (Stites, 2021);
 - Natural Resource Management and Nutrition (Birch, 2021);
 - Nutrition, Environment, Conflict & Disasters (Marshak and Venkat, 2021).

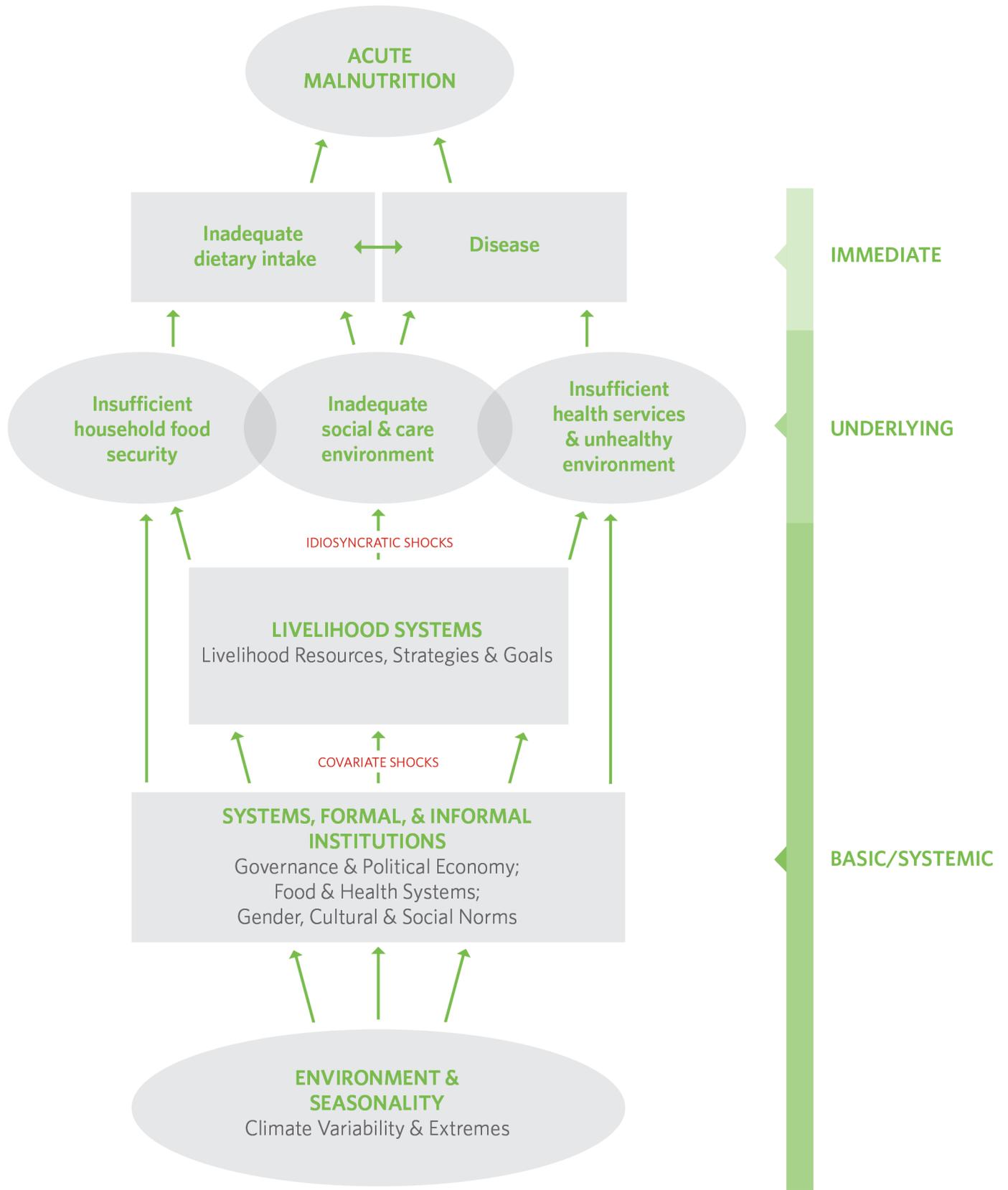
The focus of this literature synthesis is an intentionally narrow, gendered analysis of key areas of transformation and evolution in people's livelihoods in the Kenyan Arid and Semi-Arid Lands (ASALs), primarily in Isiolo and Marsabit Counties. This analysis did not set out to cover the broad topic of gender dynamics and roles in this region; rather, it sought to examine the existing literature in four key thematic areas linked to the region's persistent acute child malnutrition. This synthesis discusses the existing evidence in these areas and identifies knowledge gaps that might call for further primary research.

The four themes covered in this gender gap analysis are: 1) sedentarization, gender and nutritional implications, 2) mobility, gender and nutrition, 3) changing gender and generational roles, and possible impacts on nutrition and livelihoods, and 4) customary and kin-based social safety nets, and implications for nutrition and food security. In selecting the four themes, we considered the:

- large body of existing evidence that has few recent updates (theme 1);
- large body of existing evidence that lacks information on gender dynamics and implications (themes 2 and 3);
- relative lack of information on the topic in the geographic area in question, including by gender (theme 4); and

¹ The consortium is led by Catholic Relief Services, and includes Concern Worldwide, Village Enterprise, Tufts University, The Global Alliance for Improved Nutrition, International Business & Technical Consultants, Inc., and the Manoff Group.

Figure 1: Nutrition causal framework for drylands



- assumption that the topic in question could have direct and/or indirect implications for livelihoods, food security and nutrition, especially when understood through a gendered lens (all themes).

We then collected and reviewed a broad range of peer-reviewed and grey literature. We located sources through a general review of livelihoods in the region. We also conducted specific searches on each of the four themes and/or gender in the ASALs, northern Kenya, pastoral and agro-pastoral regions, or eastern Africa more broadly. Each source was screened and rated by inclusion or exclusion by the primary researcher (EDM) and the principal investigator (EHS).

We had hoped that this gap analysis could truly cover *gender*—i.e., the different experiences, roles, responsibilities and outcomes of girls, boys, women and men. However, we found that the vast majority of sources that discuss gender in the region are often exclusively about the experiences of women. We have attempted to bring in the experiences of men, boys and girls, and to account for age variations wherever possible. However, the lack of gender- and age-disaggregated evidence around these themes in the Kenyan ASALs remains an over-arching gap.

This gap analysis focuses specifically on the four thematic areas and does not seek to go beyond these topics. However, based on our experience and knowledge of pastoral and agro-pastoral regions and livelihoods in the Greater Horn of Africa, we make a number of assumptions about the intersection of gender, livelihoods and nutrition in the Kenyan ASALs. These assumptions should be confirmed in the specific contexts of Isiolo and Marsabit, but, in the meantime, they underpin the analysis and discussion in this paper. These assumptions include:

- With the erosion of livestock-based production systems, women take on an increased role for providing sustenance and income within households. This is because women are generally more adept than men at diversifying their activities, and because men often struggle to take on activities that fall outside a set of prescribed masculine roles.

- Women’s increased efforts as providers add greatly to an already disproportionate time burden. Many of women’s additional activities to support the household require extended periods away from home while engaging in activities such as firewood collection, charcoal production, opportunistic agriculture, wild food collection and sale, petty trade, and paid services (e.g., domestic work, water carrying and brewing). This means that women are away from their children (with the exception of breastfed infants) for most of the day, and these children are left in the care of (often barely) older siblings, other relatives, or neighbors. These alternate care regimes can have negative nutritional outcomes for the children.
- Most women are aware of the best foods for children but are unable to access this food regularly. For instance, pastoral women are well aware of the nutritional benefits of milk, but milk is not always available, including during the dry season, when the herd is far away, when milk must be sold for cash to meet other pressing needs, or when animals have been lost to disease, conflict or impoverishment.
- Wealth plays a major role in the different experiences of households, including intra-household distribution of resources, roles and responsibilities. Inequity of livestock ownership is increasing, and households that are able to retain large herds may be engaging in the same livelihood strategies—such as sedentarization or petty trade—with remarkably different outcomes.

In preparing this gap analysis, we have had to overlook critical differences by location, ecology, wealth, ethnicity, class, education and other variables. We recognize that the Kenyan ASALs and Isiolo and Marsabit Counties are home to a wide diversity of women, men, boys and girls. While generalizations were unavoidable in this gap analysis, we hope that additional research will elucidate some of these important differences.

Theme 1: Sedentarization, Gender and Nutritional Implications

This section explores the existing evidence on gender and pastoral sedentarization and identifies knowledge gaps on this topic in the Kenyan ASALs and similar regions. A large body of evidence on sedentarization in northern Kenya is from 20 to 30 years ago, (Eric Abella Roth, 1996; 1990; E Fratkin and Smith, 1995; Elliot Fratkin, 1992; Elliot Fratkin, Roth, and Nathan, 1999; Fujita et al., 2004; Nathan, Fratkin, and Roth, 1996), and includes analysis of the specific impacts for women. This body of research illustrates that although some changes associated with sedentarization may be positive—such as improved access to services and markets—many are also negative, particularly indicators such as nutrition and well-being. Overall, the picture is mixed. Further research is needed as to the ways in which these patterns have evolved in the intervening years, and the implications for gender dynamics, food security and nutrition.

Livelihood diversification as related to sedentarization

The pressures on pastoral production systems have resulted in livelihood diversification in many arid and semi-arid regions (P.D. Little et al., 2001). Diversification patterns, strategies and outcomes are gendered. In the Kenyan ASALs and similar regions, diversification may include sedentarization by all or only some members of a household. While some of the literature illustrates that diversification is an important risk-management strategy that does not entail a full exit from pastoralism, other sources show that it is the type of diversification, who diversifies, and for what reason that may ultimately determine livelihood viability (Catley and Aklilu, 2013; Elliot Fratkin, 1998; Ellis, 2000; Davies 1993; P.D. Little et al., 2001; 2008; Barrett,

Reardon, and Webb, 2001; McCabe et al., 2014; Deng, 2010). This is particularly the case in regard to sedentarization.

The household is the unit of production in pastoral economies. However, livelihood strategies are gender-specific, and the gendered trends that may contribute to sedentarization, such as women accessing personalized income streams or sending children to school, change the way the household unit functions (E. Fratkin and Smith, 1995; Giles, 2001). Men who move, temporarily or permanently, to towns often engage in wage labor for cash (Stites, 2020). In comparison, in a study in Marsabit which compared pastoral communities with a recently sedentarized agro-pastoral one, Smith found that sedentarized women were more likely to engage in small-scale, income-generating activities such as dairy farming, shopkeeping, petty trade, wage labor or group collectives (E. Fratkin and Smith, 1995; Smith, 1997). Many pastoral women also pursue these activities by making regular and often time-consuming trips to towns. If and when these strategies gain in economic importance for the household, then women—and their dependents—are more likely to settle in a peri-urban or urban location.

Evidence from Smith's study also points to greater crossover of gendered work roles in sedentarized as compared to mobile livelihood systems. In addition, sedentarization has contributed to shifts in intra-household economic dynamics. Smith states that women's newfound

ability to generate cash from produce sales gives them greater leverage in household decision making. Even if they do not own the land, women can claim control over the

produce they harvest in the same way they have rights to the milk they have obtained from the family's herd. (1997, 13)

The evidence regarding women's rights to cash proceeds from a harvest is not uniform; Smith also points out that although women sold small quantities of subsistence garden surplus, men controlled the production and sale of more valuable cash crops such as maize. However, though men retain control of these more lucrative sectors, Fujita et al.'s study in Marsabit points out that while small, surplus produce from women's subsistence gardens is normally available all year and so makes consistent contributions to household food and income security (2004). A 2017 study in Karamoja, Uganda found similar results (Burns, Valone, and Carlberg, 2017).

Wealth and gender intersect to influence the nature of diversification and sedentarization. A 2018 study by Achiba of Borana pastoralists in Isiolo County found that male-headed households were largely better off than female-headed households; and were better able to take advantage of the more profitable market opportunities associated with towns. The male-headed households had a greater degree of income diversification and were more engaged in high-value non-pastoral income activities, including livestock trade and retail shop activities. In contrast, female-headed households were more likely to engage in "low-entry-barrier" activities such as the sale of wild products (Achiba 2018, 9-10). Although not covered in Achiba's article, the better-off male-headed households he sampled would also have been in a more advantageous position to settle all or part of their household in or near town to establish a base for their economic activities. The poorer female-headed households in his sample would likely have struggled to do so and would have had to choose between residing in urban or rural locales.

Increasing cultivation as a form of sedentarization

Sedentarization in the Kenyan ASALs may entail people moving closer to towns to take on wage labor or access services, or because they have lost livestock. In other cases, however, households

may settle in hopes of increasing their cultivation activities, whether at subsistence levels or with the goal to sell surplus crops. Increased cultivation impacts gender roles; the standard assumption is that women's labor will increase. However, the evidence illustrates that these changes are not necessarily uniform, consistent or predictable. Interestingly, a 1972 study by Rada Dyson-Hudson in Karamoja, Uganda, found that *self-reported* time use by gender and age in farming activities differed from *observed* time allocations. While it is impossible to know how broadly this type of bias in reporting holds true, it may challenge some expectations. In one example, Smith found that when households in Marsabit were more settled to farm, elders and male youth who traditionally would not have participated in most aspects of farming became more involved to compensate for women and children's engagement in other activities (1997).

The nutritional impacts of increasing settled agriculturization in the Kenyan ASALs have important gendered components, largely around milk consumption, dietary diversity and household decision making. Findings are mixed as to whether settling improves or reduces nutrition and may depend on wealth. A 1989 study by Nestel of Maasai women and child nutrition found that entry into the cash economy didn't improve dietary diversity (1989); Campbell et al.'s (1999) study concluded that settled Turkana women exhibited nutritional deficiencies. For the Rendille, the biological consequences of sedentism included declining nutritional health of children, as evidenced by lower height-for-age and weight-for-age when compared to samples from pastoral populations (Elliot Fratkin, Roth, and Nathan, 1999; Nathan, Fratkin, and Roth, 1996; B. Shell-Duncan and Obiero, 2000). A study by Fratkin and Smith from the mid-1990s of the Rendille in Marsabit found that, for both wealthy and poor households, proximity to town markets led to improvements in child nutrition when milk (high in protein and vitamins) was regularly sold to buy maize meal (which has five times the caloric value of milk). This market strategy was only possible for those households able to retain a milking herd. Advantageously, maize can be procured more continuously than milk, which is often unavailable during the dry season. This means that improved access to a cash economy may reduce

the seasonal stress associated with the pastoral diet, assuming households have the means to engage in this economy. The exchange of milk for maize, for instance, would not be possible in the dry season when animals were not producing. In addition, the potential protein loss from the sale of milk and milk products may have a negative impact on maternal and child nutritional health. Some studies indicate that the pressing need for cash may cause some women to sell too much from dairy stocks (E. Fratkin and Smith, 1995; Fujita et al., 2004). This is supported by a finding of high rates of anemia among Ariaal mothers (Miller, 2010; Corbitt, Ruvalcaba, and Fujita, 2019), and evidence that mothers in communities more reliant on pastoralism had lower rates of anemia than those in settled communities, regardless of number of animals owned (Miller, 2010).

Fujita et al. confirmed that sedentism reduced nutritional fluctuations by season and explored further the effects of economic status on dietary intake (2004). They found that although economic status affected dietary intake and seasonality in the more settled agricultural community of Songa, it did not have an effect in pastoral Lewogoso. In Songa, women in poorer households consumed significantly less than half the beans and greens than women in wealthier households. Examining lactating mothers, Fujita et al. found that, despite being in an agricultural community, sedentarized (Songa) women fared poorly in the rainy season. In contrast, pastoral (Lewogosa) women did not show such rainy-season vulnerability despite experiencing more seasonal volatility. This study pointed to negative biological consequences of the transition from pastoralism to sedentary agriculture, as suggested in previous analyses of child health (Fujita et al., 2004, p. 281; Nathan, Fratkin, and Roth, 1996; Elliot Fratkin, Roth, and Nathan, 1999; Bettina Shell-Duncan, Obiero, and Muruli, 2005). One major caveat, identified by Fujita et al., may be that changes in breastfeeding patterns and maternal nutrition expenditure may still be evolving as households take up new subsistence activities, and have increased access to cash and greater diversity of store-bought commodities. Additional research is needed to better understand these changes.

The evidence indicates that a shift to settled cultivation may impact social structures. In much

of sub-Saharan Africa, cultivation is within the realm of women. Rao et al. illustrate how, in West African agro-pastoral communities, farming is still feminized and regarded as a fall-back option to more preferred livelihoods (2020). This lesser status of farming, particularly within communities that were until recently deeply invested in pastoralism, may afford space for young men and women to make decisions outside the traditional hierarchical structures. Smith describes how young men and women in the recently sedentarized community of Songa were able to claim the harvest and associated profits as their own. Smith explains:

Even though elders own most of the land, as they do animals, they do not control the crops women and warriors grow...With farming, however, a warrior can work on his own plot instead of his father's, while claiming control over the produce he has grown or the cash he has made from selling it. This arrangement, combined with the ability to make money almost daily, gives warriors incentive to concentrate on their own economic activities instead of obligations to their fathers or elders (1997, p12).

Income generation and sedentarization: Impacts by gender

In traditional pastoral households, the male household head controls the majority of the resources and assets, which are in the form of livestock. However, pastoral women can control certain aspects of family resources. As Smith narrates, "households as loci of production, distribution, and consumption can show a considerable degree of female input into decision making" (1997, p. 212). As livelihood systems shift, including diversifying out of pastoralism and, in some instances, becoming more settled, women and men's roles and responsibilities also change. The male realm of livestock production may become less central to the household and women, who are normally adept at diversifying, will often take on income-generating activities. Nduma et al. found that sale of dairy products (discussed below) was the most common for both pastoral and agro-pastoral women in Marsabit (30 percent of respondents engaged in this activity), followed

by petty trading (23 percent) and firewood sales (22 percent). The authors note that these three activities are proxies for the extent of women's income from pastoral production, natural resource exploitation and market integration (Nduma, Kristjanson, and McPeak, 2001). We discuss each of these forms of income generation briefly.

Sale of dairy products

The sale of dairy products is a common livelihood diversification strategy for communities who settle but still retain access to herds (Little, 1994). In a study of both settled and pastoral Rendille women in Marsabit, Nduma et al. found that a woman's decision to sell milk was influenced by herd size, whether she was educated, if her children were employed, and if her husband was absent (2001, p. 323). That a husband's presence decreases milk sales is indicative of intra-household decision-making tensions: a woman may control the milk, but her ability to sell it depends on her husband, who controls the cattle. McPeak and Doss, in their research on Gabra nomadic pastoralists in Marsabit, discuss whether the household decisions around dairy marketing are cooperative, and conclude that the decision making is contested: "men appear to be making decisions about the distance from town in order to limit wives' milk sales. This result is consistent with the notion that men resist the ability of their wives to move milk from current cultural institutions into the market domain" (2006, p. 538).

Anderson et al. (2012) discuss the growth and commodification of dairy industries in Isiolo. In pastoral societies, camel milk was a subsistence product and not traditionally sold; doing so was a sign of economic desperation. Milk and milking fall within the female sphere of influence and, prior to the formalization of the market, research shows that the dairy trade was also a female domain (P. Little, 1994; Herren, 1990). The trade in camel milk in Isiolo began as a small-scale activity, largely by poor women taking their milk to areas where they suspected it might be scarce. Trading in milk required minimal start-up capital and was an appealing way for women to increase their economic status and autonomy (Anderson et al., 2012, p. 388). Over time, urban centers in northern Kenya, and particularly Isiolo, have become hubs for the trade in camel milk. In 2004, women in Isiolo who had been selling

milk informally created the Anolei Women Group to pool resources for the purchase of fridges for transporting the milk to Nairobi. As the trade became more lucrative, men sought to compete and created their own cooperative (the Isiolo Dairy Camel Milk Cooperative). The men's co-op required members to pay a joining fee and own at least one camel, illustrating the continued role and importance of male control of livestock. The mostly male cooperative also pushed for the regulation of health and safety standards. While these measures aimed at benefitting the overall market system, they also would have pushed the more informal female traders to the margins. In this case, the women managed to prevail at the time the research was conducted (in 2012), but this example serves as a lesson in how the formalisation of a market sector can come at a detriment to women (Anderson et al. 2012).

Petty trade

Nduma et al. found a strong connection between location and age in women's petty trade activities in Marsabit, with younger women who lived close to or in town being the most likely to engage in petty trade (2001). Income from the sale of tobacco, tea, sugar or handicrafts is very small, estimated by Fratkin and Smith to equal only 200 Kenyan shillings per month, or less than four US dollars at the time of data collection (1995). Petty trade can be appealing, however, due to the potential for independent control of resources, even with very small profit margins. In addition, innovations—often undertaken collectively—can result in larger successes. Smith relates one instance, in which a group of women created a committee to ensure rotating market access for different female producers of *sukuma wiki* (local greens). They created a schedule, set a fixed price to minimize market fluctuations, instituted fines for failure to comply and organized a new marketplace. A committee member explained, "Since the time we started [this new system], even poor people can sell enough to pay school fees. People make more money this way...We are making a profit...We see women know how to organize" (1997, p. 232). Little is known about how the subsequent growth of urban areas in northern Kenya, which has included the expansion of both informal and formal markets, has influenced these patterns or the opportunities and challenges for

female traders, sedentarization and nutritional outcomes.

Firewood sales

Traditionally, women would collect firewood for their daily household consumption. It was not sold, as everyone had ready access to this resource. However, the market for firewood grew with the expansion and settling of populations, the spread of deforestation and the increased demand for cooking fuel. Women and children (primarily girls) in many parts of eastern Africa travel long distances to collect and cut firewood, which they sell either immediately or, if financially possible, after drying it and/or waiting for the price to increase in the rainy season. Watete *et al.*, in their study on Turkana and Mandera Counties in northern Kenya, point out that returns from firewood sales are very low and that this strategy is pursued primarily by the poorest households (2016). However, in Nduma *et al.*'s research, both low and higher income women participated in firewood collection (2001), which may illustrate that although firewood sales make up a greater income share in poor households, collection of firewood is undertaken by women of various economic strata. Flintan and Ridgewell's study on Ethiopia's pastoral rangelands shows that privatisation of land has increased the risks and time required to collect firewood, exposing women and girls to insecurity and adding to their labor (2007).

In summary, the gender dynamics around women's income generation as linked to sedentarization echo a wider trend, whereby women are largely only allowed space for innovation and income-generation in low-value industries. Tavenner and Crane, in a study in southwestern Kenya, cite the local notion that "if a wife has more than 200 chickens, they go to the husband" to highlight how traditional gender divisions around asset ownership can be disrupted as activities become higher in value (2018, p. 708). A respondent in Anderson *et al.* asserted that men were not involved in milk trade when it was "something small," but became involved when it started to bring a profit (2012, p. 396). Similarly, Dolan's study in Meru County demonstrates how commodification of a market can shift gendered control and norms of involvement. Dolan's research shows that horticulture in Meru was considered a small-scale female

domain for household consumption. However, men rapidly appropriated the industry following the introduction of French beans for export to the European market (2001). Similarly, female respondents in Smith's research with sedentarized Songa highlighted how their husbands were more interested in controlling the sale of higher-value *sukuma wiki* than that of milk (1997, p. 223).

However, the discussion above highlights how women's diversified livelihood strategies can directly benefit children's nutrition. Fratkin and Smith find that "women's market integration contributes to greater food security in terms of foods bought, particularly high calorie maize meal" (1995, p. 446). Critically, while data from existing research highlights that better dietary diversity can sometimes be realized when living in or near towns, there is a significant gap in the data as to *which* households can regularly and continuously benefit from markets once sedentarised. The existing studies cited here largely focused on communities where women were able to earn cash. These women are likely reliant on stronger and larger kin networks to support such enterprises. In reality, many women in sedentarized communities lack these productive resources and networks and sell labor or petty commodities or resort to begging (E. Fratkin and Smith, 1995). In addition, data is lacking on the difference between some members of a household sedentarizing—such as a successful male herder's co-wife and children who retain strong kin-based support—and an entire household giving up on pastoralism and moving to town. The impoverishment inherent in giving up pastoral production—normally due to the loss of animal assets—means that many (if not most) of the households moving to towns are destitute and with limited skills, capital or assets to effectively integrate into urban markets. This assumption requires additional research to understand how these households are getting by, and what the gendered and generational impacts of sedentarization are for the different household members. Additionally, many of the seminal studies on sedentarization cited here are more than 20 years old. New research is needed to understand the evolution of household dynamics as they relate to sedentarization and income, and the potential implications for the nutrition and well-being of women, men, girls and boys.

Theme 2: Mobility, Gender and Nutrition

The second section of this gap analysis explores the nexus of gender, mobility and nutrition. We look first at mobility as it relates to pastoral livelihoods and then briefly consider mobility in the form of migration.

As in many pastoral locations, the mobility of pastoralists as part of transhumant livelihood systems in the Kenyan ASALs has drastically decreased in comparison to preceding generations (Markakis, 2004). In traditional pastoral and agro-pastoral systems, decision making around herd mobility is within the male domain, but women are active participants. As Hodgson explains, female-headed domestic units are significant as “anchors in nomadic and semi-nomadic societies” and the “mobility of men and herds which is central to successful pastoral production in areas of extreme ecological and climatic variance and uncertainty is premised on the capacity of women to stay in one place for long periods of time and fend for themselves” (2000, p. 13). Resources, time allocation and social networks differ depending on where the community and household is at any one time and how mobile the household members are in a given period. These factors inform and influence nutritional outcomes.

Patterns of mobility in pastoral and agro-pastoral production systems rely on a broad range of ecological, climatic, historical, social and political factors. Male herders, in charge of the livestock, know where to find different types of pasture to meet livestock needs and know where water is likely to be available at different times. Using social networks, men collect information on the presence of livestock disease, ticks and other pests, and potential conflicts. Men move their herds based on patterns established by previous generations, and rely on long-standing linkages with stock associates which may cut across ethnic, territorial and international borders (N. Dyson-Hudson, 1966;

Gulliver, 1955). Political allegiances and tensions also determine livestock mobility, and are based on shared access to natural resources like water and pasture, as well as conflict avoidance with rival groups.

As outlined, these factors lie largely within the domain of men. However, pastoral women are also mobile (IFAD, 2020). Some move with the herds to engage in specific tasks (such as hut construction, watering and milking the animals, and preparing food); or to access a steady supply of milk and blood to boost their nutritional status. Research in 2007 in Karamoja, Uganda, found that male elders historically identified the most nutritionally vulnerable—often pregnant and lactating mothers or malnourished children—and sent them to the mobile cattle camps in order to improve their health (Stites et al., 2007). This practice decreased, however, as insecurity rose, movement between settled and mobile populations became more difficult, and herders were unable to maintain their traditional routes due to changing land-use regulations and border restrictions. Although the literature found to date does not detail the existence of similar mechanisms of coping with vulnerability at the community level in Marsabit or Isiolo Counties, we assume that such systems exist. This is a knowledge gap with potentially important implications for understanding gender and nutrition.

Research from Karamoja and elsewhere also shows the role of mobility by age and gender in support of pastoral livelihood systems. Young men are the primary herders and move with the animals to seasonal water and grazing points. From a nutritional standpoint, this gives them ready access to animal protein, but less access to the higher-calorie grains consumed by their settled or semi-settled counterparts. Young boys often travel with the men and are charged with herding

the small ruminants while the men take the larger animals farther afield. Both young men and young women and girls move back and forth between the settled and mobile locations, relaying information, visiting suitors or spouses, and carrying supplies such as water, veterinary medicines, food purchased from markets, relief food, milk and blood (Stites et al., 2007). These movements allow communities to smooth consumption across different locations, share decision making around critical issues such as animal sales and household expenditure, and take advantage of variations in market access. If the community has a cohesive approach to managing the food security and nutrition of its most vulnerable, these movements of food and commodities are a central mechanism in this system, particularly in lean periods. At the same time, these journeys are often physically arduous and expose young women, young men, boys and girls to protection risks en route (IFAD, 2020). Additional research is needed on the patterns of movement of goods, food, information and people (by age and gender) among and between settled, semi-settled and mobile communities in Marsabit and Isiolo Counties, and the implications on nutritional outcomes.

Older people are the demographic group least likely to move between settled and mobile sections of a community. From a nutritional standpoint, this may not matter if they are provided for adequately by younger people who make these journeys. Older men may own herds and, as related by Rao et al. (2020), may shift herd composition to require less movement or hire younger herders who are better equipped to travel longer distances. However, older people without status (such as widows) who lack access to animals or don't have strong social or kinship ties, may be particularly vulnerable to malnutrition and other health risks. Additional research on the experiences and specific vulnerabilities of older men and women is needed to understand these trends in Isiolo and Marsabit Counties.

Turning to migration as a form of mobility, we examine the ways in which migration is incorporated into pastoral livelihood strategies. We draw a distinction from sedentarization, discussed above, which is when households migrate in order to settle. Migration may take place on an individual or household level and may be

seasonal, temporary or permanent (i.e., complete sedentarization). Migration decisions are highly gendered, as illustrated by a number of sources. McPeak and Doss examine the extent to which men take into account the income women earn from dairy sales when considering migration, and find that the ways in which men make these decisions may indicate resistance to female financial autonomy. In contrast, when "food aid enters joint household consumption, it appears that men are willing to adjust location decisions to ease their ability to access food aid" (2006, p. 537).

Migration patterns also align with gendered life stages. Rao et al.'s research in northern Kenya and southern Ethiopia showed that while men were more likely to migrate to towns, there existed highly gendered risks for young women who did migrate and often found themselves pushed into sex work due to lack of other viable options (2020). Those young men and women who are successful in finding employment in urban centers often send remittances to assist those still at home, which can offset expenditure on basic needs and boost food security and nutrition of receiving households (Stites 2020). However, Rao et al. stress that these benefits depend in part on who receives or controls, the remittances. Stites finds that, in Karamoja, the flow of goods and food goes in both directions, with many migrants—and particularly the better off and better connected—working hard to maintain their social and livelihood ties to their rural home and relatives (2020).

External shocks such as drought, disease, and conflict may force households to migrate, often leaving essential and productive assets—including livestock—behind. These forced migrations are gendered in their impact. Pike (2019) notes how Turkana women's "sense of place" is tied to their knowledge of the water sources and famine foods. The loss of this sense of place can negatively affect both household nutrition and female agency, as women's ability to nurture children is closely tied to their social standing. For men, forced migration and separation from livestock undermines their ability to provide for their family, with profound impacts on masculine identity. Pikes shows that, when faced with external shocks, able-bodied men often migrate further than other household members. A Turkana man who had travelled beyond his family to avoid raids lamented: "I miss

the evenings drinking tea while the children all try to find different places to sit next to me. I used to carry my smallest son around in the evening; now he must sit alone”(2019, p. 132).

Much remains to be understood on the gendered impacts and associated nutritional implications of mobility and migration in the Kenyan ASALs. Mobility is both central and essential to pastoral and agro-pastoral livelihoods, and we know that child nutrition suffers when access to animals lessens or is cut off (Sadler and Catley, 2009; Sadler et al., 2009; Stites and Mitchard, 2011). However, we do not know how these patterns play out in the Kenyan ASALs, by season, gender and age, or population or wealth group. Similarly, we know that the migration of one household member can positively or negatively impact the larger household (Rao et al., 2020), but we do not know the ways in which this is playing out in Isiolo and Marsabit and/or the gendered and nutritional impacts. We do not know how roles of women, men, boys and girls are changing in these locations as a function of shifts in mobility and migration. Without a firm understanding of processes that are embedded in the evolution of pastoral livelihoods, it is very difficult to effectively and appropriately program interventions.

Theme 3: Changing Generational and Gender Roles and Possible Impacts on Nutrition and Livelihoods

This section examines the evidence on changes over time in generational and gender roles in the Kenyan ASALs and similar regions; and the ways in which these changes may affect food security and nutrition. While there is limited recent information on these topics in Isiolo and Marsabit Counties, we believe that shifts in social and intra-household dynamics, rites and responsibilities are important factors in understanding the gender and cultural norms, as are the social and care environments that influence child nutrition.

Male age-sets are part of the gerontocratic system of governance of numerous pastoral groups in the Greater Horn of Africa (Gulliver, P.H., 1953; P. Spencer, 1976). Although differences exist from one system to the next, age-sets consist of men of approximately the same age. Series of age-sets normally form generation sets, which rotate into positions of authority. Male age-sets play important social and political roles, as men in an age-set share a strong bond which can provide social and financial support. Age-sets move through different stages over time, with clear expectations around community roles (Smith, 1997; Giles, 2001). Modernization has brought changes to the age-set system, including a weakening of the strict hierarchical order. Smith (1997) argues that the erosion of pastoral livelihoods and the increase in sedentarization has reduced the importance of young men as raiders, herders and defenders. Livestock play a critical role as social currency within an age-set, and the decline in herd sizes and increased inequity of ownership has further undermined the system of mutual support and exchange. As

value shifts away from cattle for young men, the rift between the senior and junior male generations grows (Stites, 2013). Keane et al. find that those who “had received formal education placed less value on both cattle and small stock,” illustrating that, with modernization and sedentarization, livestock ownership has become less of a pivotal part of adulthood and identity (2016, p. 9). These analyses point to some of the pressures on male generational systems in northern Kenya. However, relatively little is known about how the evolution of the system of customary authority, prescribed roles for men, and a strong male-based system of solidarity may result in changes to the drivers of malnutrition or community efforts to manage vulnerability.

Females pass through distinct life periods with associated behavior expectations and restrictions, but they do not inhabit age-sets in the same way as men in eastern Africa. Young women’s roles are also changing with modernization, greater financial autonomy and increased access to education. Pike finds that some “women who are successful at income generation are also considered admirable, with reports that bride price is higher for young women who have spent some time in school” (2019, p. 128). Roth et al. (2001) find that educated Ariaal girls were able to opt out of the adolescent *nykeri* tradition, in which adolescents engage in sexual relations without an expectation of marriage, but this may be because parents who invest in girls’ education are less likely to allow them to participate in this rite of passage (Eric Abella Roth et al., 2001; Giles, 2001). Opting out of this custom may have positive health outcomes

for girls by decreasing the risk of early pregnancy and sexually-transmitted infections, but may also erode social cohesion and reduce the social status of females who do not participate. Additional research on these trends and their implications is needed.

Recent decades have brought major changes to generational and gender roles within communities and households. One area of visible change is in decision making and income generation. As discussed earlier, women are increasingly involved in income-generation activities. Numerous authors (Rao et al., 2020; Rao, 2019; Giles, 2001; Oumer, 2007; Smith, 1997; McPeak and Doss, 2006) identify trends in resource management—including the sale of firewood, charcoal, milk and produce—that may be resulting in greater control of and benefit from these resources for women. Importantly, this control may be occurring at the expense of the authority of the male gerontocratic leadership system. Women's income from these sources often exists outside traditional patriarchal structures, and may be leading to a shift in the balance of power between women and male elders. These shifts may also affect intra-household dynamics, as Rao argues that some younger women in Isiolo have different expectations of domestic relationships and responsibilities. These women stressed a desire to have more collaborative relationships with their husbands and to have their husbands provide more support, including capital, of their entrepreneurial activities (2019).

A related change is the greater financial inclusion and market access of women. Smith (1997) suggests that one indicator of greater female independence in settled communities is that more settled Songa women reported keeping their money separate from their husbands than did pastoral women. This may be because Songa women were better integrated into the local markets and had better access to financial services and products. This theory is supported by Towari et al.'s study on financial products and services for poor women in northern Kenya. The authors find that women who were able to earn and control income, accumulate savings and access credit were able to decrease their dependence on male relatives. Furthermore, Towari et al. find a correlation between participation in financial

inclusion programs and nutritional outcomes. Over a period of two years, there was a rise from 79.9 percent to 99 percent of participants reporting consumption of two meals a day. At baseline, 53.2 percent of respondents reported that their child had gone to bed without an evening meal; by the endline, this number was 1.5 percent (2019, p. 995). These findings are not uniform, however, on the relationship between women's control over resources, and health and nutritional improvements. While some studies confirm the Towari et al. conclusions that women's increased control over household resources and involvement in decision making leads to better health outcomes in children (Caldwell, 2010; Caldwell and Caldwell, 1993; Hindin, 2000; Koenen, Lincoln, and Appleton, 2006; Shen and Williamson, 1999), other studies suggest negative or negligible effects (Aden et al., 1997; Bradley, 1995). Some authors question the extent of female autonomy in subsistence economies. Smith points out that even when women in his study were integrated into the cash economy and had more personal control over their income, they were limited in their ability to spend the money due to their cultural and gendered obligations to provide for their households (1997). Smith suggests that as women's incomes increase, they are likely compelled to spend greater amounts on the household as their husbands will not. Smith also argues that a benefit for women of a sedentarized lifestyle is a decreased reliance on male labor, which theoretically increases the relative value of female production. However, this decrease in reliance on male labor may also mean a decrease in *assistance* from male labor. A settled Borana woman, interviewed by Rao, captures these two components:

[My husband's] income was not sufficient to support me and our 7 children, all of whom were in school...I moved here and started a miraa business. After saving money for two years, I managed to open a small grocery shop...After he retired, my husband came here and helps in the shop. He is not good at networking, nor does he have business ideas, but I can trust him to look after the shop when I am selling miraa. I know how to invest cash and get profit, so have the final say financially. (Rao, 2019, p.31)

This may point to women's greater adeptness at diversifying livelihoods, and is supported by time-

use analyses by Fratkin and Smith's 1995 study. They show that pastoral women in Marsabit spent 35 percent of their time resting compared to 52 percent of time resting for pastoral men (1995). In settled populations, married women rested 30 percent of the time compared to 73 percent for men. In other words, men worked half as much when settled, while women worked approximately the same amount. Waithanji's analysis of changes in time use following sedentarization in Somali communities in Mandera County in northeastern Kenya supports this finding. Men's time spent in prayer and rest increased significantly after settling, she finds, while for women the amount of time in these activities did not change (2008).

The changes in control over income, involvement in decision making and time use may affect household structures, although causality is difficult to determine. Some of the literature suggests an increase in the number of female-headed households, potentially due to the changes outlined above. For instance, Nduma et al. find a third of women had permanently absent husbands amongst the Rendille sampled in Marsabit (2001). In Turkana, Omolo finds that one in four households were female-headed due to widowhood, divorce and single motherhood. Omolo's data indicated that while these women made the decisions in their households, they had low participation in community-level decisions (2010). In addition, Rao's work in Isiolo finds that between 1989 and 2015 the number of smaller households (one to five members) among total households had increased from 23 percent to 44 percent. The percentage of female-headed households rose from 32 percent to 36 percent in the same period. Rao posits that these demographic changes are evidence of increased "abandonment" of wives (2019). In addition, Rao et al. point to a growing number of multi-generational and multi-locational households as younger women were "opting out of marriage, in favour of forming new types of households, often with their mothers and sisters, or other matrifocal kin" (Rao et al., 2020). Pike's 2018 ethnographic analysis of Turkana women cites similar examples in which women use their own financial means and the support of the other women in their polygamous household unit to leverage independence. These data imply that women in northern Kenya are relying less on husbands and more on their own

resources. Still needed is additional information about the direction of causality and the possible impacts on the caregiving environment, food security and nutrition.

Overall, the shift in many of the societies in northern Kenya is one of power and control over financial and social assets. The authority of traditional gerontocracy relied heavily on male elders' control over livestock (Paul Spencer, 1968; Giles, 2001, p. 23). Yet, with the increased access to markets and income-generating activities, women and younger men are now able to access cash and are increasingly making decisions outside the purview of the elders. These shifts certainly remain contested, as pointed out by Smith: "people may not be aware of, or refuse to acknowledge the possibility that elders are experiencing a decline in their control over resources and community affairs" (1997, p. 185). Smith's observation was from more than 20 years ago, but little is known today how these myriad gender, generational and power shifts have affected the underlying factors that determine and contribute to food security and nutrition.

Theme 4: Customary and Kin-Based Social Safety Nets and Implications for Nutrition and Food Security

The final section of this gap analysis examines the evidence on gender and customary and kin-based safety nets, and potential relevance for nutrition and food security. Pastoral and agro-pastoral systems are heavily reliant upon informal social institutions that allow access to resources, transfers of cattle, risk management, recovery from shock, marriage systems and the sharing of critical information. We are interested in how these mechanisms might be changing over time and the implications of these changes, with a focus on gender.

Systems of customary safety nets in pastoral production are sometimes described as general reciprocity models or moral economies (Dahl, 1987; Rosander, 1997). These long-standing mechanisms form the backbone of pastoral societies and entail the redistribution of resources from wealthier to poorer kin, which can diminish dietary differences by wealth status (Fujita et al., 2004; Elliot Fratkin, 1998; Homewood, 1992; Grandin, 1983; Talle, 1988). However, Rao et al. note that such systems can also become exclusionary in nature and delineated along ethnic lines, and can leave out “the poorest or most marginalised who cannot offer reciprocal services or goods” (2020, p. 4). These models are highly gendered, whereby men participate in a reciprocal horizontal system based largely upon the exchange of cattle. Women rely on their marital male relatives and their natal kin, as well as informal networks of other women (Nduma, Kristjanson, and McPeak, 2001). Much of the literature focuses on the role of social connectedness and reciprocity in these

mechanisms following disasters (Smith, 1995; Rao et al., 2017); less exists on the ways in which these systems function on a daily basis (Rao et al., 2019).

We know that poverty and marginalization intersect with gender, and can assume that female-headed households and abandoned, unmarried, childless or widowed women are often in the categories of those who are unable to reciprocate or participate in the social mechanisms described above. However, more recent literature (Khalif and Oba, 2018; Aregu and Belete, 2007; Shetler, 2007) focuses on the role of female-specific social networks, which may exist separately from kin or marital-based systems. As Shetler notes, in reference to the Ngoreme population in Tanzania:

Women especially depended on the gift economy for maintaining a diverse set of reciprocal relations between neighbouring homesteads that gave them access to food, household implements, and services necessary to their everyday work...Women understood these exchanges as gifts and did not repay them one for one. (2020, p. 4)

Aregu and Balete discuss female social and kinship networks and associated coping strategies in the Borana rangelands, where women redistribute goods or labor to those in need. These mechanisms are particularly active following shocks and when men are absent (Aregu and Belete, 2007).

Khalif and Oba analyze reciprocal networks among Waso Borana women in northern Kenya and

find that the majority of households participate in these systems to some degree, regardless of wealth or literacy levels (2018). Older women are more likely than younger women to take part, perhaps because older women are more likely to depend on social support. In examining change over time, Khalif and Oba find that women have become more likely to exchange labor than food, either as a result of greater food insecurity or better access to markets. Importantly, they argue that market access has been most profitable for wealthier women who are able to sell produce, but has negatively impacted the nutrition of poorer women who engage in distress sales of animals in exchange for grain. (This aligns with the findings of Catley and Aklilu on the disproportionate benefits of markets for wealthy male pastoralists (Catley and Aklilu, 2013).) Importantly, the majority of women in Khalif and Oba's 2018 study said that these informal networks were no longer effective. This shift was also noted by Aregu and Balete in their 2007 study on the Borana Rangelands in Ethiopia, in which they suggest that privatisation and commercialisation is promoting individualism at the expense of mutual support systems.

The traditional social safety nets found in pastoral and agro-pastoral systems do not seem to exist to the same extent in sedentarized communities in northern Kenya. Sedentarising can increase wealth differences and up-end existing social systems (Smith, 1997; Waithanji, 2008), weakening redistribution and reciprocal mechanisms in the process. This is exacerbated by the fact that poorer pastoral families are more likely to settle (Nduma, Kristjanson, and McPeak, 2001; E. Fratkin and Smith, 1995), resulting in a higher proportion of poor households in sedentarized communities. A community of impoverished households cannot benefit from the support of better-off members, and poor households are unlikely to be able to engage in reciprocal systems. However, we posit that the vestiges of a reciprocal economy are still visible in informal institutions such as village savings and loan associations in settled communities. These supportive communal networks are particularly popular among women, who might have been more involved in the "gift" economy that was based on, in the words of Khalif and Oba, an understanding of the "informal system of credits and debits to be activated whenever needed" (2018, p. 250). Rao et al. found that,

when faced with shocks, women in Isiolo turn to their female, matrifocal kin for support with both domestic responsibilities and income-generating opportunities. They suggest that "cooperation between women within and across households seems key to improving agency as well as material wellbeing" although they do not offer direct evidence on nutritional outcomes (Rao et al., 2020).

Men are largely excluded from women's informal social support networks (H. Watson, 1994; Oba, 1994). Coppock and Desta (2013) find that women actively exclude men from their financial groups, as they consider men a risk to collective action, unreliable in paying back loans, and overly demanding in their attempts to exert influence. Coppock and Desta note that male-led and -managed groups are increasing, but that they do not range across the social and economic activities of women's groups. Rao reads a source of potential conflict into the lack of cooperative structure for young men: wealthy and older men dominate formal structures for cooperation, there are fewer (and less clear) non-pastoral livelihood options for young men, and women have more developed forms of alternate support.

We do not know how migration, diversification and growing inequity have affected the customary safety nets discussed in this section; nor how these changes play out by gender and affect nutritional status. What are the impacts on community cooperation, systems of reciprocity and support to those in need? Writing in 1997, Smith speculated that individualism would increase along with market integration, and that intra-community bonds would suffer. If his predictions were accurate, how have the rise in individualism and the changing social systems affected livelihoods, food security and nutrition? Twenty-plus years later, the impacts of these transformations remain a gap in our knowledge and understanding.

Conclusions

Rao quotes Mohamed, a Borana male elder who had settled in a rural site in Isiolo:

Life was easy in the old days but things have changed. There is no mercy between people these days; no milk as before, as a result of bad weather. I have less expectation of success going forward. I expect to turn my kids into entrepreneurs, hoping to train one of my sons as a mechanic. (Rao, 2019, p. 19)

These words reflect a number of the issues raised in this synthesis: changing livelihoods, loss of access to animals, generational shifts and the erosion of traditional safety nets. However, while we can speak broadly about these themes in arid and semi-arid lands, including in northern Kenya, there is an overall lack of up-to-date evidence on these patterns. This gap analysis calls attention to what we do and don't know about women and these experiences, but largely fails to cover—due to the lack of evidence—the differentiated experiences of men, boys and girls. Importantly, there is very little solid data on how these changes—and the gendered experiences of them—affect persistent acute malnutrition in these regions.

This gap analysis identifies key opportunities for research to improve the understanding of change over time in the Kenyan ASALs and possible connections to nutrition. These include, by theme:

Sedentarization

- In the approximately 25 years since the seminal work of Fratkin and colleagues, how have the nutritional status and well-being of the settled versus pastoral groups evolved, particularly for women and children? What are the differences between those who settled in an urban or peri-urban area and those who settled in order to cultivate?
- What differences in intra-household dynamics and decision making exist

between sedentarized and non-sedentarized households? *E.g.*, sharing of domestic labor, market access, control of income, decisions about expenditures, access to services (including health and education access, by gender), and allocation of time and resources (including food)? Are there discernible differences between those who settled in an urban or peri-urban area and those who settled in order to cultivate?

- For settled households, what forms of diversified livelihoods are the most successful? Who within the household is performing these livelihoods? Who controls the proceeds from these activities, and what are those proceeds used for?

Mobility

- What are the nutritional implications of changing pastoral mobility patterns and for whom?
- How does pastoral mobility intersect with nutritional vulnerability and how has this changed over time? How has the relation of different groups—men, women, boys and girls—to pastoral mobility changed and what are the potential implications of this by wealth, status and nutritional vulnerability?
- Who is currently migrating on a temporary basis, to where, and for what purpose? Who decides who goes? What are the links between migrants and their sending communities/families? If remittances are sent, what is their primary use?

Changing generational roles

- How is the male age-set system changing? What are the implications for social networks and horizontal exchanges that could balance nutritional needs?

- What are the implications for changing roles for boys and young men, including changing notions of masculinity and authority? How do these changes affect women, children, and intra-household decision making and allocation of resources?
- How are roles and expectations changing for girls and young women? What are the implications of these changes on social status and networks, bride wealth, marriage age, intra-household decision making, and the balance of domestic and reproductive duties with income-generating activities? What are the implications for child nutrition?
- How are profits from income-generating activities used within a household? Who decides?
- What are the nutritional implications of better market integration for women? What factors are most important?

Social safety nets

- What are the traditional systems for community-based management of vulnerability and malnutrition among the pastoral groups in northern Kenya and how have they changed over time? How successful are they? How is vulnerability understood and determined, and by whom? Who is excluded from these mechanisms?

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