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Livelihood diversification and civil war: Dinka communities in Sudan’s civil war

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It is generally recognised that diversification is among the livelihood strategies adopted by rural households to manage risk events, yet understanding of its status and effectiveness in the context of civil war is lacking or inadequately researched. The empirical findings in a non-conflict context suggest that the higher the risk and the more assets available, the more households will diversify. This article is an attempt to gain a nuanced understanding of the status of livelihood diversification in the context of civil war. The empirical findings of this article indicate that diversification is not always the best livelihood strategy option in the context of civil war. Within the households exposed to civil war, those exposed to endogenous counter-insurgency warfare tend to diversify their primary livelihood activities less. Contrary to commonly held views, among the households exposed to exogenous counter-insurgency warfare, the non-poor households tend to diversify their primary livelihood activities less than the poor households. Similar findings are also observed from the results of the comparative analysis of different forms of diversification in crop production, livestock management and assets. The differential status of livelihood diversification observed during civil war is more explained by the nature and characteristics of counter-insurgency warfare.

Keywords: Sudan; civil war; counter-insurgency; diversification; livelihood; risk

Civil wars have become pronounced and endemic in many African countries particularly after the end of the Cold War. Unlike other continents, Africa has the highest incidence of intense civil wars. This trend has been increasing during the last two decades, while it has fallen or remained static in other continents. This upsurge of civil wars in Africa has a considerable negative impact on the socio-economic structures of the rural communities, resulting in the apparent increased vulnerability and poverty among rural communities. The risk of civil wars in much of Africa now stands as the leading contributory cause of vulnerability and has overtaken the long-dominant role of ecological risk.1

The empirical findings in non-conflict contexts recognise the important role played by diversification in rural livelihoods and suggest that the higher the risk and the more assets available, the more households will diversify. Despite this commonly held view about diversification, understanding of its status in the context of civil war is lacking or inadequately researched. In fact, there have been no research attempts...
made in the rural development literature to assess the status of livelihood diversification in the context of civil war.

This article is an attempt to gain a nuanced understanding of the status of livelihood diversification in the context of civil war. It is organised into five sections. Section 2 discusses the concept of diversification and its determinants. Section 3 provides a description of the empirical context and results on the status of livelihood diversification during civil war in Southern Sudan. Section 4 presents the status of poverty as an outcome of livelihood strategies adopted by households during the civil war. General conclusions are presented in the final section.

Diversification, risk and assets

The term diversification is one of the few concepts that is widely recognised and dominates most writings on risk management approaches, poverty reduction and rural development, but with limited consensus on its meaning and uses. While economic development literature uses the term diversification to define the structural transformation of the economy, the popular use of the term diversification tends simply to mean either changing or increasing the number of assets or activities at the household level. This concept of diversification is well founded in finance theory that is based on the wisdom of the old adage of “not keeping all your eggs [investment] in one basket”. This concept has been applied in the context of poor rural households to show the link between risk events, vulnerability and the level of livelihood diversification.

The relationship between levels of diversification and the nature of risk and assets in fairly predictable risk contexts, such as drought and economic shocks, has been inconclusive in most empirical studies in low-income environments. Early studies suggest that neither wealth nor income had a significant effect on the observed choices of levels of diversification and suggest that differential level of diversification can only be explained by differences in the nature and characteristics of risks to which the households are exposed.

Lately some studies, however, support the hypothesis that the level of diversification is significantly influenced by farmers’ ability, wealth, locations and access to credit and the nature of risk events. Dercon and Eswaran and Kotwal find that if liquid asset holdings are large, then households will be more willing to diversify more. Moser also notes that the greater the risk and uncertainty, the more households diversify their assets to prevent asset erosion.

Linking the level of diversification to assets, the empirical findings suggest that poor households will tend to choose less risky livelihood strategies while non-poor households tend to diversify more and adopt riskier livelihood strategies. Specifically, Dercon argues that asset-poor households tend to adopt specialised portfolios with low risk and low returns, while asset rich households diversify more and enter into high-risk and high-return livelihood activities. It has been generally observed that the poor households, especially those facing food security, market and credit constraints, tend to be more diversified in terms of cropping activities.

It is a commonly held view, with considerable empirical evidence from many case studies in Africa, that rural households do indeed engage in multiple activities and rely on diversified livelihood activities. It is argued that in sub-Saharan Africa the more diverse the income portfolio, the better-off is the rural household, while elsewhere a common pattern is for the very poor and the comparatively well-off to
have the more diverse livelihoods than middle-income households, who display less diversity.\textsuperscript{12} However, when non-farm income diversification is considered, the evidence from various case studies in Africa indicates the empirical regularity of a positive association between income diversification and wealth, because of the existence of substantial entry or mobility barriers.\textsuperscript{13}

What is apparent in the literature and in the empirical studies on diversification is that, although risk has been identified as one of the natural determinants of diversification, it hardly features in the analysis of diversification. In most case studies the choice of diversification is less associated with the source of risk that is seen to be playing an insignificantly explanatory role. There is an apparent absence in rural development literature of any comparative analysis of diversification strategies across households exposed to different sources of risk.

It is clear in the risk literature that there is a consensus that level of diversification is primarily determined by the level and nature of risk and assets. The higher the risk and the more assets available, the more households will diversify in order to reduce the adverse effects of risk events. Given the lack of empirical evidence, it is unclear whether such commonly held arguments of attributing diversification to asset ownership and the intensity of risk events are tenable and relevant in the context of civil war. In the light of this understanding, this article is an attempt to provide a better understanding of the status of diversification during civil war.

\textbf{Status of diversification during civil war}

In assessing the status of diversification during civil war, it is important to understand the way in which the war is fought and conducted. Much of the human devastation during civil war can be traced back to the criminal tactics with which the war is fought, conducted, prosecuted and sustained. As governments at war with their citizens are becoming increasingly unable to sustain and control their armies, they turn to local sources of provisioning through counter-insurgency warfare that involves intense predatory behaviour of soldiers and their militias.

The post-independence Sudanese leaders who inherited political power, instead of winning political support from all their citizens, adopted counter-insurgency campaigns to suppress the civil wars waged by communities whose political aspirations had not been met by the independence arrangements. The Sudanese ruling elite presided over states that lack the means for effective and disciplined counter-insurgency and have resorted to recruiting civilians into unpaid militias.\textsuperscript{14}

In Southern Sudan, the second civil war started in 1982 and gradually reached most rural areas by 1990. Bahr el Ghazal region as one of the three regions of Southern Sudan was the epicentre of counter-insurgency warfare in the 1990s. This counter-insurgency campaign was being waged by the government militia, mainly composed of northern Arab pastoralists who live just to the north of the internal frontier of Bahr el Ghazal region, and later on during the 1990s by the Government of Sudan (GoS) sponsored southern militias composed of the major ethnic groups of Southern Sudan (Nuer and Dinka).

The situation in Bahr el Ghazal region worsened after 1991 when divisions erupted within the main rebel movement, the Sudan People’s Liberation Movement (SPLM), which resulted in a splinter group (mainly composed of Dinka and Nuer). This splinter group joined the government forces to further intensify counter-insurgency warfare in Bahr el Ghazal region, a stronghold of the SPLM. Unlike the
raids of the Arab militia that were exogenous and occurred during the dry season, the counter-insurgency warfare that was waged by the splinter group (Dinka militia) was year-round and emerged from within the Dinka communities.

For easy reference I term the counter-insurgency warfare that is waged by government militia using members within the targeted communities (such as Dinka militia) as “endogenous counter-insurgency”, while the counter-insurgency warfare waged by government militia using members outside the targeted communities (such as Arab militia) is termed “exogenous counter-insurgency”. The unique characteristics of Bahr el Ghazal region and its experience in the 1990s made it ideal for assessing the status of diversification during civil war.

The period covered by the study is the 1990s with the pre-war period used as a baseline to gauge changes and trends in the level of diversification. The data used in this article are from my thesis that provides a detailed analysis of vulnerability during civil war in Southern Sudan. The primary data were collected during 2000–01 from the two areas of Abyei and Gogrial in Bahr el Ghazal region that were purposively selected to respectively represent communities exposed to exogenous counter-insurgency warfare (Arab militias) and endogenous counter-insurgency (Dinka militia). Using participatory methods such as focus group discussion and proportional piling for gauging the community’s perception about sources of risk facing them in the 1990s, the data as presented in Table 1 show that people attached more importance to counter-insurgency warfare than to the direct war or natural disasters and diseases.

Because of the lack of secondary socio-economic household data, questionnaire-based household surveys (about 211 households in Abyei and 205 households in Gogrial) and community surveys (women and men focus group discussions conducted separately in each area) were used as the most relevant field methods to generate primary data for assessing the status of diversification during civil war. In assessing the status of diversification during civil war, two types of diversification, namely a change in the portfolio of livelihood activities and a change in the management of each constituent livelihood activity, are considered in the context of risk reduction and risk mitigation strategies. The Statistical Package for Social Sciences was used for quantitative data analysis.

### Risk reduction livelihood strategies: reducing susceptibility

Generally, risk reduction strategies refer to the livelihood strategies including livelihood diversification adopted by households for reducing their susceptibility

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**Table 1. Community perceptions of sources of risk in the 1990s.**

<table>
<thead>
<tr>
<th>Main sources of risk</th>
<th>Abyei</th>
<th>Gogrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dinka militias</td>
<td>17</td>
<td>68</td>
</tr>
<tr>
<td>Arab militias</td>
<td>62</td>
<td>9</td>
</tr>
<tr>
<td>Nuer militias</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Drought</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>SPLM/GoS war</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Diseases (human/livestock)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
to risk. Although these strategies have more bearing at the national and community levels, households at micro level do adopt some livelihood diversification measures, such as adjusting livelihood activities and the reallocation of household members. In assessing the status of diversification during civil war, different methods comprising of an analysis of the sources of livelihoods and the construction of typologies of livelihood diversification are used as suggested by Ellis.\textsuperscript{16}

\textit{Adjusting sources of livelihoods}

In order to assess the level at which households adjusted their sources of livelihoods to reduce their susceptibility to civil war, their current sources of livelihoods are compared with the pre-war period. Given the lack of household income portfolio data to determine the proportional contribution of each source of income, I used participatory rural appraisal methods (proportional piling) to gauge the proportional contribution of each livelihood activity to the overall household livelihood at the community level.

Before the current civil war, the Dinka economy in Bahr el Ghazal was based on transhumant animal husbandry, agriculture, fishing, trade and a limited dependence on gathering.\textsuperscript{17} In order to reveal visually the change and adjustments in the sources of livelihoods in the 1990s, radial graphs are used as shown in Figures 1 and 2. It is visually clear from these radial graphs that the communities adjusted differently in their sources of livelihoods in the 1990s. While the results from the communities exposed to exogenous counter-insurgency warfare in Abyei display a great amount of homogeneity in their sources of livelihoods, the Gogrial results reveal a great amount of change, as compared with the pre-war periods. While in Abyei area all sources of livelihoods increased slightly to compensate for the decline in the share of livestock, those households in Gogrial adjusted their livelihoods sources towards gathering of wild foods.

\textit{Adjusting primary livelihood activities in the 1990s}

The use of adjustments and changes in the contribution of the sources of livelihood to evaluate the level of livelihood diversification during war in the 1990s is inadequate, as it does not capture the relative level of participation in each activity. Specifically, in assessing the level of livelihood diversification it is necessary to assess

![Figure 1. Adjustment in livelihood activities during war in Abyei area.](image)
the proportion of households engaged in each livelihood activity. Alternatively, we should have used the *livelihood diversity index* measure\(^\text{18}\) to provide a summary statistic that captures both income shares and participation shares in a single figure that can be compared across households.\(^\text{19}\)

Given the critical observations raised about the utility of diversity indices and lack of detailed data, I used the “typologies of livelihood strategies” approach that was developed by Ellis\(^\text{20}\) to analyse livelihood diversity. This approach classifies each household according to a typology of livelihood strategies and based on a proportional measure of the distribution of households between different livelihood activities. In the context of Dinka communities of Sudan, I constructed from the household survey data four typical livelihood activities that lie along a specialisation-diversification continuum. The aim of constructing a typology of livelihood strategies is to reveal within which category of activities specialisation occurs, and to explore the combination of activities that represent diversified livelihood strategies. Asking households about their main livelihood activities before and during the 1990s, the summary of their responses is presented in Table 2.

**Reverting to pastoralism**

It is clear from Table 2 that while trading existed as a livelihood activity in the pre-war period in Abyei, it vanished and pastoralism emerged as a new livelihood strategy in the 1990s. Interestingly, while the households relying on agro-pastoralist livelihood activity during the pre-war period declined during the war, the proportion

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**Table 2. Classification of household livelihood activities in the 1990s.**

<table>
<thead>
<tr>
<th>Research communities</th>
<th>Periods</th>
<th>Agro-pastoralist</th>
<th>Farming</th>
<th>Pastoralist</th>
<th>Trading</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abyei</td>
<td>Pre-war</td>
<td>185 (88%)</td>
<td>13 (6%)</td>
<td>0 (0%)</td>
<td>13 (6%)</td>
<td>211</td>
</tr>
<tr>
<td></td>
<td>1990s</td>
<td>166 (79%)</td>
<td>13 (6%)</td>
<td>32 (15%)</td>
<td>0 (0%)</td>
<td>211</td>
</tr>
<tr>
<td>Gogrial</td>
<td>Pre-war</td>
<td>205 (100%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>205</td>
</tr>
<tr>
<td></td>
<td>1990s</td>
<td>120 (59%)</td>
<td>85 (41%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>205</td>
</tr>
</tbody>
</table>
of households depending on farming did not change in the 1990s. Pastoralism emerged as a significant new phenomenon during the 1990s, with almost 15% of the sample households adopting it as their main livelihood activity.

Interestingly, the households that adopted pastoralism in the 1990s were previously agro-pastoralists during the pre-war periods, meaning that specialisation was preferred to diversified livelihood strategies. The disappearance of trading as a specialised livelihood strategy in the 1990s also indicates that not all specialised livelihood strategies are appropriate, and suggests instead the preference for pastoralism as the most appropriate specialised livelihood strategy during civil war.

In order to know the type of households that adopted specialised or diversified livelihood strategies during war in the 1990s in Abyei, it is clear as shown in Table 3 that while most households still maintained an agro-pastoralist livelihood, the middle and non-poor households adopted pastoralism more than poor households, who increasingly adopted agro-pastoralism in the 1990s. Interestingly, while the proportion of poor households who adopted a diversified agro-pastoralist livelihood increased in the 1990s, the proportion of non-poor households who did the same declined.

This finding clearly suggests that the poor households tend to diversify more than non-poor households, particularly in the context of exogenous counter-insurgency warfare. Although we cannot draw firm conclusions, this finding challenges, at least in the context of exogenous counter-insurgency warfare, the posited argument that links diversification positively with the level of income. Generally, farming in the context of counter-insurgency warfare tends to be riskier than pastoralism, as it necessitates households to be in stationary and permanent settlements, which make them more susceptible to counter-insurgency raids.

**Pushed to pure farming as necessity**

It is clear from Table 2 that while all households in Gogrial area were agro-pastoralists in the pre-war period, nearly half of the sample households resorted to pure farming as their core traditional livelihood activity in the 1990s. Despite the fact that crop farming is a risky livelihood activity in the context of civil war, more households in Gogrial were forced by the nature of endogenous counter-insurgency to adopt pure farming in the 1990s.

The activities of the Dinka militias in the Gogrial in the 1990s stifled any attempt to possess or acquire livestock or any other valuable assets, which left households

| Table 3. Wealth and adjustment in livelihood activities in Abyei, 1990s. |
|---|---|---|---|---|---|---|
| **Wealth status** | **Typologies of household livelihood strategies during 1990s** | **Periods** | **Agro-pastoralist** | **Agriculturist** | **Pastoralist** | **Trading** | **Total** |
| Poor | Pre-war 1990s | 20 (69%) | 9 (31%) | 0 (0%) | 0 (0%) | 29 |
| Poor | 1990s | 55 (80%) | 12 (17%) | 2 (3%) | 0 (0%) | 69 |
| Middle | Pre-war 1990s | 102 (90%) | 3 (3%) | 0 (0%) | 8 (7%) | 113 |
| Middle | 1990s | 101 (79%) | 1 (1%) | 26 (20%) | 0 (0%) | 128 |
| Non-Poor | Pre-War 1990s | 63 (91%) | 1 (1%) | 0 (0%) | 5 (7%) | 69 |
| Non-Poor | 1990s | 10 (71%) | 0 (0%) | 4 (29%) | 0 (0%) | 14 |
with no other choice except farming and gathering of wild foods. In spite of this shift towards farming, the contribution of crops to the overall household livelihood declined considerably, as seen in Table 2. Interestingly, this shift from agro-pastoralism to pure farming had been experienced across all wealth groups in Gogrial. This clearly suggests that within the households exposed to counter-insurgency warfare, those households exposed to endogenous counter-insurgency warfare are less likely to diversify than are those exposed to exogenous counter-insurgency warfare.

**Off-farm and permanent migration**

Development economics recognises imputing the logic of rural migration behaviour as part of risk management strategies. It is generally argued that the households exposed to risk events widely use the *spatial* diversification of human assets, in the form of permanent or seasonal migration.

Seasonal labour migration during the pre-war periods used to play an important economic role in the livelihood of the Dinka communities in Sudan. The monetisation of the Dinka economy in the 1970s encouraged a new pattern of labour migration to western Sudan. This labour migration fitted flexibly into the cultivation pattern of the Dinka; they finished with their fields first and could take advantage of the later rains to work on the fields in western Sudan through sharecropping. Equally, there were also opportunities for Dinka youth to obtain employment as domestic or construction workers in most major towns in northern Sudan. This seasonal agricultural labour migration and off-farm employment activities in northern Sudan became an important livelihood diversification strategy for Dinka communities during the pre-war periods.

With the eruption of civil war and the intensification of counter-insurgency warfare in northern Bahr el Ghazal in the 1980s, seasonal agricultural labour migration was entirely disrupted and almost ceased to exist in the 1990s. While this disruption has had a profound impact on the livelihoods of Dinka community, the Arabs in western Sudan were equally affected by the acute shortage of labour. It is widely believed and reported that the increased incidents of abduction, forced labour and slavery experienced by Dinka communities in northern Bahr el Ghazal in the 1980s and 1990s at the hands of Arab militias, are directly linked to the acute labour shortage in western Sudan.

As a result of the increased insecurity and intensification of counter-insurgency warfare in northern Bahr el Ghazal in the 1980s, some members of households migrated permanently to the major towns and cities of northern Sudan. Using the data on permanent migration from the household surveys as shown in Table 4, it is

<table>
<thead>
<tr>
<th>Research communities</th>
<th>Initial level of household wealth status</th>
<th>Mean household members permanently migrated in the 1990s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Middle</td>
</tr>
<tr>
<td>Abyei</td>
<td>2.6</td>
<td>4.12</td>
</tr>
<tr>
<td>Gogrial</td>
<td>0.61</td>
<td>0.54</td>
</tr>
</tbody>
</table>
apparent that a considerably higher number of members of households in Abyei migrated permanently to northern Sudan in the 1990s than those in Gogrial. The households from Abyei have made best use of their position adjacent to northern Sudan, though this is a source of their susceptibility to raids, by sending household members to northern Sudan for employment opportunities and education, and importantly, to circumvent their susceptibility to counter-insurgency warfare.

In general, the non-poor households tend to have more members permanently migrated than do poor households as shown in Table 4. However, such variation is greater in the Abyei area, where non-poor households have higher numbers who have permanently migrated, almost double that of poor households, than in the Gogrial area. As rich households or families with multiple conjugal units tend to be larger in size with more members than poor households, they are able to supply their “labour surplus” to work off-farm. Another significant entry barrier to off-farm markets for poor households is the high transaction costs that are more likely to be afforded by rich households.

Interestingly, most household members who have permanently migrated are women and children, as they are the most likely victims of counter-insurgency warfare. The perceived status of women as neutral, less harmful and suspicious allows them to move freely across and between the fighting parties. Besides taking care of children and engaging in casual labour work in northern Sudan, the Dinka women have become the only link and a crucial factor in sustaining family union between the divided members of families in the divided warring Sudan.

**Risk mitigation strategies: reducing potential impact**

Generally, risk mitigation strategies aim at reducing the potential impact if the risk event were to occur, and they include livelihood diversification strategies, such as asset portfolio management, insurance and hedging. Importantly, asset and livelihood activities portfolio management includes the diversification of assets and livelihood activities, the holding of stock and investment in social capital, while insurance covers marriage, family and community arrangements.

As the main livelihood activities of Dinka communities include farming, animal husbandry, fishing and the gathering of wild foods, the most relevant livelihood activities for assessing risk mitigation strategies are farming and livestock management. Holding of stock (livestock and food) as precautionary savings will also be discussed under each of the traditional livelihood activities (farming and livestock). The status of social capital during civil war is discussed at length by Deng.24

**Farming and crop production**

Crop production is an important livelihood activity of the Dinka communities that allows households to adopt wide-ranging forms of diversification to reduce the anticipated and actual adverse effect of risk events. These forms of diversification within crop production include *enterprise* diversification (planting different crops and inter-cropping), *spatial* diversification (planting in different fields), *temporal* diversification (staggered plantings) and *varietal* diversification (e.g. use of drought-resistant varieties). I will focus in this section on enterprise, spatial and market diversification.
Enterprise diversification

On the basis of the data generated from community and household surveys, the households in Gogrial continued to plant in the 1990s the same varieties and crops that were planted during the pre-war period but with an apparent change in proportions allotted to each crop. In Abyei, however, the households adopted in the 1990s a mono-cropping of sorghum. In other words, while pre-war enterprise diversification persisted during civil war in Gogrial, households in Abyei adopted only one type of crop (sorghum) and ceased to plant other crops in their fields in the 1990s.

During the pre-war periods, the farmers of Abyei used to plant a number of varieties of sorghum (ruath, ngai and anguol) and also amounts of sesame, groundnuts, maize and okra interspersed among the sorghum. The planting, sequencing and interspersing of these crops fit well into the annual agricultural cycle (April through January), which is conditioned by the rainfall pattern and topography of the area. The garden close to the house is sown first with fast maturing varieties of sorghum (ngai), maize, and other crops, which are harvested in late August for daily meals and snacks, then the large field is sown with varieties of slower maturing sorghum (ruath) which is harvested in October. The sorghum stalks are cut at the base, allowing new shoots to sprout and accompanied sometimes with some replanting, depending on the level of moisture, which produces a smaller second harvest (anguol) which constitutes about 30% of the original harvest.

The civil war was in many ways a blessing in disguise, particularly in the context of farming systems in Abyei. As the planting time of the short maturing sorghum (ngai) and other crops coincided with the start of Arab militia activities in April/May, when they returned northward with the start of the rains, the farmers shifted their focus away from these crops to the second harvest (anguol). The massive displacement in Abyei area in the 1980s resulted in the rapid re-growth of shrubs that increased the level of moisture and provided new opportunities for the households to adopt a mono-cropping of one type of sorghum (anguol) in the second harvest when the Arab militias would be outside the area. The sorghum production, paradoxically, increased considerably during the civil war in the 1990s and even more than during pre-war period.

This shift to investing more in one planting season, or in one variety of sorghum (anguol), is an effective livelihood diversification strategy that is primarily aimed not only at reducing the effects of drought but also at reducing susceptibility to the counter-insurgency warfare in Abyei area. It is important to note that the mono-cropping (sorghum) system adopted by farmers in Abyei area, besides coping with the capricious rainfall pattern and threats of Arab raids, is largely conditioned by the market opportunities of sorghum which is in short supply in the region immediately to its south.

Spatial diversification

Using the data from the household surveys to assess the level of spatial diversification, the results show that households exposed to counter-insurgency warfare tended to have a lower number of fields than during pre-conflict periods as shown in Table 5. Comparing the mean number of household fields in the pre-war periods with that in the 1990s, the results show a lower number of fields in Abyei in
the 1990s. While the difference between the average number of fields planted by poor and non-poor households is evident in the pre-war periods, with non-poor households having more fields, such difference is negligible in the 1990s.

Interestingly, despite the fact that households in Abyei and Gogrial were equally exposed to drought, as well as counter-insurgency warfare, they opted not to take spatial diversification as an effective livelihood strategy to confront counter-insurgency warfare. This finding further confirms that diversification is not always the best risk management option for households exposed to civil war.

### Market diversification

Proximity to markets and infrastructure is a critical asset for managing risk. In the context of counter-insurgency warfare in Bahr el Ghazal region, access to markets that are in government-held areas plays a crucial role in providing not only goods and services but also provides a platform for local conflict resolution. This makes market diversification a critical livelihood option for households exposed to counter-insurgency warfare.

Using data from the household surveys to assess the level of access to markets in the 1990s, as compared to pre-war periods, the results show increased market access in Abyei area while considerable decline in Gogrial. This increase in access to markets in Abyei area is primarily attributed to the households that reverted to pastoralism who became increasingly dependent on markets and proximity of other households in Abyei area to the main market in the government-held Abyei town.

The Abyei market is an important link between south and north and it used to be one of the largest livestock markets in the Sudan. Despite the fact that civil war greatly reduced its role, the Abyei market continued to be pivotally the major source of basic commodities that are supplied from the north to most parts of Bahr el Ghazal region during the civil war. In fact, Abyei market had encouraged the fighting parties to cooperate and to allow free movement of traders and the civilian population because of their vested economic interests. While the government armed forces in Abyei town virtually monopolised the trading and market activities, the local rebel forces benefited from the high taxes levied on traders and individuals who moved in and out of the market. Besides these markets in the government-held areas, new markets emerged in the rebel-held areas that allowed free interaction between Arab nomads and the Dinka communities and local conflict resolution mechanisms.
Investment in physical assets and holding of stocks

Physical assets are generally broad and they are usually classified into productive assets, household assets and stocks. In the context of civil war, the most relevant category of physical assets in assessing the status of livelihood diversification is the holding of stocks (livestock and food) as precautionary savings. The holding of stocks is recognised as the most common form of asset diversification for risk management.26

Storing sorghum is harder than its planting

Generally, the holding of food stocks as precautionary savings plays an important role in risk management, as they have the advantage of being fairly liquid and can be consumed or sold to smooth consumption. However, these attributes of food stocks that make farmers invest in them equally make them immediate targets and susceptible to militia raids. In particular, their attributes, such as lumpiness and immobility, make grain stocks increasingly susceptible to militia raids and also make their management, particularly storage, an arduous task. The holding of grain stocks and the associated risk, particularly in the context of counter-insurgency, caused communities to drastically change their traditional storage systems.

The pre-war traditional surface storage systems of the Dinka community in Abyei have been transferred to underground storage and that made grain holding harder than its planting. With this new storage system, farmers in Abyei were able to successfully conceal their grain stocks from Arab militia raids. Generally, the storage of sorghum that is harvested in November/December must finish in mid-December and early January, prior to the arrival of Arab militias in January/February, and such urgency necessitates collective action and shared roles between men and women. The stored grain must remain untouched until the rains start in April/May, when Arab nomads start returning northwards. Of great interest is that when these underground stores are opened in May, it coincides well with the opportune time when there would be high demand for sorghum in the southern neighbouring Twic area.

During the pre-war periods, the farming activities, particularly harvesting and threshing, like any other livelihood activity in Dinka society were strictly and traditionally apportioned by sex. Cleaning of fields, sowing, and weeding were done by both men and women. But for the harvest, men used to chop sorghum stalks and women cut sorghum heads, and threshed and stored the harvest as a prelude to their (female) cooking duties.27 In the 1990s, these roles and others changed drastically, with men assuming more responsibilities in harvesting, threshing and storage. Besides the erosion of apportioning agricultural activities by sex, mutual labour assistance clubs (mat) and beer parties became more institutionalised and practised in the 1990s to perform collectively the most critical agricultural activities, such as harvesting, threshing and underground storage.

Unlike the situation in Abyei area, the households exposed to endogenous counter-insurgency warfare in Gogrial were less successful in holding their stocks in the 1990s. The households in Gogrial area had tried various measures, including underground storage and on trees in the forest, of keeping their limited crop harvest but such measures did not reduce the susceptibility of these stocks to Dinka militia raids. Unlike the situation in Abyei, the failure of stock storage in Gogrial is largely related to the nature of endogenous counter-insurgency warfare as the potential
victims (households) and the attackers (Dinka militias) have the same information about the newly adopted storage strategies. As most of the attackers came from within their communities, they had inside and detailed information, not only about the general household livelihood strategies, but even specific information about the particular strategies adopted by each individual household including the stock stores.

One chief in Gogrial said “we tried first to hide our stocks in the forest (bodiec), then we buried our stocks in the form of a grave (rang), and then stored them underground in our own huts and cattle byres, but we did not succeed as we were failed by our own sons who revealed our survival secrets”. Another woman said “we became victims of our own stored stocks, as we did not only lose our stocks but also we were brutally forced to carry such stocks when discovered by militias”. Unlike the situation in Gogrial area, information about food storage strategies adopted by each household in Abyei area was not easily available to their attackers (Arab militias).

Livestock management
Livestock as assets have the dual characteristic of being productive assets and stocks. Livestock, such as cattle, can be used as work animals and for transport, can be consumed (milk, meat or blood), represent a good store of value, and also serve as stocks that can be liquidated and have other social values. Unlike food stock that is stationary and lumpy, livestock are mobile and this makes them increasingly important for reducing the effects of risk events. All these attributes of livestock make them a popular means of precautionary savings and an effective means for household risk mitigation strategy.

Animal husbandry, particularly cattle, is the primary feature of the Dinka economy and the significance of cattle goes beyond their economic value, as they are used to maintain social relations, religious values and political institutions. The value of cattle in Dinka society, as described by Lienhardt, is that of “something to which men have assimilated themselves, dwelling upon them in reflection, imitating them in stylised action, and regarding them as interchangeable with human life in many social situations”. Despite the effect of modernisation, the monetisation of their economy and even wars, cattle are still pivotal to Dinka livelihoods.

The management of livestock during the pre-war period was very much conditioned by seasonality and organised around regular and seasonal migration between cattle camps in swampy areas (toic), and permanent settlements or villages (baai), which maximised the utilisation of livestock products and minimised the tension between animal husbandry and crop production. The herding of cattle is generally collective except for the few cows kept permanently at home for milk. As a single family or household cannot protect its cattle alone, the co-operation of territorial groups – either a section of the tribe or a subsection – becomes necessary. Normally cattle are directly managed by family members, mainly youth, with a few cases where cattle are entrusted or loaned to members outside the family.

During the civil war, the management of cattle changed drastically. While the management of cattle became less of a preoccupation of the households exposed to endogenous counter-insurgency warfare, the households in Abyei area adopted a different way of managing their cattle. In Abyei area the regular and seasonal migration between cattle camps in swampy areas (toic) and permanent settlements or villages (baai) changed with cattle being kept more in new swampy areas in the areas south and west of Abyei and far away from permanent settlements. This change in
the management of cattle resulted in households having limited access to and utilisation of livestock products but minimised as well the tension between animal husbandry and crop production.

During the counter-insurgency warfare in the 1990s, two of the possible options available to cattle owners were either to directly manage their cattle, or to diversify their livestock by entrusting or “tethering” some animals to the custody of close relatives or friends. The custom of giving cattle in custody to others known as “kuei”, is normally practised by the Dinka to minimise the risk of diseases or to disguise wealth, in order to escape the risk of cattle being claimed in discharge of kinship or other obligations. Other functions of kuei include: improving cross-breeding, creating space for one’s herd, a form of assistance to relatives or friends and to accumulate independent and concealed wealth, particularly by young men.30

According to the risk literature and on the basis of diversification arguments, it is rational that the strategy of entrusting or loaning cattle (kuei) would be practised more during counter-insurgency warfare in the 1990s than the direct management of cattle. In fact the practice of kuei declined considerably, while the direct management of livestock increased in the 1990s among households exposed to endogenous counter-insurgency warfare in Gogrial. On the other hand, the practice of kuei slightly increased in Abyei area with custodians mainly from maternal relatives who are more trusted in Dinka society than paternal relatives or friends.

This practice of kuei increased among the households in Abyei area because the nature of exogenous counter-insurgency warfare strengthened trust and specialisation. This necessitates that those households farming, but with a limited number of livestock (poor households), entrust their small number of livestock to those who have adopted a pastoralist livelihood away from Abyei area during the 1990s. This explains the apparent decline in the contribution of livestock to household livelihood in Abyei area as shown in Figure 1, as livestock are kept far away from the area.

Forward bartering of sorghum with livestock

Despite the apparent decline in the contribution of livestock to household livelihood in the 1990s, there has been a considerable but gradual acquisition of livestock through the bartering of sorghum with cattle in Abyei area as shown in Table 6. It is clear that during the 1990s, most households in Gogrial sold more livestock (92%), particularly non-poor households (97%). Interestingly, about 46% of households in Abyei area bought more livestock in the 1990s, while only 24% of households sold more livestock.

The high purchases of livestock, particularly cattle, in Abyei area are linked to the substantial increase in sorghum production which is being bartered with livestock from Twic area. The sorghum is stored underground during the critical periods (January–May) of potential raids by the Arab militias, and these stored sorghum stocks are only used in May/June when the risk of attacks by Arab militias is minimal that coincided with high demand for sorghum in Twic area.

However, while households will be anxiously concerned about their stored sorghum because of potential Arab militia attacks, they will be equally concerned about disposing of their stored sorghum during the rainy season, so as to avoid storage losses caused by rains and potential underground moisture and humidity. On the other hand, households in Twic area, who normally face food shortage as a result of limited arable land and recurrent flooding and drought, have a high demand for...
sorghum during the hunger period (June/July), but are also concerned about the high prices of sorghum and the low prices of livestock at this time.

With these conditions faced by households and farmers in Abyei and Twic, they innovatively resort to forward bartering of sorghum with cattle, with prices fixed immediately after harvest in November/December, and actual payments taking place in May/June. These hedging measures and forward bartering have actually stabilised bartering prices and have greatly helped farmers to dispose of and clear their stored sorghum stocks in a timely manner, while households in Twic area have been able to sell their cattle at reasonable prices and terms of trade. With these innovative measures, the households in Abyei area were able during the 1990s to acquire additional assets (cattle) that encouraged them to specialise in and increase sorghum production.

### Status of poverty in the 1990s

The status of poverty, as one of the major outcomes of the risk management strategies, is used to assess the effectiveness of livelihood strategies adopted during civil war. In assessing the status of poverty during the 1990s, the focus has been on the dynamics of transition and movement within and across various wealth groups. 31

Given the lack of panel data, I relied in the fieldwork household survey on a household’s perception of its wealth status.

In order to assess the number of households that moved in or out of the poor group in the 1990s, the data relating to the initial level of household wealth in the pre-war periods are cross-tabulated with their wealth status in the 1990s, as shown in Table 7. The personal wealth ranking measure is used by specifically asking household heads to describe the wealth status of their households both before and during war. It is clear from Table 7 that there was considerable increase in the level of poverty in both areas in the 1990s but higher among the non-poor households and households exposed to endogenous counter-insurgency in Gogrial.

Equally the immobility measure (I), as indicated by the sum of the shaded cells of the leading diagonal of the transition matrix in Table 7, shows that about 57.3% of households in Abyei did not change their wealth status in the 1990s, while about 19.5% of households did not change their wealth status in Gogrial. It is clear that

<table>
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<tr>
<th>Research communities</th>
<th>Livestock purchases in 1990s compared with pre-war periods</th>
<th>Initial level of household wealth status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Middle</td>
</tr>
<tr>
<td>Abyei</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sold more</td>
<td>8 (28%)</td>
<td>24 (21%)</td>
</tr>
<tr>
<td>The same</td>
<td>10 (35%)</td>
<td>31 (27%)</td>
</tr>
<tr>
<td>Bought more</td>
<td>11 (38%)</td>
<td>58 (51%)</td>
</tr>
<tr>
<td>Gogrial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sold more</td>
<td>27 (71%)</td>
<td>97 (97%)</td>
</tr>
<tr>
<td>The same</td>
<td>9 (24%)</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Bought more</td>
<td>2 (5%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

*Table 6. Level of livestock acquisition by households in the 1990s.*
while there was increased incidence of poverty during civil war, the households exposed to endogenous counter-insurgency warfare suffered more.

Applying proportional hazard model to compare the dynamics of poverty during civil war, Deng finds that households exposed to endogenous counter-insurgency warfare were more likely to enter poverty than were those households exposed to exogenous counter-insurgency warfare. This is attributed partially to the nature of counter-insurgency that weakened the effectiveness of livelihood strategies that were adopted by the households exposed to endogenous counter-insurgency warfare.

**Conclusions**

This article is an attempt to assess the status of livelihood diversification during civil war in the 1990s among the Dinka communities of Sudan. Taking diversification as the most popular livelihood strategy used in development studies to assess the level of adjustment to changes in external environment, the results of a comparison of primary livelihood activities indicate that diversification is not always the best livelihood strategy option in the context of civil war. Generally, the households exposed to counter-insurgency warfare tend to diversify their primary livelihood activities less than during the pre-war period.

Within the households exposed to civil war, those exposed to endogenous counter-insurgency warfare tend to diversify their primary livelihood activities less than those households exposed to exogenous counter-insurgency warfare. Interestingly, among the households exposed to exogenous counter-insurgency warfare, the non-poor households paradoxically tend to diversify their primary livelihood activities less than the poor households. Similar findings are also observed from the results of the comparison of different forms of diversification in crop production and assets management.

The findings in this article clearly point to the important role played by the nature of risk in determining the level and type of diversification strategies adopted by households. Specifically, sweeping generalisations about the common pattern of livelihood diversification in the context of climatic risk or macro-economic shocks in rural sub-Saharan Africa may not be tenable in the context of civil war. Even within the context of civil war, as shown by the case of Sudan’s civil war, it is difficult to

<table>
<thead>
<tr>
<th>Research communities</th>
<th>Level of household wealth status in the 1990s</th>
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<tr>
<td></td>
<td>Initial household wealth status</td>
</tr>
<tr>
<td>Abyei</td>
<td>Non-poor</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
</tr>
<tr>
<td>Chi-square = 78.64</td>
<td>Kendall’s tau-b = 0.457</td>
</tr>
<tr>
<td>Gogrial</td>
<td>Non-poor</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
</tr>
<tr>
<td>Chi-square = 4.15</td>
<td>Kendall’s tau-b = 0.111</td>
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</tbody>
</table>
draw common patterns in livelihood diversification, as communities in conflict areas are differently exposed to various types of counter-insurgency warfare.

One clear policy implication for the international organisations and humanitarian agencies operating in the war zones is that livelihood diversification is not necessarily the best livelihood strategy option and humanitarian intervention, particularly in food security programme, needs to be tailored to the context. Specifically, development of markets in the war zones is extremely important as such markets play a critical role in bridging between the divided communities and warring forces and can equally provide a forum for local conflict resolution and confidence building.

As this article has primarily focused on the effect of counter-insurgency warfare on the choice of the level of livelihood diversification, there is a need for future research to assess and disentangle the effects of insurgency warfare on the choice of household livelihood strategies. Equally, future research needs to use more rigorous methods, such as a livelihood diversity index method, and to incorporate other combinations of various livelihood activities that have not been considered in this article.

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Notes
1. Devereux, “Famine in the Twentieth Century.”
2. Ellis, *Rural Livelihoods and Diversity in Developing Countries*, 15.
4. Alderman and Paxon, *Do the Poor Insure?*
12. Ellis, *Rural Livelihoods and Diversity*.
15. Deng, “Confronting Civil War.”
17. Deng, “Famine in the Sudan.”
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22. Little, *Somalia: Economy without State*.
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