

2013

# Child poverty in a conflict situation: a multidimensional profile and an identification of the poorest children in Western Darfur

Jean-Francois Trani

*Washington University in St. Louis, George Warren Brown School, [jtrani@wustl.edu](mailto:jtrani@wustl.edu)*

Timothy I. Cannings

*University of Cambridge, UK*

Follow this and additional works at: [http://openscholarship.wustl.edu/brown\\_facpubs](http://openscholarship.wustl.edu/brown_facpubs)



Part of the [Social Work Commons](#)

---

## Recommended Citation

Trani, Jean-Francois and Cannings, Timothy I., "Child poverty in a conflict situation: a multidimensional profile and an identification of the poorest children in Western Darfur" (2013). *Brown School Faculty Publications*. Paper 42.

[http://openscholarship.wustl.edu/brown\\_facpubs/42](http://openscholarship.wustl.edu/brown_facpubs/42)

This Journal Article is brought to you for free and open access by the Brown School at Washington University Open Scholarship. It has been accepted for inclusion in Brown School Faculty Publications by an authorized administrator of Washington University Open Scholarship. For more information, please contact [digital@wumail.wustl.edu](mailto:digital@wumail.wustl.edu).

# Child poverty in a conflict situation: a multidimensional profile and an identification of the poorest children in Western Darfur

Jean-Francois Trani and Timothy Ivor Cannings

July 13, 2012

## Abstract

Darfur is currently in a very complex situation making humanitarian intervention a very challenging endeavour. The civilian population is caught in the middle of armed confrontation resulting in massive forced displacement as well as in food shortage, lack of access to safe source of water and sanitation facilities, shelter, essential health services. Children are particularly vulnerable in conflict situation as they are higher risk of physical and sexual violence or emotional abuse. Applying the Alkire and Foster index of multidimensional poverty to a selected set of dimensions of deprivation identified through a large scale household survey in Western Darfur carried out in 2009, included dimensions usually missing in surveys, such as economic exploitation or child labour, physical safety, empowerment or social participation, and psychological wellbeing, our findings show that children with disability, particularly girls with severe disability, are more often multidimensional poor and on a higher number of dimensions. They are particularly excluded from education as school are not accessible, teachers lack training to welcome special needs children and appropriate equipment and materials are missing. These findings also implies that because of the variety of domains of deprivation, tackling poverty of children in Western Darfur cannot only rely on identifying those below a given income poverty line.

## 1 Introduction

Darfur has been in a state of conflict since 2003 and West Darfur has been the site of much of the ongoing Darfur conflict. There have been numerous Security Council resolutions to enforce stability in the region since 2004 with little improvement in the security of civilians. Currently there is only a small force of African Union and United Nations (UNAMID) peacekeepers in the region to protect the civilian population. Many have questioned the extent to which there is a unified and

enforceable programme for protection of people in Darfur. The current political crisis has been at the origin of a major humanitarian assistance operation. War has a collective impact on families, communities and societies that widely affects their members. The population has been subjected to forced displacement and armed conflict, with children being most at risk of violence in comparable armed conflict situations . Yet, there is a limited literature on the impact of the current civil war on the circumstances of the local population and on how to identify and address its needs. It is even more so the case for children although they are at a higher risk of poverty than adults as they are not economically independent. Children often pay the heaviest toll to conflicts: since 2000, conflicts orphaned one million children, killed a further 2 million, left 6 million disabled and forced 20 million to flee their homes . Half of the poorest states are experiencing conflict and half of their population is under 18, raising concern about the threat armed conflict presents for safety, health and livelihood to civilian children . Before the war, Darfur was neglected by the central government and as a result was not benefitting from any development policy. As a result, the Darfurian population has been in a state of chronic poverty for decades, and insecurity has been adding a new dimension to existing material poverty and deprivation of other basic capabilities such as access to adequate quantity and quality of food, clean water or sanitation but also to education and healthcare .

### **1.1 poverty in post-conflict situations**

A growing body of literature has established the existence of a strong link between poverty and conflict . War constitutes a major external shock for households that increases vulnerability understood as the risk to fall into poverty . Countries affected by conflict are left with disrupted basic services (particularly healthcare and education systems), a disorganized economic system translating in lack of livelihood opportunities for the adult population. Besides direct death or injuries, civilians in war torn countries are also affected by forced recruitment of household members, forced displacement or migration, morbidity and disability linked to absence of adequate healthcare services and poor mental health due to exposure to traumatic events . Forced migration provokes important loss of assets that inevitably leaves displaced households in situation of poverty hard to overcome . Ibaez and Moya (2010) argue that economic recovery is particularly unlikely for households at the lower end of income distribution. Their lack of assets creates a lasting poverty trap and structural poverty as assets have been identified as a strong protection mechanism against shocks . Relatively wealthier households are able to adopt various strategies to mitigate the impact on conflict and other types of shocks such a famine on their livelihoods . They first reduce short-term consumption and then sell non productive assets to protect productive assets such as land and animals . But often, as it is the case in Darfur, armed groups are able to pursue the fight by extorting resources such as land, animals and other assets from the civilians, jeopardizing

the future capacity to recover from the conflict and escape poverty. Finally, conflict also has a strong impact on social relations and often disrupt social networks making it more challenging to escape poverty. As a matter of fact, social capital is central to fighting poverty by providing assistance to raise capital, to find a job and, through risk sharing, strategies to mitigate shocks (Little et al., 2006). Therefore, prolonged conflict has an important toll on a large portion of the population.

## **1.2 Measuring child poverty**

In this paper, we examine the extent and intensity of child poverty in West Darfur taking a capability approach. We argue that we need to shift the poverty measurement and analysis from a uni-dimensional perspective to a multidimensional one to capture child specific requirements in terms of basic needs. Traditional welfarist univariate measure of poverty is based on income or expenditure and is a money-metric measure. Poverty is either absolute when basic needs to survive are not covered or relative when income or consumption levels are below the living standard of a considered country. This approach has been criticised by Sen (1976) who argued that the welfarist approach does not take into account the relative situation of the poor: individuals defined as poor remain poor even if they benefit from an increase in income as long as they remain below the poverty line. Sen (1976) seminal work aiming at a multidimensional measure of poverty has addressed the issue of identifying the poor and aggregating their characteristics in a unique index. The multidimensional approach draws Sen's capability approach and focus on various factors that impede individual's well-being. Sen gives preeminence to the individual's well-being, which does not only depends on income but on capabilities, and agency, the individual freedom to achieve goals the person values (Sen, 1999). Poverty defined as deprivation of capabilities refer to the absence of choice for a person to lead a life that she values. Multidimensional poverty measurement and analysis enables a greater understanding of how the inclusion of non-income dimensions can modify the appraisal of poverty. Multidimensional measures provide an accurate, easy to comprehend, able to identify variation through time, in depth and yet integrated view of poverty. Furthermore, multidimensional measures enable researchers to view not only how many deprivations people experience at the same time, but also how these deprivations overlap. Several measures have faced two main limitations. First, they assume that variables for each dimensions are cardinal. Second, there is no identified method for the identification of the poor, especially beyond two dimensions. A rapid overview of child poverty measures explores what methods and instruments are available to explore multiple domains of child deprivation, but at the same time allow to quantify child poverty and guide poverty reduction strategies.

In the absence of income poverty figures for children in developing countries, the literature has explored non-income dimensions of poverty and different definitions

and measures of multidimensional child poverty. Several international institutions such as UNDP (2000), UNICEF (2005) and the World Bank (2005) have introduced definitions based on several dimensions. All organisations point out that poverty dimensions children experience are interrelated and have an impact on the child's development process. Child poverty measures have evolved from unidimensional to multidimensional approaches and we can identify three major measures of poverty.

First, the child poverty count measure is a unidimensional headcount ratio measure applied to different deprivations of children. Corak (2006) has applied this measure to household income but suggested to use various indicators inspired from a definition of poverty based on the Convention on the Rights of the Children (CRC). Minujin et al. (2006) referring to the work of a team from the University of Bristol and the London School of Economics propose a measure based on the deprivation approach that defines a basket of seven basic services and capabilities and identified what proportion of children are deprived of them. A threshold is fixed for each of the seven dimensions and reflects child rights violations. Children were defined as being absolutely poor if they were under the threshold of two or more basic human needs. The Bristol approach introduces several dimensions but summarizes them in a single headcount ratio that only provides a limited analysis of depth and intensity of child poverty.

Second, the child poverty index measures are composite indices combining indicators related to child well-being. Bradshaw et al. (2007) introduced a European Child Wellbeing Index to allow child deprivation comparison across the European Union. It is based on the Convention on the Rights of Children and identifies eight clusters with 23 domains and 51 indicators constructed to compare the Member States. The clusters are children's material situation, housing, health, subjective well-being, education, children's relationships, civic participation and risk and safety. Save the Children UK (2008) developed the Child Development Index used in more than 140 developed and developing countries to look into child poverty. It relies on three indicators of health (under-five mortality rate), nutrition (proportion of under-five underweight) and education (proportion of primary school-age children not enrolled in school). These indicators, easily available across countries, are considered of equal weight and combined in an index based on the average score between them. A high score represents a high level of child deprivation. The US Child and Youth Wellbeing Index (CWI) was developed by . The index is constructed to monitor changes in the quality-of-life of children and youth in specific demographic and geographical groups and includes seven domains: family economic well-being; health; safety and behavioral concerns; educational attainment or productive activity; community connectedness; social relationship and emotional or spiritual well-being. All these indexes have been criticised for not carrying enough information and for not being affected by variation between their components.

Finally, there are comprehensive child poverty measures that are characterised by the

inclusion of all aspects of children's lives in the definition of the deprivation index. The Young Lives project explores childhood poverty and perception of poverty over 15 years in four countries using a participatory approach (Ethiopia, Peru, Vietnam and India). The project identifies six domains of child deprivation based on a set of basic needs also derived from the CRC: nutritional status; physical morbidity; mental morbidity; life skills (literacy, numeracy, work skills etc.); developmental stage for age; perceptions of wellbeing and life chances. Christian Children's Fund (CCF) established another holistic index based on a study related to experiences and impact of poverty on children. Authors developed the DEV (deprivation, exclusion and vulnerability) framework to account for the complex nature of child poverty. The framework investigates domains of deprivations but also the context, severity and intensity of these deprivations. The Deprivation domain reflects the shortage of provision of basic needs. Exclusion explores the mechanisms that prevent child's full participation in society. Vulnerability explores poverty dynamics over time and the factors that cause the child to fall into or on the contrary enable him to escape poverty. Both holistic frameworks did not attempt to develop into a tool for child poverty analysis and measurement. Authors argue that child poverty is such a complex phenomenon that quantifying it would only jeopardise the understanding of the phenomenon. As a result, these approaches do not provide any easy-to-use instrument on which to elaborate straightforward recommendations and to conduct monitoring and evaluation of policy aiming at fighting child deprivation.

None of the existing child poverty approaches combine an in-depth and extensive understanding of child poverty while at the same time providing an instrument of measure that includes all identified domains of child deprivation, through, for instance, a participatory process. In our study, we used a combination of quantitative and qualitative analysis to identify domains and to understand the scale and causes of child deprivation in Darfur. We apply the Alkire-Foster counting method (2011) to the identified components of deprivation functioning as it offers the possibility to identify in which dimensions, to what extent and which groups of children are effectively deprived.

### **1.3 Poverty and disability**

A relatively vast literature has been referring to the association that might exist between poverty and disability. However, the evidence base that explores this relationship, with a few notable exceptions, is largely anecdotal in nature and remains under-researched. It has been argued that a vicious, self-reinforcing cycle exists between disability and several domains of multidimensional poverty. Poor nutrition, poor living conditions, low literacy, limited access to child and maternal health, natural disaster may cause disability. Majority of people with disabilities find their situation affects their chances of accessing healthcare services, going to school, working for a living, enjoying family life and participating as equals in

social life. Further, disability might reinforce poverty and vulnerability through social exclusion, and economic burden not only on the individual but also the family as a whole. Hence they are caught into the vicious circle of disability - vulnerability and poverty. It has been estimated that 10% of the world's population are disabled and facing barriers to function in society at par with other citizens as a corollary of their impairment, and that 80% of these people with disabilities allegedly live in low- and middle-income countries, and that over 80% of them live below the poverty line : 1.

Exploring the link between disability and poverty is a complex endeavour as definitions of both disability and poverty vary. Disability has been defined differently depending on the paradigm considered. The medical approach based on the individual and his/her impairment, considers the physical or mental 'problem' that a person has . The model is strongly normative as people are considered disabled on the basis of being unable to function as a "normal" person does . This model although still largely used in practice, especially in the medical field, has been criticised on several grounds. First, authors argue that in individualizing disability, the medical model downplays social factors that are central for allowing or impeding persons with impairments to function in society. Secondly, the concept of human diversity assumes away wider consideration of diversity in terms of age, sex, general intellectual and physical abilities, social circumstances, and climatic differences : 28. Finally, the medical view may lead to or be used to justify a stark and exclusionary separation between normal individuals and those defined as abnormal. The social model of disability conversely put forward the argument that persons are 'disabled' because of the structure of the society in which they live, which does not accommodate their impairment. This means that it is the environment, both physical and social, that makes an individual with impairment, a person with disability . It also aims to address issues of marginalisation, oppression and discrimination while trying to denounce and remove the disabling barriers produced by hegemonic social and cultural institutions. This model also presents a number of shortcomings. By putting the emphasis on over-socialisation, the model undermines the impact of impairment on abilities and underplays the possibility to remove some of the pain, fatigue or even illness or activity limitations and problem of body function that can be associated with certain conditions. Furthermore, the social model ignores the problematic of welfare policies that need tools and references to evaluate impairment and disability to compensate for instance for incapacity to work and earn a living. By downplaying the notion of impairment and focusing on disability as created by society, the model restricts considerably the potential reach of policy intervention. The World Health Organisation (2001) has suggested a definition that covers both the medical and the social model . Disability is an umbrella term, covering impairments, activity limitations, and participation restrictions. Impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in

involvement in life situations. Thus disability is a complex phenomenon, reflecting an interaction between features of a person's body and features of the society in which he or she lives. Sen's capability approach offers original and important resources for redefining impairment and disability, and designing inclusive social policies. Sen argues that equality should be defined and aimed at in terms of the capability each individual has to pursue and to achieve well-being, i.e. to pursue and enjoy states and objectives constitutive of her or his well-being. Within this space, Sen distinguishes functionings and capabilities. Functionings are defined as 'beings and doings constitutive of a person's being', such as being adequately nourished, being in good health, being happy and having self-respect, or taking part in the life of the community : 39. Capability is, thus, a set of vectors of functionings, reflecting the person's freedom to lead one type of life or another : 40. Rather than trying to 'label' whether a person is disabled or not, it focuses on whether a given impairment leads to vulnerability and difficulty in functioning. The capability approach looks at the impact of disability on the family and community as well (in terms of coping strategies, resources and burden). It focuses mainly on the agency of the person, to take the decisions that s/he has reason to value.

Following the introduction, the present paper is organised as follows. Section 2 introduces data source used in this study and methods of measurement of children multidimensional poverty. Section 3 provides some results on child multidimensional poverty in West Darfur. Finally, Section 4 concludes.

## **2 Methodology**

### **2.1 Data source**

Our analysis uses data gathered through a census of all households in all rural and urban localities, nomadic households and Internally Displaced Persons (IDP) settlements in the rural council of Um Kher, part of the locality of Wadi Salih in the state of West Darfur. We interviewed 11089 heads of household on household member characteristics (gender, age, matrimonial status, employment, education, income) and household assets (type of housing, possession of land and animals, agricultural production). We randomly selected 10% of these Households for interviews on disability prevalence as well as vulnerability of children aged 6 to 18 years old. Face-to-face interviews were conducted with 1126 children on various dimensions of poverty initially identified through the deliberative participatory process (education, health, nutrition, employment, livelihoods, social participation, care, love and mistreatment). To be able to compare deprivation among disabled and non disabled children, disability was assessed using a 35-items screening tool referring to activity limitations, adapted to the cultural context, avoiding stigma and negative stereotypes, and initially elaborated for Afghanistan. This questionnaire



is based on the International Classification of Functioning, Disability and Health (ICF) (WHO, 2001) as well as the Capability Approach (Sen, 1993, 1999). As a result, it includes the short set of questions of the Washington Group of Disability Statistics developed in application of the ICF as well as 29 other questions looking at activity limitations and difficulty in functionings. We used a four-level Likert-type scale (1 = no, never; 2 = yes, sometimes; 3 = yes, often; and 4 = yes, constantly /always, then adapted and tested for internal consistency. Six types of disabilities were screened for: motor or physical disabilities, sensory disabilities, learning and developmental disabilities, behavioural disabilities mood and affect disabilities and neurological disabilities. In absence of any established cut-offs and any gold standard, we used frequency of occurrence of items to elaborate an overall prevalence score of disability. No sign of disability corresponds to absence of positive answers to any of the 35 items (56.0% of the total sample); 'mild' level of disability is reflected by one answer "Yes, sometimes" to any of the 35 items (12.5%); 'moderate' disability when the respondent gave between 2 and 3 answers "Yes, sometimes" or 1 answer "Yes, often" (10.3%); 'severe' more than 3 answers "Yes sometimes" or between 1 and 3 answers "Yes, often" (14.1%) and very severe at least 1 answer "Yes constantly, always" or more than 3 answers "Yes, often" (7.1%) . We regrouped the disability score in three categories: (1) no disability, (2) mild/moderate and (3) severe/very severe disability. For purpose of simplicity, we will refer to (1) no disability, (2) moderate disability and (3) severe disability in the analysis. We conducted sensitivity analysis to check for robustness of the difference in terms of multidimensional poverty between disabled and non disabled children by calculating the multidimensional poverty index (MPI) by disability types: (1) no disability, (2) mobility/locomotor, (3) sensory, (4) behavioral and mental, (5) multiple disability. <sup>1</sup>

## 2.2 Alkire-Foster multidimensional index

In this paper we use the multidimensional poverty measurements introduced by Alkire and Foster . The methodology utilises a dual cutoff criteria, that is, it uses two different types of cutoff, the first relating to each dimension separately, and the second across the dimensions.

We let  $n$  be the number of individuals in the population, and  $d$  be the number of dimensions under consideration. We suppose that the data are contained in an  $n \times d$  matrix where the  $ij$ th entry represents the value of the  $j$ th variable for individual  $i$ . The cutoffs are represented in a vector  $C$  of length  $d + 1$ , with entries  $c_j$  for  $j = 1, 2, \dots, d$  specifying the poverty line for the dimension  $j$  and  $c_{d+1} \in \{1, 2, \dots, d\}$  specifying the minimum number of dimensions in which an individual must be deprived in order to be classified as poor. Subsequently a poverty measure,  $M_0$ , derived from the Foster et al. (1984) measures is introduced to aggregate the data into a unidimensional index. Alkire and Foster (2011) outline

a series of intuitively desirable properties that this methodology satisfies . These include decomposability, allowing comparison of different subgroups of the population, and dimensional monotonicity, i.e. it accounts explicitly for the number of deprivations experienced by those identified as poor.

### 2.3 Identification

Given the  $n \times d$  matrix  $Y$  containing the data and the vector of cutoffs  $C$ , we define the matrix  $G^0$  as follows:

$$g_{ij}^0 = \begin{cases} 1 & \text{if } y_{ij} < c_j \\ 0 & \text{otherwise.} \end{cases}$$

Then the generic element  $g_{ij}^0$  of  $G^0$  represents an indicator of whether individual  $i$  is deprived in dimension  $j$ . More formally,  $g_{ij} = \gamma(y_{ij}, c_j)$ , where  $\gamma : R \times R \rightarrow \{0, 1\}$  is an identification function for a single dimension which recognises if the individual  $i$  can be considered poor with respect to the dimension  $j$ . Given the matrix  $G^0$  we let,

$$d_i = \sum_{j=1}^d g_{ij}^0$$

be the generic entry of vector  $D$  representing the number of dimensions on which individual  $i$  is deprived. Then that person is considered poor if  $d_i \geq c_{d+1}$ . This methodology incorporates two key features, firstly it allows us to preserve information at the single dimension level and secondly provides flexibility through the choice of the second cutoff,  $c_{d+1}$ ; a natural generalisation from the commonly used union ( $c_{d+1} = 1$ ) and intersection ( $c_{d+1} = d$ ) approaches. As a result the analysis can be adapted to target specific policy goals and priorities . By increasing the cutoff we can *zoom in* to analyse a smaller group with a more multiplicity of deprivations, alternatively we can consider a wider proportion of the population by decreasing the cutoff.

### 2.4 Aggregation

After identifying the poor for a specific cutoff vector  $C$  we can define a series of multidimensional poverty measures. The first of these measures can be easily derived from the number deprivations experienced by each individual. Let  $Q$  be an  $n$ -dimensional vector with generic entry,

$$q_i = \begin{cases} 1 & \text{if } d_i \geq c_{d+1} \\ 0 & \text{otherwise.} \end{cases}$$

then the quantity,

$$H = \frac{1}{n} \sum_{i=1}^n q_i$$

represents the *proportion of population identified as poor* in the data.  $H$  gives an easily understandable indicator of poverty, however it does not satisfy the property of dimensional monotonicity. That is for a poor person  $i$ , say,  $H$  remains unchanged as  $d_i$  changes unless individual  $i$  becomes non-poor. To capture the breadth of deprivation experienced by the poor, a new matrix  $G^{0*}$  is defined with generic entry

$$g_{ij}^{0*} = \begin{cases} g_{ij}^0 & \text{if } q_i = 1 \\ 0 & \text{otherwise.} \end{cases}$$

and subsequently we can calculate,

$$A = \frac{\frac{1}{d} \sum_{i=1}^n \sum_{j=1}^d g_{ij}^{0*}}{\sum_{i=1}^n q_i}$$

the *average deprivation share* across the poor, i.e. the average proportion of the  $d$  dimensions that those identified as poor are deprived in. Finally the *adjusted head-count ratio*,

$$M_0 = \frac{1}{nd} \sum_{i=1}^n \sum_{j=1}^d g_{ij}^{0*} = H \times A$$

can be introduced. Note that  $M_0 \in [0, 1]$  can be seen as the total number of all the dimensions on which poor people are deprived, divided into its maximum possible value. As noted above,  $M_0$  satisfies the property of *dimensional monotonicity* as it increases according to any increase in the number of deprivations experienced by a poor person. It is also *poverty focused* as it is invariant to changes in the value of  $d_i$  for a non-poor person (who remains non-poor). In other words, if a non-poor individual becomes more (or less) deprived on some dimension but still remains identified as a non-poor, then the  $M_0$  index does not change.

There are some limitations to this method, primarily in the choice of the dimensions to be considered and subsequently in the choice of the cutoff for each those dimension. While the choice of  $c_{d+1}$  can allow flexibility in the analysis, the choice of the first  $d$  cutoffs must be made carefully. Indeed, there is no universal criteria for these choices, and decisions need to be well informed.

## 2.5 Selecting dimensions of deprivation and cutoffs

In any approach to poverty measurement the selection of domains is central to explore multiple deprivations. Often, available data constitutes a first limitation over the selection of dimensions. In any case, choosing relevant dimensions for children deprivation should be based on public discussion and debate to better reflect children's multiple deprivation. It should encompass basic capabilities as fulfilling basic capabilities are crucially important functionings, comparable to basic needs. In a context of extreme poverty such as Darfur, including basic capabilities such as sufficient nutrition, adapted shelter, basic education and access to healthcare

seems relevant . Yet determining adequate levels of basic capabilities to escape poverty can vary between individuals and societies. Similarly, identifying which dimensions are central depends on social and individual characteristics. The literature has also shown the relevance of separating children from their adult nexus and for identifying the relevant dimensions of deprivation based on their specific circumstances . Biggeri et al. (2006) demonstrated that in the case of children, age and parental functioning (as well as capability to function of other parental figures such as guardians or teachers) are discriminant factors for identification of relevant capabilities and their own agency . Another important issue to consider for child poverty measurement is the “missing dimensions” that weakens the significance of the whole endeavor . Alkire (2008) suggested five different modes to choose the domains and argued that they often overlap and are used in tandem : relying on data or convention, following lists based on public consensus, choosing dimensions through a participatory process, selection according to a theory based on an implicit or explicit assumption about what people do value or should value, and empirical evidence regarding people’s values (or expert analysis) . Robeyns (2003) identified four conditions for the choice of dimensions: to explicitly formulate the reasons for choosing each dimension, to justify the methodology by which these were chosen, to draw an ideal list of dimensions and a more pragmatic list taking into consideration constraints linked to data, measurement design, socio-economic or political factors and to include all important elements, i.e., any element that is not reducible to other elements . In our study, we followed four steps identified by Biggeri and Libanora (2011) to select relevant dimensions: (1) A participatory approach to identification of deprivation dimensions, (2) identifying achieved functionings in each dimension, (3) establishing a consensus on the relevance of dimension and (4) prioritising dimensions through the participatory process . A recent study looking at multidimensional poverty among people with psychiatric disorders has shown the relevance of adopting a comprehensive participatory framework to select dimensions of poverty and rank these dimensions to determine relative weights . Yet, it was not possible to conduct such an in-depth participatory process in the context of Darfur for several reasons. We faced major logistic and human resources issues as well as conceptual issues, particularly for ranking dimensions. As a first step, we engaged a debate around an initial theoretical list of basic capabilities based on the literature and the expertise of NGO staff who have been involved in the child protection program for several years. Secondly, to identify the empirical list of relevant dimensions for children in Darfur, we conducted free listing exercises followed by focus groups discussions (FGDs) and in-depth interviews with different groups of Darfurian children and their parents separately in the localities of Garsila, Habila and Forobaranga between August and October 2008. The main objective of this participatory process was to identify and rank relevant capabilities for children, as well as obstacles to these relevant capabilities and major protection and deprivation issues as perceived by the participants - and as a preliminary step to a comprehensive assessment. We interviewed three groups of five to ten boys and girls aged 10 to 13 and 14 to 18 in each locality

and about 40 children and 40 parents individually. This helped us to identify relevant capabilities and existing barriers that we include in our questionnaire for the quantitative survey. We found that the number of FGDs and free listing exercises was adequate as we reached a point of saturation regarding the list of relevant capabilities and the types of barriers faced identified by participants. We asked the participants to identify if they have the opportunity to do or be the following: be well nourished and sheltered, escape violence, mistreatment, excessive labour and various factors of mental distress, access school and healthcare, get enough love and care. Participants were asked to provide as many dimensions as they wanted, and then to rank their responses from most to least frequent/relevant/important. Facilitators of the process were data collectors selected within the community with a high school level of education, and a couple of NGO staff in charge of the child protection program. They encouraged children and their parents to identify other relevant capabilities. To achieve consensus on the selection of dimensions and the identification of the deprivation threshold for each dimension, they encouraged the debate until they reached exhaustion of the topic. We kept all dimensions identified during the participatory process. On each dimension identified by children, the cutoff defining deprivation is determined by the deliberations among children and among parents themselves. Children were also able to discuss extensively on the importance of basic capabilities and to identify a minimum number of dimensions that could constitute the second cutoff for identifying multidimensional poverty. Unfortunately, we faced difficulty with ranking dimensions of deprivation by children, particularly the younger ones, but also by parents. Most of the facilitators were unable to guide respondents to help them in the ranking process. Yet, children expressed particular concern about different issues affecting considerably their quality of life and their wellbeing: material poverty, poor diet, violence, poor access to services, psychological distress. Material poverty was invoked by many children and parents as a major impediment to many other capabilities (healthcare, education, nutrition, etc.). Lack of food was often reported as well. Very often, children and parents reported concern about their poor and insufficient diet. Since the conflict started in Darfur, families have been undergoing what is called locally as a "hunger season" during the fallow between two crops, when the stocks from the last harvest are consumed and the sowing of the next crop has not started. Furthermore, at the end of the rainy season, nomads start moving south and often incidents occur, such as robberies or crop destruction. Such incidents lead to loss of most of households assets and increase poverty. Some women associated poverty with divorce or death of their husband which left them and their children without means to support themselves. Protection risks for children stated by both parents and children were often conflict related being the target of violence or witnessing violence and even more frequently by children than by parents. In Habila, children referred to robbery and looting as bad things that happen to them. Several times, very disturbing tales of sexual gender based violence were reported by interviewees. Concern for being in bad health and not getting treatment were often reported particularly in Forobaranga and most of the time in correlation with

absence or poor quality of healthcare facilities. The main reason mentioned for not accessing school was the incapacity to pay the fees. In theory, no children should be denied access to school by the teachers, even if they cannot pay any fees. In practice however, participants stated that children were often sent home for such reason or the parents were not sending them to school at all. Violence at school or on the way to school (which is often far) is also a concern that often came as a second barrier to accessing school. Absence of appropriate clothing school uniforms was also very often listed usually as a 3rd reason for not being able to send children to school. Uniform is compulsory in class and constitutes a sign of social status. , Finally, we included a consideration of policy relevance as we aim at informing development actors involved in the on-going humanitarian process in Darfur.

Based on this participatory process , we carried out a quantitative survey using dimensions identified by children and indicators within those dimensions. The calculation of the multidimensional poverty index for children is based on this list of dimensions (Table ??) . We avoided any overlapping between dimensions and indicators to allow using equal weights across them. The deliberative participatory process did not allow to rank dimensions as already explained above. Nevertheless, some dimensions are identifying similar types of deprivation. For instance, level of income, possession of land and animals can be considered as different aspects of a wider concept of material deprivation. We identified 14 dimensions and explored different specifications of the indicators based on several questions. For instance, social participation is defined by child participation in community events such as ceremonies, for instance Eid, Ramadan, weddings or birth ceremonies. The dimension of care is a combination of people who take care of the child or to whom the child goes when s/he needs support or help. In the context of Darfur, qualitative interviews with children showed the central importance of having the possibility to call upon adults in case of needs. In terms of deprivation of education, we tested the level of deprivation linked to illiteracy, the drop-out rate from primary school and access to secondary school. We chose indicators that would most evidently discriminate between children who are deprived in a given dimension. Considering literacy, finishing primary school or attending secondary school as the cutoff point led to a very high proportion of children being deprived in the dimension of education. We made a point to include usually forgotten parameters: mistreatment, mental distress are often forgotten from poverty and vulnerability surveys.

In the present paper, we selected 14 dimensions of child deprivation in Darfur identified during the deliberative participatory process, including some of the usually missing dimensions, namely: economic exploitation or child labour, physical safety, empowerment or social participation, and psychological wellbeing. Alkire (2007b) has drawn attention to these missing dimensions of poverty, which are rarely included in studies due to limited data availability . She notes that commonly used international survey instruments fail to incorporate these dimensions,

Table 1: Dimensions of Children's Deprivation

Dimensions	Questions	Deprived if...
1) Health access	Can you get medical care? Where would you go in case of accident, injury or health problem?	No access to doctor, clinic, pharmacy or NGO
2) Nutrition	How often do you get enough to eat?	Frequently or always not enough food
3) Access to clean water	Do you have access to a safe drinking water source? If yes, how?	Well or surface water
4) Education	What kind of Education did you receive or are you receiving	No education
5) Child/youth labour	How many hours per day do you work (including chores)?	More than 2 hours (under 12 years old) or more than 4 hours (12 years or over)
6) Material Wealth-Income	Income per person per day calculated from total household income	Less than \$1.25
7) Land	What is the size of Household Land (in mokhammas)?	Less than 3 Mokhammas
8) Animals	Does the household own animals? How many?	No cows, donkeys, camels or horses and less than 5 sheep or goat
9) Housing	Number of people per Tukul in the household calculated?	More than three people per Tukul
10) Social Participation	Are you invited to participate in community events such as ceremonies?	No
11) Care	Who takes care of you? Who do you go to if you need support or help?	Neither question answered with mother or father
12) Love	Who do you love? Who do you feel loves you?	Neither question answered with mother or father
13) Mistreatment	Has anyone ever mistreated you?	Yes
14) Psychological well-being	Based on 8 questions ( <i>see appendix A for details</i> )	Severe or very severe

which restricts an extensive understanding of multidimensional poverty. We did not include 'quality of employment' as many children were just helping family in farming or as shepherd and none of the criteria -namely informal employment; income from self-employment; occupational safety and health- for low quality job as suggested by seem relevant or were mentioned by the children during the participatory process. All child labour is informal in Darfur; income is non-existent in those activities to help family; there are no real safety and health issues associated with farming and shepherd except when the number of hours is excessive and this is included in the "'employment'" dimension.

The first dimension of deprivation is the lack of access to healthcare services. We used access to a modern health service (doctor, clinic, pharmacy or NGO) in case of accident, injury or health problem as the cutoff for deprivation. Children and parents expressed concern about the quality of healthcare services available during in-depth interviews and FGDs. Achieving child health' target of the reduction by two third between 1990 and 2015 of the under-five mortality rate, Millennium Development Goal (MDG) 4 (UN,2011), can be done only through universal access to basic health services. In Darfur, strong concern about absence of access to healthcare for a large majority of the population has been raised especially after the expulsion of NGOs following President Bashir indictment for war crimes and crimes against humanity .

Food security is measured through the quantity and quality of the daily food intake of the child. Frequent or permanent deprivation of food is a good proxy for insufficient food intake . It is also a factor of poor health and halve by 2015 the number of people who suffer from hunger constitutes part of the MDG 1 about end of poverty and hunger . Little evidence exist about insufficient food intake of children in Darfur but two recent hospital-based study has shown that maternal anaemia was the main risk factor for low birth rate but also fetal anaemia and perinatal mortality .

Similarly, lack of access to clean drinking water is also an essential dimension of deprivation that prevent achieving MDG4. UN report (2011) points to the failure to reach the most vulnerable groups (women, ethnic minorities, disabled people) identified as the hardest to reach . Consumption of unclean water remains an important source of disease and impairment in Darfur. Recent literature has shown that diarrhoea-related mortality rates remain high among under-five years old children . In West darfur, the reduction in rate was more important for violence-related than for diarrhoea-related mortality, and authors conclude that diseases have been the primary cause of most deaths since 2005.

School attendance is the indicator for the fourth dimension - education - and school non-attendance is the cutoff for this dimension. Universal primary education by 2015 represents MDG 2 . The World Declaration on Education for All (EFA, UNESCO 1990) considers access to school as a central component of fighting poverty and inequality in the long term . Many children, due to violence and displacement,



have not been able to attend school . Furthermore, many schools have been built only recently through the international community effort. We observe very low literacy and primary school completion rates in 2009 in Darfur.

Freedom from economic and non-economic exploitation (article 32 of the CRC), measured as the intensity of work, represents the fifth dimension of deprivation. Child labour is widespread in Darfur, even among children going to school. Children help with household chores or with farm work. We use a cutoff of two and a half hours of work a day, as above this limit child labour is likely to jeopardise his or her right to good health, education and time for play. This is in line with the International Labour Office Convention No. 138, which allows light work after 12 years of age.

The sixth dimension regards material deprivation and is defined by lack of income. We calculated an average per capita daily income based on the overall income of the household. We defined the threshold as being the International Poverty line (\$1.25 dollars per capita per day or 3.34 Sudanese Pound) . This is a very rough measure of material poverty that does not consider intra household allocation of income that can be defavorable to children . Lack of income is generalised in West Darfur, characterised by a non monetary economy. Thus, we completed this dimension with ownership of land and animals that constitute more appropriate indicators of material wellbeing. The deprivation level is set respectively at less than 3 Mokhammas (1 mokhammas= 1.796 acres) for land and no big animal (such as cow) or less than 5 sheep or goats.

Housing constitutes the ninth dimension. Poor housing is a central issue in West Darfur. Violence has resulted in destruction of entire villages and forced migration resulting in people living in poor conditions in IDPs camps (Alix-Garcia et al. in press). The indicator takes into consideration how crowded is the house and determines a cutoff for deprivation at more than three people living in a Tukul (hut).

The tenth dimension encompasses empowerment and social participation and is measured through participation to community events. Social inclusion is paramount in determining the quality of life of children and participation to the life of the community is central to child well-being in the human rights-based approach and in the capability approach .

Care and love constitute two distinctive dimensions (11 and 12). Care is measured by the presence of caretakers to whom the child can refer in case of needs. Deprivation of care is identified both by the absence of care and of support received from the parents of the child. Similarly, deprivation of love is measured by absence of love given to or received from parents. These family circumstances are essential to protect and develop children's resilience or ability to continue functioning normally in spite of extreme adversity . Recent research with war-affected children in Sri Lanka and Colombia has identified six prominent factors in ensuring

healthy adaptation and pro-social behaviour, among which are stable meaningful relationships with caregivers offering models of positive behaviour . Many children have been displaced, made orphans, or have been victims of violence during the on-going war and parental love and care are identified as fundamental protective resilient factors.

Lack of physical safety is a direct outcome of the violence linked to the conflict. Measured through mistreatment underwent, this dimension translates one of the ten central capabilities identified by . In the trauma focused model, exposure to violence is thought to be a major cause of post-traumatic stress disorders in war affected children . Mental suffering resulting of violence iss certainly of major concern in Darfur. But recent research has put more focus on the psychosocial model of encouraging and enabling children and youth to cope in order to alleviate symptoms of mental suffering in conflict and post-conflict settings . As mentioned above, mechanism ensuring or reestablishing strong bonds within the family are considered essential to build up mechanisms of resilience.

To complete our approach to multidimensional poverty, and complement the dimensions of love and care and physical safety, our study explored the impact of the ongoing conflict on the psychological well-being of children. There is a large body of literature showing that armed conflict deteriorate social and material conditions and that this can create or aggravate stressors, which in turn have major effects on mental well-being . Psychological traumas are often critical in activating developmental concerns and emotional troubles that a child might be burdened with in the longer term . Mental distress is measured through a series of height questions using a five items Likert scale. Children's deprivation of mental well-being is established by existence of sign of severe mental distress.

### **3 Results**

We present the results in two different but complimentary forms. Firstly we present the raw headcount ratios of deprivations in each of the 14 dimensions, and secondly we present the multidimensional measures of  $H$ ,  $A$  and  $M_0$  for all possible cutoffs. We decompose the children population by subgroup of age, gender, disability type and severity.

#### **3.1 Proportion of deprived children according to gender, age and disability**

In figures 1 to 3, we report the headcount ratio that indicates the proportion of Darfurian children globally as well as according to different subgroups that are classified as poor. Subgroups of children are defined according to age, gender and

disability status. The proportion of children in each group that are poor varies considerably according to dimension. Deprivation of care and love from parents is almost inexistant. This is unexpected as we assumed that the conflict had a negative effect on parent-child bond. Yet, this is a positive outcome as parental love and care is an important protective factor and the destruction of child-parents relationships has been recognised as one of the most potentially damaging effects of war on children' resilience and wellbeing .

On the contrary, nearly the whole child population, 95%, have an average income below the international poverty line. This is expected as Darfur is not a monetary economy on one hand, and material poverty is quite widespread on the other hand and identified as a major contributor to the current crisis . Furthermore other livelihood issues such as food intake, access to safe water housing space animals and land for cultivation are also identified as major factors in the crisis. Living in overcrowded space for instance affect over 60% of the children in West Darfur. Unsuprisingly, 64% of all children have no access to education.

Deprivation varies according to age, gender and disability status. Elderly children, aged 15 to 18, are more deprived than younger children in terms of love and care received from the family. This is possibly due to their parents having passed away already,life expectancy of 55.4yrs being quite low in Sudan in general and probably lower in Darfur due to the on-going violence. It is also explained by the fact that being elder they are less in need of parental care. On the other hand, elderly children are less deprived in terms of housing probably as they left the parental home if married. As expected, younger children(5 to 9 year olds) are more deprived in terms of education as many children start school at 6 in Darfur and some elderly children who could not go to school at school going age or who repeat several classes are still at primary school level at an advanced age. We see that 10 to 14 year olds are the most exploited for work or more involved in chores. Finally, younger children are also less included in social activities. Table ?? also shows that a higher proportion of girls 73% are excluded from school compared to 54% of boys. Moreover, girls also do more work, with 20% of them working too much compared to 15% of boys. Comparing disability severity, we see that the severely disabled are significantly more deprived in 9 out of the 14 dimensions, namely nutrition, mental wellbeing, water access, employment, education, love, care, land, and most notably mistreatment. The gap between disabled and non-disabled children in terms of education is minimal. We argue that extreme poverty is a great leveller and that the lack of schools explain that generally children have poor access to school, whatever their socioeconomic characteristics.

Table 9 gives the headcount ratio for each individual dimension comparing children and youth according to a combination of the three criteria of gender, age and disability severity. Findings show that lack of education is the major contributor to the deprivation gap between girls and boys, particularly between severely disabled males and females and among the 10 to 14 and 15 to 18 year olds age groups: 68%

and 75% of females with severe disability aged 10 to 14 and 15 to 18, respectively, received no education, compared with 42% and 38% respectively for males.

Findings for other dimensions of deprivation apart from education show different trends among severely disabled males and females in the different age groups. For children between 5 and 9 years old, we found that 19% of females were working more than two hours per day compared to 15% of the males. Similarly, girls with severe disability are more deprived than boys with disability in terms of access to food, living in overcrowded space, access to school, social exclusion, lack of care and love and higher level of mistreatment. Conversely, boys with disability have less access to good healthcare and safe water. Levels of deprivation are quite similar in the remaining dimensions.

Amongst the 10 to 14 year olds, we observe a gap in the same direction between severely disabled girls and boys for access to food, access to school, access to healthcare, family access to land and lack of love. Findings show a higher rate of mistreatment among boys than girls, especially for boys with severe disability. Boys with severe disability are also more deprived than girls with severe disability in terms of mental wellbeing and living in overcrowded spaces. Results show similar trends of deprivation between girls and boys with disability on the other dimensions.

For the 15 to 18 year olds, girls are more deprived than boys in terms of access to healthcare, safe water, child labour, education. This trend is even more pronounced for disabled girls for deprivation of healthcare. Conversely, boys, especially those with severe disability are more deprived than respectively girls with or without disability on dimensions of mental wellbeing and possession of livestock in the household. Disabled girls are significantly more deprived in this age group than other children for access to food, healthcare, safe water source, living in overcrowded spaces, child labour, education, amount of land possessed by the household and less income. There is little difference between the non disabled males and females in terms of mistreatment, however the severely disabled males are far more deprived with 22% being mistreated compared to 6% of severely disabled girls.

### **3.2 Multidimensional poverty**

The property of decomposition is appropriate to study deprivation for different subgroup of children. The breadth of poverty varies among subgroups of children. Some children might be deprived in two dimensions, others in six out of fourteen dimensions. Intensity of poverty varies across subgroups of children. Exploring variation of poverty breadth across subgroups allows to better target poverty reduction policies towards the most vulnerable subgroups. In the present paper, we explore poverty across gender, age groups, severity and type of disability.

In Table 2 we present the multidimensional measures of poverty, i.e. the *multidi-*

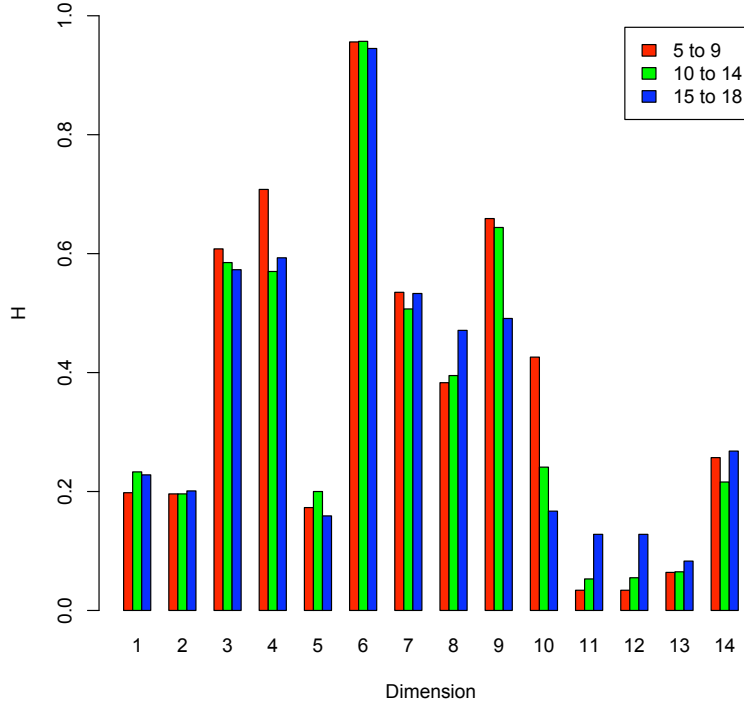


Figure 1: The proportion of children deprived in each dimension by Age Group

*mensional headcount ratio ( $H$ ), the average deprivation share across the poor ( $A$ ) and the adjusted headcount ratio ( $M_0$ ) for all possible cutoffs. Table 2 reports the number of dimensions in which the children are deprived. It shows that nearly all children are deprived in at least one of the 14 dimensions, and they on average are deprived in approximately 4.9 dimensions. If we identify the poor using the union approach, which defines a child as poor if s/he is deprived in at least one dimension, then it means that all children of Darfur are poor. Depending where we put the cutoff, the proportion of children multidimensionally poor varies considerably. If a child requires to be deprived either in 4, 5 or 6 dimensions simultaneously to be considered multidimensionally poor, the proportion of poor children is of 81%, 59% or 33.9% respectively. Conversely, if we consider the intersection approach, that defines as poor a child that is deprived in all fourteenth dimensions, then none of the children of Darfur are poor. In fact, no one is deprived in 11 or more dimensions and virtually no one is deprived in 10. Table 2 presents the results for males and females: there is a small indication that females are more deprived than males, since on average the males are deprived on just 4.8 dimensions, whereas the females are deprived on 5. Consequently we see slightly higher values of  $M_0$  for girls than for boys for all  $k$  values of the cutoff.*

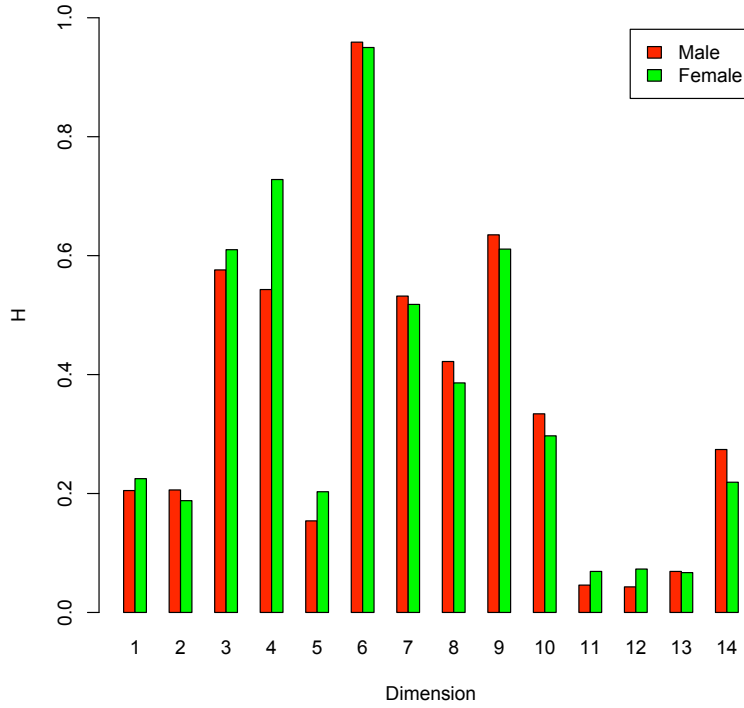


Figure 2: The proportion of children deprived in each dimension by Sex

Table 3 presents the results according to severity of disability and Table 5 by type of disability. Table 3 shows that the severely disabled are far more deprived than those with moderate or no disability, 66% of the severely disabled are deprived on 5 dimensions or more, compared with 57% of the non disabled. We also see that on average the severely disabled are deprived on half a dimension more than the non disabled. Moreover, the difference increases for higher values of the cutoff: among the most deprived children, the severely disabled are more worse off than the non disabled. Finally, Table 5 demonstrates that children with multiple or associated disabilities are the most deprived, and that those with learning difficulties are the least deprived, whatever value of  $k$  we consider.

In Table 4 we break down the population by age group. The adjusted headcount ratio  $M_0$  shows that the 5 to 9 year old children are worse off whatever the value of the cutoff  $k$  1 through 9. Yet, we observe very little gap between the age groups 10 to 14 year olds and 15 to 18 year olds.

In tables 6 through 8, we break down the results by gender, age group, and disability severity. We observe differing results for each of the three age groups and for different choices of the cutoff  $k$ . Firstly among the 5 to 9 year olds, we see that,

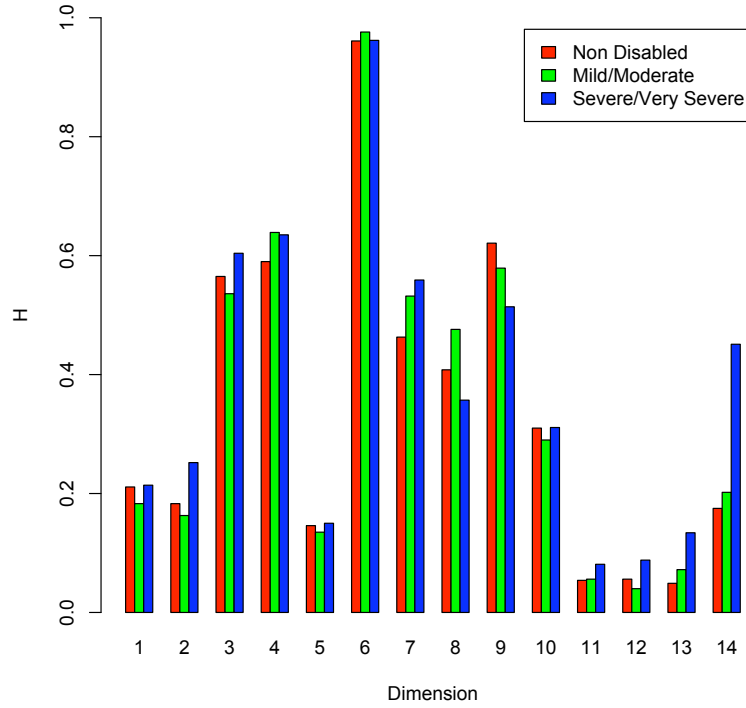


Figure 3: The proportion of children deprived in each dimension by Disability Status

when considering a large proportion of the group as poor, (specifically  $k$  varying between 1 and 6) females without disability are worse off than the males without disability. However when looking at the most deprived among this age group (value of  $k$ , 6), the males are slightly worse off. We see a similar result for the 15 to 18 year olds but the reverse for the 10 to 14 year olds. Our results also that severely disabled girls are worse off than severely disabled boys in all three age groups for all values of  $k$ .

Our results show that disabled children are often more deprived than non-disabled ones at all ages. The gap in the intensity of poverty increases with the value of cutoff  $k$  from 1 to 6 for all age groups and with age. The proportion of poor children among disabled children is higher than among non-disabled children, and they suffer from a higher number of coupled deprivations as shown in the literature for Afghanistan for instance, another conflict setting. At all ages, girls with disability are poorer than boys with disability whatever the value of  $k$  except for  $k=9$  for the age group 15 to 18 years old. These results establish that a conversion handicap exists that a person with a disability requires more resources than one with no

Table 2: Multidimensional poverty measures for children in Darfur by sex

Cutoff	$H$			$A$			$M_0$		
	All	Male	Female	All	Male	Female	All	Male	Female
1	0.999	1.000	0.999	0.353	0.347	0.359	0.353	0.347	0.358
2	0.986	0.983	0.989	0.357	0.352	0.361	0.352	0.346	0.357
3	0.940	0.924	0.954	0.368	0.366	0.370	0.345	0.338	0.352
4	0.810	0.803	0.817	0.392	0.388	0.396	0.318	0.312	0.323
5	0.590	0.574	0.605	0.432	0.429	0.434	0.255	0.246	0.263
6	0.339	0.312	0.364	0.487	0.490	0.485	0.165	0.153	0.177
7	0.175	0.171	0.179	0.542	0.541	0.543	0.095	0.092	0.097
8	0.077	0.074	0.080	0.595	0.594	0.596	0.046	0.044	0.048
9	0.024	0.022	0.025	0.650	0.648	0.651	0.015	0.014	0.016
10	0.002	0.002	0.003	0.714	0.714	0.714	0.002	0.001	0.002
11	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000
12	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000
13	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000
14	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000

disability to achieve the same level of wellbeing . The conversion handicap is even more prominent for girls with disability: more than 50% of girls with disability are deprived in the dimensions of material wealth, housing, education and access to land. Existing development effort in Darfur is not addressing the needs of this most vulnerable subgroup. Disabled children also face higher social exclusion, at least among the elderly two age groups, reflecting probably stigma and prejudice existing in Sudanese communities.



Table 3: Multidimensional poverty measures for children in Darfur by disability severity

Cutoff	$H$			$A$			$M_0$		
	Not Disabled	Moderate Disability	Severe Disability	Not Disabled	Moderate Disability	Severe Disability	Not Disabled	Moderate Disability	Severe Disability
1	1.000	1.000	1.000	0.342	0.350	0.378	0.342	0.350	0.378
2	0.983	0.996	0.989	0.346	0.351	0.381	0.340	0.349	0.377
3	0.923	0.970	0.955	0.360	0.356	0.389	0.332	0.346	0.372
4	0.790	0.810	0.851	0.384	0.384	0.411	0.303	0.311	0.350
5	0.568	0.574	0.662	0.422	0.425	0.447	0.240	0.244	0.296
6	0.304	0.316	0.431	0.479	0.480	0.494	0.146	0.152	0.213
7	0.146	0.135	0.245	0.534	0.549	0.544	0.078	0.074	0.134
8	0.052	0.063	0.119	0.594	0.605	0.592	0.031	0.038	0.070
9	0.015	0.025	0.033	0.651	0.655	0.643	0.010	0.017	0.022
10	0.002	0.004	0.000	0.714	0.714	NA	0.001	0.003	0.000
11	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000
12	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000
13	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000
14	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000

Table 4: Multidimensional poverty measures for children in Darfur by age group

Cutoff	$H$			$A$			$M_0$		
	5 to 9	10 to 14	15 to 18	5 to 9	10 to 14	15 to 18	5 to 9	10 to 14	15 to 18
1	0.998	1.000	1.000	0.367	0.340	0.341	0.366	0.340	0.341
2	0.991	0.983	0.981	0.369	0.345	0.346	0.366	0.339	0.339
3	0.966	0.915	0.908	0.375	0.360	0.362	0.362	0.329	0.329
4	0.853	0.776	0.762	0.396	0.386	0.390	0.338	0.300	0.298
5	0.644	0.536	0.552	0.432	0.431	0.430	0.278	0.231	0.238
6	0.361	0.314	0.327	0.490	0.484	0.481	0.177	0.152	0.157
7	0.198	0.150	0.152	0.541	0.543	0.540	0.107	0.082	0.082
8	0.086	0.065	0.067	0.594	0.600	0.592	0.051	0.039	0.039
9	0.026	0.022	0.019	0.647	0.657	0.643	0.017	0.014	0.012
10	0.002	0.004	0.000	0.714	0.714	NA	0.001	0.003	0.000
11	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000
12	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000
13	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000
14	0.000	0.000	0.000	NA	NA	NA	0.000	0.000	0.000

Table 5: Multidimensional poverty measures for children in Darfur by disability type

Cutoff	$H$					$A$					$M_0$				
	Locomotor	Sensory	Learning	Behavioural and Mental	Multiple	Locomotor	Sensory	Learning	Behavioural and Mental	Multiple	Locomotor	Sensory	Learning	Behavioural and Mental	Multiple
1	1.000	1.000	1.000	1.000	1.000	0.369	0.355	0.330	0.373	0.381	0.369	0.355	0.330	0.373	0.381
2	0.967	1.000	0.991	0.994	0.993	0.379	0.355	0.332	0.374	0.383	0.367	0.355	0.329	0.372	0.381
3	0.967	0.946	0.954	0.971	0.961	0.379	0.367	0.340	0.380	0.392	0.367	0.347	0.324	0.369	0.376
4	0.767	0.811	0.787	0.869	0.837	0.422	0.393	0.366	0.399	0.418	0.324	0.319	0.288	0.347	0.350
5	0.633	0.595	0.546	0.623	0.673	0.451	0.432	0.402	0.444	0.450	0.286	0.257	0.220	0.277	0.303
6	0.333	0.324	0.250	0.417	0.451	0.536	0.494	0.455	0.487	0.496	0.179	0.160	0.114	0.203	0.224
7	0.267	0.189	0.074	0.217	0.242	0.563	0.541	0.518	0.541	0.554	0.150	0.102	0.038	0.118	0.134
8	0.167	0.108	0.019	0.091	0.131	0.600	0.571	0.571	0.598	0.600	0.100	0.062	0.011	0.055	0.078
9	0.067	0.000	0.000	0.034	0.046	0.643	NA	NA	0.643	0.653	0.043	0.000	0.000	0.022	0.030
10	0.000	0.000	0.000	0.000	0.007	NA	NA	NA	NA	0.714	0.000	0.000	0.000	0.000	0.005
11	0.000	0.000	0.000	0.000	0.000	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	0.000	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	0.000	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000

Table 6: Multidimensional poverty measures for children aged 5 to 9 in Darfur by sex and Disability severity

Cutoff	$H$				$A$				$M_0$			
	None/Mild/Moderate		Severe/Very Severe		None/Mild/Moderate		Severe/Very Severe		None/Mild/Moderate		Severe/Very Severe	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	1.000	1.000	1.000	1.000	0.344	0.366	0.383	0.406	0.344	0.366	0.383	0.406
2	0.985	1.000	0.984	0.984	0.349	0.366	0.388	0.412	0.343	0.366	0.382	0.405
3	0.951	0.980	0.952	0.967	0.356	0.370	0.396	0.416	0.338	0.363	0.378	0.403
4	0.808	0.868	0.905	0.852	0.381	0.391	0.406	0.444	0.308	0.339	0.367	0.378
5	0.562	0.657	0.714	0.754	0.423	0.424	0.438	0.464	0.238	0.279	0.313	0.350
6	0.266	0.377	0.444	0.508	0.496	0.474	0.487	0.516	0.132	0.179	0.217	0.262
7	0.158	0.157	0.238	0.361	0.542	0.538	0.538	0.552	0.086	0.084	0.128	0.199
8	0.059	0.059	0.095	0.230	0.613	0.601	0.595	0.582	0.036	0.035	0.057	0.133
9	0.030	0.025	0.032	0.033	0.655	0.643	0.643	0.643	0.019	0.016	0.020	0.021
10	0.005	0.000	0.000	0.000	0.714	NA	NA	NA	0.004	0.000	0.000	0.000
11	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000

Table 7: Multidimensional poverty measures for children aged 10 to 14 in Darfur by sex and Disability severity

Cutoff	$H$				$A$				$M_0$			
	None/Mild/Moderate		Severe/Very Severe		None/Mild/Moderate		Severe/Very Severe		None/Mild/Moderate		Severe/Very Severe	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	1.000	1.000	1.000	1.000	0.344	0.326	0.342	0.366	0.344	0.326	0.342	0.366
2	0.991	0.976	0.979	1.000	0.347	0.333	0.348	0.366	0.344	0.324	0.341	0.366
3	0.914	0.909	0.938	0.957	0.364	0.347	0.357	0.376	0.333	0.315	0.335	0.360
4	0.793	0.738	0.813	0.830	0.387	0.377	0.379	0.401	0.307	0.278	0.308	0.333
5	0.586	0.482	0.583	0.553	0.422	0.426	0.416	0.459	0.248	0.205	0.243	0.254
6	0.310	0.280	0.354	0.404	0.480	0.475	0.454	0.496	0.149	0.133	0.161	0.201
7	0.155	0.110	0.104	0.255	0.532	0.548	0.514	0.536	0.083	0.060	0.054	0.137
8	0.060	0.055	0.021	0.085	0.582	0.595	0.571	0.607	0.035	0.033	0.012	0.052
9	0.009	0.012	0.000	0.043	0.643	0.679	NA	0.643	0.006	0.008	0.000	0.027
10	0.000	0.006	0.000	0.000	NA	0.714	NA	NA	0.000	0.004	0.000	0.000
11	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000

Table 8: Multidimensional poverty measures for children aged 15 to 18 in Darfur by sex and Disability severity

Cutoff	H				A				M <sub>0</sub>			
	None/Mild/Moderate		Severe/Very Severe		None/Mild/Moderate		Severe/Very Severe		None/Mild/Moderate		Severe/Very Severe	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	1.000	1.000	1.000	1.000	0.325	0.339	0.354	0.399	0.325	0.339	0.354	0.399
2	0.971	0.987	1.000	1.000	0.332	0.342	0.354	0.399	0.322	0.338	0.354	0.399
3	0.838	0.961	1.000	0.931	0.362	0.347	0.354	0.418	0.304	0.334	0.354	0.389
4	0.735	0.753	0.810	0.862	0.383	0.384	0.387	0.434	0.282	0.289	0.313	0.374
5	0.529	0.558	0.476	0.793	0.421	0.419	0.457	0.447	0.223	0.234	0.218	0.355
6	0.294	0.299	0.286	0.517	0.471	0.472	0.524	0.495	0.139	0.141	0.150	0.256
7	0.118	0.143	0.190	0.276	0.536	0.519	0.571	0.554	0.063	0.074	0.109	0.153
8	0.059	0.026	0.095	0.172	0.571	0.607	0.643	0.586	0.034	0.016	0.061	0.101
9	0.000	0.013	0.095	0.034	NA	0.643	0.643	0.643	0.000	0.008	0.061	0.022
10	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000
11	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	NA	NA	NA	NA	0.000	0.000	0.000	0.000

Table 9: Proportion of Children deprived in each dimension in Darfur by Age, Sex and Disability severity

Dimensions	5 to 9				10 to 14				15 to 18			
	None/Mild/Moderate		Severe/Very Severe		None/Mild/Moderate		Severe/Very Severe		None/Mild/Moderate		Severe/Very Severe	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Nutrition	0.176	0.181	0.179	0.254	0.211	0.131	0.255	0.320	0.208	0.190	0.217	0.313
Health Access	0.161	0.191	0.258	0.190	0.250	0.223	0.160	0.204	0.197	0.238	0.130	0.333
Material Wealth	0.973	0.944	0.985	0.984	0.969	0.977	0.922	1.000	0.986	0.952	0.870	0.938
Mental Health	0.190	0.190	0.493	0.476	0.195	0.114	0.471	0.400	0.278	0.190	0.478	0.344
Housing	0.647	0.625	0.522	0.540	0.641	0.634	0.588	0.480	0.556	0.417	0.304	0.531
Water	0.529	0.600	0.701	0.508	0.578	0.554	0.588	0.580	0.444	0.583	0.565	0.677
Child/youth labour	0.131	0.167	0.149	0.190	0.164	0.160	0.137	0.160	0.069	0.107	0.087	0.125
Education	0.578	0.782	0.657	0.774	0.416	0.615	0.420	0.680	0.333	0.705	0.381	0.750
Social Participation	0.454	0.404	0.323	0.435	0.244	0.203	0.280	0.229	0.125	0.110	0.261	0.250
Care	0.027	0.037	0.030	0.111	0.094	0.029	0.059	0.082	0.069	0.155	0.130	0.125
Mistreatment	0.055	0.038	0.106	0.190	0.064	0.046	0.157	0.083	0.083	0.083	0.217	0.063
Love	0.023	0.033	0.045	0.127	0.071	0.040	0.039	0.104	0.069	0.155	0.130	0.125
Land	0.462	0.477	0.657	0.619	0.477	0.480	0.431	0.500	0.583	0.476	0.435	0.625
Animals	0.425	0.394	0.299	0.286	0.461	0.389	0.333	0.360	0.542	0.452	0.652	0.438

### 3.3 Correlations between Dimensions

In table 10 we calculated the estimates for the Spearman rank correlation coefficients between each pair of dimensions. This procedure allows us to demonstrate that the identified dimensions of child deprivation in Western Darfur cannot be represented by a unique welfare indicator of poverty such as household income. We observe that the correlation coefficients between pairs of dimensions are close to zero illustrating the absence of association between them. Most notably the identified dimensions are not correlated to material wealth, justifying the multidimensional approach used in the present paper to analyse child poverty in Western Darfur. There are two exceptions to the otherwise low correlation between dimensions. The first one shows an association between love and care. In Nussbaum's (2000) definition of universal capabilities, the fifth central capability (emotions) associates love and care received from those who are emotionally close. Nevertheless in the context of crisis of Western Darfur we chose to distinguish between the two dimensions of love and care as some children lost their parents during the conflict and were taken care of by members of the extended family, by other members of the community or even by humanitarian workers. The second correlation is observed between material wealth and number of animals owned, the negative direction of the correlation is explained by the non-monetary and cultural specificity of Western Darfur economy and society. As a matter of fact the tribes who possess land are different from the nomadic or semi-nomadic tribes who own the livestock explaining the absence of correlation between those two dimensions. Currency is used to pay daily wage labourers who do not possess either land or animals. These findings strongly suggest that focusing child poverty eradication policies on the income poor children only might leave out large segments of those deprived in other dimensions.

Table 10: Spearman Rank Correlation Coefficients Between Dimensions

	Health Access	Nutrition	Access to Clean Water	Education	Child/youth labour	Material Wealth	Land	Animals	Housing	Social Participation	Care	Love	Mistreatment	Psychological Well-being
Health Access	1.00													
Nutrition	0.04	1.00												
Access to Clean Water	0.15	0.02	1.00											
Education	0.11	-0.03	0.19	1.00										
Child/youth labour	0.07	-0.02	-0.00	0.12	1.00									
Material Wealth	0.10	-0.14	0.28	0.22	0.15	1.00								
Land	0.11	-0.14	0.05	0.01	0.02	0.20	1.00							
Animals	-0.04	0.10	-0.08	-0.22	-0.08	-0.73	-0.14	1.00						
Housing	-0.01	-0.08	0.17	0.11	-0.03	0.08	-0.04	-0.08	1.00					
Social Participation	0.02	-0.06	-0.04	-0.17	-0.17	-0.08	-0.03	0.05	0.04	1.00				
Care	-0.04	0.07	-0.02	0.06	0.06	-0.05	-0.09	0.07	-0.17	-0.04	1.00			
Love	0.11	0.07	-0.01	0.11	0.11	-0.06	-0.07	0.06	-0.14	-0.04	0.78	1.00		
Mistreatment	0.02	0.08	0.01	0.04	0.04	-0.01	-0.06	0.01	-0.04	-0.08	-0.00	-0.01	1.00	
Psychological Well-being	-0.08	0.22	-0.01	0.03	-0.02	-0.02	-0.09	0.03	-0.08	0.03	0.02	0.02	0.12	1.00

## 4 Conclusion

The present paper aims at evaluating the breath and various factors of child poverty as well as identifying the most vulnerable groups of children. This would allow to provide rationale for policy makers to identify domains of priority as well as priori-

tise the poorest children. The findings of this study offer a pioneering contribution to understanding the disparity in multidimensional deprivation in a conflict setting.

Poverty levels in Darfur are strikingly high, with virtually all children, girls and boys, disabled and non-disabled, and of all age groups being deprived in at least one of the fourteenth dimensions identified. We found disabled children, particularly disabled girls, to experience highest level, breadth and intensity of poverty. These findings are of great concern as the literature has shown that disabled people in conflict and other humanitarian disasters often face additional challenges due to their specific situation: loss of assistive devices as well as of family or caregiver support, inaccessibility of temporary shelters, but also higher risk of violence and abuse, and in difficulty to access information, food, water or sanitation . Children with disability are particularly vulnerable in disaster situations and often excluded from mainstream humanitarian programmes. Many factors explain due to their invisibility for humanitarian workers, lack of follow up of interventions, as well as various assumptions of humanitarian agencies about disability, particularly the belief that only specialised agencies can provide adapted services .

The International community has been struggling to provide humanitarian assistance to the population of Darfur since the onset of the conflict in 2003. Yet, more needs to be done to tackle the issues raised in the present paper, particularly in outlying areas. In fact, concentration of humanitarian aid, facilities, food distributions and better security conditions found in more urban areas appear to be a problem to address the variety of needs of the population of Darfur and an accelerator of internal displacements of population. Targeted attacks of humanitarian workers and their assets, including hijacking of cars, destruction of assets, break-ins in compound and abduction of personnel, as well as bureaucratic obstacles to movements, armed confrontations, make the relief of the poorest of the poor particularly problematic and challenging. Working with local communities might be a way to access the most vulnerable groups, particularly children, by associating them to the delivery of services in out of reach areas.

## **A Appendix**

### **A.1 Calculation of the Psychological Well-being Dimension**

This dimension was based on the following eight questions:

- 1) Do you feel happy? 1. All of the time 2. Often 3. Sometime 4. Rarely 5. Never
- 2) Do you feel 1. Very happy? 2. rather happy? 3. neither happy nor sad? 4. rather sad? 5. very sad?
- 3) Do you have problem sleeping? 1. never 2. almost never, rarely, less than 1 time a month 3. sometimes, 2-3 times a month 4. often, 1 time a week 5. almost always, almost everyday

- 4) Do you have bad dreams/nightmares? 1. never 2. almost never, rarely, less than 1 time a month 3. sometimes, 2-3 times a month 4. often, 1 time a week 5. almost always, almost everyday
- 5) Do you get headaches? 1. never 2. almost never, rarely, less than 1 time a month 3. sometimes, 2-3 times a month 4. often, 1 time a week 5. almost always, almost everyday
- 6) Do you get stomachache? 1. never 2. almost never, rarely, less than 1 time a month 3. sometimes, 2-3 times a month 4. often, 1 time a week 5. almost always, almost everyday
- 7) Do you get nausea? 1. never 2. almost never, rarely, less than 1 time a month 3. sometimes, 2-3 times a month 4. often, 1 time a week 5. almost always, almost everyday
- 8) Do you have rapid changes of mood? 1. Yes, constantly/ always 2. Yes, often 3. Yes, sometimes 4. No, Never

A person was identified as deprived in this dimension if any of questions 1 to 7 were answered with option 4 or 5; or if question 8 was answered with option 1 or 2, otherwise identified as non-poor.