The role of the informal sector in poverty alleviation : An empirical investigation with reference to greater Wad Medani locality of the Gezira State, Sudan

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ABSTRACT

This study investigated the role of the informal sector in poverty alleviation in Sudan with reference to Wad Medani Locality of the Gezira State in January 2008. The data for the study was collected by means of a questionnaire, which was distributed to a random cluster sample of 80 households working in the informal sector in the study area. To examine the impact of the informal sector in poverty alleviation, the "before and after" approach was adopted where data on the relevant variables were analyzed for two periods, before and after joining the informal sector. Income and expenditure were used separately as indicators of welfare. The Lorenz curve and Gini coefficient were used as measures of income and expenditure inequality. The three standard poverty indices were also calculated, namely incidence, depth, and severity of poverty. The results suggested that the income and expenditure distribution after working in the informal sector was more equitable than before joining the sector. With regard to poverty measures, the results suggested that 92% of the households in the sample fell below the income poverty line before working in the sector compared to 70% after working in the sector, while 94% and 60% of households fell below the expenditure poverty line before and after joining the sector, respectively. Thus, income and expenditure poverty was found to be more prevalent among the sample of households before working in the sector. Similar results were also obtained for the depth and severity of poverty, where income and expenditure poverty were deeper and more severe before joining the sector. These results indicated the important role of the informal sector in reducing inequality and alleviating poverty.

INTRODUCTION

Poverty is an extremely complex and multi dimensional phenomenon. A comprehensive definition of poverty was given in the summit for social development held in Copenhagen in March 1995. According to this definition, "poverty has various manifestations including lack of income, hunger, malnutrition, ill health, limited or lack of access to education and other basic services, increased morbidity from illness, homelessness and inadequate housing, unsafe environment, social discrimination and exclusion. In addition to lack of income and productive resources that are sufficient to ensure sustainable livelihood, the poor are also characterized by lack of participation in decision making (Sayed, 2006).

More recently the rise in poverty particularly in developing countries has attracted the attention of researchers, international organizations, and policymakers alike. According to the World Bank (2001), it is estimated that 21% of the world population live in extreme poverty while half of them are poor. Furthermore, extreme poverty characterizes many third world countries, where people live on less than US $ 1.0 per person per day; absolute poverty characterizes other countries, where people live on less than US $ 2.0 per person per day. Sudan like other developing countries is characterized by widespread and mass poverty affecting both urban and rural populations. The high incidence of poverty in both urban and rural areas of Sudan is visibly reflected in various material deprivations inflicting the majority of the population. The most affected are those people in remote rural areas, the urban poor, nomads, women, children and the internally displaced (United Nations Development Program, 1999).

Indeed, studies on poverty in Sudan produced rather indisputable evidence on the incidence, depth, and severity of poverty and its dynamics in Sudan. Thus, Nur (1996) argued that "the incidence of poverty in Sudan does not require much effort to prove because poverty can be seen in the eyes of the people". Many others, notably Anand and Nur (1984), Nur (1988, 1992), Ali (1992), Sayed (2006) and Mohammed (2006), have provided evidence that the income and expenditure inequality as well as poverty as measured by the incidence, depth, and severity indices have been increasing. While these studies focused on measuring poverty, others have examined the role of public policy and social institutions in poverty alleviation, notably Sayed (2006), Mahran (2005), Elsafi (2007), and Zakaria (2007). This study is an attempt to examine the role of the informal sector in poverty alleviation in the Gezira State with reference to Wad Medani locality.

METHODOLOGY

The data for this study were collected by means of a questionnaire containing questions on the relevant variables such as income and expenditure. This questionnaire was distributed to a random cluster sample of 80 households in different locations around Wad Medani public market in Wad Madani town in January 2008, located between latitude 14´ , 24° North and longitude 33° , 29´ East, (University of Gezira Metrological Station, 2006). The informal sector consists of many sub-sectors. This study focused on six groups as shown in Table 1. Thus, a cluster random sample of households

was chosen from the six groups in accordance with the proportion of each group in the total. The sample size (N) was determined according to the following equation:

$$N = Z_{\alpha}^{2} \frac{\pi (1 - \pi)}{d^{2}} \qquad (1)$$

where:

Z_{α} :The standardized variable that corresponds to the 95% confidence level.

π : Proportion of those working in the informal sector.

D : The desired marginal error (or precision).

According to the official estimates by the Central Bureau of Statistics (2008), 51138 persons are employed in Wad Medani town, with 2732 persons working in the informal sector, who represent 5% of the total employment. Thus, setting Z_{α} = 1.96 and d = 0.05, and applying the above equation, we have:

$$n = (1.96)^{2} \frac{0.05(0.95)}{(0.05)^{2}} = 80$$

Table 1. Distribution of groups of people working in the informal sector in Wad Medani Locality, 2008.

Group (cluster)	Number	%	Sample size
Street vendors	754	27	22
Restaurant casual workers	650	24	19
Fruit sellers	528	19	15
Tea makers	350	13	10
Water sellers	250	9	8
Other groups of sellers	200	8	6
Total	2732	100	80

Source: Own construction based on data from Wad Medani Locality (2008).

Thus, eighty respondents of households have been chosen by cluster sampling procedure, in accordance with the weight of each group in the total population. Table 1 gives the distribution of the sample according to clusters.

To measure the income and expenditure inequality, the Lorenz curve and Gini coefficient were used. The Lorenz curve shows the relationship between population groups and their respective income or expenditure levels in cumulative percentages. On the horizontal axis, the numbers of those who receive income or make expenditure are plotted in cumulative percentages. The vertical axis portrays the share in total income or expenditure received by or associated with each percentage of the population. Both axes are equally long and the entire figure represents a square. A diagonal line is drawn from the lower left hand corner of the square to the upper right hand corner. At every point of that diagonal the percentage of income or expenditure is exactly equal to the percentage of those who

receive that income or incur that expenditure. The further (closer) is the Lorenz curve from the diagonal, the greater (smaller) the degree of inequality. The Gini coefficient is measured by the area A between the diagonal and the Lorenz curve in Figure1, expressed as a ratio of the area of the half square. This ratio can take values between zero (perfect equality) and one (perfect inequality). Based on the poverty line estimates, three standard poverty indices were calculated based on the more general formulas suggested by Foster *et al.* (1984) given by:

$$P_{\alpha} = \frac{1}{n}\sum_{i=1}^{q}\frac{(z - y_i)^{\alpha}}{z}, \alpha \geq 0 \qquad (2)$$

Where:

P_{α} :Poverty measure

q : Number of the poor.

Z : The poverty line.

y_i : Income or expenditure of poor individual (i).

n : Total population.

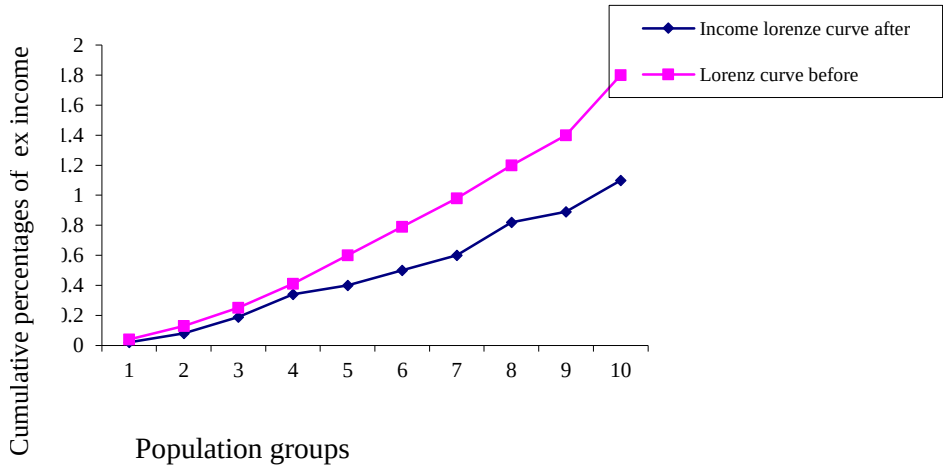

Fig.1. Lorenz income curve.

When α = 0, we obtain the head-count index (p_0), measuring the incidence of poverty, which is given by:

$$P_0 = \frac{q}{n} \qquad (3)$$

When α = 1, we obtain the poverty gap index (P_1), measuring the depth of poverty, which is given by:

$$P_1 = \frac{1}{n}\sum_{i=1}^{q}\frac{(z - y_i)}{z} \qquad (4)$$

Finally when α = 2, we obtain the squared poverty gap index (P_0) which is given by:

$$P_2 = \frac{1}{n}\sum_{i=1}^{q}\frac{(z - y_i)^2}{z} \qquad (5)$$

Having outlined the research methodology, we are now in a position to calculate the poverty lines based on income and expenditure, and the corresponding Gini coefficients as well as the corresponding poverty indices. The data were analyzed by the statistical package for social science (SPSS) and Microsoft excel software program to obtain the empirical results.

RESULTS AND DISCUSSION

To begin with, we look at some basic distribution of sample. In this respect the data suggested that 40% of the respondents were females, whereas 60% of them were males. Their ages were distributed between 8 and 65 years. The respondents' incomes ranged from the minimum income of SDG 100 per month to maximum of SDG 1600 per month.

Table 2 below shows the basic data necessary for calculating the Gini coefficients based on income and expenditure using the following equation (Todaro, 1977), denoted G, is given by:

$$G = 1 - \sum_{i=1}^{10} W_i PCS_i \qquad (6)$$

Table 2. Calculation of income Gini coefficient before and after working in the informal sector (2008).

N	Income (y)	Share of (y) in total income	Cumulative share	Pairwise cumulative	W	
(1)	(2)	(3)	(4)	(5)	(6)	(5)*(6)
		Before working in informal sector				
1	295	0.020014	0.020014	0.020014	0.1	0.002001
2	645	0.043758	0.063772	0.083786	0.1	0.008379
3	1000	0.067843	0.131615	0.195387	0.1	0.019539
4	1200	0.081411	0.213026	0.344640	0.1	0.034464
5	1210	0.08209	0.295115	0.508141	0.1	0.050814
6	1420	0.096336	0.391452	0.686567	0.1	0.068657
7	1600	0.108548	0.500000	0.891452	0.1	0.089145
8	2070	0.140434	0.640434	1.114043	0.1	0.114043
9	2650	0.179783	0.820217	0.460651	0.1	0.146065
10	2650	0.179783	1.000000	0.820217	0.1	0.182022
Total	14740	1.000000			1.0	0.715129
		After working in informal sector				
1	2070	0.041186	0.041168	0.041168	0.1	0.004119
2	2420	0.048150	0.089335	0.130521	0.1	0.013052
3	3600	0.071628	0.160963	0.250298	0.1	0.025030
4	4700	0.093514	0.254477	0.415440	0.1	0.041544
5	4800	0.095503	0.349980	0.604457	0.1	0.060446
6	4800	0.095503	0.445483	0.795464	0.1	0.079546
7	4800	0.095503	0.540987	0.986470	0.1	0.098647
8	8000	0.120772	0.661759	1.202746	0.1	0.120275
9	7200	0.143255	0.805014	1.466773	0.1	0.146677
10	9800	0.194986	1.000000	1.805014	0.1	0.180501
Total	50260	1.000000			1.0	0.769837

Source: own calculations based on survey data.

Where W_i is the weight of the i^{th} deciles in the total sample and PCS_i are the pair-wise cumulative shares in income or expenditure of the i^{th} decile. Applying these results into that formula, we observe that the Gini coefficients (G) for income distribution among the sample of households before and after working in the informal sector were estimated at G =1 – 0.715 = 0.285 and G = 1– 0.77= 0.23, respectively. This means that the income distribution among the sample of households after working in the informal sector is more equitable than before working in that sector. Figure 1 depicts the income Lorenz curves before and after working in the informal sector.

Similarly, based on the data reported in Table 3, the Gini coefficients for the expenditure distribution are estimated at 1 – 0.516 = 0.48 and G = 1 – 0.66 = 0.34 before and after working in the informal sector, respectively. These results suggest that the expenditure distribution among the respondents after

working in the informal sector is more equitable than before joining the sector. Figure 2 depict the expenditure Lorenz curves before and after working in the informal sector.

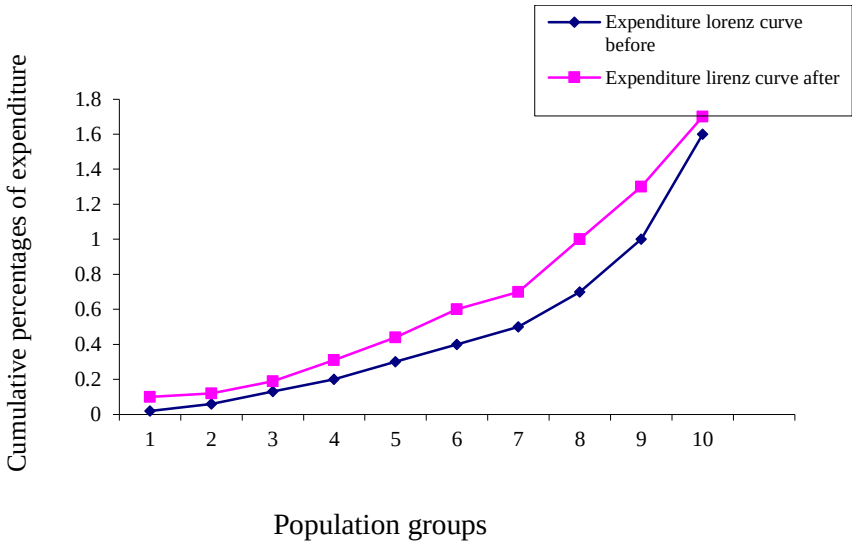

Fig.2. Lorenz expenditure curve.

Table 3. Expenditure Gini coefficient before and after working in the informal sector (2008).

N	Income(y)	Share of (y) in total income	Cumulative share	Pair wise cumulative	W	
(1)	(2)	(3)	(4)	(5)	(6)	(5)*(6)
		Before working in informal sector				
1	17.00	0.022097	0. 022097	0.022097	0.1	0.002210
2	19.47	0.025308	0.047405	0.069502	0.1	0.006950
3	27.40	0.035615	0.083020	0.130425	0.1	0.001304
4	33.17	0.043115	0.126136	0.209156	0.1	0.020916
5	38.33	0.049823	0.175958	0.302094	0.1	0.030209
6	46.13	0.059961	0.235920	0.411878	0.1	0.041188
7	68.40	0.088909	0.324828	0.560748	0.1	0.056075
8	95.73	0.124433	0.449261	0.774089	0.1	0.077409
9	128.67	0.167249	0.616510	1.065772	0.1	0.106577
10	295.03	0.383490	1.000000	1.616510	0.1	0.161651
Total	769.33	1.000000			1.0	0.516227
		After working in informal sector				
1	57.43	0.033213	0. 033213	0.033213	0.1	0.003321
2	70.13	0.040558	0.073772	0.106999	0.1	0.010699
3	87.80	0.050777	0.124549	0.198321	0.1	0.019832
4	106.93	0.061841	0.186390	0.310939	0.1	0.031094
5	124.23	0.071846	0.258253	0.444625	0.1	0.044463
6	146.77	0.084881	0.343117	0.601352	0.1	0.060135
7	188.10	0.108784	0.451900	0.795017	0.1	0.079502
8	223.80	0.129430	0.581330	1.033231	0.1	0.103323
9	316.53	0.183058	0.764389	1.345719	0.1	0.134572
10	407.40	0.235611	1.000000	1.764389	0.1	0.176439
Total	1729.12	1.000000			1.0	0.663379

Source: survey data own calculation.

For purposes of calculating the poverty indices, we estimated the absolute poverty line for the sample based on the food energy intake (FEI) at SDG 7.2 per family per day. The multiplier for food consumption amounted to 1.66, so that the overall poverty line is estimated at SDG 11.5 per family per day. Also we estimated subjective poverty lines for the sample, on the basis of the responses to the question related to the minimal income that household heads perceived as sufficient for the family to meet its basic needs. These poverty lines are estimated at SDG 11.7 and 25.3 per person per day before and after working in the informal sector, respectively.

From the results in Table 4 we observe that when income is taken as welfare indicator based on objective poverty line, the head-count indexes before and after working in the informal sector suggest that 92 % and 70% of households, respectively, fall below the income poverty line and are therefore, classified as poor. On the other hand, taking expenditure as welfare indicator, the incidences of poverty

are estimated at 94 % and 60%, respectively. Measures of depth of poverty based on income before and after joining the informal activities are estimated at 69% and 53%, respectively.Thus, both the incidence and depth of income and expenditure poverty among households have fallen after joining the informal activities. Similarly, the indices for the severity of poverty based on income and expenditure as welfare indicators suggest that poverty was more severe before joining the informal activities. Form these result we conclude that the informal sector has played an important role in poverty reduction in Wad Medani locality.

Table.4. Poverty measures (%) of Wad Medani locality, 2008.

Poverty Index	Income Poverty Index		Expenditure Poverty Index	
	Before	After	Before	After
P_0	0.92	0.70	0.94	0.60
P_1	0.69	0.53	0.51	0.25
P_2	0.61	0.43	0.42	0.17

Source: Own calculations based on survey data.

CONCLUSION

The results suggest that the income and expenditure distribution after working in the informal sector is more equitable than before joining the sector. With regard to poverty measures, the results suggest that 92% of the household in the sample fall below the income poverty line before working in the sector compared to 70% after working in the sector, while 94% and 60% of households fall below the expenditure poverty line before and after joining the sector, respectively. Thus, income and expenditure poverty is found to be more prevalent among the sample of households before working in the sector. Similar results were also obtained for the depth and severity of poverty, where income and expenditure poverty are deeper and more severe before joining the sector. These results indicate the important role of the informal sector in reducing inequality and alleviating poverty.

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دور القطاع غير الرسمي في تخفيف الفقر: تحليل تطبيقي لمحلية واد مدني الكبرى، ولاية الجزيرة ، السودان

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الخلاصة

تقصت هذه الدراسة دور القطاع غير الرسمي في التخفيف من وطأة الفقر بمحلية واد مدني الكبرى بولاية الجزيرة بالسودان . لهذا الغرض، استخدم الاستبيان كوسيلة لجمع البيانات من عينة عشوائية عنقودية تتكون من 80 أسرة تعمل في القطاع غير الرسمي في منطقة الدراسة. لأغراض التعرف على تأثير العمل بالقطاع غير الرسمي على الفقر، استخدمت الطريقة القبلية والبعدية، حيث جمعت البيانات لأفراد العينة حول متغيرات الدراسة لفترتين: الأولى قبل العمل بالقطاع غير الرسمي ، والثانية بعد العمل بذلك القطاع. استخدم الدخل والأنفاق كمؤشرين للمستوى المعيشي للأسرة، كما استخدم منحنى لورنز ومعامل جينى لقياس عدم العدالة في توزيع الدخل والأنفاق. أما فيما يختص بمؤشرات الفقر، فقد استخدمت الصيغ الثلاث المعروفة لقياس حدوث الفقر، عمق الفقر، وحدة الفقر استناداً على الدخل والإنفاق كمؤشرين للرفاه.أشارت النتائج الإحصائية إلى أن توزيع الدخل والأنفاق بعد العمل في القطاع غير الرسمي أكثر عدالة منه قبل العمل في هذا القطاع. فيما يتعلق بتأثير العمل بالقطاع غير الرسمي على الفقر، أشارت النتائج إلى أن 92% من الأسر بعينة الدراسة يقعون تحت خط الفقر على أساس الدخل قبل العمل بالقطاع غير الرسمي، بينما 70% يقعون تحت خط الفقر على أساس الدخل أيضاً بعد العمل بالقطاع غير الرسمي. كذلك أشارت الدراسة إلى نتائج مماثلة تستند إلى خط الفقر على أساس الإنفاق، حيث لوحظ أن 94% من الأسرة يقعون تحت خط الفقر على أساس الإنفاق قبل العمل بالقطاع غير الرسمي، بينما 60% من الأسر يقعون تحت خط الفقر بعد العمل بالقطاع غير الرسمي. توضح هذه النتائج أن الفقر على أساس الدخل والإنفاق كان أكثر انتشاراً وسط الأسر بعينة الدراسة قبل العمل في القطاع غير الرسمي مقارنة بحالة الفقر بعد العمل بذلك القطاع. كذلك تشير الدراسة إلى نتائج مماثلة فيما يختص بعمق وحدة الفقر على أساس الدخل والإنفاق، حيث لوحظ أن الفقر أكثر عمقا وحدة قبل الارتباط بالقطاع غير الرسمي مقارنة بالحالة بعد العمل بذلك القطاع. تفضي هذه النتائج إلى تأكيد أهمية الدور الكبير الذي يمكن أن يلعبه القطاع غير الرسمي في التخفيف من وطأة الفقر وتعزيز العدالة في توزيع الدخل.