

# DCR Knowledge Network

## Annotated Bibliography

### Local Development Theme

#### Research Question:

*What local economic development approaches are appropriate in fragile  
– post-conflict – communities in Africa\*?*

*\*Revised to Sudan*

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**Aker, J. (2012). Information from markets near and far: Mobile phones and agricultural markets in Niger. *American Economic Journal: Applied Economics* , 2 (3), 46-59.**

The article begins by highlighting the issues that arise when economic theories are applied to some African states – the theories assume agents have sufficient and symmetrical market information. In Niger this has not been true; obtaining market information has been too costly for traders and a distinct monopoly on information occurred. The imbalances lead to a significant occurrence of price dispersion across markets. The advent and spread of mobile phones from 2001 has had a profound effect upon this; farmers with mobile phone access can obtain far greater local and international market information whilst reducing their search costs as they must no longer physically travel to markets to garner such information. Aker's study shows that this has led to a significant decrease in price dispersion (10-16%) amongst grain traders, even when variables and spill-over effects are accounted for. When combined with the reduction in search costs, both the trader and consumer benefit. The effects of mobile phones are increased in remote areas where market information is more costly due to the large distances between markets and the greater lack of infrastructure. Because the commodity in question is storable, market information allows traders the opportunity to sell at a premium price rather than hedging their bets. Aker suggests that the relationship between mobile phone use and agricultural markets may be an effective means of poverty reduction for rural households.

The article provides solid evidence and backing for the use of mobile phones in developing countries as a way of improving market systems, and the flow on effects that this has for welfare. This is the first article to look at the impact of mobile phones on storable crops, making it useful for Sudan's agricultural environment. Sudan's market systems, lack of infrastructure, and spread of mobile phones means the article will be, in most parts, applicable to the state. Aker has used economic models and equations to analyse the data, accounting for variables as well as ruling out spill-over effects, ensuring the reduction in price dispersion is due solely to mobile phone use. By using a number of varied markets and associated networks, Akers is able to isolate the effects specific to market characteristics. The article describes a means of economic development through an already existing market system.

**Bozzoli, C., & Bruck, T. (2009). Agriculture, poverty, and postwar reconstruction: Micro-level evidence from Northern Mozambique. *Journal of Peace Research*, 46(3), 377-397.**

The article examines not the statistical welfare of post-conflict households in Mozambique, but rather what households *do* and the corresponding effects this has on welfare levels. The study uses two rural areas in Mozambique to determine which household activities benefit welfare levels in terms of income generation, consumption, and food security. The findings show a positive relationship between cultivated land area and consumption and food security. Not only this, welfare is further improved by production expansion rather than crop diversification; it is farm size, not scope, that is crucial. On-farm activities increase both income and consumption, however this is due to the unstable nature of labour markets in post-conflict states lacking infrastructure. Subsistence farming negatively effects household income, but is neutral regarding consumption. Instead it is cash crops that have positive effects for both income and consumption. Market participation is a means of increasing household welfare levels to which policy should be directed. Interestingly the article finds cotton adoption has negative effects on all measures of household welfare. This may be due to its inedible and labour-intensive nature proving unsuitable for a post-war environment, even if it does increase market participation. The article finishes with three post-war market policies to promote market participation, thus increasing household welfare and levels of local economic development.

The article stresses the need to account for the effects the legacies of war have on household economies, and the lack of literature that currently does so when examining household activities. The transition from subsistence farming to market participation is a necessary step for local economic development, and the article depicts the fluidity of households as being responsible for the existence of markets. The article looks at development in possibly the most 'micro-level' available, but this can be extremely limiting in terms of the scope of economic impact. Although Mozambique, like Sudan, is an agricultural post-conflict African state, the article gives the impression that Mozambique is at a more advanced stage of recovery, meaning Sudan may be better suited to focusing on market development and stability, rather than the market participation policies of this article.

**Elbadawi, E., Arshad, F., Mohammed, Z., & Ismail, M. (2013). Assessing the competitiveness of sheep production in selected states in Sudan. *Journal of Agricultural Science*, 5(1), 75-83.**

Much of the scholarship on economic development in Sudan bases itself around the agricultural industry. There is an emphasis on improving the efficiency of the sector, rather than developing new economic development schemes. This article focuses on sheep production in the Sudanese states of North Kordofan and Gadarif. Livestock is a relatively large contributor to Sudan's GDP, and as a strategic commodity, it is argued that more needs to be done to develop the sheep production economy for local development. The article examines current market conditions, determining that sheep production is largely profitable in these states and could be further expanded. It is recommended that given the livestock levels in Sudan, more needs to be done to tap into the available Arab market through exports. Although some recommendations are government policy based, the results of the study still find very much in favour of sheep farming as a profitable source of income on both domestic and international markets, even with cost increases in domestic factors of production.

The article provides statistical reasoning for further developing and expanding profitable agriculture sectors in Sudan, rather than a new 'innovative' IGA. Although significant levels of results are generated using Policy Analysis Matric (PAM), there is little discussion of the results or even of the recommendations given, leaving the weighting of the article a little unbalanced. It is to be assumed that the article has been translated as it is full of incorrect sentences, grammar, and spelling, resulting in sections being extremely difficult to follow. This detracts a lot from the article despite its publication in a peer-reviewed journal. There are also issues with the referencing, with one cited source not appearing in the reference list making it difficult to track down related articles.

**Fadl, K., & El Sheik, S. (2010). Effect of Acacia Senegal on growth and yield of groundnut, sesame and roselle in an agroforestry system in North Kordofan state, Sudan. *Agroforestry Systems*, 78(3), 243-252**

There has been a decline in arabic gum production in Sudan despite the significant value of its export to the economy. Drought, desertification, and food demand increases are accountable for the shift away from the fallow rotation method. The article compares the economic returns of an intercropped agroforestry system with a monocropped system. Plots were divided into: intercropped sesame, roselle, and groundnut with *A. senegal*; monocropped sesame, roselle, and groundnut; and sole *A. senegal*. Although crop yields decreased in intercropped systems, when net revenues were compared using a land equivalent ratio (LER) to measure productivity and efficiency, intercropping showed greatly increased values. Soil quality was also improved in intercropping systems due to the nitrogen fixation associated with *A. senegal*. Sesame showed the greatest percentage increase in net revenue, with roselle giving the highest overall net revenue. For these reasons, it is recommend that sesame and roselle are intercropped with *A. senegal* for greatest economic returns from available land.

This article is an example of local economic development through improved agricultural returns. Like similar articles, although net revenue would significantly increase, it would be difficult to implement the required changes to farmers' current mindset and methods. The data is well formatted and thorough in presentation. With intercropping resulting in decreased yields, one must assume that the increased profits are due to the inclusion of *A. senegal* revenues as the discrepancy between yield and revenue levels are not addressed. The application of this article is limited to specific areas of Sudan where gum trees are more naturally suited, e.g. the gum belt. The article will have little effect on other farming areas or urban areas, other than the potential increased cash flow.

**Gorlorwulu, J. (2011). Job creation in fragile states through SME financing: Notes from post-war Liberia. *Development in Practice*, 21(2), 295-299.**

The article looks specifically at the issues involved in economic recovery in the context of unstable states where local issues undermine larger economic intervention strategies. Gorlorwulu systematically works through the faults that have hampered attempts at job creation in Liberia, and the 'lessons' that can be learnt and applied to other post-conflict African countries. The article's emphasis lies in the need to combine financial with technical assistance; the author argues there is little point in throwing money at a country lacking in infrastructure. Similarly, the article argues that traditional financial models cannot be used in such states and it must be ensured that regenerative job creation is not established in areas perpetuating the economy of war. What this essentially means is that there must be encouragement for donors to invest in the seemingly 'unattractive' – e.g. areas lacking market-based activities and infrastructure. The article promotes capacity-building and venture capital models as more effective means of financial assistance strategies, as they have the long-term investment periods required in post-conflict states. Essentially Gorlorwulu stresses the need for innovative and tailored financial investment strategies if small and medium enterprises (SMEs) are to provide sustainable job creation and economic development in post-conflict states.

The article is somewhat lacking in specific economic development content due to its relative brevity. However, although it does not provide detailed strategies the lessons learnt from Liberia are extremely applicable to efforts of job creation in Sudan. The article provides a reprieve from agro-industry methods, which is useful given the levels of urbanisation in Sudan – the development of SMEs are likely to be a main source of job creation in urban areas. Gorlorwulu's area of speciality is Liberia, but the reference list provides broader post-conflict state studies. The article is useful not in specifying a specific means of local economic development for Sudan, but in its application of such strategies and using Liberia's failures as a means of ensuring the same does not occur to development attempts in Sudan.

**Janvry, A., & Sadoulet, E. (2010). Agriculture for development in Africa: Business-as-usual or new departures? *Journal of African Economics*, 19, ii7-ii39.**

The paper focuses on Sub-Saharan Africa and the lack of structural transformation that has occurred there. Unlike the majority of the rest of the world, Sub-Saharan Africa missed the industrialisation process and subsequent urban economic development. A lack of agricultural development has seen urban migration without job opportunities to support such, creating increased poverty rates. Statistics show an increasing urban poverty rate whilst the rural rate declines – the agricultural industry is an important means for economic development. The returns of growth multiplier effects ( e.g. increased income leads to more spending) significantly favour agricultural investment as opposed to non-agricultural; agricultural success creates growth in urban sectors. The paper emphasises the unique model needed for Sub-Saharan agriculture due to the heterogeneity of the area, along with the complex nature of agricultural expansion compared with other economic development schemes. Provided is a list of new agricultural development techniques along with corresponding examples from Sub-Saharan Africa.

As with other African economic development articles, the need for an integrative approach is stressed; though the paper takes into account the post-conflict instability of the region, some of the requirements for agricultural development may be overly ambitious for Sudan's current state. The article is well-researched and clearly presented, if a little theory heavy. The emphasis lies on creating the foundation for agricultural development schemes, rather than proposing specific schemes themselves. The local grass-roots sections of the article may be more appropriate for DCR purposes than the sections on international financing. For Sudan, the article is useful in terms of long-term agricultural development rather than short-term, quick-return schemes.

**Omer, A. (2011). Energy, environment, and sustainable development in Sudan. *IIOAB Journal*, 2(1), 31-44.**

The article highlights the importance of the energy sector, especially sustainable energy, on a country's socio-economic development. With Sudan's agricultural and relatively resource-rich nature, Omer argues sustainable energy is a key factor in developing the national economy with specific benefits for the rural poor. Not only this, but a global shift towards sustainable energy sources is crucial for agricultural environments, such as Sudan's, to survive, with the effects of global warming already beginning to have an impact. The article cites 50% of Sudanese land as suitable for electricity generation via wind power, and 75% as suitable for hydropower generation. The article also stresses the viability of increasing biomass energy generation, with relatively high levels of this already occurring. Shifting towards sustainable energy sources would reduce the costly reliance on imported energy sources. Improving the accessibility and efficiency of energy sources has the potential to directly benefit rural communities; sustainable fuel wood farming programmes are not only a means of income generation, but also improve rural quality of life by simply lowering the cost and difficulties of cooking. Going a step further, Omer cites solar power as an ever greater potential source of rural development, as only capital costs need be regained. The article continues by delving into national economic development opportunities (savings in foreign exchange, improved energy security, job creation), rather than local development, and subsequent policy recommendations.

Though the article does not provide a strategy for local economic development, it does address one of the most important factors in development – energy. A shift towards sustainable energy will have valuable flow-on effects for the rural poor. The article was clearly written before Sudan's partition, leaving the oil production section, and some of the land statistics, to be inaccurate. Also it would seem the article has had electronic formatting issues, with segments repeated or incomplete. In terms of national sustainability schemes, 'key change agents' include the government and private sector making the ultimate aims of the article beyond the scope of the research question. The article raises some interesting points that should be taken into account when reviewing local economic development schemes.

**Ousman, A., & Aune, J. (2011). Effect of seed priming and micro-dosing of fertilizer on groundnut, sesame and cowpea in Western Sudan. *Experimental Agriculture*, 47(3), 431-443.**

This article, like many others, focuses on improving agricultural efficiency in Sudan as this is such an economically important sector for the country. The article begins by noting the increase in total production of groundnut and sesame in Kordofan and Darfur, yet productivity (efficiency) has decreased. Traditional rain-fed farming methods are used in this area meaning there is erratic 'natural irrigation' and poor soil quality. The article tests the effects of seed priming (soaking the seeds before they are planted) and micro-dosing (applying small amounts of fertiliser to planting pockets) with both on-station and on-farm trials. Groundnut, sesame, and cowpea are the crops tested. Controls are used throughout the trials, and priming and differing levels of micro-dosing are tested both independently and conjointly. Together the techniques improved plant numbers, vigour, and pods per plant. The article then does an economic analysis to see which method will give the greatest net benefit. Priming + 0.6g fertiliser increases the economic return of groundnut from US\$184 to US\$497 per hectare of sesame from US\$99.80 to US\$148.11 per hectare, and of cowpea from US\$96.01 to US\$109.88 per hectare. These figures are still underestimations as the value of hay is not considered in these equations, with grain and hay yields increasing by up to 102%. There may be flow-on effects from increased productivity as livestock production may be strengthened due to the increase in both the quality and the levels of fodder. However, the broadcasting of fertiliser is not recommended due to the high costs of doing so.

With the three crops examined in the article already well-established in both the country and regions of interest, the article provides a clear method of increasing economic gains from the crops. With such a strong emphasis constantly placed on improving Sudan's agricultural efficiency due to the natural resources and arable land it possesses, seed priming and micro-dosing is a relatively simple means of doing so, which will lead to significant results. The article does note the necessity for dissemination of knowledge to the farmers, along with the need for agricultural banks to ensure fertiliser availability and accessibility. These would both be major difficulties to overcome in any attempt to implement such a programme. Overall the article is thoroughly referenced, citing other related studies, and presents the findings in a clear and thorough manner. The use of on-farm trials further strengthens the applicability of the article to Sudan, with increased crop yields already resulting from seed priming and micro-dosing in similar dryland states.

**Rahim, A., van Ierland, E., & Wesseler, J. (2007). Economic incentives for abandoning or expanding gum arabic production in Sudan. *Forest Policy and Economics*, 10, 36-47.**

Expansion of gum arabic production is a potential means of economic development in Sudan, as it generates export revenue due to its use as an emulsifier. The article examines the required changes in Sudan's economy for valid cessation or extension of such. Although gum arabic has a lower profitability than other crops, its advantages lie in social benefits and its time of harvest. Gum arabic is harvested in the 'off season' meaning there is no economic conflict with other agricultural crops. Expanding production is a matter of the opportunity cost of lost non-agricultural labour income versus gum arabic profits. With the present land availability and harvest profits, the labour opportunity cost would need to increase nine to ten times for abandonment to occur. So the question remains of the necessary incentives to increase gum arabic production. With the importance of agro-industry in Sudan's economic development, there is much to be gained from incentivisation. Not only does gum arabic provide a source of income in the dry season, it is environmentally beneficial as it improves soil fertility for crop rotation and provides a natural buffer between desert and fertile lands; whereas deforestation would decrease the productivity of other agricultural crops. Current political instability and lack of infrastructure discourages land investment by farmers. The article finishes by detailing required policy reforms which would increase the export price of gum arabic to levels that would incentivise expansion.

The article provides a sound economical model for both its means of data formation, but also potential incentivisations of the arabic gum production. Well referenced and peer reviewed, the article makes a point of accounting for social as well as economic benefits. This is critical when examining sustainable economic development approaches. Although slightly more dated than other articles, the material presented should still be applicable given Sudan's rate of development. The data is based solely on the Kordofan region and may need altering should it be applied to other areas of Sudan. The suggested policy reforms may be difficult to enact given the noted instability and lack of formal institutions in Sudan.

**Reddy, B., Ramesh, S., Kumar, A., Wani, S., Ortiz, R., Ceballos, H., et al. (2008). Bio-fuel crops research for energy security and rural development in developing countries. *BioEnergy Research*, 1(3-4), 248-258.**

The article examines the social and economic benefits of introducing bio-fuel crops into the agricultural systems of developing nations. It is quickly concluded that there cannot be a compromise between food and fuel in such states, as food sources are often scarce. Instead by diversifying crop use so that food needs may be met whilst at the same time profits generated from bio-fuel generation from the same crop, farmers may increase their incomes. The article focuses mainly on the advantages of switching from grain sorghum (a crop present in Sudan) to sweet sorghum. Sweet sorghum produces similar grain yields, may be used as animal feed, and can produce significant levels of ethanol for bio-fuel use. Genetic engineering is espoused as the means of enhancing crops for bio-fuel use. The article also looks cassava crop use, second-generation ethanol from grasses, and bio-diesel production. It is argued that energy security is equally important for developing nations as it not only provides a source of income, but lowers associated costs.

Although the sorghum crop example may be applicable to Sudan, the rest of the bio-fuel crops are less likely to be suitable to Sudan's social and physical environment. Switching to sweet sorghum could open up new channels for Sudan's agricultural sector, but it appears to be heavily dependent upon genetic engineering and plant breeding improvement programmes. Although the article focuses on 'developing' nations, those cited (India, China etc.) are further along the development path Sudan. Although this is an interesting article, it may be some time before schemes such as this are worthwhile investments in Sudan.

**Simonetti, R., Wuyts, M., & Wuyts-Fivawo, A. (2007). Banking on rural innovation for poverty reduction: A case study of value-chain lending in Mozambique. *The European Journal of Development Research*, 19(1), 136-155.**

The article examines the effectiveness of GAPI (a non-bank, domestic financial institution) in assisting rural economic development in Mozambique. As highlighted by other articles, there is a need in post-conflict African states to invest in the economically 'unattractive' e.g. areas lacking infrastructure in order to develop the agricultural sector. Due to the high risk and lack of collateral associated with rural small and medium enterprises (SMEs), banks and foreign investors are extremely unlikely to provide credit, let alone credit with reasonable interest rates. GAPI's purpose was to create rural productive capabilities through supporting value chains rather than just single producers. The article highlights the need to stimulate demand, as well as supply, in order for chains of production to succeed. Two case studies are examined in the article – cashew nut processing, and poultry farming – both of which are current enterprises in Sudan. The creation of processor associations allowed economies of scale to occur, leading to access to export markets. Where local markets have limited levels of demand, international markets hold the potential for high demand levels for these rural value chains. Creating associations results in multiplier effects from the provision of microfinance through to the reduction of rural poverty rates. Market systems often fail in undeveloped countries; supporting entire value chains is a means of overcoming this in order to achieve local economic development.

Although the article is based around a Mozambican financial institution, the concepts and commodities used in the article may be useful for exploring value chain development in Sudan. The idea of supporting the entire chain of production would require the backing of a potential financial institution, but the success associated with such should not necessarily be overlooked. Though the article provides basic information on the processes of developing both cashew processing and poultry farming, it is lacking in specific details. The article does not elaborate on the difficulties faced in establishing the scheme, as no doubt there would have been many. Overall the article provides an interesting take on the successful development of value chains.

**Yagoub, S., Hassabo, A., & Dawelbeit, M. (2007). Integration of livestock and crop production in the Sudan. In *African Crop Science Conference Proceedings* (Vol. 8, pp. 573-576). El-Minia: African Crop Science Society.**

Like many other agricultural articles, improving efficiency of the sector is one of the main themes in this article. This time the integration of livestock with crops on farms is advocated for a large number of reasons. The article cites this integration as the shortest and easiest approach of increasing farmer income, with both economic and social benefits. Integration improves soil quality and fertility by avoiding high-intensity crop production techniques; it reduces the economic risk for farmers; it lowers animal production costs via the utilisation of crop residues and failed crops; it favours the reduction of urban migration; and by increasing productivity, it will reduce the risk of the degradation of natural resources. The article then lists 'strategies of integration', most of which are based on implementing new technologies. Finally, the challenges to integration are listed, including potential stock malnutrition, poor management, lack of markets, and lack of finance.

Although the article is extremely short, it succinctly details the potential advantages of crop and livestock integration in Sudan. The article does however lack a case study, and any means of data and results generation. There is currently an absence of research methodology for the studying of integration, which means that the article is unable to prove statistically the economic advantages of integration. Despite this, the article does present an interesting case for encouraging divergence from traditional farming methods, even if this may be difficult to implement. It notes the need for changing the perspective among many in the Sudanese agricultural sector from agriculture as a lifestyle, to agriculture as a profession. The article integrates well with those emphasising technology and market-based improvements in Sudan's agricultural industry.