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Review

Review: Time use as an explanation for the agri-nutrition disconnect? Evidence from rural areas in low and middle-income countries

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ABSTRACT

Time is a vital input into nutritional outcomes, as it is necessary for the production, procurement and preparation of food, child feeding and childcare. Thus, agricultural interventions may fail to improve nutritional outcomes if they do not take account of time constraints, particularly of rural women who spend a considerable portion of their time in agriculture. Given the potential trade-offs pertaining to time in productive vs. reproductive activities and its implications for maternal and child nutrition, the goal of this review is to systematically map and assess the available evidence, both qualitative and quantitative studies, agriculture-time use-nutrition pathway.

Through an analysis of 89 studies, identified through a systematic search, on rural areas of low and middle-income countries, we observe three findings. First, women play a key role in agriculture, as reflected in their time commitments. Second, evidence from a very limited set of studies suggests that agricultural interventions tend to increase time commitments in agriculture of the household members for whom impact is measured. Third, while changing time use tends to change nutritional outcomes, it does so in a range of complex ways and there is no agreement on the impact. Nutritional impacts are varied because households and household members respond to increased time burden and workload in different ways.

1. Introduction

The causes and consequences of maternal and child undernutrition cut across sectors. There is now a firm recognition of the need for wider development policies to be more effective in tackling the underlying determinants of undernutrition (Bhutta et al., 2013). Agriculture has been recognised as a key sector to leverage for improved nutrition outcomes. However, several systematic reviews to date have failed to find clear evidence that agricultural interventions are associated across the board with nutritional improvement (Webb and Kennedy, 2014).

The current evidence-base on the impact of agricultural interventions on nutrition outcomes is weak due to the absence of sufficient good-quality research and evaluation (Girard et al., 2012; Ruel and Alderman, 2013; Webb and Kennedy, 2014). In particular, Webb and Kennedy (2014) argue that there is a need for more research on the pathways to impact, because many of the existing studies have focused on determining the size and direction of impacts, rather than the

channels by which impact occurs. In addition, many studies and reviews identify women's role as key in leveraging agriculture interventions to accelerate reductions in undernutrition. Ruel and Alderman (2013) argue that all researchers in this field agree that women are central mediators of the pathway from agriculture to nutritional outcomes. However, they also note that few studies measure the impact of agricultural interventions on women's time, knowledge, resources, or nutritional status.

Our review investigates the gender dimensions of changing time use in agriculture, and the subsequent impact on nutritional outcomes due to the time needed for food production, purchase, preparation, child feeding and child-care. Specifically, we attempt to disentangle two pathways: that connecting agricultural practices and interventions and time use; and that linking time use with nutrition, through a rigorous and comprehensive systematic review methodology. The review is aimed at addressing the question on *how* agriculture can produce nutritional impacts via time use. We analyse quantitative, qualitative and

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mixed-method evidence using narrative synthesis technique. This technique organises findings and discussion around key themes, as they emerge from the studies and as previously set out in the underlying theory of change. Finally, we discuss the implications for both academics and policy makers of the findings.

This research is significant for several reasons. It is the first to provide a summary of evidence on the time burdens of agricultural practices and interventions, providing tentative evidence that agricultural interventions tend to increase agricultural time commitments. Second, it provides evidence of the complex impact of rising time burdens on nutritional outcomes and sets out key factors that determine the impact. Third, it makes a series of recommendations about useful lessons for future research on this topic, given the fragility of much of the evidence.

2. Time-use constraints confounding the agri-nutrition relationship? Three conceptual hypotheses

In this study we look at the impact of changing time burdens in agriculture, with time burden understood as an increase in overall time commitments. Time use patterns shape food consumption practices and nutritional outcomes (for example, Hull, 2013), as time is a vital input into the production, procurement and preparation of food, child feeding and childcare. In this context, if agriculture is a primary source of employment and income for many women and men, then changing time use in agriculture can affect nutritional outcomes.

The literature on agriculture and nutrition (called ‘agri-nutrition’ in much of the literature) and time use contains several conceptual hypotheses about the relationship between agriculture, nutritional outcomes and time use. The first hypothesis suggests that women spend a significant amount of time on agricultural activities in rural areas of low and middle income countries, which, coupled with other activities, leads them to experience high overall time burdens (Rost et al., 2015). Women are heavily involved in agriculture, comprising 40 percent of the agricultural labor force in low-income countries (FAO, 2011). Regional differences exist due to variation in farming systems and gendered division of labor—for instance, in sub-Saharan Africa women are disproportionately in charge of agricultural production (50 percent of labor force in agriculture) relative to other regions of the world (for example, Latin America has on average 20 percent of women working in agriculture) (FAO, 2011). Women also play a significant role in shaping agricultural and food practices due to their involvement in food production and in other stages of food provision such as food purchase, preparation, and processing. One of the most laborious activities for women in rural areas is food preparation (Barrett and Browne, 1994; Hyder et al., 2005).

At the same time, studies conducted in Africa and Asia demonstrated that women work as much as 13 hours more per week than do men (FAO, 2009). Time use studies expose women’s time poverty and unequal burdens (Blackden and Wodon, 2006; Hirway, 2010). Concerns with time constraints gave rise to debates on time-saving technologies to help women decrease their time burden and drudgery (Carr, 1978; Cecelski, 2000).

The second hypothesis is that this overall high time burden leads to time constraints and subsequent decisions about the trade-off between activities that are relevant for nutrition. Time must be divided between farming, wage work, food purchasing, food preparation and childcare, so trade-offs exist between them. For example, if women spent more time growing crops, they may have less time to prepare nutritious foods for themselves and their children. Trade-offs can be complex and unpredictable and depend on a range of factors, some of which are highlighted in recent discussion of agriculture and health linkages (Kadiyala et al., 2014). Kadiyala et al.’s (2014) review of studies from India shows that the increased income obtained through women’s wage work does not necessarily improve nutritional outcomes because women have less time to spend on child health. However, women’s

employment in agriculture may not always reduce time for childcare, especially when there are other people in the home who take on this responsibility (Kadiyala et al., 2014). Issues of seasonality and work intensity are also relevant, and may produce contradictory time use outcomes (Kadiyala et al., 2014,) and suggest that a narrow focus on time-saving technologies may not be sufficient to address women’s time burdens. Men are affected by time constraints too, but they are seen as being more able to perform their activities sequentially, whereas women may have to pursue their paid and unpaid work simultaneously (Blackden and Wodon, 2006), thus facing more severe trade-offs.

If we then differentiate donor- or government-led agricultural projects (‘interventions’) from ongoing agricultural practices, the third hypothesis is that agricultural interventions may unwittingly increase household time burdens, particularly of women, with negative consequences for nutritional outcomes. Thus, we see some concern that effective agricultural interventions need to consider the gendered impact on workloads and time constraints (Berti et al., 2004; Arimond et al., 2011). However, the evidence to understand how agricultural interventions affect women’s or men’s time is quite limited in practice. Kawarazuka’s (2010) systematic review of aquaculture interventions found limited evidence of the impact of aquaculture activities on gendered time allocation. Further, in the systematic review by Leroy and Frongillo (2007) of animal husbandry and aquaculture, only 4 of the 14 included studies have even a limited assessment of the impact on caregiver time and workload, and these show mixed impacts. Leroy and Frongillo conclude that given this lack of knowledge, it is possible that the potential benefits from any successful intervention to increase the output of animal-sourced protein may be offset by a reduction in the time available for childcare (2007).

3. Theory of change and research methodology

This study is a systematic review of available evidence on the direction and causes of impact along the pathways set out in Fig. 1.

The theory of change represented in the diagram summarizes the key linkages between agriculture and nutrition, via time use. This theory of change informed our search strategy and selection process in the systematic review, as it will be explained below. First, it illustrates that agriculture practices tend to use household labor in various ways; agriculture interventions tend to change that labor use. Changes can occur at any point in the agriculture and food value chain: in labor used in agricultural inputs (such as making mature or collecting seed), in production itself, or downstream in terms of the storage, processing, distribution or sale agricultural outputs.¹

The exact impacts on time use in agriculture will depend on various factors and will interact with existing social norms about agricultural work. For example, intra-household dynamics may affect who engages in an agricultural intervention project itself. This changing labor input into agriculture will change the overall time burdens of various household members. There may be changes in the time spent on productive activities and reproductive activities, and these may affect nutrition in various ways. Nutrition may be affected directly – by changing energy expenditure, hygiene and healthcare practices, and thereby nutritional status. Changing time burdens may change child feeding, food preparation or food provisioning.

Given the theory of change and the comment in the reviews quoted above on the limited available evidence, this research sets out to solve two problems. *debFirst, to address the lack of evidence in previous reviews, it uses an innovative approach intended to capture a wider set of data than previous reviews. As such, the review analyzed three kinds

¹ Land access and ownership shape how agriculture and time use are linked and there is a specific concern that agricultural commercialisation and land reforms or deals may lead to women losing access to land (Behrman et al., 2012). However, the discussion of land is beyond the scope of this paper.

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