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Farmers’ and academia’s views”

## Effects of credit on the adoption of drudgery-reducing crop production techniques in northern Ghana

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### Abstract

Agriculture continues to play an important role in the lives and livelihoods of smallholder farmers in developing countries. However, the role agriculture plays in improving the nutritional status of farmers is still being questioned, particularly because of a lack of strong correlation between agricultural productivity increase and nutritional outcomes observed in many developing countries. Some authors attribute the weak relationship between agricultural production increase and improved nutritional statuses of farmers in developing countries to the high level of drudgery and human labour expenditure that characterise crop production among smallholder farmers. Indeed, there is evidence of negative energy balance observed among West African farmers because of higher calorie expenditure relative to consumption, particularly during the growing season. Recent literature shows a negative association between agricultural cropping work and nutritional status, as measured by body mass index (BMI) for non-overweight individuals in developing countries. Thus, drudgery reduction in the cultivation of crops by smallholder farmers in developing countries has been identified as a potential pathway through which agriculture can improve the nutritional status of non-overweight farmworkers. One drudgery-reducing strategy is to substitute manual land preparation and manual weed control for tractor ploughing and herbicide weed control respectively. However, adopting these drudgery-reducing cropping strategies come with financial costs, which is a constraint to smallholder farmers. Hence the objective of this research is to examine how credit-constrained farmers will adjust their cropping plans to reduce total labour energy expenditure when they are provided with a credit facility. The role of farmers’ access to credit in the adoption of improved agricultural technologies is well documented in the literature and this research intends to contribute to that. Using preemptive goal programming, we construct a household model for a typical farm household in northern Ghana to analyse the effects of credit provision on the adoption of drudgery-reducing cropping techniques. Our analysis shows that the provision of credit at a 25 % interest rate per annum to credit-constrained farm households in northern Ghana enables them to adopt drudgery-reducing production techniques. We also observe a trade-off between total energy expended in crop production and amount of credit households can borrow.

**Keywords:** Credit, mathematical programming, nutrition, smallholder farmers