



Title Registration for a Systematic Review: What are the Impacts of Agricultural Input Subsidies on Productivity, Farm Incomes, Consumer Welfare and Wider Growth in Low- and Middle- Income Countries: A Systematic Review

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TITLE OF THE REVIEW

What are the Impacts of Agricultural Input Subsidies on Productivity, Farm Income, Consumer Welfare and Wider Growth in Low- and Middle- Income Countries: A Systematic Review

BACKGROUND

Agricultural subsidies were common in poor rural economies from the 1960s to 1980s, with widespread use of price subsidies (on products, machinery, seed, fertiliser, and electricity), export or import subsidies, exchange rate management (affecting import and export prices), tariff protection, and subsidised financial, irrigation, extension and research services. Subsidies were often associated with parastatal marketing and credit agencies and with offsetting agricultural taxation. The economic justification of agricultural input subsidies involved reducing temporary knowledge and risk constraints to farmers' adoption of improved technologies and practices, and increasing productivity, creating farmer benefits and/or consumer gains (from produce and labour market and price effects). However, while subsidies sometimes played a key but time-limited development role (for example, Timmer, 2004), empirical studies generally revealed difficulties in cost control, diversion, overuse of inputs and capital (discouraging more labour-intensive methods), regressive benefits, and market distortions inhibiting private investment in agricultural services (for example, Ellis, 1992; Morris et al., 2007; Timmer et al., 2009). Dominant analyst and donor thinking therefore considered agricultural subsidies as generally ineffective and inefficient.

This thinking has been challenged by re-examination of the successes and failures of both state- and market- led agricultural development (Djurfeldt et al., 2005; Dorward, 2009; Fan et al., 2004), by the calls of African governments, NGOs and some donors for input subsidies to address agricultural stagnation in Africa, and by recognition of wider potential subsidy impacts with different delivery mechanisms for 'smart' input subsidies (Dorward, 2009; Morris et al., 2007). This has been associated with the introduction of new and innovative agricultural input subsidy programmes, which in turn are generating new impact studies (for example: Chirwa et al., 2011; Liverpool-Tasie, 2012; Liverpool-Tasie et al., 2010; Pan and Christiaensen, 2011; Ricker-Gilbert et al., 2010; Ricker-Gilbert et al., 2009; Ward and Santos, 2010). Such programmes use vouchers for targeting, rationing, and private sector delivery, while wider impacts that are now recognised and investigated include private market development, soil fertility replenishment, social protection, and national and household food security. These wider impacts, still critically dependent on links from productivity impacts, are affected by a variety of factors including:

- Technology characteristics - for example: scale neutral/biased, labour, land or capital bias, fertiliser, seeds, demand elasticity

- Subsidy modalities- for example: universal, targeting, rationing, producer/supplier shares
- Farm constraints addressed – for example: knowledge, risk, affordability, profitability
- Subsidy rates
- Subsidy scale and market effects
- Subsidised product characteristics - for example: cash/food, tradable/non-tradable, demand elasticity
- Design and implementation features
- Context - for example, general 'stages of growth', market/economy 'thickness', macroeconomic conditions (including for example rules and situation), livelihoods, 'low productivity traps', complementary services (research, extension, transport, inputs, markets, finance), political systems

This is illustrated in the impact pathway (Figure 1). This figure has been developed from reviews of theory and literature (for example Dorward, 2009 and intensive evaluation by Dorward and Chirwa of the Malawi Agricultural Input Subsidy from 2006/7). The main part of the diagram illustrates the main outcomes and impacts flowing from input subsidies and the causal links between them. On the right hand side of the diagram are the main contextual influences that affect impacts and the links between them.

A policy relevant systematic review of agricultural input subsidy impacts therefore requires:

- broadening impacts to be considered, including the productivity impacts on consumer welfare and wider growth (increasingly recognised as major benefits of successful subsidies) in addition to farm incomes;
- analysis that distinguishes between different contexts, issues and impact chains.

This systematic review will fill the gap outlined below in existing reviews by taking a more holistic approach and addressing the question of “What are the impacts of agricultural input subsidies on productivity, farm incomes, consumer welfare and wider growth in low- and middle- income countries?” Answering this question will build on the causal pathway to:

- examine separately the evidence on each category of impact as well as on variables that are important in understanding links between them (such as prices);
- relate findings to the contextual factors set out in the causal pathway.

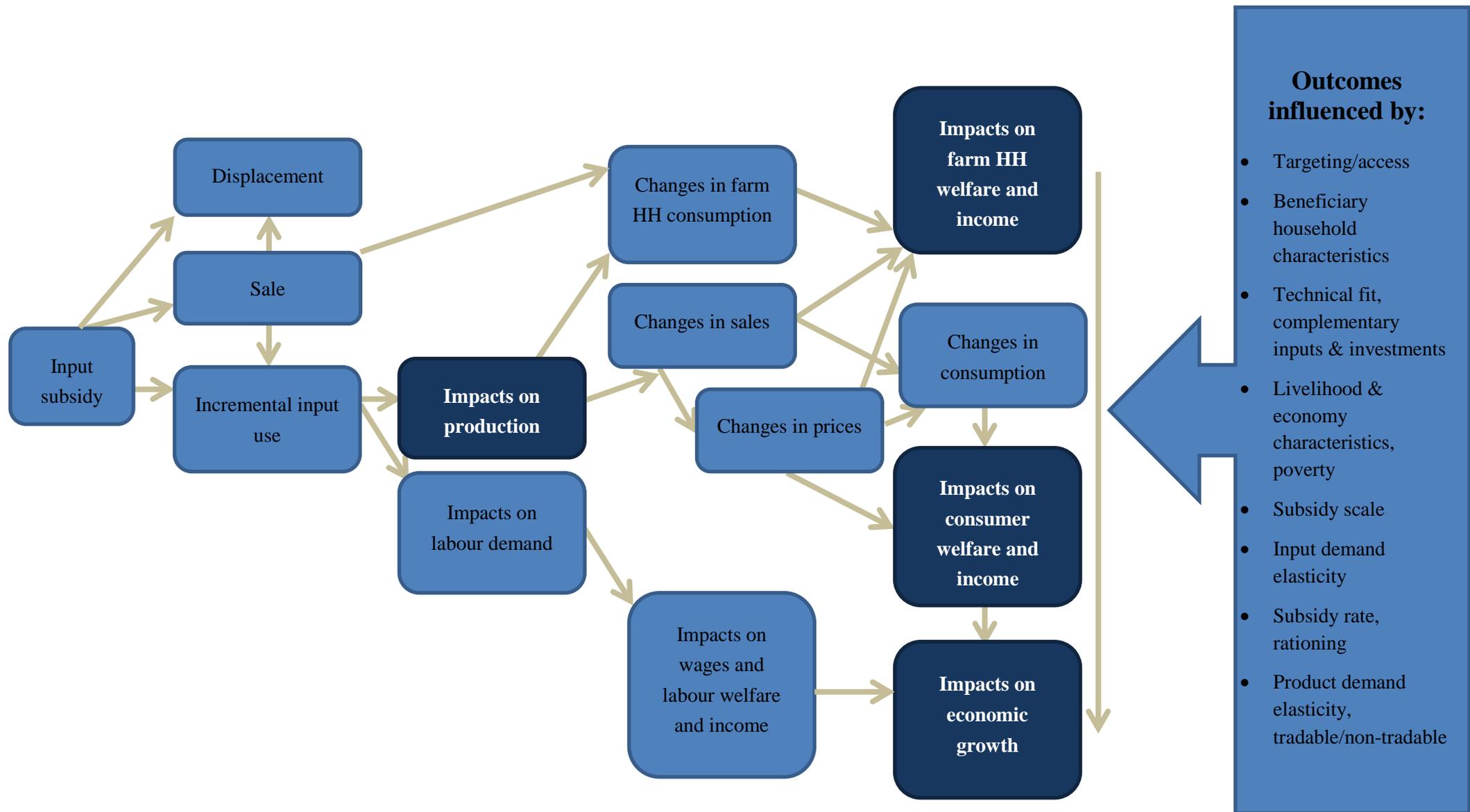


Figure 1: Impact pathway. Developed from reviews of theoretical and literature (for example Dorward, 2009 and intensive evaluation by Dorward and Chirwa of the Malawi Agricultural Input Subsidy from 2006/7). The outcomes directly addressed in this review are highlighted in darker blue

This review intends to become a key resource in ensuring that all stakeholders:

- are aware of a range of strengths and weaknesses, advantages and limitations of agricultural input subsidies for achieving different policy goals in different contexts; and
- are able to draw on accessible guidelines for improved policy selection, design and implementation.

The review aims to contribute to the achievement of these objectives and to influence the policy discourse away from more ideological arguments for or against subsidies to much more empirically based (and theoretically grounded) arguments that consider their particular short- and long-term strengths and weaknesses for particular purposes in particular situations. There is a particular policy focus on Africa as it is in Africa that there is the greatest interest in agricultural input subsidies and where there is likely to be the greatest potential benefit from them and therefore the greatest potential for applying learning to policy.

A systematic review question on this subject was proposed by 3ie regarding the impact of agricultural inputs subsidies on productivity and farmer incomes and welfare. The authors suggested broadening the scope in terms of the outcomes assessed, on the basis of theory and experience in developing countries, anticipating that the original question would miss key impacts relevant to considering the usefulness, or otherwise, of subsidies.

A recent search of CAB Abstracts examining the impacts of agricultural input subsidies (Harman, in prep.) suggests that the overall size of the literature base is manageable, and that the proposal to expand the question to address consumer and economy-wide effects would allow a more coherent assessment of input subsidy impacts without unreasonably expanding the literature base. It also demonstrated significant variation in methodological quality (particularly in the analysis of counterfactuals and attribution). Consideration of contextual issues and impact chains discussed above is also highly variable. Computable general equilibrium (CGE) and other models addressing counterfactual and attribution questions are often weak at describing contextual issues. These may be better covered by farmer surveys and commodity/sectoral studies - but such studies are weaker in addressing attribution. Separation of subsidy impacts from other complementary policies and identification of determinants of positive and negative impacts are particularly problematic. There are, however some recent good-quality studies of 'smart subsidies' (for example, Chirwa et al., 2011; Liverpool-Tasie, 2012; Liverpool-Tasie et al., 2010; Pan and Christiaensen, 2011; Ricker-Gilbert et al., 2010; Ricker-Gilbert et al., 2009; Ward and Santos, 2010).

OBJECTIVES

The study question is:

What are the impacts of agricultural input subsidies on productivity, farm incomes, consumer welfare and wider growth in low- and middle- income countries?

This will be treated as a set of linked sub-questions, examining:

- Impacts on productivity
- Impacts on farm incomes
- Impacts on consumer welfare
- Impacts on wider growth
- Linkages between these areas

EXISTING REVIEWS

No systematic review of agricultural input subsidies has, to our knowledge, been published in the past, and neither have more general reviews been sufficiently theoretically rigorous in addressing the range of possible outcomes and impacts discussed above.

This systematic review will therefore not only provide the first systematic review of this topic, it will also address a major gap existing in general reviews, by taking a more holistic approach and addressing the question of, “What are the impacts of agricultural input subsidies on productivity, farm incomes, consumer welfare and wider growth in low- and middle- income countries?”.

INTERVENTION

This study will assess the impact of agricultural input subsidies defined as: grants or loans (if repaid at below the market price) given to a farmer as a means of reducing the market price of a specific inputs used in agricultural production (Harman, in prep). The agricultural input subsidies considered will include but are not limited to: tax exemption, subsidies of seeds, fertiliser, pesticides, herbicides, animal feed, livestock drugs, and machinery subsidies. All providers of agricultural subsidies (government, agricultural extension services, NGOs and so on) will be considered in the review as well as all lengths of subsidy programme. These details will be recorded during data extraction.

Loans and grants not specifically given for the purchase of agricultural inputs and/or given at or above the market price will not be considered in this review.

Comparisons will be made between the impact of a subsidy compared to that of no-subsidy by using before/after analysis or looking at comparable groups. We will include studies that involve counterfactual comparison of with and without subsidy treatments.

Direct subsidy beneficiary impacts: Methods to be included here include randomised control trials and studies that use some formal methods for removing likely biases from non-random assignment of subsidy receipt. Such methods will include, but not be limited to: regression studies using difference in difference, instrumental variables, fixed effects and propensity score matching methods.

Indirect subsidy impacts: Methods to be included here include randomised cluster control trials, regression analysis across different regions or states (for example Fan et al., 2004) and different forms of modelling that allow comparison of with and without subsidy situations (for example, partial equilibrium, CGE and other models that link direct subsidy impacts into wider labour and produce markets).

It is recognised that studies vary in their methodological rigour, in the quality of data, and in their contextualisation. Clear recording criteria will be developed for coding each study on these parameters.

POPULATION

The population considered will be people (at all levels: for example, country, region, community, household, individual) living in low and middle income countries.

OUTCOMES

Outcomes are changes in one of the following:

1. **Agricultural productivity**- measured in broad terms by production per unit resource such as yields per unit land, production per unit labour, production per unit input, total production per farm.
2. **Farm income**- measured by value of production at market prices, net of cost of purchased inputs, it may or may not also be considered net of imputed costs (for example, of own land or family labour).
3. **Consumer welfare**- changes in real income are commonly used as proxy measures of welfare in benefit cost analysis, and generally provide similar answers (Alston et al., 2000; Sadoulet and de Janvry, 1995). Consumer welfare (particularly for poorer consumers) may be affected by changes in food prices, and hence food prices can be an indicator of real incomes. Real incomes are often measured by consumption or expenditure.

4. **Wider growth**- refers to growth outside the agricultural sector and may be measured by GDP growth in the wider economy or in sectors and subsectors outside those directly affected by (benefiting from) a subsidy.

STUDY DESIGNS

The following study designs will be eligible for inclusion:

Quantitative designs; before after control intervention, control intervention, interrupted time series, quasi-randomised control trial, randomised control trial, site comparison, time series, counterfactual modelling

Qualitative: observation, site comparison, survey/questionnaire

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REVIEW AUTHORS

Lead review author: The lead author is the person who develops and co-ordinates the review team, discusses and assigns roles for individual members of the review team, liaises with the editorial base and takes responsibility for the on-going updates of the review.

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ROLES AND RESPONSIBILITIES

- **Content:**

Dorward, Chirwa, Harman: To further develop understanding of the causal pathway, with consideration to contextual factors that will affect impacts etc (have conducted research and literature reviews in this field, written on subsidy impact chains).

Osborn, Barbosa, Lamontagne-Godwin, Wright: Contribute to developing project outline (substantial knowledge of academic publications in this field).

- **Systematic review methods:**

Dorward, Chirwa, Harman: Help define relevant issues for protocol (have good understanding for identification of relevant studies involving appropriate experimental approach. Dorward and Harman have worked on a closely related review).

Roberts: Devising protocol, advising team on methods (substantial experience of applying systematic review methods).

Osborn: Contribution to developing protocols (understanding of importance of impact chain – has developed previous systematic review protocols).

Hemming, Wright: Ensuring all elements of systematic review methods are applied appropriately (experience on previous systematic review and relevant training).

- **Statistical analysis:**

Dorward, Chirwa, Harman: Define key variables and hypothesised relationships between them, interpret findings. Subject expertise for fuzzy set calibration (experience in analysing relevant studies and their significance).

Roberts, Finegold: Developing appropriate statistical approach. Substantial experience of using statistical methods in meta-analysis in systematic reviews (Roberts), experience in working with fuzzy sets (Finegold).

Lamontagne-Godwin: Applying appropriate statistical methods (has conducted relevant statistical analysis).

- **Information retrieval:**

Dorward, Chirwa, Harman: Suggest relevant databases and other sources, input into designing framework for data extraction (experience in finding relevant subject material).

Roberts, Finegold: Advice on general approach to information retrieval and data extraction (experience in ensuring full range of inputs used, and appropriate approach taken).

Lamontagne-Godwin: Guidance on assessing quality and relevance of material (has combined quantitative and qualitative assessment in previous work).

Osborn: Devising data searches and interpreting them, provide guidance and support for research assistant (substantial experience in running database searches and using appropriate terminology and strategies, developed and ran searches for previous systematic review).

Hemming: Supporting information retrieval and identification of relevant material, overall supervision of the process (long experience of database searching and assessing documents against key criteria, and managing research assistant conducting such tasks).

Wright: searching, maintenance of End Note database, data extraction (substantial experience of previous systematic review).

- **Information retrieval:**

Dorward, Chirwa, Harman: Writing and revising the narrative of draft report (Dorward and Chirwa have authored many papers on the subject).

Roberts, Finegold: Meta-analysis methodology and conclusions (Roberts has conducted meta-analysis and written systematic review reports).

Osborn: Comment on final review (substantial editing experience in socioeconomics field).

Hemming, Wright: (Experience of writing and editing reports).

POTENTIAL CONFLICTS OF INTEREST

There are no conflicts of interest to declare.

FUNDING

The project is funded by 3ie and is timetabled to be delivered by May 2014.

PRELIMINARY TIMEFRAME

Note, if the protocol or review are not submitted within 6 months and 18 months of title registration, respectively, the review area is opened up for other authors.

- Date you plan to submit a draft protocol: August 2013
- Date you plan to submit a draft review: January 2014

DECLARATION

Authors' responsibilities

By completing this form, you accept responsibility for preparing, maintaining, and updating the review in accordance with Campbell Collaboration policy. The Coordinating Group will provide as much support as possible to assist with the preparation of the review.

A draft protocol must be submitted to the Coordinating Group within one year of title acceptance. If drafts are not submitted before the agreed deadlines, or if we are unable to contact you for an extended period, the Coordinating Group has the right to de-register the title or transfer the title to alternative authors. The Coordinating Group also has the right to de-register or transfer the title if it does not meet the standards of the Coordinating Group and/or the Campbell Collaboration.

You accept responsibility for maintaining the review in light of new evidence, comments and criticisms, and other developments, and updating the review every five years, when substantial new evidence becomes available, or, if requested, transferring responsibility for maintaining the review to others as agreed with the Coordinating Group.

Publication in the Campbell Library

The support of the Coordinating Group in preparing your review is conditional upon your agreement to publish the protocol, finished review and subsequent updates in the Campbell Library. Concurrent publication in other journals is encouraged. However, a Campbell systematic review should be published either before, or at the same time as, its publication in other journals. Authors should not publish Campbell reviews in journals before they are ready for publication in the Campbell Library. Authors should remember to include a statement mentioning the published Campbell review in any non-Campbell publications of the review.

I understand the commitment required to undertake a Campbell review, and agree to publish in the Campbell Library. Signed on behalf of the authors:

Form completed by: Holly Wright

Date: 07 August 2013