

Reviewer's Comment:

All of my concerns still exist in the new version. I have responded to the authors in the MSWord document that they have responded to me. I have given more detail (by means of examples) in there. I still think that the underlying problem is interesting and needs to be researched and published, but this paper is not on standard. My problem is if I have to highlight everything I think should be corrected/improved, I will pretty much have to rewrite the whole paper. I do not feel that is the responsibility of a reviewer though.

The minimum that the paper should contain is (with my remarks in brackets):

1. There should be an introduction (sufficient)
2. Agricultural background (poor, but covered to some extend in the methodology section)
3. Literature review (non-existing)
4. Model (poor – a model always goes with assumptions; the mathematical presentation hereof is far from sufficient)
5. Results (fair)
6. Conclusion (poor – The thing that I would like to see are: What do the authors recommend? Was this results implemented? What is the farmers' feedback on the results? In other words what was the real life impact of this research?)

Please find my response in red below

My three main reasons are (a) that the author(s) use a very simplistic model without proper assumptions and explanation, (b) that the author(s) does not link their work up with a rich, international literature on the optimization of agricultural business units and (c) the fluency, style, quality, language and grammar of the

paper is not on an international scholarly standard. (My last concern can be corrected by a good editor, but the first two concerns are major concerns.)

MY REACTION TO THE AFORE-MENTIONED COMMENTS OF THE 2ND REVIEWER:

The revised paper contained explanations that would dismiss the first reason/concern. It is a known fact that modeling of crop and livestock together has been a major challenge in mathematical programming due to calibration problems. Given the small scale nature of the farmers in the area of our study, we imposed certain restriction and have defined our units of measurement in the revised version of our paper.

I am not saying that it is easy to model the problem under consideration – as you argue above. I would be the first to admit it is difficult to mathematically model agricultural systems. I am saying the model is simplistic – this means something totally different. In other words the model might not take into account all the complexities of underlying problem (and that is exactly where assumptions comes into play – you have to physically state by means of examples what do you include and what do you ignore in the model, and also why). For example you introduce existing optimal cropping/enterprise patterns into the model – how do you (or me as the reader) know these are optimal? I know that popular rotary crop systems (or other mixes of crops) emerge amongst farmers, but are they optimal? All that your model takes into consideration is using the resources and producing at least two minimums (crop and protein requirement). What about things like the interaction between crops? (...that for example uses the same tools) What about labor? Etc.

Furthermore the model is documented in a very simplistic (it is non-mathematical) way. For example a “sum of” signs in the first constraint should look like below – some of your sum signs in equations 3 and 4 do not even have limits. And you have say that the equation are replicated for all i and c .

$$\sum_{i=1}^n \sum_{j=1}^m a_{ij} x_j \leq \sum_{j=1}^m b_j$$

There is dearth of literature on application of linear programming involving crop and livestock combination. We could not just bring in any work on optimization of agricultural units when it is not about linear programming and/or related to the line of our study.

I am sorry but this is simply not true. I'll admit that most of the literature is rather old –due to the fact that research on farming units has moved on from simple LP to incorporate this like risk, etc. But most of these methods still utilize LP. I took 15 minutes (more than I should have) and could easily find the following references to optimizing framing units with mixed business activities and none of them are cited in the paper under review. A more thorough search will most definitely provide more! [And as a side comment the first two are so similar to the paper that my feeling is that it should have been cited!]

AL Kenny, 2007, Optimal Land Allocation of Maize, Cassava and Teak for Small Landholders in Southern Togo, West Africa (Thesis)

KM Denison, 2011, Farmer land allocation for maize, groundnut and cotton production in Chipata District, Eastern Province, Zambia (Thesis)

Beneke, R. and Winterboer, R. 1973. Linear Programming Applications to Agriculture. The Iowa State University Press. Ames, Iowa.

Dent, J., Harrison, S., and Woodford, K. 1986. Farm Planning with Linear Programming: Concept and Practice. Butterworths, Sydney.

R.M. ELZAKI, H.H. ELFAKI, H.A. ELOBIED and S.E.H. AHMED, Online Journal of Animal and Feed Research Volume 1, Issue 6: 423-433 (2011) ISSN 2228-7701, LIVESTOCK INTEGRATION IN THE IRRIGATED AGRICULTURAL SYSTEM IN SUDAN

Catrileo, Adrián S.; Véjar, Max M. & Rojas, Claudio G., Production Strategies to Maximize the Gross Margin on a Traditional Crop-livestock System of the Dryland of the IX Region, Agricultura Técnica, Vol. 63, No. 3, 2003, pp. 240-250

We have revised the paper and do hope the fluency, style, quality, language and grammar have improved. If any editorial touch is strongly made and returned to us or the paper considered yet unsatisfactory, we shall look into that appropriately.

I do not believe the English is on an international standard, but I leave it to the editor to make this call.

Author's Feedback:

The minimum that the paper should contain is (with my remarks in brackets):

1. There should be an introduction (sufficient)

WE HAVE REWORKED AND BEEFED UP THE INTRODUCTION

2. Agricultural background (poor, but covered to some extend in the methodology section)

ADDITIONAL BACKGROUND INFORMATION HAS BEEN DONE.

3. Literature review (non-existing)

A SECTION HAS BEEN ADDEDED ON LITERATURE REVIEW BASED ON THIS COMMENT

4. Model (poor – a model always goes with assumptions; the mathematical presentation hereof is far from sufficient)

I AGREE BUT WE HAVE HAD TO PROVIDE INFORMATION ON HOW WE MEASURED VARIOUS LIVESTOCK BESIDES THE STATING THE EQUATIONS. WE DID NOT CONSIDER IT NECESSARY TO STATE THAT BECAUSE IN LP AS LONG AS THERE IS CONSISTENCY IN MEASUREMENT, THERE IS NO RIGIDITY TO IT. WE FEEL THAT ANY READER WHO IS INTERESTED IN LP UNDERSTANDS BASIC ASSUMPTIONS AND SO THAT DOES NOT REQUIRE FURTHER EXPLANATION AND EMPHASIS.

5. Results (fair)

WE HAVE REPORTED OUR FINDINGS THE BEST WAY WE COULD.

6. Conclusion (poor – The thing that I would like to see are: What do the authors recommend? Was this results implemented? What is the farmers' feedback on the results? In other words what was the real life impact of this research?)

WE HAVE MADE OUR RECOMMENDATION. IT IS NOT IN OUR POWER TO IMPLEMENT OUR FINDINGS. MAY BE THE AGRICULTURAL DEVELOPMENT PROGRAMME (ADP) OF THE STATE MAY TAKE IT UP. IT IS HOWEVER INTERESTING TO PERHAPS FIND A WAY OF MARRYING WHATEVER GOVERNMENT HAS FOR THE FARMERS THERE, IF ANY AND COMPARE IT WITH OUR FINDINGS; THIS WAS NOT PART OF THE STUDY ABINITIO. NEVERTHELESS, THE REAL LIFE IMPACT IS THAT WE HAVE A PROTOTYPE ON THE AREA THAT COULD A BASIS FOR POLICY MAKING FOR THE FARMERS.