Letter to the editor

1. State what are our major changes in the revised version of the manuscript?

Dear Editor,

Following major changes has been made to the manuscript:

* The title has been revised and changed as “Adoption of Sustainable Agriculture Practices among Kentucky, USA Farmers.
* We revised the introduction and literature review section (which was renamed later as “Factor Influencing SAPs Adoption”) giving more perspective of Kentucky agriculture and adoption of SAPs in Kentucky, previous researches and the detail research gap and importance and the uniqueness of this research. A paragraph was added to give a perspective of when the research related to sustainable agriculture practices has started and its development till the date.
* The brief perspective of different SAPs adoption in Kentucky was also added in the description of “Study Area” in the method section.
* We added a table to give details about sustainable agriculture practices identified through discussion and workshops among farmers in different locations of Kentucky which gives ideas of different SAPs adopted throughout Kentucky. This list identified several practices that were commonly adopted by farmers but were never focused on similar researches in Kentucky and in some cases, entire USA.
* We summarized all research and review papers that were cited in this paper and have research or reviews done focusing on USA agriculture, SAPs and BMPs adoption in the USA. Beside literature review of papers in the body of the paper, a separate table summarize all related literature in this paper.
* Also mentioned above, the “Literature Review” section about is renamed as “Factor Influencing SAPs Adoption” and Introduction is renamed as “Introduction and Relevant Literature Synthesis”
* As suggested by one of the reviewers, the section “Conceptual Framework” is removed and merged to Econometric/Empirical Model Section” in the method section. The Study area section was edited to give some perspective of different SAPs adopted in Kentucky.
* The limitations of the research were added in the “Result and Discussion” section. Some of the limitations added to the research are limited researches in the policy aspects (though some major are included), and unable to use smaller geographical level of study than agriculture district.
* The contradicting explanation of findings related agriculture districts was merged into a single paragraph and edited to make it a more justifiable explanation and result. And also added what is unique to this research in the last paragraph of research.
* The conclusion section of the paper was edited summarizing the major findings in the paper. A box with the significant findings was added to the body of the paper, the uniqueness as well as the policy implication of the findings, was added making conclusion section more precise, objective and concise.

These are changes made in the paper based on the suggestions of reviewers and editor. I believe these edits addressing suggestions of reviewers made this valuable and publishable in your renounced journal.

Thanks

Authors.

On Jun 28, 2018, at 9:41 PM, Environmental Management (EMVM) <[em@editorialmanager.com](mailto:em@editorialmanager.com)> wrote:  
>   
> CC: [em\_eic@baylor.edu](mailto:em_eic@baylor.edu), [jacob\_stanley@baylor.edu](mailto:jacob_stanley@baylor.edu)  
>   
> Dear Professor Paudel,  
>   
> We have received peer reviews of your manuscript entitled "Adoption of Sustainable Agriculture Practices among Kentucky Farmers", which was submitted to Environmental Management. Based on these reviews, your manuscript could be reconsidered for publication should you be prepared to incorporate major revisions.    
>   
> When preparing your revised manuscript, you are asked to carefully consider the reviewer comments that are attached, and submit a list of responses to these comments, indicating the page and line numbers of each comment. If you disagree with any specific reviewer comment, provide a justification for your decision to not make these changes.  All changes in the revised manuscript must be highlighted in Word to assist checking of revisions by the editorial staff. Please make sure to submit your manuscript as editable source files (i.e. Word, TeX).    
>   
> Please also submit your responses to the reviewers' comments as a separate submission item.  
>   
> In addition, all papers need an acknowledgment section that gives information on all financial and in-kind support for the project.

**Page 24, line 503 to 506.**

**Acknowledgement**

This research was funded by National Institute of Food and Agriculture (NIFA), United States Department of Agriculture, Grant Number 2014-6800621865. Small Farm Diversification in Kentucky. Paudel’s time in this project is supported by the USDA NIFA Hatch project #

>   
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> We look forward to receiving your revised manuscript **by 28 Aug 2018.**  
>   
> With kind regards,  
> Environmental Management Office  
> Environmental Management  
>   
> Comments for the Author(s) :  
> Editorial comments: The title of the article should insert ", USA" after "Kentucky" in the revised submission.   
> Addressed. New Title: **Adoption of Sustainable Agriculture Practices by Farmers in Kentucky, USA**

Reviewer #1:   
> The paper studies one of the oldest problem in the field of agricultural studies: the adoption of new practices by farmers. It has been studied in particular during the green revolution in order to understand how innovation are diffusing, and since then in many different studies concerning the adoption of so called sustainable practices by farmers. The originality of the paper does not lie on the theme, but on the survey that has been applied to support the authors’ conclusions. This survey is impressive and its results are correctly analyzed. Some findings are interesting (particularly the fact that agricultural innovation are localized), even if not surprising.

COMMENT:  
 Nevertheless, I found three major problems with this paper:

First, the bibliography review gives the impression that the study of agricultural innovation diffusion only started in the last few years. It is far from true, of course, and there are many different approaches of such a problem:

**RESPONSE:**

**Page 4, lines 48 to 57.**

Pretty (2008) traced the study of sustainable agriculture practices back to 1950s. Rural sociologists (see Ryan and Gross, 1943; Ruttan, 1996) were the pioneer in technology adoption-diffusion studies during early 1940s to late 1950s which were continued by economists and other researchers (see Foster and Rosenzweig, 2010). Grilliches (1957) wrote one of the influential papers on hybrid corn technology and diffusion. Later, National Research Council also published reports “*Alternative Agriculture*” in 1989 and “*Towards Sustainable Agricultural Systems in the 21st Century*” (Kornegay et al., 2010). Also, Baumgart-Getz et al. (2012) and Prokopy et al. (2008) studied literature related to sustainable agriculture practices adoption among US farmers from 1982 to 2007. However, this paper summarized recent literatures from last two decades only.

**Page number 24-27 multiple lines.**

Bibliography added for following new cited papers:

Griliches, z. (1957). Hybrid corn: An exploration in the economics of technological change. *Econometrica, Journal of Econometric Society*, 501-522.

Foster A.D. and M.R. Rosenzweig. (2010). Microeconomics of technology adoption. *Annu. Rev. Econ.,* 2(1), 395-424.

Ruttan V. W. (1996). What happened to technology adoption-diffusion research? *Sociologia Ruralis.* **36**(1), 51-73.

Ryan B. and N. C. Gross. (1943). The diffusion of hybrid seed corn in two Iowa communities. *Rural Sociology*, 8(1), 15.

COMMENT:

I think in particular that spatial studies should have been taken into account to explain one of the major finding of the paper (see below).

RESPONSE:

We wanted to do the analysis at the ZIP code level but USDA/NASS did not approve the request because there were simply too few observations that would have negotiated the confidential agreement stated during the survey implementation phase. Therefore, we introduced district level dummy to identify the district level heterogeneity in data.

COMMENT:

Furthermore, studies that make links between innovation and public policies, or farm development, are not really used in the bibliography review, which explains that there is not any independent variable that uses policy factors, access to agricultural extension webs, etc. Even if the survey cannot be done again included such factors, they must be taken into account in the discussion to underlie the limits of the study.

**RESPONSE:**

**Page 17 line 357 to 369**

Several studies about sustainable agriculture practices show that policy factors play an important role in the adoption process. A few policy-related studies have been done in relation to sustainable agriculture practices in Kentucky. Cuoghenour (2003) studied the innovation of no-tillage cropping practices. Zhong and Hu (2015) studied farmer’s participation in cost-share conservation programs in Kentucky watershed. Also, the Da Costa et al. (2012) studied the impact of the Agriculture Water Quality Act in the adoption of SAP and participation in conservation programs in Kentucky. Larkin et al. (2008) studied the use of small mammals in the coal mining reclamation process in Kentucky. This research has included some policy-related factors such as farmers’ “happy” attitude, implementation and knowledge barriers, TBP as policy-related factors which are identified as important factors in the adoption of sustainable agriculture practices through literature review and interaction with farmers. Moreover, the impact of governmental and non-governmental policies in the adoption of SAPs can be another complete and in-depth study in Kentucky.

COMMENT:

Second, the discussion makes assertions that are not demonstrated, nor by statistical analysis neither by field studies (doing interviews with farmers for instance). For instance, when authors try to explain why districts have different incident rate of adopting SAPs, their explanations can be contradicted by other bibliographical studies (p. 18, l. 38 to 48: large cities use to influence positively the adoption of sustainable practices) or be contradictory with assertions made in the same papers (the conclusion p. 19, l. 29-39 are opposite to those of p. 18).

RESPONSE:

Thanks for your comments. We have brought together and rewrote these two paragraphs. Please see the update paragraph below:

**Page 20, line 413 to 424**

In contrast to the common trend of farmers moving towards sustainable farming (Kornegay et al., 2010), we found that farmers in District 3 and 5 are more profit-oriented than environmental friendly whereas farmers from agriculture district 4 are more environmentally friendly. Agriculture districts 3 and 5 have two major cities—Lexington and Louisville—as well as several small and medium sized growing towns. Farmers from this regions might be motivated by growing commodity market in this region. However, agriculture district 4 lies in between two major cities Louisville and Cincinnati. As they are not part of major cities but are located in between them, environmental pollution coming from these surrounding cities might be a big concern to farmers in agriculture district 4. This research could be done on a smaller geographical scale such as zip code or county level. The data collection procedure and the data privacy issue and the confidentiality agreement with NASS forced us to limit this study in agriculture district level.

COMMENT:   
 Last, all SAP innovation are considered as having the same importance in the paper while they don't have the same impact. **I suggest that authors make a distinction between innovation, and studying particularly those that are more important for sustainable agriculture.**

RESPONSE

**Page 5, Line 80 to 91.**

We understand not all practices included in this research are equally effective towards sustainable agriculture. However, the main propose of this paper is to understand the adoption intensity of most commonly adopted practices which are identified through workshops and group discussion with Kentucky farmers. Limiting research to only most effective and common practices would divert the objective of the research. SAPs which are most commonly studied in the context of Kentucky, as well as SAPs identified as commonly adopted SAPs among Kentucky farmers, are provided in the table below:

**<< Insert Table 1 >>**

Thus, the overall objective of this research was to investigate factors that affect adoption intensity of sustainable agriculture that was identified as commonly adopted practices among Kentucky farmers. This was achieved by conducting a farmers’ survey which provided the required data to develop a predictive model of SAP adoption.

**Table in Page 31 line 612**

|  |
| --- |
| **Table 1: Commonly Adopted Sustainable Agriculture Practices among Kentucky Farmers:** |
| *Some Commonly Adopted and Studied Sustainable Agriculture Practices in Kentucky and Included in this Research:*  ***Animal for Land Reclamation:*** Small mammals such as mouse help to loosen the mined surface which favors quick succession (Larkin *et al.,* 2008).  ***Biological Pest Control:*** Pest are suppressed by their natural enemies (Filho *et al.*, 1999).  **Conservation Tillage:** Tillage and cultivation practice that incorporate crop residue into the field (Coughenour, 2003).  ***Composting:*** Waste recycling technique converting waste into nutrient rich humus with high soil organic matter using microbes (Filho et al., 1999).  **Cover Crops and Green Manuring**: Use of legumes such as clover, vetch and non-legumes such as rye, wheat to improve soil fertility and reduce erosion and incorporate into soil as green manure (Gillespie et al, 2007).  **Crop Rotation:** System of rotating legumes and non-legumes crops in same field to maintain soil fertility (Kornegay et al., 2010).  **Improved Water Management:** improve irrigation facility to reduce irrigation water losses (Kornegay et al., 2010).  **Increase Biodiversity:** Diversify flora and fauna in farm (Kornegay et al., 2010).  **Integrated Pest Management:** A pest management strategy using biological, chemical and physical, cultural production cost and protect the environment (Kornegay et al., 2010).  **Mulching:** A shallow layer of grass or crop residues at the soil/air interface to improve soil quality and moisture retention (Filho *et al.*, 1999).  ***Precision Agriculture:*** Observation, measurement and response based farm management strategy to address inter and intra-field variability in crops and increase farm efficiency, productivity and economic returns (Kornegay *et al.*, 2010).  ***Reduced Chemical Fertilizer Use:*** Reduced in the use of chemical fertilizers (Kornegay *et al.*, 2010).  ***Reduced Chemical Pesticide Use:*** Reduce in the use of chemical pesticides (Kornegay *et al.*, 2010).  *Other Commonly Adopted Sustainable Agriculture Practices in Kentucky as identified by this research during the interaction with farmers:*  ***Alley Cropping:*** Planting trees or shrubs with agronomic, horticultural or forage crops cultivated in the alleys between woody plants (Kornegay *et al.*, 2010)  **Controlled Grazing:** The grazing of animals is controlled by rotating and striping field letting field to recover before successive round of grazing (Gillespie et al, 2007).  **Crop and Livestock Production System Integration:** An integrated system where crop and livestock enterprise are combined and benefitted from each other (Kornegay et al., 2010).  **Cultural Pest Control:** Managing the crop, weed, disease and pest complex by manipulating cultural practices (Kornegay et al., 2010).  **Fallow Management:** The use of fallow period to conserve rainfall as stored soil water and reduce soil erosion (Kornegay et al., 2010).  **Farm Machinery Adjustment**: Adjustment in planting, spraying and harvesting farm machinery operation, calibration, repair, and their safety (Kornegay et al., 2010).  **Forest Stewardship:** Forest conservation and development of forest in own farm land.  **Land Reforming:** Forming terrace, reducing slope, and other slope stabilizing technologies to reduce surface run off of water and top soil.  **Local or Native Crops:** Locally available crops or local varieties (Kornegay et al., 2010).  ***Multi-species Grazing:*** Grazing more than one species of livestock such as chicken, duck, goat and horse in same land (Kornegay *et al.*, 2010).  ***Poly-culture Farming:*** Different and less competitive crops grown together to optimize biomass yield and improve environmental quality (Kornegay *et al.*, 2010).  ***Reforestation:*** Reestablishing forest in barren land or farm land.  ***Ridge Tillage:*** Scalping and planting on ridges built during cultivation (Kornegay et al., 2010).  ***Sprayer Calibration (and Application Accuracy):*** Calibrate sprayers to use optimum amount of chemicals as well as other spraying inputs in farm.  ***Varietal Mixture of Single Crop:*** Mixing different variety of same crops. Also known as Cultivar Mixtures (Kornegay et al., 2010).  ***Windbreaks and Shelterbelts:*** Create wind barriers and provide shelter to crops by planting tall, dense and strong trees along the edge of farmland (Kornegay et al., 2010). |

**RESPONSE TO REVIEWER 2**

**We thank this reviewer for positive and constructive comments. Our responses are directly below his/her comments**

This piece is a timely study on the determinants of the adoption of more sustainable agricultural practices in Kentucky. The study clearly has relevance, and the authors do a fine analysis. Below are some more detailed considerations, but in a nutshell I believe further revision is needed primarily to better contextualize the research and present the results in a way that highlight their novelty value a bit more.

The Introduction currently is a bit black-and-white and it black-boxes what is labeled as "Sustainable Agriculture Practices". Techniques such as conservation tillage or "cover crops" are mentioned without ever being explained. I think this needs to be fleshed out; you can't assume all readers know the details and characteristics of these practices you cite. Moreover, some of these techniques have pros and cons. No-till agriculture, for instance, usually means an increase in the use of herbicides. So clearly it is not black-and-white as sometimes presented. It is a matter of nuancing what the authors are saying and giving a bit more detail while cutting on the repetition. If a point is made, you don't need to carry on repeating it.

The beginning spends perhaps too long lauding the merits of Sustainable Agriculture Practices without ever going in much depth about them. It becomes repetitive without being too informative. This can be easily redressed by cutting back on the "laudation" of the importance and benefits of sustainability in agriculture (which can really take no more than a paragraph or two, as it is a pretty consensual point) and devote more space to fleshing out the problems of (1) unsustainable agriculture to date and (2) of explaining, as illustrative examples, particular techniques you deem important and characteristic of sustainable agriculture in the Kentucky context. Some better contextualization ought to be given, particularly for readers who may not be too familiar with the Kentucky context.

(Some of these techniques do get talked about from p.11 on, but they should be mentioned early, not just in the results section. By then the readers should already know what you are talking about  
 when referring to SAPs)

RESPONSE:

Thanks for your comments and we agree. We have rewrote the introduction section. We have now added a table defining different sustainable agricultural practices include in the paper (See Table 1). We have also added in the introduction section that some of these practices may have unintended consequences such as no tillage increases soil productivity, soil moisture conservation and soil erosion but at the same time increases herbicides use. We hope the positive effects trump the negative effects as these practices are endorsed by USDA/NRCS. Overall, we have revised the introduction section, added sustainable practices definition table and brought the context of agricultural practices in Kentucky and need to adopt SAPs for long term profitability and viability of farming in Kentucky.

RESPONSE:

Paragraph modified to give a perspective of SAPs adoption in Kentucky and the problem identified behind this research: Also, in Table 1, there are two sections 1) ***Some Commonly Adopted and Studied Sustainable Agriculture Practices in Kentucky and Included in this Research:*** and 2) ***Other Commonly Adopted Sustainable Agriculture Practices in Kentucky as identified by this research during the interaction with farmers:*** which gives distinction between practices that are commonly adopted and studied practice vs. practices that are commonly adopted but not commonly studied. (See table 1. **Table in Page 31 line 612**)

**Page 4 & 5, line 65 to 91**

Previous studies have shown that Kentucky has been adopting soil and water conservation related SAPs. Cropping systems such as no-tillage practice spread widely during the 1950s in Kentucky (Coughenour, 2008). Recent studies by Da Costa et al. (2012) and Zhong and Hu (2014) emphasized the use of conservation practices related to water quality and watershed area. Despite the widespread benefits and positive impacts of SAPs in farming, the adoption has not been studied well. The most common types of practices adopted throughout the state and its adoption intensity is not well known. A limited number of research focusing on the adoption of only a few conservation-related practices are found in the context of Kentucky. Thus, we included thirty-one different sustainable agriculture practices commonly adopted among Kentucky farmers to understand how farmers respond to the adoption of a set of SAPs. These practices were identified through workshops and group discussions with local farmers throughout the state of Kentucky. So, the originality of paper lies on the identification of most commonly adopted sustainable agriculture practices throughout Kentucky which were identified through the discussion, the study of the adoption intensity a SAPs and their relationship with socioeconomic behavior, attitudes and policy aspects in the context of Kentucky.

We understand not all practices included in this research are equally effective towards sustainable agriculture. However, the main propose of this paper is to understand the adoption intensity of most commonly adopted practices which are identified through workshops and group discussion with Kentucky farmers. Limiting research to only most effective and common practices would divert the objective of the research. SAPs which are most commonly studied in the context of Kentucky, as well as SAPs identified as commonly adopted SAPs among Kentucky farmers, are provided in the table below:

**<< Insert Table 1 >>**

Thus, the overall objective of this research was to investigate factors that affect adoption intensity of sustainable agriculture that was identified as commonly adopted practices among Kentucky farmers. This was achieved by conducting a farmers’ survey which provided the required data to develop a predictive model of SAP adoption.

COMMENT:

The section "Literature Review" could receive a more attractive title. More importantly, it would greatly benefit from a summarizing table. The authors cite a number of studies that seem to point to the relevance of multiple factors, but it is challenging for the reader to keep track of all those. A table, containing the various factors as well as the references to the studies that discuss them, should not be too hard to put together and would substantially increase the usefulness of this section. It would also add value to the lit review work you have done.

**RESPONSE:**

**Thanks. Based on your suggestion, we have changed the title to “Factors influencing SAPs Adoption” (Page 6 line 96) and added a table summarizing the literature cited in the paper. See Table 2. ( Page 33, line 619)**

**Table 2:** Relevant Literature cited in this Paper Summarizing their Major Findings:

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference** | **SAPs Types** | **Study Area** | **Findings relevant to Paper** |
| \*Baumgart-Getz (2012) | BMPs | USA | Access to and quality of information, financial capacity, connection with extension agents and farmer’s network have largest impact on adoption. |
| \*Carlisle (2016) | Soil health practices | USA | Combining education, research, policy, measure to overcome equipment barriers, and addressing farm and food system context increase the adoption of soil health practices. |
| Da Costa (2012) | Watershed Conservation | Kentucky, USA | Counties with more farms and larger farms are more likely to participate in conservation program. The adoption depends upon land characteristics of individual plots. |
| Gillespie et al. (2007) | 16 BMPs in Cattle Industry | Louisiana, USA | Farmers does not adopt technologies because of unfamiliarity, non-applicability, high cost, preference towards technologies. Education and extension activities are important to improve adoption of BMPs. |
| Hall et al. (2009) | Sustainable Floriculture Practices | USA | The concerns about the implementation (eg. easiness), and risk associated with the implement are two major important factor affecting adoption of SAPs beside location and farm size. |
| \*Kabii and Horwitz (2006) | Conservation Easement Programs |  | Landlords’ demographics, land tenure nature, knowledge and awareness about the program, financial circumstances, and participation risk perception, benefit of programs, incentives and compensation are important factors that affect the participation of conservation programs. |
| \*Knowler and Bradshaw (2007) | Conservation Agriculture |  | The variable explaining the adoption of conservation practices is also localized alike conservation practices themselves. So, policy development and planning, attempts to improve adoption should be localized to address location specific needs and demands. |
| Mullendore et al. (2015) | Conservation Behavior | Midwest USA | The sense of place or place attachment and the place identity have significant effect on the specific conservation behavior but not in the overall. |
| \*Prokopy et al. (2008) | Best Management Practices | United States | Education level, income, farm size, access to information, positive environmental attitudes, environmental awareness, and utilization of networking has more often positive relation with the adoption of best management practices. |
| Singer et al. (2007) | Cover Crop | US Corn Belt: IL, IN, IA, MN | Crop diversification plays an important role in the adoption of cover crops and availability of cost share program would enhance use of cover crop among corn belt farmers. |
| Wilson et al. (2014) | Nutrient Management Practice | Ohio, USA | The attitude towards the adoption of practice to improve nutrient management is driven by farmer’s attitudes, perceived risks and response towards the negative impact of nutrient losses from farm in the environment. Younger farmers are already engaged in and have more positive attitudes towards management practices. |
| Zhong and Hu (2014) | BMPs via Water Quality Trading Program | Kentucky, USA | Farmers who participate in conservation program are more likely to adopt BMPs. Attitude of farmers towards BMPs and conservation practices are more important when adopting BMPs among farmers. |

|  |
| --- |
| \* Review or Meta-Analysis Paper. |

COMMENTS:

The sections 3 and 4 could also receive better titles that aren't just bare and basic as "Conceptual Framework". Moreover, this may be a misnomer. The authors do not really discuss or set \*concepts\* in there. I think this section belongs much better merged with what currently is 4, as a "Methodology" section.

RESPONSE:

We agree. We have removed the title conceptual framework to “Condition for sustainable Agriculture Practices Adoption Consideration” as a sub section of “3.5 Econometric/Emperical Model” (Page 13, line 265) and merged it as a part of the methodology section then comes “3.5.2 Data Analysis Technique Applied” in same section.

COMMENTS:

The authors should highlight a bit better the relevance of Kentucky as a traditional farming state also within the broader USA context, not just within the state per se. It would also be very useful to get a bit more context; currently the authors hardly even give us the background of farming in Kentucky or what the farmers there grow and the relevance of that for the state economy, for livelihoods, etc.

RESPONSE:  
**We have included this in the introduction section.**

COMMENT:

In section 5, it would be extremely useful to have a synthesis of the findings on a table or figure. The authors discuss many variables in sequence. A synthesis at the end of the section would be really handy.

RESPONSE:

Thanks for the suggestion. We have added a table summarizing the effects of different variables in the text.

**This box added in Section 5 Page 21, line 455.**

|  |
| --- |
| Adoption of Sustainable Agriculture Practices among Kentucky Farmers has positive and significant relationship with crop and vegetable growers with irrigation facilities, farmers in favor of diversification, farmers participating in Tobacco Buyout Program, farmers with formal college degree or above education level, but negative and significant relationship with age of farmers. Lack of Knowledge and Perceived difficulty of implementation are two major and significant barriers to the adoption of SAPs. Last but not the least, SAPs adoption are localized very specifically: Agriculture districts 2 and 4 have positive and significant relationship with SAPs adoption but agriculture districts 3 and 5 are significant but negative. |

COMMENT:

The authors should be much more objective in their Conclusions section. Right now there is too much recap, and restatement of general considerations that everyone already knows (e.g. farmers make decisions on the basis of multiple factors). Instead, the authors should state their conclusions more objectively and emphasizing the novelty value of their research findings on top of what was already known from the literature. 

RESPONSE:

We have rewritten the conclusion section following your suggestions. Thank you again for your very constructive and useful suggestions. Our revised manuscript is better because of your and other reviewer’s comments.

> A few more specific remarks below:  
>

COMMENT:  
> P.5  
> L.46: "Age is found to have a negative effect". Be specific. If you mean that older farmers are less likely to change their practices, say it explicitly.  
RESPONSE:

Revised

COMMENT:

> L.47: "THE education" sounds odd if you are not referring to specific type of education but just to schooling in general.

RESPONSE:

Education is only schooling in our study but it could be training and other vocational learning as well.

**Page 6, lines 105 to 108**

Older farmers are less likely to adopt new practices which they are not very familiar with (Awan et al. 2015; Baumgart-Getz et al. 2012; Kabii and Horwitz, 2006). But, farmers are positive and more likely to adopt sustainable agriculture practices as they achieve higher level of formal education (Soule, 2001; Upadhyayet al*.* 2003).

> P.8  
> L.41: The motivation behind adoption of SAPs cannot be presented as "either/or". Surely there are farmers who adopt SAPs \*both\* due to environmental considerations and economic expectations.

RESPONSE:

We agree and it is likely. However, we based this on the literature which indicates the primary motivation could be one dominating factors among profit, environment and to be in the forefront of technology. The secondary could be the other (profit, environment, to be on the forefront of technology etc.).

**Page 13 line 268 to 275.**

Farmers adopt SAPs for various reasons. Some farmers adopt SAPs because they believe these practices increase yield (and consequently net returns) associated with farming whereas others believe that SAPs are good for the environment. Also, there are farmers who adopt SAPs considering economic and environmental benefits. Whether farmers adopt the technology for a yield/profit reason or for an environmental quality reason, they believe that adopting SAPs give them higher utility than not adopting the technology. We believe that farmers adopt a higher number of SAPs because they perceive a number of SAPs adoption or more SAPs applied in more acres of land give them higher utility than otherwise.