Earth System Dynamics

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Discussions

Interactive comment on "Farmers' perceptions of and adaptation strategies to climate change and their determinants; the case of Punjab province, Pakistan" *by* M. Abid et al.

Anonymous Referee #2

General comments

This contribution is based on the broadly accepted principle that "understanding how farmers perceive changes in climate and what factors shape their adaptive behavior is desirable for adaptation research".

The originality of the paper resides mostly on the chosen case study. In fact, as stated in the paper "Despite internationally extensive research on agriculture adaptation to climate change, a little work is done so far in South Asia. Similarly in Pakistan, the scope of research on linking climate change to agriculture is very restricted."

Findings from the modeling procedure are robust and support the results and discus-

sion sessions.

The following scheme resumes the main elements presented in this work:

Dataset: Farm household data of 450 households from three districts in Punjab province of Pakistan

Climate challenges: Rising temperatures Floods Droughts Yield losses

Aims: Examine how: farmers perceive climate change farmers adapt their farming accordingly

Results from dataset analysis: 58% of the farm households adapted their farming to climate change

Most common adaptive strategies: Changing crop varieties Changing planting dates Plantation of trees Changing fertilizer

Factors improving adaptive capacity Education Farm experience Household size Land area Tenancy status Ownership of tube-well Access to market information Information on weather forecasting Extension

Factors hampering adaptive capacity Lack of information Lack of money Resource constraint Shortage of irrigation water

Method Binary logistic model

Identified policy shortfalls Ineffective climate policy V. low technological, financial capacity in adapting to climate change

Policy-making suggestions Greater investment in farmer education Improved institutional setup for climate change adaptation _____ Specific comments

Pages/lines: comment

1363-1371: There are overlaps between sections 2 and 3 in that both of them present methodological aspects. Section 2 presents methodological aspects related to model-

ing. Section 3 presents methodological aspects related to sampling and data collection as well as description of the study area. These two sections could be restructured as follow: 3.2 could be integrated in the introduction, becoming e.g. 1.2 2 and 3 could be merged as 2, where: 3.1 becomes 2.1 2.1 to 2.5 follow accordingly 4 becomes 3 and so forth

1370/1: The presence of table 2 here suggests that an arrangement similar to that proposed above has previously been considered.

1363/23: Adaptation is a term with a very long trajectory of use across disciplines. Here you should specify the field/domain to which you area referring before stating "Adaptation is a way to avoid losses due to increasing temperature and decreasing precipitation (Hassan and Nhemachena, 2008)."

1364/4-7: Economical and risk factors are the only ones considered to affect household adaptive choices in the present model: "we assume that farm households will choose to adopt certain adaptation measure only if they perceive reduction in risks to crop production and increase in net farm benefits associated with adoption of a particular measure". No cultural traits are considered to affect household choices in the present study. This is fine as long as it is clearly stated, or otherwise taken into account (i.e. by introducing uncertainty in the decision making process), and perhaps shortly justified.

1400/Figure 3: It may be useful to add a figure here presenting actual (measured) changes in summer/winter temperature and precipitation over a given time (which should correspond to the estimated time of meteorological/climatic memory applied in this study, i.e. c. 10/20 years according to 1371/20)

1373/10-14: It is unclear whether or not this statement is based on answers from the interviews. In this sense, it would be useful to have a table/image presenting a sample of the questionnaire used for interviews.

1373/18-20: Idem

1377/20: "schooling of the household head" is a powerful explanation factor in this model. In the introduction you could perhaps briefly introduce how households are organized in the region/districts of study: e.g. average number of members, composition, structure, "head", internal hierarchies relative to decision-making,. . .

1378/6: it is difficult to imagine a 1% increase in household, unless households are made of 100+ members. It may be more useful to present these data in terms of increase in members, e.g. "an increase in one member of the average household. . .".

1379/14: Information nowadays is mostly passed via mobile telecommunications (phones and internet services). Would perhaps "Access to telecommunication technologies" be a more robust indicator of access to information than proximity to market.

1379/24-25: Within the same sentence, changing crop type is said to be positively and negatively correlated to access to farm credit

1380/10: conclusive sentence is missing in this section (4.5.10)

1381/17: idem

1383/4: Clarity of the conclusions may perhaps be improved by some rephrasing and the presentation of the main findings of the study as bullet points
_____ Technical corrections

Although I have tried to address some of the typos and grammatical issues in the text, a further revision/editing by a native English speaker would help clarify some passages in the manuscript (specifically in Sections 1, 4 and 5).

Numbering of tables and figures should be revised as tables and figures in the text are not always introduced progressively. E.g.: Table 1 is introduced at p. 1366, followed by Table 3 at p. 1367 Figure 1 is followed by figure 3 at p. 1368

Pages/lines: comment

1361/2: delete space in "food- insecure" 1362/17: perceive rather than perceived

1362/21: delete "a" before "little" 1362/22: delete "on" before "linking" 1363/5-7: for clarity formulate the two questions separately 1363/10: add "are" before "already" 1363/20: "Sect." should be "Section" 1363/20: change to "We conclude presenting. . ." 1364/21-22: in two instances "his or her" should be "its" (i.e. for household) 1366/23: "measure" should be "measures" 1368/26: revise unclear sentence "even. . .stage" 1372/25: add "some form of climatic risk" after "perceived" 1372/27: delete "the next", write "Section" 1373/2: delete "long-term" 1373/3: delete "by them" 1373/6: rewrite as ". . ., the most common adaptation measures. . ." 1373/7: delete "the" 1373/6 and 17: add ":" after "were" 1373/19: add "be" after "may" 1373/24: "used" instead of "use" 1374/5: delete "the" 1374/17-18: "interest" is used in the same sentence in two instances with different meanings making the message unclear 1374/25: ";" should be "," 1375/3: "Section" 1375/5: "theses" should be "these" 1375/6-8: unclear sentence needs reformulating "Hence, we assume that perceptions, intentions to adapt and adaptation to climate change differ both in term of extent and decision to choose different adaptation measures. 1375/12: "term" should be "terms" 1375/19: change as follows: "schooling were more likely (44.2%) to perceive changes in climate over the past 10-20 years than farmers. . ." 1376/4: idem 1375/25: "had" instead of "are having" 1376/15-71: modify as follows "In summary, the higher the level or education and farming experience for a given household, the higher its probability of adaptation to climate change. 1402/Figure 5: in the legend "total" should be "average" or "mean" 1377/7: change to "in years of experience" 1377/10: Begin sentence as follows "Results from this study are in accordance with those from. . ." 1378/2: use "more" instead of "higher" 1378/13: use "held' instead of "holds" 1378/22: use "This" instead of "As" 1381/15: use "farmers" 1382/8: delete "one exception" 1382/14: unclear sentence ". . .both for Rahim Yar Khan respectively which indicates. . ." 1382/18: these two sentences should be merged, separated by a ",": ". . .Rahim Yar Khan. While the lowest elasticity. . ." 1382/7: what do you mean by "less uncertain rains"? perhaps "less predictable precipitation patterns" 1382/7: perhaps you should rephrase "Being mostly rain-fed, agriculture in Pakistan is most likely to be affected by ongoing climate change" 1384/10: use "by" instead of "with" 1384/13:

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I am not sure about the choice to use "improvement" here rather than "betterment". ("Betterment, making better, is a general term used particularly in connection with the increased value given to real property by causes for which a tenant or the public, but not the owner, is responsible". Wikipedia)