## Supplementary material

**Appendix 1:** Summary of themes and issues raised in the qualitative interviews influencing a household’s participation in the improved fallows research project

| Theme | Issue raised | Influence on participation | Issue raised by which participationgroup | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Participants | Dropped-out | Meetings only | Non-Participants |
| HH and livelihood characteristics | HH size | The larger the HH size the more likely the HH is to participate in the trials. This is likely a result of the association with access to labor. | X | X | X | X |
| Off-farm income/livelihood diversification | The more HHs incorporate off-farm income/livelihood activities as part of their livelihood strategies, the less likely they are to participate in the trials. Part of the reason for this is the effect on access to labor. It may also possibly be related to increased access to financial resources enabling greater access to farm inputs (agricultural and livestock). | X | X | X | X |
| Lifecycle stage | Closely related to HH size and age of heads of HH, it appears that younger and older HHs are less likely to participate in the trials, while established HHs with older children are the most likely to participate in trials. | X | X | X | X |
| Vulnerability/resource endowment | More vulnerable HHs and HHs with fewer resources are less likely to participate in trials. | X | X | X |  |
| Individual characteristics | Interest | Individual, personal reasons for participation in the experimental trials. | X | X | X |  |
| Disinterest | Individual, personal reasons for not participating in the experimental trials. | X |  |  |  |
| Paternalism | There is growing concern that community members are not participating in participatory research projects as previous interventions have created expectations of receiving aid “gifts” and “donations”. | X | X | X |  |
| Access to resources | Land | Access to land is important factor in participation in the trials. Those HHs with less land are less likely to participate. | X | X | X |  |
| Irrigation water | Access to irrigation water increases land use intensity, decreasing fallow practices. This would suggest that those that have access to irrigation are less likely to participate in the trials. | X | X |  | X |
| Purchased forage or other solutions to forage deficit | In the cases where forage production challenges have been addressed by other mechanisms, such as buying in extra forage externally (HHs with high resource endowment), there is less pressure for HHs to participate in the trials. | X | X |  | X |
| Production approach | Chemical inputs | Industrial production techniques such as pesticides and chemical fertilizers are leading to soil degradation. This could encourage HHs using these techniques to engage in the trials. However, overall, HHs using more agrochemical inputs may be less interested in participating in the current experimental trials. Interviewees gave mixed responses. | X |  |  |  |
| Agroecological production | HHs that already practice agroecological techniques may be more likely to engage in the experimental trials. | X |  |  |  |
| Management by context (zones) | Differentiated management among agroecological zones means improved fallows may be more suitable for HHs with significant amounts of land in the upper zone. HHs tend not to employ fallows in the lower zone and to a lesser degree in the middle zone. Access to irrigation water in the middle and lower zones increases land use intensity and therefore decreases the length of time land is left fallow. HHs without significant amounts of land in the upper zone may not be as interested in the innovation.  However, most interviewees reported that the trial plot was located in the middle zone, and that ease of access (transport) was an important factor in where the trial plot was located in order to harvest the forage material. This raises an important contradiction in innovation suitability in that from an ease of access perspective the middle zone is preferable for the innovation, but from a land use intensity perspective, the upper zone is preferable. | X |  | X |  |
| Integrated crop-LS production system | HHs with mixed crop-livestock systems seemed to be more likely to participate in trials than those either just dedicated to crops (less need for forage material), or livestock (more likely to employ permanent pasture techniques). | X | X | X |  |
| Innovation suitability | Forage deficit (dry season) | There is a reported deficit in nearly all communities for forage material in the dry season. Improved fallows potentially have the benefit of increased access to improved fallows. HHs with such deficits are likely to participate in the trials that have a particular interest in better access to improved forage. | X | X |  | XX |
| Erosion | Erosion is often mentioned as a significant process of soil fertility loss in the communities. Farming HHs may be more likely to participate in the trials the more these challenges exist in their fields (upper zone with steeper gradients). However, it is reported that most of the field trials are taking place in the middle zone, in fields with less steep slopes. Again, this raises a potential contradiction in suitability by context. While from an erosion perspective the innovation may be more suited to the upper zone, the middle zone may be where the technique will be most employed. | X | X | X | X |
| Livestock ownership | Somewhat contrary to the above issue, other HHs suggested that the greater the amount of livestock ownership, the higher the likelihood of participation in the research trials. These contrasting issues may suggest that there is a tipping point in livestock ownership, beyond which HHs find the improved fallow trials less suitable. This coincides with some comments that suggest for some HHs, the fallow area may be too small for their (forage) needs (livestock intensification focused on pastureland). | X |  |  |  |
| Fertility problems | HHs that suffer from soil fertility problems may be more likely to participate in the experimental trials. However, fertility problems were reported to be ubiquitous in all groups and all communities. | X |  | X | X |
| Use of fallows | HHs that are already employing some sorts of fallow techniques may be more likely to participate in these experimental trials to improve their current practices. | X | X |  | X |
| Guinea pigs | There is an association between guinea pig rearing and cut forage. Such a link may make it more likely that those with more guinea pigs are likely to participate in trials that help generate greater amounts of cut forage. | X | X | X | X |
| Miscellaneous | “Wait and see” strategy | Potentially associated with HHs that are less able to participate or simply do not want to expend resources on the trials, HHs can often adopt a “wait and see” strategy, when they first wait to see the results of the trial before deciding to adopt the innovation. | X | X | X |  |
| Unforeseen circumstances (e.g., family health issues) | Circumstances can impede participation in the experimental trials, such as changes in the health of family members. |  | X |  | X |
| Poor trial plot performance | In some cases where the trial plot performed poorly the first year, a number of participants dropped out of the experimental trials. |  | X |  |  |