Supplementary Table S1: *Farmer and household information for Aweil rice scheme and Yambio County in South Sudan*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   |   |  Payams in Yambio County |   |  |  |   |
| Variable  |  Class | Aweil rice scheme  | Gangura | Yambio Center | Lirangu | Bangasu | Total counts | DF | Chi-square value | *P*-Value |
| Age (years)  | <20 | 0 | 0 | 0 | 4 | 1 | 5 | 12 | 16.007 | 0.191 |
|  | 21-40 | 17 | 15 | 13 | 17 | 18 | 70 |
|  | 41-60 | 6 | 14 | 11 | 16 | 7 | 54 |
|  | 61-80 | 0 | 3 | 0 | 3 | 1 | 7 |
| Household relationship | Head | 11 | 31 | 24 | 40 | 14 | 120 | 12 | 53.988 | <0.001 |
| Spouse | 6 | 1 | 0 | 0 | 3 | 10 |  |  |  |
| Child | 3 | 0 | 0 | 0 | 0 | 3 |  |  |  |
| Relative | 3 | 0 | 0 | 0 | 0 | 3 |  |  |  |
| Household size (number of individuals) | <5 | 8 | 2 | 12 | 12 | 4 | 38 | 12 | 50.699 | <0.001 |
| :6-10 | 15 | 18 | 6 | 16 | 2 | 57 |  |  |  |
| :11-15 | 0 | 11 | 2 | 6 | 3 | 22 |  |  |  |
| >15 | 0 | 1 | 4 | 6 | 8 | 19 |  |  |  |
| Level of education | None | 9 | 9 | 5 | 5 | 6 | 34 | 12 | 16.048 | 0.189 |
| Primary (Grade 1-7) | 9 | 19 | 16 | 28 | 7 | 79 |  |  |  |
| Ordinary school certificate (Form 1-4) | 3 | 4 | 3 | 6 | 4 | 20 |  |  |  |
| Certificate (Agricultural training) | 2 | 0 | 0 | 1 | 0 | 3 |  |  |  |
| Total farm size (hectares) | <1 | 12 | 17 | 14 | 20 | 11 | 74 |  8 | 9.183 | 0.327 |
| 1.1-2.5 | 11 | 13 | 7 | 13 | 3 | 47 |  |  |  |
| >2.5 | 0 | 2 | 3 | 7 | 3 | 15 |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| Land size allocated for rice (hectares) | 0.01-0.1 | 0 | 2 | 0 | 0 | 3 | 5 | 12 | 29.786 | <0.01 |
| 0.1-1.0 | 15 | 29 | 23 | 34 | 16 | 112 |  |  |  |
| 1.0-2.0 | 8 | 3 | 0 | 5 | 1 | 17 |  |  |  |
|  | >2.0 | 0 | 0 | 1 | 1 | 0 | 2 |  |  |  |
| Variety cultivated | Local landraces | 11 | 25 | 21 | 32 | 14 | 103 |  8 | 39.254 | <0.001 |
| Improved varieties | 0 | 5 | 1 | 7 | 1 | 14 |  |  |  |
| Local & improved | 12 | 2 | 2 | 1 | 2 | 19 |  |  |  |
| Estimated yield (Mg/ha)  | 0.4-1.0 | 9 | 10 | 10 | 14 | 4 | 47 | 12 | 15.842 | 0.199 |
| 1.0-1.6 | 11 | 15 | 5 | 17 | 5 | 53 |  |  |  |
| 1.6-2.2 | 1 | 3 | 0 | 2 | 2 | 8 |  |  |  |
| 2.2-2.8 | 2 | 4 | 9 | 7 | 6 | 28 |  |  |  |

Supplementary Table S2 : *Pair-wise ranking of most desirable variety traits by respondents in lowland and upland rice ecologies in South Sudan*

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Trait | A | B | C | D | E | F | G | H | Score ǂ | Rank |
| ***i)*** | ***Aweil rice scheme*** |  |  |  |  |  |  |  |  |  |  |
| A | Nutritional importance | - | B | A | A | A | F | A | H | 4 | 4 |
| B | Early maturity |  | - | B | B | B | B | B | B | 7 | 1 |
| C | Drought tolerance |  |  | - | C | C | F | C | H | 3 | 5 |
| D | Pest/insect resistant |  |  |  | - | D | F | D | H | 2 | 6 |
| E | Disease resistant |  |  |  |  | - | F | G | H | 0 | 8 |
| F | Yield |  |  |  |  |  | - | F | H | 5 | 3 |
| G | Cooking and eating quality |  |  |  |  |  |  | - | H | 1 | 7 |
| H | Phenotypic acceptability |  |  |  |  |  |  |  | - | 6 | 2 |
| ***ii)*** | ***Gangura*** |  |  |  |  |  |  |  |  |  |  |
| A | Nutritional importance | - | A | A | A | A | F | A | A | 6 | 2 |
| B | Early maturity |  | - | B | D | B | F | B | B | 4 | 4 |
| C | Drought tolerance |  |  | - | D | E | F | G | C | 1 | 6 |
| D | Pest/insect resistant |  |  |  | - | D | F | D | D | 5 | 3 |
| E | Disease resistant |  |  |  |  | - | F | G | H | 1 | 6 |
| F | Yield |  |  |  |  |  | - | F | F | 7 | 1 |
| G | Cooking and eating quality |  |  |  |  |  |  | - | G | 3 | 5 |
| H | Phenotypic acceptability |  |  |  |  |  |  |  | - | 1 | 6 |
| ***iii)*** | ***Yambio center*** |  |  |  |  |  |  |  |  |  |  |
| A | Nutritional importance | - | A | A | A | A | F | G | A | 5 | 3 |
| B | Early maturity |  | - | C | D | E | F | G | B | 1 | 7 |
| C | Drought tolerance |  |  | - | C | C | F | G | C | 4 | 4 |
| D | Pest/insect resistant |  |  |  | - | D | F | G | D | 3 | 5 |
| E | Disease resistant |  |  |  |  | - | F | G | E | 2 | 6 |
| F | Yield |  |  |  |  |  | - | F | F | 7 | 1 |
| G | Cooking and eating quality |  |  |  |  |  |  | - | G | 6 | 2 |
| H | Phenotypic acceptability |  |  |  |  |  |  |  | - | 0 | 8 |
| ***iv)*** | ***Lirangu*** |  |  |  |  |  |  |  |  |  |  |
| A | Nutritional importance | - | B | C | D | E | F | G | H | 0 | 8 |
| B | Early maturity |  | - | B | B | B | F | B | B | 6 | 2 |
| C | Drought tolerance |  |  | - | C | C | F | G | C | 4 | 4 |
| D | Pest/insect resistant |  |  |  | - | D | F | G | H | 2 | 6 |
| E | Disease resistant |  |  |  |  | - | F | G | H | 1 | 7 |
| F | Yield |  |  |  |  |  | - | F | F | 7 | 1 |
| G | Cooking and eating quality |  |  |  |  |  |  | - | G | 5 | 3 |
| H | Phenotypic acceptability |  |  |  |  |  |  |  | - | 3 | 5 |
| ***v)*** | ***Bangasu*** |  |  |  |  |  |  |  |  |  |  |
| A | Nutritional importance | - | B | C | D | E | F | G | A | 1 | 7 |
| B | Early maturity |  | - | B | B | B | F | G | B | 5 | 3 |
| C | Drought tolerance |  |  | - | C | C | F | G | C | 4 | 4 |
| D | Pest/insect resistant |  |  |  | - | D | F | G | D | 3 | 5 |
| E | Disease resistant |  |  |  |  | - | F | G | E | 2 | 6 |
| F | Yield |  |  |  |  |  | - | G | F | 6 | 2 |
| G | Cooking and eating quality |  |  |  |  |  |  | - | G | 7 | 1 |
| H | Phenotypic acceptability |  |  |  |  |  |  |  | - | 0 | 8 |

Ɨ Letters correspond to traits listed along the column. ǂ The score is given by the frequency of the letter representing the trait. 'Rank 1 = most desirable, to rank 8 = least desirable'

Supplementary Table S3: *Matrix ranking of stakeholder variety preferences for cooking and eating quality attributes during a focus group discussion*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  Variety | Individual rank | Rank index | Overall rank Ɨ | Preference |
| 1 | 2 | 3 | 4 | 5 | Like | Dislike |
| A (Pakistan) | 4 | 1 | 1 | 3 | 1 | 26 | 1 | Sweet taste, swelling capacity, grain shape and size, aroma and non-sticky | None |
| B (Basmati) | 1 | 5 | 0 | 1 | 3 | 30 | 2 | Grain shape and size, sweet taste, appealing, non-sticky and aroma | None |
| C (China) | 3 | 2 | 1 | 0 | 4 | 30 | 2 | Aroma, taste, non-sticky, grain colour, swelling capacity, | Grain shape and size, require more water to cook |
| D (NERICA 1) | 1 | 0 | 4 | 4 | 1 | 34 | 3 | Grain colour, aroma, sweet taste, swelling capacity, and require less water to cook | Sticky, Grain shape and size |
| E (NERICA 4) | 1 | 2 | 4 | 2 | 1 | 30 | 2 | Sticky, swelling capacity, sweet taste  | Non-aromatic, Sticky, require more water to cook, Grain shape and size |

Ɨ 'Overall rank 1 = best, to overall rank 3 = worst'. In parenthesis are the cultivar common names.