**Supplementary Material For:**

**WOMEN’S EMPOWERMENT IN AGRICULTURE AND CHILD NUTRITIONAL STATUS**

**IN RURAL NEPAL**

**Supplemental Table 1: Women’s Empowerment in Agriculture Index Five Domains of Empowerment: Index Construction**

| **Domain** | **Indicator (weight)** | **Survey questions**  | **Answers**  | **Aggregation cut-off** |
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| **Production** | Input into productive decisions (1/10) | (1) Did you (singular) participate in \_\_\_ in the past 12 months? (2) If yes, how much input did you have in making decisions about \_\_? *(food crop farming; cash crop farming; livestock raising; poultry; fishing or fishpond aquaculture)* | (1) yes; no (2) no input; input into very few decisions; input into some decisions; input into most decisions; input into all decisions | Adequate if some input into decisions, makes the decisions, or feels should could make the decisions if wanted, in at least two domains |
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| (1) Who normally takes the decision regarding \_\_? (2) To what extent can you make decisions regarding \_\_ if you want(ed) to? *(agricultural production; taking crops to market; livestock raising)* | (1) self; spouse; self and spouse; etc. (2) not at all; to a small extent; to some extent; to a large extent |
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| Autonomy in production (1/10) | (1) Regarding \_\_ I do what I do partly because I will get in trouble if I do differently. (2) Regarding \_\_ I do what I do so others don’t think poorly of me. (3) Regarding \_\_ I do what I do because I personally think it is the right thing to do. *(agricultural production; taking crops to market; livestock raising)* | (1-3) strongly disagree; disagree; somewhat agree/disagree; agree; strongly agree | Adequate if does not strongly disagree that a coerced reason for decision in at least one of: agricultural production, taking crops to the market, and livestock raising |
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| **Resources** | Ownership of assets (1/15) | (1) Does anyone in your household currently have any \_\_\_\_\_? (2) Who would you say owns most of the \_\_\_\_\_? *(agricultural land; non-agricultural land; large livestock; small livestock; fish pond or fishing equipment; non-mechanized farm equipment; mechanized farm equipment; non-farm business equipment; house; large consumer durables; small consumer durables; mobile phone; transportation)* | (1) yes; no (2) self; spouse; self and spouse; etc. | Adequate if solely or jointly owns at least two small assets (non-mechanized farming equipment or small consumer durables) OR one large asset (all the other); also inadequate if household has no assets |
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| Right to purchase, sale, or transfer agricultural assets(1/15) | (1) Who can decide whether to sell \_\_\_\_\_ most of the time? (2) Who can decide to mortgage or rent out \_\_\_\_\_most of the time? (3) Who contributes most to decisions regarding a new purchase of \_\_\_\_\_? *(agricultural land; large livestock; small livestock; fish pond or fishing equipment; non-mechanized farm equipment; mechanized farm equipment)* | (1-3) self; spouse; self and spouse; etc. | Adequate if has at least one joint right over at least one household agricultural asset (or two if small assets); also inadequate if household has no assets |
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| Access to and decisions on credit(1/15) | (1) Has anyone in your household taken any loans or borrowed cash/in-kind from \_\_\_ in the past 12 months? (2) Who made the decision to borrow from \_\_\_? (3) Who makes the decision about what to do with the money/item borrowed from \_\_\_\_\_? *(NGO; informal lender; formal lender; friends or relatives; savings and credits groups; women’s groups)* | (1) yes, cash; yes, in-kind; yes, cash and in-kind; no; don’t know (2-3) self;-spouse; self and spouse; etc. | Adequate if has at least one source of credit and makes at least one decision solely or jointly for at least one type of household credit; also inadequate if household has no credit  |
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| **Income** | Control over use of income(1/5) | (1) (If yes to 401.1), How much input did you have in decisions on the use of income generated from \_\_\_\_\_?*(food crop farming; cash crop farming; livestock raising; poultry; fishing or fishpond aquaculture; non-farm activity; wage and salary employment)* | (1) no input; input into very few decisions; input into some decisions; input into most decisions; input into all decisions; decision not made; not applicable | Adequate if has at least some input into decisions about income generated or feels she can make decisions in at least one household income/ expenditure domain as long as it is not only minor household expenditures |
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| (1) Who normally takes the decision regarding \_\_\_\_\_?; (2) To what extent can you make decisions regarding \_\_\_\_ if you want(ed) to? *(your own wage or salary employment; major hh expenses; minor hh expenses)* | (1) self; spouse; self and spouse; etc. (2) not at all; to a small extent; to some extent; to a large extent |
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| **Leadership** | Group membership(1/10) | (1) Is there a \_\_\_\_\_ group in your community?; (2) Are you a member/active member of any \_\_\_\_\_\_? *(agricultural, livestock, fisheries producer; water users’; land/forest users’; credit or microfinance; mutual help or insurance; trade and business; civic or charitable; religious; mothers’; other women’s’; other)* | (1) yes; no (2) yes member; yes active member; no | Adequate if participates in at least one group  |
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| Speaking in public(1/10) | (1) Do you feel comfortable speaking up in public to \_\_\_\_? *(help decide on infrastructure to be built in your community?; ensure proper payment of wages for public works or other similar programs?; protest the misbehavior of authorities or elected officials?)* | (1) No, not at all comfortable; yes but with a great deal of difficulty; yes but with a little difficulty; yes mostly comfortable; yes very comfortable | Adequate if comfortable to any degree speaking in public in at least one context |
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| **Time** | Workload(1/10) | (1) Please describe all the time you gave to work and leisure activities you engaged in, since the time you woke up yesterday (or day before, where applicable). Please include time for travelling and commuting as part of the time for a given activity. *(sleeping and resting; personal care; school; work as employee; work as self-employed; farming/livestock/fishing; domestic work; care for children, adults, elderly; leisure; social and religious activities; other)* |  | Adequate if works no more than 10.5 hours a day; the following are included as work: employed for others; work as self employed; farming/livestock/fishing; and domestic work |
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| Leisure(1/10) | (1) How satisfied are you with your available time for leisure activities like visiting neighbors, watching T.V., listening to the radio, seeing movies or participating in sports? | (1) Very satisfied; somewhat satisfied; neither satisfied nor unsatisfied; to some extent unsatisfied; very unsatisfied | Adequate if doesn't express any dissatisfaction with amount of leisure time |

Source: Adapted from Alkire et al. 2013

**Supplemental Table 2: Bivariate associations between child, maternal, and household characteristics and Weight for Length Z-scores among children 0-24 months of age\***

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| --- | --- | --- | --- | --- |
|  | **N=1294** | **Mean**  | **SD** | **P-value** |
| Child age  |  |  |  | 0.02 |
|  0-5.9 months | 284 | -0.55 | 0.10 |  |
|  6-11.9 months | 354 | -0.89 | 0.09 |  |
|  12-17.9 months | 352 | -1.03 | 0.11 |  |
|  18-23.9 months | 304 | -0.95 | 0.08 |  |
| Child sex |  |  |  | 0.69 |
|  Boys | 661 | -0.88 | 0.06 |  |
|  Girls | 633 | -0.85 | 0.09 |  |
| Maternal height |  |  |  | 0.42 |
|  <148 cm | 321 | -0.83 | 0.09 |  |
|  >148 cm | 973 | -0.88 | 0.07 |  |
| Maternal age  |  |  |  | <0.001 |
|  < 19 years  | 183 | -0.75 | 0.10 |  |
|  20-29 years | 906 | -0.83 | 0.07 |  |
|  30-39 years | 181 | -1.13 | 0.13 |  |
|  40-49 years | 22 | -1.10 | 0.19 |  |
|  > 50 years | 2 | -2.09 | 0.42 |  |
| Maternal schooling |  |  |  | 0.04 |
|  Less than grade one | 395 | -1.06 | 0.12 |  |
|  Some primary | 170 | -0.88 | 0.13 |  |
|  Completed primary (1-5) | 102 | -0.76 | 0.13 |  |
|  Some secondary | 335 | -0.71 | 0.08 |  |
|  Completed secondary (6-10) | 143 | -0.75 | 0.08 |  |
|  Completed class 12 or higher | 149 | -0.86 | 0.09 |  |
| Maternal agricultural occupation (primary or secondary) |  |  |  | 0.40 |
|  Yes | 1071 | -0.85 | 0.07 |  |
|  No | 233 | -0.93 | 0.11 |  |
| Maternal empowerment in agriculture |  |  |  |  |
|  Overall WEAI 5DE: empowered | 119 | -0.83 | 0.10 | 0.74 |
|  Overall WEAI 5DE: disempowered | 1175 | -0.87 | 0.07 |  |
|  Input into production decisions: empowered  | 1026 | -0.89 | 0.08 | 0.18 |
|  Input into production decisions: disempowered | 268 | -0.77 | 0.08 |  |
|  Autonomy in production: empowered | 400 | -0.82 | 0.07 | 0.49 |
|  Autonomy in production: disempowered | 894 | -0.89 | 0.09 |  |
|  Ownership of assets: empowered | 1099 | -0.86 | 0.07 | 0.61 |
|  Ownership of assets: disempowered | 195 | -0.91 | 0.11 |  |
|  Right to purchase, sale, or transfer agricultural assets: empowered | 739 | -0.90 | 0.09 | 0.37 |
|  Right to purchase, sale, or transfer agricultural assets: disempowered | 555 | -0.81 | 0.07 |  |
|  Access to and decisions on credit: empowered | 388 | -0.85 | 0.08 | 0.69 |
|  Access to and decisions on credit: disempowered | 906 | -0.87 | 0.07 |  |
|  Control over use of income: empowered | 770 | -0.88 | 0.08 | 0.68 |
|  Control over use of income: disempowered | 524 | -0.84 | 0.08 |  |
|  Group membership: empowered | 270 | -0.79 | 0.08 | 0.28 |
|  Group membership: disempowered | 1024 | -0.89 | 0.08 |  |
|  Speaking in public: empowered | 1030 | -0.87 | 0.07 | 0.67 |
|  Speaking in public: disempowered | 264 | -0.83 | 0.12 |  |
|  Workload (<10.5 hours of paid/unpaid labour): empowered | 493 | -0.89 | 0.09 | 0.52 |
|  Workload (<10.5 hours of paid/unpaid labour): disempowered | 801 | -0.85 | 0.07 |  |
|  Leisure (satisfaction with time): empowered | 1081 | -0.86 | 0.13 | 0.65 |
|  Leisure (satisfaction with time): disempowered | 213 | -0.91 | 0.07 |  |
| Household religion |  |  |  | 0.95 |
|  Hinduism | 1178 | -0.87 | 0.07 |  |
|  Other | 116 | -0.86 | 0.12 |  |
| Household caste |  |  |  | 0.02 |
|  Upper caste groups | 634 | -0.92 | 0.05 |  |
|  Relatively advantaged *Janajatis* | 82 | -0.62 | 0.21 |  |
|  Religious minorities & disadvantaged non-Dalit *terai*  | 55 | -1.36 | 0.08 |  |
|  Disadvantaged *Janajatis* | 300 | -0.70 | 0.09 |  |
|  Dalit | 223 | -0.90 | 0.17 |  |
| Household wealth quintiles |  |  |  | 0.14 |
|  Lowest | 235 | -0.84 | 0.13 |  |
|  Second | 253 | -0.90 | 0.11 |  |
|  Third | 279 | -0.73 | 0.08 |  |
|  Fourth | 291 | -0.89 | 0.10 |  |
|  Fifth | 236 | -0.98 | 0.12 |  |
| Household agro-ecological zone of residence |  |  |  | 0.19 |
|  Mountains | 352 | -0.88 | 0.10 |  |
|  Hills | 642 | -0.75 | 0.09 |  |
|  *Terai* | 300 | -1.10 | 0.17 |  |
| Household size |  |  |  | 0.11 |
|  1-6 members | 789 | -0.82 | 0.06 |  |
|  7 or more members | 505 | -0.94 | 0.09 |  |
| Household number of children under 5 years of age |  |  |  | 0.10 |
|  One  | 824 | -0.82 | 0.07 |  |
|  Two or more | 470 | -0.95 | 0.10 |  |

Note: **\***In this table, these bivariate associations control only for district-level clustering. Stars indicate statistically significant differences between those: \*P < 0.05, \*\*P < 0.01, \*\*\*P<0.001

**Supplemental Table 3: Multivariate associations between women’s empowerment in agriculture (measured by the WEAI 5DE (Five Domains of Empowerment)) and Weight for Length Z-scores among children 0-24 months of age\***

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| --- | --- |
|  | **Weight-for-Length Z-scores** **(N=1294)** |
| **β**  | **(95% CI)** |
| Overall 5DE: empowered  | 0.02 | (-0.22, 0.26) |
| Dimensions of women’s empowerment in agriculture  |  |  |
|  Input into productive decisions | -0.07 | (-0.25, 0.10) |
|  Autonomy in production decisions | 0.08 | (-0.10, 0.26) |
|  Ownership of assets | 0.03 | (-0.19, 0.26) |
|  Purchase, sale, or transfer control for assets | 0.00 | (-0.17, 0.17) |
|  Access to and decision-making power for credit | 0.07 | (-0.04, 0.19) |
|  Control over use of income | -0.02 | (-0.19, 0.14) |
|  Group membership | 0.08 | (-0.12, 0.27) |
|  Confidence speaking in public | -0.14 | (-0.31, 0.02) |
|  Workload | -0.07 | (-0.20, 0.06) |
|  Satisfaction with time for leisure activities | 0.01 | (-0.19, 0.22) |

Note:

\*In this table, each row represents the results of a separate regression analysis for each of indicator of the Women’s Empowerment in Agriculture Index (WEAI) 5 Domains of Empowerment (5DE) and its association with child weight-for-length z-scores. In the full model, we control for district-level clustering; child sex and age; maternal age, height, and education; and household wealth status, number of children under five, and agro-ecological zone of residence. Each women’s empowerment indicator is binary: not empowered=0 and empowered=1.