Gender-equity or gender-equality scales and indices for potential use in aquatic agricultural systems

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GENDER-EQUITY OR GENDER-EQUALITY SCALES AND INDICES FOR POTENTIAL USE IN AQUATIC AGRICULTURAL SYSTEMS

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LIST OF ABBREVIATIONS

AAS	CGIAR Research Program on Aquatic Agricultural Systems
AT	African Transformation
GEI	gender equality index
GEM	gender equitable men scale
GGGI	global gender gap index
GII	gender inequality index
OECD	Organisation for Economic Co-operation and Development
RH	reproductive health
SIGI	social institutions and gender index
SRPS	sexual relationship power scale
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development
WEAI	women's empowerment in agriculture index

EXECUTIVE SUMMARY

Background
This report summarizes existing gender equality/equity scales or indices found in a review of the literature, conducted to inform the design and evaluation of a communication intervention to generate community-based, gender-transformative action in agricultural or aquatic agricultural systems (AAS). It is anticipated that findings from this report will contribute to a comprehensive research design to test the effects of gender transformative interventions beyond this single intervention.

Methodology
Six search engines and publically available information from ten gender equality or aquaculture/ agricultural organizations were used to explore existing gender equality/equity scales or indices related to aquatic agriculture and agricultural systems. A total of 48 relevant, peer-reviewed articles and articles from the gray literature were found. Of these, only 15 included scales or indices with indicators related to gender equality/equity or aquatic agricultural systems/agriculture, and are thus included in this report.

Results
This review identified 12 scales/indices related to gender-equality or equity and aas/agriculture. The scales/indices measured gender equality from various levels of the socio-ecological framework (i.e. individual, interpersonal, community and structural). Six scales/indices measured gender-equality or equity at the individual level. Five of the six scales measured individual attitudes to gender norms related to sexual relationships and gender roles. One scale (the empowerment scale) measured individual mobility, economic security and economic autonomy. The review did not find any scales related to aas or agriculture and gender-equality or equity at the individual level.

Two scales/indices measured gender-equality or equity at the interpersonal level. These scale/ indices/questionnaires measured decision-making power and ownership among couples and households about issues such as reproductive health, household expenses and assets. Only one index, the women's empowerment in agriculture index (WEAI) included questions on agriculture.

Additionally, three scales/indices were identified, which addressed structural level constructs. These scales/indices examined gender equality in laws, policies, labor-force participation, leadership and health at the state or national level, using existing data collected by various national and international sources. None of the structural-level scales/indices identified by this review measured equality related to agricultural or AAS policies or practices.

Key findings
- There is a lack of gender equality/equity scales/indices related to aquatic agriculture and agricultural systems.
- The majority of gender equality/equity scales/indices were designed to assess the effects of gender norms on reproductive health (RH) attitudes and practices.
- Existing agricultural programs that seek to promote gender equality tend to only measure outcomes in terms of women's empowerment, women's status in relation to men or in relation to their male partners.

Recommendations
- There is a need to develop a scale/index that assesses gender equality or equity in aquatic agricultural systems.
- Instead of focusing solely on women's empowerment or women's status in relation to men/ male partners, measurements of gender equality/equity should explore the interdependence between husband and wife and community members.
- In order to address empowerment better, indicators should measure couple-, household- and community-level changes in terms of gender equality/equity, and social equity and inclusion.

BACKGROUND

In anticipation of developing a communication intervention to spark community-based, gender-transformative action in agricultural or aquatic agricultural systems, a scan of the literature on existing gender-equality/gender-equity indices or scales was undertaken to help inform both its design and evaluation. At this juncture, the proposal is to adapt the Arab Women Speak Out/African Transformation (hereafter referred to as AT) model to the Aquatic Agricultural Systems (AAS) Program context with country- or region-specific modifications, as indicated. AT incorporates what Freire (1970) called "problem-posing or emancipatory education" in that this approach encourages the emergence or amplification of critical consciousness or reflection so as to precipitate participants' intervention in reality – to change restrictive gender norms and relations that limit the range of opportunities available to individual men and women, couples, households and communities and thus the potential for achieving greater productivity and overall well-being.

This report describes and assesses gender scales/indices found in an exploration of the literature, which has been conducted to contribute to a wider conversation about methodologies and measures that can best contribute to our understanding of both processes and outcomes of the proposed intervention.[1] The indictors that constitute the scales and indices described herein will be considered for possible incorporation into a new gender index for purposes of this intervention. Additionally, it is anticipated that this exercise will also contribute to a comprehensive research design to test the effects of gender transformative interventions beyond this single intervention. Parenthetically it is worth noting that while the inclusion of poor and marginalized groups is integral to the mandate of the AAS program, this area of inquiry is beyond the scope of this review.

Photo credit: Finn Thilsted/WorldFish

A family fish in Chandpur, Bangladesh.

METHODOLOGY

Photo credit: Felix Clay/Ducklabbit

Conscious of nutrition to ensure a balanced diet, Mongu, western Zambia.

Peer-reviewed literature

The primary search engines used for this report were: Pubmed, Scopus, Web of Science, Embase, CINAHL and Google Scholar. A search string was developed to explore existing peer-reviewed literature on gender equality scales/indexes related to aquatic agriculture and agricultural systems. Terms such as 'gender equality,' 'gender equity,' 'women's empowerment,' 'masculinity,' and 'gender norm' were used to search for gender equity-related citations (Appendix I). For the purposes of this study, 'gender equality' was defined as equality between men and women, or the ability of both sexes to develop and make choices without limitations set by their gender role (UNESCO 2000). 'Gender equity' was defined as equal and fair treatment of men and women with regard to their rights, obligations and opportunities (UNESCO 2000).

Additionally, terms such as aquatic agriculture, fisheries, fish trade and fishing production were used to search for aquatic agriculture-related terms; terms such as agriculture, food production and farm were used to search for agricultural-related terms. Articles were only included in this report if they had full texts and used, developed or described a gender-equality/gender-equity or women's empowerment scale or index. An Excel matrix was used to document articles citing key interventions.

Gray literature

Other publically available information from expert-recommended organizations, such as USAID, World Bank, *Instituto Promundo*, UNFPA, UN Women, International Center for Research on Women, Care International and the CGIAR Consortium, were searched for scales/indices used in their programs.

A total of 48 relevant, peer-reviewed articles and articles from the gray literature were found. Of these, only 15 included scales or indices with indicators; this review is limited to those articles.

The scales/indices identified in this review measured gender equality from various levels of the socio-ecological framework (i.e. individual, interpersonal, community and structural). At the individual level, scales measured material or easily testable cognitive changes such as assets, knowledge or practices, alongside more intangible perceptual changes, including shifts in attitudes, values and self-efficacy. Other scales/indices measured gender equality at the interpersonal and community level by collecting data on intimate partner relationships and household decision-making. Finally, structural-level scales measure changes in societal rules (formal and informal), regulations, laws and their enforcement that produce gender inequality and, more broadly, the distribution of access to and/or control over opportunities and resources.

It is worth mentioning that lower-level (e.g. individual-level) measures can be aggregated at higher levels (e.g. neighborhood/community, provincial or national levels) to assess whether individual-level changes are associated with meaningful changes at higher levels in terms of changing access to and/or control over opportunities, resources, and/or power. Mediated communication programs often change the public discourse around a topic. In some cases, such changes in discourse have led to structural change, as demonstrated by the ratification of the South African Government's Domestic Violence Act, which was attributed in part to the influence of "Soul City," a mass media campaign against domestic violence (Usdin et al. 2005). Therefore, while these dimensions will be explored in separate sections, in actuality, individuals, relationships, communities and societal norms are interrelated; they mutually produce one another and so must be combined in a prospective index in order to fully understand an intervention's contribution to gender equality.

Individual

The individual-level scales identified through this review consist mostly of scales that measure attitudes about gender equality. These include: the gender equitable men (GEM) scale, the gender relations scale, the gender equity scale, the gender norms attitudes scale, the empowerment scale, and the gender equality index (GEI). Additionally, the empowerment scale explores individuals' actions such as decision-making, mobility, earnings and employment.

Gender equitable men (GEM) scale

The GEM scale was developed by Barker et al. (2006) to measure attitudes towards gender norms in intimate relationships and the community. The scale consists of two subscales: equitable gender norms and inequitable gender norms, which measure violence domain items, sexual relationship items, reproductive health and disease prevention items, as well as domestic chores and daily life items. This scale has been used in 10 countries (Bangladesh, Brazil, China, Ethiopia, India, Kenya, South Africa, Tanzania and Uganda) to test for associations between gender norms and reproductive health outcomes. The scale was designed for men, and the majority of studies that have used this tool have administered it to men only (Nanda 2011). As part of the evaluation of the AT model (Underwood et al. 2011) the GEM scale was augmented by incorporating attitudes about women that parallel those about men (e.g. "women are always ready to have sex").

Subscale 1: Inequitable gender norms	Subscale 2: Equitable gender norms
a. It is the man who decides what type of sex to have	a. A couple should decide together if they want to have children
b. A woman's most important role is to take care of her home and cook for her family	b. In my opinion, a woman can suggest using condoms just like a man can
c. Men need more sex than women do	c. If a man gets a woman pregnant, the child is the responsibility of both
d. Changing diapers, giving the kids a bath, and feeding the kids are the mothers' responsibility.	d. A man should know what his partner likes during sex
e. It is a woman's responsibility to avoid getting pregnant	e. It is important that a father is present in the lives of his children, even if he is no longer with the mother.
f. A man should have the final word about decisions in his home	f. A man and woman should decide together what type of contraceptive to use
g. Men are always ready to have sex	g. It is important to have a male friend with whom you can talk about your problems.
h. There are times when a woman deserves to be beaten	
i. A man needs other women, even if things with his wife are fine	
j. A women should tolerate violence in order to keep her family together	
k. I would be outraged if my wife asked me to use a condom	
l. It's ok for a man to hit his wife if she won't have sex with him	

Table 1. Selected indicators for GEM scale.

Scoring

Items are scored on a three-point scale: 1 (agree) – 3 (disagree). Responses to each item are summed to generate the overall score on the scale. High scores reflect high support for equitable gender norms. It is possible to split the continuous GEM score into three equal parts: high, moderate and low support for equitable gender norms during statistical analysis (Nanda 2011).

Strengths and limitations

The GEM scale offers important insight into men's perspective on gender norms, which has historically been limited. However, this scale mainly measures men's approval/disapproval of hegemonic masculine norms, which promote male dominance and control over women. This ultimately neglects other masculinities and their related norms/beliefs. Furthermore, this scale does not include any items that measure the ways in which women may contribute to the perpetration of gender inequality.

Gender relations scale

Stephenson et al. (2012) combined elements of the GEM and the sexual relationship power scale (SRPS) to create a scale that measures the balance of power and equitable attitudes within relationships. The combination of these two scales, which were originally developed separately for men and women, allows the gender relations scale to be administered to both sexes and insight gained on respective perspectives. This scale has been used in studies among men and women in Ethiopia and Kenya, and has been found to be a predictor of contraceptive use (Nanda 2011).

Balance of power scale (from SRPS)	Equitable attitudes (From GEM scale)
a. My partner has more say than I do about important decisions that affect us	a. Men need more sex than women do
b. I am more committed to this relationship than my partner is	b. It is a woman's responsibility to avoid getting pregnant
c. A woman should be able to talk openly about sex with her husband	c. A man should have the final word about decisions in his home
d. My partner dictates who I spend time with	d. A woman should tolerate violence to keep the family together
e. When my partner and I disagree, she/he gets her/his way most of the time	e. A man needs other women even if things with his wife are fine
f. I feel comfortable discussing family planning with my partner	f. Changing diapers, bathing and feeding children are the mother's responsibility
g. I feel comfortable discussing HIV with my partner	g. A woman can suggest using condoms just like a man can
	h. A man and a woman should decide together what type of contraceptive to use
	i. Men and women should share household chores

Table 2. Selected indicators from the gender relations scale.

Scoring

Participants indicate whether they agree (1) or disagree (0) with each item. After reversing scores for statements that reflect gender bias, responses in each scale were summed to generate the score. A higher score on the equity subscale indicates acceptance of more equitable norms. A higher score on the power subscale represents more perceived agency and control in the relationship (Nanda 2011; Stephenson et al. 2012).

Strengths and limitations

A major strength of this scale is its ability to gain insight into the perspectives of both male and female partners. By collecting information from both male and female partners, this scale acknowledges the dyadic nature of relationships and sheds light onto the nuances of power dynamics within relationships. However, many of the limitations noted above regarding the GEM scale remain. In particular, the equitable attitudes section of the scale only measures male approval/disapproval of hegemonic masculine norms, which promote male dominance and control over women. As noted earlier, this neglects other masculinities and their related norms/beliefs. Furthermore, this scale does not include any items that measure the ways in which women may contribute to the perpetration of gender inequality.

Gender equity scale

Kostick (2011) sought to develop a "culturally-grounded measure of gender norms" that could provide a composite picture of women's roles and expectations in relation to her husband and family, as well as general community expectations about gender. This scale was implemented in Mumbai, India among a community sample of males and females.

Indicators	
1.	A woman can talk to men other than her husband
2.	A woman should always be ready whenever her husband wants to have sex
3.	A woman should obtain permission to seek medical treatment from her husband for any kind of health problems
4.	A man should have control over his wife
5.	A wife should get permission from the husband when she goes anywhere out of the house
6.	A woman can participate in community activities if she wishes to
7.	The status of women is lower than that of men
8.	A wife should feel free to criticize her husband's bad behavior
9.	A woman should finish all the household work before taking rest
10.	A wife can be beaten up if she does not listen to (obey) her husband

Table 3. Sample indicators included in the gender equity scale.

Scoring

Participants indicated their agreement with the statements on a 4-point Likert scale (0= strongly disagree; 4=strongly agree). Scores on gender inequitable statements (2-5, 7, 9, 10) were reversed before summing the results. Higher scores indicate more equitable norms. Items are summed to get the overall score on the scale.

Strengths and limitations

One of the strengths of the gender equity scale is that it was developed for both male and female participants. This is an important aspect because it has the potential to offer insight into the perspectives of both sexes, ultimately painting a more nuanced picture of gender dynamics. Another strength of this scale is that it is "culturally grounded". This means that the scale was gradually developed through an iterative process of analyzing qualitative ethnographic data collected from key informants in the community. Through this process, Kostic et al. (2011) ensured that the scale was relevant to the study community. This aspect of the scale, however, also makes it less generalizable to populations in different settings. Therefore, before using this scale more broadly, it would need to be validated, and possibly modified, for other settings.

Gender norm attitudes scale

This scale aims to measure equitable beliefs about male and female gender norms. It was used in a study by Waszak et al. (2000) to assess the relationship between gender equitable attitudes and condom use, depression and anxiety among Egyptian women. As a consequence, it has only been used with women. The scale consists of two subscales, which measure the rights and privileges of men/boys and equity for women/girls.

Rights and privileges of men	Equity for girls
a. It is important that sons have more education than daughters	a. Daughters should be able to work outside the home after they have children if they want to
b. Daughters should be sent to school only if they are not needed to help at home	b. Daughters should have just the same chance to work outside the home as sons
c. The most important reason that sons should be more educated than daughters is so that they can better look after their parents when they are older	c. Daughters should be told that an important reason not to have too many children is so they can work outside the home and earn money
d. If there is limited amount of money to pay for tutoring, it should be spent on the sons first	d. I would like my daughter to be able to work outside the home so she can support herself if necessary
e. A woman should take good care of her own children and not worry about other people's affairs	
f. Women should leave politics to men	
g. A woman has to have a husband or sons or some other male kinsman to protect her	
h. The only thing a woman can really rely on in her old age is her sons	
i. A good woman never questions her husband's opinions, even if she is not sure she agrees with them	
j. When it is a question of children's health, it is best to do whatever the father wants	

Table 4. Indicators included in the gender norm attitudes scale.

Scoring

Participants were asked to indicate whether they (1) agree (more traditional response) or (2) disagreed (more egalitarian response) with each item. Higher scores on the rights and privileges of men subscale indicated more egalitarian beliefs. The equity for girls subscale is reverse coded, so higher scores indicate more egalitarian beliefs (1= disagree (traditional response), 2=agree (equitable response)). Scores for the subscales were "computed as the mean of individual items," ranging from 1 to 2 (Nanda 2011). Higher scores on each represent more egalitarian beliefs.

Strengths and limitations

A key strength of this scale is that it was developed to measure both inequitable and equitable gender attitudes among women. Thus, this scale is unique because it sheds light on the ways in which women may propel gender inequitable norms, or challenge them. Although used only with women to date, this scale could be administered to men.

Empowerment scale

The empowerment scale was developed as part of a study that explored the effectiveness of two programs that provided credit to women in rural Bangladesh (Hashemi et al. 1996). Women's empowerment was the outcome of interest in this study. The empowerment scale consists of eight domains: mobility, economic security, ability to make small purchases, ability to make larger purchases, involvement in major household decisions, relative freedom from domination within the family, political and legal awareness, and involvement in political campaigning and protests (Hashemi et al.1996).

Mobility
a. Have you ever gone to the following: market, medical facility, movies, outside the village?
b. Did you attend any of these places on your own?
Economic security
a. Have you ever owned your own house or homestead land?
b. How many productive assets do you have? ___# of assets
c. Do you have cash savings?
d. If yes, were those cash savings ever used for business or moneylending?
Ability to make larger purchases
a. Do you purchase pots and pans?
b. Was this purchase made, at least in part, with money you earned yourself?
c. Do you purchase clothing for your children?
d. Was this purchase made, at least in part, with money you earned yourself?
e. Do you purchase saris for yourself?
f. Was this purchase made, at least in part, with money you earned yourself?
g. Do you purchase your family's daily food?
h. Was this purchase made, at least in part, with money you earned yourself?
Participation in public protests and political campaigning
a. Have you campaigned for a political candidate?
b. Have you got together with others to protest about a man beating his wife, a man divorcing or abandoning his wife, unfair wages, unfair prices, misappropriation of relief goods, or "high-handedness" of police or government officials?

Table 5. Selected empowerment indicators.

Scoring

Answer choices are dichotomous yes (1)/no (0), except where indicated otherwise in the table above. Each domain is scored separately and then the composite empowerment indicator is calculated by adding up each domain score. For the 'mobility' domain, respondents get 1 point for each place they visited and an additional point if they went there alone. A respondent with a score of 3 or better was classified as 'empowered' and coded as 1 ("not empowered" is coded as 0). In the 'economic security' domain, 1 point is given if a respondent owns her house or homestead land, 1 point for any productive asset, 1 point for having cash savings and an additional point if the savings were ever used for business or money-lending. A respondent with a score of 2 or higher in the economic security domain is classified as 'empowered' (1). A score of less than 2 is classified as 'not empowered' (0). In the 'large purchases' domain, a score of five or more is considered "empowered." Finally, in the 'participation in public protests' domain, a participant is classified as "empowered" if she answered yes to one or both of the questions. A woman is classified as empowered if she has a positive score in five of the eight domains described above (Hashemi et al. 1996).

Strengths and limitations

One advantage of this scale is that it assesses women's autonomy and involvement in the home, the community and the State. However, a limitation of this scale is that the majority of the domains focus solely on economic autonomy, which leaves out other important indicators of autonomy. And, as is true of many 'women's empowerment' measures, this scale does not include measures of women's status in relation to men. Ideally, scales would measure changes in autonomy over time among women (as well as among poor and marginalized men) *and* changes in access to resources and power relative to more advantaged groups, e.g. women relative to men.

Interpersonal: Relationships and household levels

Interpersonal-level scales measure the ways in which relationship dynamics among intimate partners and households influence or produce gender equality/inequality. The review found two scales that focused on the interpersonal level: the sexual relationship power scale (SRPS) and the women's empowerment in agriculture index (WEAI).

Sexual relationship power scale (SRPS)
Developed by Pulerwitz et al. (2000), this scale measures decision-making dominance and control in intimate relationships. The scale has been used in studies around the world (e.g. China, Jamaica, South Africa, Thailand, United States and Zimbabwe) to measure the association between relationship power and various health outcomes including condom use, contraceptive use and intimate partner violence.

The SRPS consists of two subscales: relationship control and decision-making dominance. The scale was designed for women, and the majority of studies that have used this tool have administered it to women only, although some studies have also used it with men (Pulerwitz et al. 2000; Nanda 2011).

Scoring
Items in the relationship control subscale are scored on a 4-point Likert scale: 1 (strongly agree) – 4 (strongly disagree). Items in the decision-making dominance subscale are scored from 1-3, where 1= your partner, 2= both of you equally, and 3= you. Items on the subscales are summed separately and then combined to get the final SRPS score. A high score represents high sexual relationship power (Pulerwitz et al. 2000; Nanda 2011).

Strengths and limitations
A major strength of the SRPS is the decision-making dominance subscale, which offers insight into the ways reproductive decisions are made in relationships. This is a key contribution to the literature because there are few scales that incorporate this important indicator of relationship power.

However, a major limitation of the SRPS is that the items in the relationship control subscale cast men as perpetrators and women as victims who are dominated and controlled by their male partner. This neglects the way in which women may exercise power in their relationship. Furthermore, because this scale was developed based on qualitative interviews among females, it fails to get the male perspective. This oversight further contributes to the one-sided nature of this scale.

Relationship control factor/Subscale	Decision-making dominance factor/Subscale
a. If I asked my partner to use a condom, he would get violent	a. Who usually has more say about whose friends to go out with?
b. Most of the time, we do what my partner wants to do	b. Who usually has more say about whether you have sex?
c. My partner has more say than I do about important decisions that affect us	c. Who usually has more say about what you do together?
d. My partner tells me who I can spend time with	d. Who usually has more say about how often you see one another?
e. If I asked my partner to use a condom, he would think I'm having sex with other people	e. Who usually has more say about when you talk about serious things?
f. I feel trapped or stuck in our relationship	f. In general, who do you think has more power in your relationship?
g. My partner does what he wants, even if I do not want him to	g. Who usually has more say about whether you use condoms?

Table 7. Selected indicators from the SRPS.

Women's empowerment in agriculture index (WEAI)

WEAI was developed to track the change in women's empowerment as an indirect or direct result of interventions under the US Government's Feed the Future global hunger and food security initiative. The index was developed through a partnership between the US Government's Feed the Future initiative, the United States Agency for International Development (USAID), the International Food Policy Research Institute (IFPRI), and the Oxford Poverty and Human Development Initiative (OPHI) of Oxford University.

The WEAI is composed of two subindices (1) five domains of empowerment (5DE) – production, resources, income, leadership, and time; and (2) gender parity index (GPI) – reflects the difference in the 5DE scores between the primary adult male and female in each household. In other words, it quantifies the inequality between women and the men in their households (Alkire et al. 2012). In summary, "the WEAI is an aggregate index that shows the degree to which women are empowered in their households and communities and the degree of inequality between women and men in the household" (IFPRI 2012).

Module E. Individual leadership and influence in the community
a. Do you feel comfortable speaking up in public to help decide on the infrastructure (such as small wells, roads, water supplies) to be built in your community? 1. No, not at all comfortable 2. Yes, but with a great deal of difficulty 3. Yes, but with a little difficulty 4. Yes, fairly comfortable 5. Yes, very comfortable
b. Do you feel comfortable speaking up in public to ensure proper payment of wages for public works or other similar programs? 1. No, not at all comfortable 2. Yes, but with a great deal of difficulty 3. Yes, but with a little difficulty 4. Yes, fairly comfortable 5. Yes, very comfortable
c. Do you feel comfortable speaking up in public to protest about the misbehavior of authorities or elected officials? 1. No, not at all comfortable 2. Yes, but with a great deal of difficulty 3. Yes, but with a little difficulty 4. Yes, fairly comfortable 5. Yes, very comfortable
d. Is there a [GROUP] in your community? 1. Yes 2. No
e. Are you an active member of this [GROUP]? 1. Yes 2. No
f. How much input do you have in making decisions in this [GROUP]? 1. No input 2. Input into very few decisions 3. Input into some decisions 4. Input into most decisions 5. Input into all decisions

Module F. Livestock
a. How many [LIVESTOCK] does the household (HH) own today? 1. # Livestock
b. Who in the household owns [LIVESTOCK?] If HH member, list IDs with primary owner first. If outside individual indicate if it's one of the following: 1. Household jointly 2. Outside household male 3. Outside household female 4. Government or other institution 5. N/A or decision not made
c. Who in the household takes care of the [LIVESTOCK]? If HH member, list IDs with primary owner first. If outside individual, indicate if it's one of the following: 1. Household jointly 2. Outside household male 3. Outside household female 4. Government or other institution 5. N/A or decision not made
d. Has the household sold any [LIVESTOCK] in the last 12 months? 1. Yes 2. No
e. Who in the household decided to sell [LIVESTOCK]? If HH member, list IDs with primary owner first. If outside individual, indicate if it's one of the following: 1. Household jointly 2. Outside household male 3. Outside household female 4. Government or other institution 5. N/A or decision not made
f. Who controls the money from the sale of [LIVESTOCK] and livestock products If HH member, list IDs with primary owner first. If outside individual, indicate if it's one of the following: 1. Household jointly 2. Outside household male 3. Outside household female 4. Government or other institution 5. N/A or decision not made
LIVESTOCK: Cattle, donkeys, goats, sheep and pigs, chickens, pigeons, ducks, turkeys, other fowl, fish (grown in fishponds), other (specify):

Table 10. Sample questions from the WEAI.

Scoring
For detailed instructions about the scoring of the WEAI, refer to Alkire et al. (2013).

Strengths and limitations
This index is unique as it is one of the only comprehensive indices related to gender equality and agriculture. Another strength is that it has been piloted in multiple countries around the world, including Bangladesh, Guatemala and Uganda (Alkire et al. 2013; Sraboni et al. 2014).

A limitation of this index is that it fails to represent the role of decision-making about nonagricultural activities in women's empowerment. Furthermore, the large number of household decision-making questions means that the empowerment of women living alone or in single-parent homes may be overestimated (Alkire et al. 2013). Moreover, it juxtaposes men and women in the household as if they were individuals acting alone and for their own individual benefit, thus overlooking the vital interconnectedness of family and household members. Moreover it measures a woman's "empowerment" in terms of her spouse or partner, thus failing to explore the overall socioeconomic status of the family or household unit. Even if a woman is 'empowered' in relation to her husband/partner, she (and the family) will not necessarily be 'empowered' in terms that matter to her well-being or that of her family.

Gender equity index (GEI)
The GEI is an index based on individual-level indicators together with national-level indicators and was developed from the indices of social development database at the Institute of Social Studies at Erasmus University (van Staverene 2013). It measures access to resources and rights, and well-being and attitudes towards gender norms. The GEI consists of 21 indicators, from six different sources, two of which are composite measures (women's economic rights and women's social rights and are measured at the national level). This index has been administered in 182 countries (van Staverene 2013).

Scoring
Scores range between 0 and 1 and the higher number indicates more equitable gender relations.

Strengths and limitations
A limitation of this index is that there is limited documentation regarding the conceptual framework that guided its development, as well as how this index has been used in the past.

Individual-level indicators
a. Percentage agreeing that a married man has a right to beat his wife and children
b. Percentage of respondents who tend to agree or strongly agree that "women have always been subject to traditional laws and customs, and should remain so"
c. Percentage of respondents who tend to agree or strongly agree that "women should have the same chance of being elected to political office as men"
d. Proportion of those of voting age who agree or strongly agree that on the whole, men make better political leaders than women do
e. Proportion of parents who agree or strongly agree that a university education is more important for a boy than a girl.
National-level indicators
g. Rating on women's economic rights (composite measure of 10 economic rights): equal pay for equal work, free choice of employment without husband's consent, right to gainful employment without husband's consent, equality in hiring and promotion practices, job security including maternity leave, right to work at night, right to work in dangerous occupations, right to work in the military and police.
h. Rating on level of women's social rights (composite measure of 12 social rights): right to equal inheritance, right to enter marriage equal with men, right to travel abroad, right to obtain a passport, right to confer citizenship to children or a husband, right to initiate a divorce, right to property in marriage, right to social and cultural participation in communities, right to education, freedom to choose residence, freedom from female genital mutilation, freedom from forced sterilization.

Table 6. Gender equality index indicators.

Structural

Gender is a social construct, meaning it is created and upheld through social institutions, rules and interactions. In recognition of this, some researchers have attempted to develop scales that capture the structural influences on gender inequality. This review found three scales that measured gender equality at this level: the gender inequality index (GII), the social institutions and gender index (SIGI) and the global gender gap index (GGGI).

Gender inequality index (GII)

The United Nations Programme for Development (UNDP) (2013) created the GII to capture the complex and multidimensional nature of gender inequality (Table 11, next page). The index uses a composite measure of reproductive health, empowerment and labor force participation, to calculate the total percentage loss in human development due to inequality between male and female achievements in these three domains (UNDP 2013). These constructs are measured through key indicators found from publicly available databases (Table 10) and data is collected at the country level.

UNDP has used the GII to calculate gender inequality in the three dimensions noted above in as many countries that have quality data for the required indicators. So far, the disadvantage of women compared to men has been calculated in 187 countries using this index (UNDP 2013).

Strengths and limitations

This index quantifies and illuminates the extent to which gender inequality is present on an international level, and the detrimental effects it has on human development. Furthermore, it allows researchers to identify countries that are most impacted by gender inequality, which enables them to focus their research and programmatic efforts in regions of the world that are most in need.

Despite these strengths, there are some important limitations to this index. First, the index only uses national parliamentary representation data, which does not include participation at the local government and community level (UNDP 2013). Additionally, the indicators used to measure labor force participation do not include data on incomes, employment and unpaid work, including housekeeping and child care Furthermore, the index fails to consider the time spent doing these jobs (UNDP 2013). Other important dimensions that this index does not capture

Dimension and Indicator	Source
Reproductive health	
Maternal mortality ratio (Deaths per 100,000 live births)	• United Nations Maternal Mortality Estimation Group (MMEIG) • WHO • UNICEF • UNFPA • World Bank
Adolescent fertility rate (Births per 1000 women age 15–19)	• UN Department of Economic and Social Affair's World Population Prospects
Empowerment	
Educational attainment - Population with at least secondary education (% ages 25 and older)	• UNESCO Institute for Statistics educational attainment tables • Barro-Lee data sets
Parliamentary representation - Seats in national parliament (% women)	• International Parliamentary Union
Labor force participation	
Labor market participation - Labor force participation rate (% ages 15 and older)	• International Labour Organization's Key Indicators of the Labor Market (KILM) 7th Edition

Table 11. Indicators for gender inequality index (GII).

include: ownership of assets, gender-based violence and equivalent health indicators for men (UNDP 2013).

Social institutions and gender index (SIGI)
The social institutions and gender index (SIGI) was designed to measure the drivers of gender inequality by exploring the 'discriminatory social institutions' such as: early marriage, discriminatory inheritance practices, violence against women, son preference, restricted access to public space and restricted access to land and credit (OECD Development Centre 2012). It is based on the Organisation for Economic Co-operation and Development's (OECD) gender, institutions and development database (Table 13). The SIGI consists of 14 variables, which are grouped into five sub-indices: discriminatory family code, restricted physical integrity, son bias, restricted resources and entitlements, and restricted civil liberties (OECD Development Centre 2012). The SIGI has been used in 100 countries.

Scoring
The SIGI contains both continuous and categorical variables. The continuous variables are based on quantitative data, expressed as a percentage, where 0 represents low or no discrimination, and 1 represents high discrimination (e.g. early marriage measure). The categorical variables are based on a 3 to 5 point scale and are scored based on qualitative analysis of available data such as legal documents. The categorical variables are scored so 0 represents low or no discrimination and 1 represents high discrimination (OECD Development Centre 2012).

Subindices and indicator	Coding	Source
Discriminatory family code		
Legal age of marriage	Assigned a score based on one component: minimum legal age of marriage. 0: The law on the minimum age of marriage does not discriminate against women 0.5: The law on the minimum age of marriage discriminates against some women, for example through customary, traditional and religious law 1: The law on the minimum age of marriage discriminates against all women or there is no law on the minimum age of marriage	Data from country specific sources in country profiles
Early marriage (Measures the prevalence of early and forced marriage)	Percentage of women married between 15–19 years of age.	Data from UN world marriage data (2008) and other sources
Parental authority (Measures whether women have the same right to be a legal guardian of a child during marriage, and whether women have custody rights over a child after divorce)	Score based on an average of two components: legal guardianship of a child during marriage and custody rights over a child after divorce. 0: Equal rights for men and women 0.5: (Some) women have (some) rights, but less than men 1: Women and men have unequal rights	Data from country specific sources in country profiles
Inheritance (Measures whether widows and daughters have equal rights to their male counterparts as heirs)	Score based on an average of two components: inheritance rights of spouses and daughters. 0: Women and men have equal rights of inheritance 0.5: (Some) women have (some) rights, but less than men 1: Women and men have unequal rights of inheritance	Data from country specific sources in country profiles

Restricted resources and entitlements		
Access to land (Measures women's right and *de facto* access to agricultural land)	Score based on women's legal and *de facto* access to agricultural land. Value based on the following scale: 0: Women have the same legal rights as men to own and access land 0.5: Women have equal rights with men to own and access land, but discriminatory practices restrict women's access to ownership of land in practice. 1: Women have no/few legal rights to access or own land or access is severely restricted by discriminatory practices	All data based on country-specific sources in country profiles
Access to credit (Measures women's right and *de facto* access to bank loans)	Score based on women's legal and *de facto* access to credit. Value based on the following scale: 0: Women have the same rights to access credit and bank loans as men 0.5: Women only have the right to access some kinds of credit (i.e. through micro credit), or they have rights but in practice they face discrimination in accessing credit 1: Women have no/few rights to access credit or access is severely restricted by discriminatory practices.	
Access to property other than land (Measures women's right and *de facto* access to other types of property, especially immovable property)	Scored based on women's legal and *de facto* access to property other than land, including equal rights to the administration of property contracts. Value based on the following scale: 0: Women have equal rights to own and administer property other than land as men 0.5: Women only have rights to own and administer some kinds of property (i.e. goods they received from their parents, such as inheritance or dowry) or they have equal rights but in practice they face socio-cultural discrimination to owning and administering property 1: Women have no/few/unequal legal rights to own or administer property other than land or their access is severely restricted by discriminatory practices	

Table 13. Selected indicators for social institutions and gender index (SIGI).

Strengths and limitations

The SIGI is unique because instead of measuring gender inequality by looking at gender gaps in education, employment or health, as most gender equity scales/indices do, it captures the discriminatory social institutions that drive gender equality. As such, a major strength of this index is that it illuminates the structural level factors that influence gender inequality.

SIGI is typically used at the national level. While it could be used at lower levels, such as at the provincial or, possibly, district levels, its use for community-based interventions is questionable – unless the community-based interventions were implemented at significant scale to reach a 'threshold' that could be hypothesized to have broad effects on gender equality.

Global gender gap index (GGGI)
The GGGI, developed by the World Economic Forum (WEF) in 2006, measures gaps in human development between men and women (van Staverene 2013; WEF 2013). The index consists of 14 indicators that assess four domains: economy, education, health and politics (Table 14). This index has been administered in 134 countries.

Scoring
The subindex scores are created by calculating the weighted average of the indicators within each subindex. For all subindices, the highest score is 1 (equality) and the lowest score is 0 (inequality) (WEF 2013). The final GGGI score is calculated by taking the unweighted average of each subindex score.

Strengths/limitations
The strength of this index is that it illuminates the areas in which gender-based disparities exist in countries around the world. This is important because it can motivate governments and policy makers to focus their attention and resources towards those areas in order to address these inequalities.

Dimension and indicator	Source
Economic participation and opportunity	
Ratio: female labor force participation over male value	International Labour Organization, Key Indicators of the Labor Market (KILM), 2010
Wage equality between women and men for similar work (Converted to female-over-male ratio)	World Economic Forum, Executive Opinion Survey (EOS), 2013
Ratio: female estimated earned income over male value	World Economic Forum, calculations based on the United Nations Development Programme methodology (refer to Human Development Report 2009)
Ratio: female legislators, senior officials and managers over male value	International Labour Organization, ILOStat online database, 2010 or latest data available; United Nations Development Programme, Human Development Report 2009, the most recent year available between 1999 and 2007
Ratio: female professional and technical workers over male value	International Labour Organization, ILOStat online database, 2010 or latest data available; United Nations Development Programme, Human Development Report 2009, the most recent year available between 1999 and 2007
Health and survival	
Sex ratio at birth (converted to female-over-male ratio)	Central Intelligence Agency, The CIA World Factbook, data updated weekly, 2013
Ratio: female healthy life expectancy over male value	World Health Organization, Global Health Observatory database data from 2007

Table 14. Selected indicators for the global gender gap index (GGGI).

OTHER

Gender and aquaculture

In 2009, the World Bank published the *Gender Agriculture Sourcebook*, which offered recommendations for how to design and monitor and evaluate agriculture-for-development programs that involve women to help alleviate poverty in resource-poor settings across the world. Included in this book are recommended indicators to monitor and evaluate programs that aim to address gender inequality in fisheries and aquatic agriculture (World Bank 2009).

Strengths and limitations

Although this is not a traditional scale or index, these monitoring and evaluation indicators are some of the only existing tools that measure gender equity in aquatic agriculture or fisheries in the literature.

Indicators
a. Number of women and men actively participating in 'established and well-functioning' fisher's groups, fishing boats, fish marketing and processing enterprises, or marketing cooperatives
b. Women actively participating in management committees and boards
c. Total employment or paid labor generated in fish-processing factories for the local population, disaggregated by gender
d. Change in attitudes of women and men about changed roles of women in fisheries or aquaculture

Table 15. Selected gender and aquaculture indicators.

Photo credit: Fatkhan Jay/Duckrabbit

Fetching water during the dry season, Mongu, western Zambia.

DISCUSSION

The scales and indices presented in this draft report include indicators for a wide range of gender-related norms and practices, many of which are of potential use in the evaluation of the proposed communication intervention. The majority of the scales/indices found through this exercise were designed to assess the effects of gender norms on reproductive health (RH) attitudes and practices. This might be because RH is so obviously related to locally situated and time-bound gender constructs, among other factors. It could also be an artifact of the search terms used for this draft report. The literature review found only a few gender-related scales that included measures specific to aquatic agricultural or agricultural systems. Again, it could be that the vital role of gender has only recently been made explicit in aquatic agricultural programs or it could be related to the search terms. Gender inequality has, however, been a recognized issue in agricultural research for several decades, so the fact that so few scales seem to exist is a topic to be further explored.

There is a need to reconsider what agricultural programs have typically measured in terms of contributions towards gender equality. While agricultural programs seek to achieve advances in *gender* equality, in actuality programs have tended to only measure outcomes and impacts on *women's* empowerment. Women's empowerment programs can (and often do) lead to increases in gender equality, particularly when they go beyond women's choice and agency as individuals to support also women's "capacity to undertake action to challenge the gendered structures of constraint" (UN Women 2013). However, many programs strive only for women's *individual* self-improvement (Wilson 2008), leaving unchallenged a range of structural and socially defined constraints that limit the ability of these 'improved' women to exert agency and generally fail to translate to larger scale increases in gender equality (and thus the potential for empowering other women in society). CARE International found that the indicators they were using to measure impact (such as women's participation in activities, training or political representation) can have "little or nothing to do with sustainable impacts on gender inequity" (Mosedale 2005).

While women's empowerment is a necessary component of gender equality, it is not sufficient for achieving it. It is here that the scales and indices described above can be used to augment the narrow indicators typically used to measure changes in gender equality in agriculture. Indicators of potential interest would be ones that go beyond WEAI and the World Bank indicators for gender in fisheries and aquaculture to include: measures of women and men's gender-related attitudes and values; measures of interpersonal decision-making related to household chores, short-term and long-term plans, i.e., recognizing the interconnectedness of husbands and wives, male and female partners; structural factors (in particular, social norms) that constrain or enable the full participation of women and men in families, communities and nations; as well as measures that go beyond norms and measure women's and men's agency as manifested in actions across the social ecological levels.

Capturing achievements in gender equality requires consideration of processes of change that include and go beyond the individual or household level (i.e. changes to larger social relations, rules, norms and practices), beyond the tangible or easily measurable (i.e. changes to the relationships, perceptions, attitudes, values, beliefs and expectations of individuals, communities and societies), and beyond only women (i.e. changes to men and relationships between/among men and women). In order to fully capture a program's real and potential contributions to the wider change processes involved in achieving gender equality, it is necessary to expand the scope of measurement beyond women's empowerment. Insights about what structural factors to measure and how to do it, can be gleaned from GII, SIGI and others.

Photo credit: Patrick Dugan/WorldFish

Going to market, Zambia.

The tendency of agricultural programs to focus solely on women's empowerment, combined with or driven by SMART criteria,[2] has often led to a narrow set of quantitative indicators that measure material or tangible changes for individual women, from either a baseline or in relation to their husbands (e.g. Alkire et al. 2012). Not only does the scope of measurement need to be widened, but also the narrow definition of what counts within women's empowerment (i.e. what is countable) needs to be expanded, particularly when developing new indicators. Thinking through what is measured in terms of gender equality, which is difficult to evaluate due to the complexity and intangibility of societal norms and dynamics, provides an opportunity to challenge narrow definitions of indicators (beyond SMART, quantitative indicators). It also provides an opportunity to critically assess when indicators are even desirable, recognizing that indicators typically give a 'snapshot' at a given point (or points) in time, while qualitative assessments can capture the nuance of changes over time. It is also critical to know when quantitative indicators are appropriate, how often to collect such data, and when and how to use quantitative data in tandem with qualitative measures.

The latter issue – methodological choice – will require careful consideration. Many times outsiders determine quantitative measures, which include scales and indices. Ideally, such measures are based on qualitative formative research in a subset of the study communities followed by a quantitative validation exercise. The use of aggregated data may also mask important details and nuances that could be better understood as individual items. Moreover, both quantitative data and some types of qualitative data, such as focus-group discussions, may provide useful normative data, but fail to elicit nonnormative responses.

RECOMMENDATIONS

There is a clear need to develop a scale that measures gender equality in aquatic agricultural systems. The majority of scales/ indices reviewed here examined women's empowerment or women's status in relation to men, or sometimes in relation to their male partners. While this angle is important, it seems essential to pose questions in a way that does not assume a zero-sum game between men and women, or husband and wife, but explores their interdependence as a couple and more broadly, interdependence amongst community members. From this perspective, interdependence is achieved through a dialectical process in which independence supplants a state of dependency, which in turn is transcended by interdependence (Underwood and Jabre 2003). Rather than privileging individualism and independence as the basis of empowerment, this approach highlights the potentially empowering effect of social connectedness and interpersonal harmony (Markus and Kitayama 1991). To get more fully at this aspect of empowerment, indicators of social capital – such as membership of groups working for community improvement (in health, agriculture, AAS program groups, etc.), strength of ties beyond the community that could be leveraged for resource mobilization, and equity of leadership roles in the community – could be developed and measured to assess the relationship between participation in an intervention or cluster of gender transformative interventions and the hypothesized outcomes It would also be useful to develop indicators to measure couple, household and possibly, community-level changes in terms of not only gender equity/equality, but also social inclusion.

Planting rice in Khulna, Bangladesh.

NOTES

[1] Please note that sets of questions not formally created as scales or indices were not included in this review.

[2] SMART: Specific, Measurable, Attainable, Relevant and Time-Sensitive.

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APPENDIX. GENDER EQUITY, AQUATIC AGRICULTURAL AND AGRICULTURAL SEARCH TERMS

GESI search terms		AAS search terms		Agricultural search terms
gender issue*	women`s role*	aquacultur*	fish pond*	food production farm*
gender relation*	men`s role*	aquicultur*	fishpond*	agricultur*
gender identit*	sexis*	aquaponic*	fishing communit*	livestock*
gender equalit*	sex bias*	aquatic agricultur*	fishing village*	crop*
gender equit*	gender bias*	coastal agricultur*	fisherm*	
gender inequalit*	feminis*	hydroponic*	fisherwom*	
gender inequit*	sex discrimination*	flood plain*	fisherfolk*	
gender inclus*	gender discrimination*	floodplain*	fish value chain*	
gender exclus*	women`s right*	fish trade*	fish distribution chain*	
gender norm*	women`s status*	fishing trade*	fish supply chain*	
gender ideolog*	women status*	fishery	fish market*	
sex role*	women`s liberation*	fisheries	fishing market*	
sexual role*	masculinit*	fishers	fish production*	
gender role*	feminin*	fishing	fishing production*	
woman`s role*		fish farm*	fish industr*	
man`s role*		fish culture*	fishing industr*	
		fishing culture*		

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