Beyond the double gender gap in science and agriculture: Is there space for feminist-inspired transformation within AWARD?

Sabrina Aguiari[1], Apollo Nkwake[2] and Melody Mentz[3]

[1]Independent Consultant: sabrina.aguiari@gmail.com

[2]Senior Manager, Monitoring and Evaluation, African Women in Agriculture Research and Development

[3]Research and Evaluation Specialist, MelodyM Consulting

Abstract

The existence of a structural gender gap in agriculture is commonly recognized. Solutions for overcoming this are often argued to bring about greater gender equality and increased agricultural production. Programs such as AWARD place gender equality high on their agenda, as they attempt to reduce the gap by supporting the career development of women in agricultural science research fields, while also taking stand on current international development narratives on the urgency to invest in agricultural research. Using ecofeminist theories, this paper contends that while such programs' approach to overcoming the gaps in agriculture and science is seemingly focused on women's empowerment, the risk exists that it could result in the reinforcement of an already dominant knowledge, constructed over centuries of inequality. A proposal is formulated to allow for the emergence and recognition of gender epistemological needs, and for feminist epistemological discourses to challenge the ethical premises, research priorities, approach, and methods of current internationally funded agricultural research for development.

Key words

Feminism, ecofeminism, gender needs, gender in agriculture, epistemology

Introduction

This article critiques, from a feminist perspective, initiatives in sub-Saharan Africa that are aimed at empowering women in agricultural research. Although these initiatives might succeed in augmenting the number of female scientists in agriculture-related research, this outcome cannot be considered *per se* the mark of a gender transformative intervention as contemporary feminism envisages it. Using the African Women in Agricultural Research and Development (AWARD) Program as a case study, we propose a theoretical (rather than programmatic) reflection on the nature of initiatives aimed at achieving gender parity.

We contend that AWARD's claim that it is an agent of gender equality must be weighed against the values it brings into the variegated cultural, institutional, and economic scenes of sub-Saharan Africa. The Program couples the objective of supporting women scientists' careers to the very different goal of improving agriculture through investment in research and development, in so doing presenting women's empowerment as instrumental to the second objective. We argue that the Program's underlying model of development considers the generation of profits based on intellectual property rights to be a norm which should legitimately be applied to the domain of agriculture and food security. We contend that similar assumptions have solidly supported the rise and global diffusion of the green revolution, which is deeply criticized by feminist ecologists for its

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patriarchal theoretical paradigm and for its measurable undesired consequences. Thus, the risk exists that gender empowerment initiatives (like the Program under examination) might be a mechanism for exporting a green revolution to a new region (sub-Saharan Africa) rather than a resource committed to the deep transformation of gender inequality.

From a feminist perspective situated outside the Program, we dissect the basic values which underline this model of development, and critique the level of gender transformative power that such interventions can achieve. We present our argument in three parts.

In the first part of the paper, the contextual environment within which the program operates is juxtaposed with the Program's mission, vision, and overall theory of change, as understood from its publicly available documentation and by a selected set of reports shared by the program management for this article. This section includes reflections on the gender gap in education and in scientific disciplines that the Program aims at reducing, as well as reflections on the model of global agriculture which has been, and continues to be, promoted by large parts of the international community.

In the second part of the paper, we argue that the Program's approach to gender equality is not gender transformative, given that joining two separate goals (advancing gender equality in science and supporting research for agricultural development) jeopardizes the independent advancement of women. We further argue that the limited epistemological reflection within the program hampers the possibility of epistemic innovation and prevents deeper transformation towards less male-biased knowledge production.

In the third part of the paper, we introduce proposals to deepen the gender transformative potential of the Program (and others based on a similar philosophic foundation), and pose questions to contribute to informing a feminist evaluation of programmatic relevance.

Contextual positioning: gender gaps relevant to the program

Central to the architecture of the Program is addressing the gender gaps found at the junction between two domains: agriculture (as an element of food and nutrition security) and scientific research (as a driver of development). The Program describes itself as:

> A career-development program that provides tailored and reinforcing fellowships to strengthen the research and leadership skills of top women agricultural scientists across sub-Saharan Africa, thus improving their potential to contribute to the prosperity and well-being of African smallholder farmers, most of whom are women (AWARD, 2015, p. ii).

Focusing on the sub-Saharan Africa region, the Program aims at increasing the quantity and quality of women's work in science applied to agriculture, with the intent of improving overall chances of prosperity and wellbeing for small farmers, many of whom are women and most of whom are resource-constrained. The Program description introduces a conceptual bridge to connect a potential elite of women scientists with a large multitude of farmers, and particularly women farmers. The work of the first, reinforced by the Program, is assumed to be for the good of the latter, posited in a condition of need which can be improved by science. Thus, the problem of development, or the lack of it, in the Program's presentation is framed as: first, a condition of *epistemic poverty* ('strengthen the research'), and secondly, as a current lack of *good leadership* among women in science.

The "vision of success" as stated in the official presentation of the results of the first ten years of the program (AWARD, 2015) reflects the dominant thinking of the time during which it was conceptualized (see detailed discussion of the emerging narrative directly below), but with a unique

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accent:

> Critical advances and innovations in agricultural development for Africa are led and enriched by the contributions of capable, confident, and influential African women. The agricultural research and development sector demonstrates increasing responsiveness to the needs and contributions of women (AWARD, 2015, p. ii).

Essentially, the Program theory posits that to reach prosperity and wellbeing in Africa, agricultural development is key, and that the overlooking of women's role in agriculture – and in food and nutrition security – needs to be corrected. In 2006, when AWARD was created, this rationale was an emerging narrative in the international development community.

Much literature on how to understand food insecurity and rural livelihoods by bringing gender analysis into agriculture was produced during the 1980s and 1990s – some by UN entities such as the FAO, but mostly by NGOs and women's movements in Latin America, Africa, India, and with the involvement of organizations from Sweden, Norway, Great Britain, and the Netherlands[1].

However, after the publication of the World Bank *World Development Report 2008: Agriculture for Development* (2007), attention to and legitimacy of the gender-agriculture nexus became significantly more widespread and mainstream. It was at this point that the narrative on gender gap in agriculture and in food security lost its tight link to the ethical domain and to a rights-based approach, and the emphasis shifted to the functional benefits that increased gender equality could imply for growth and development. The international development community started to reason and debate around a different rationale for justifying the need to overcome gender inequality: not because of its structural inhumanity, but because of the potential economic benefits for growth that equality could generate.

It was in this period (2000-2010) that the main narrative pointed to the paradox of the large presence of women in agriculture (particularly in Africa) and their relatively low productivity due to the gender gap. Under this narrative, women's empowerment was positioned as "smart economics" (in World Bank terminology), or – following Moser (1989) – as the "efficiency approach". The 2007 to 2008 food crisis contributed to the legitimacy of the increased public resource investment in research and the modernization of agriculture, and at the 2009 G-8 Summit, USAID (2011) presented the *Feed the Future* strategy, which opened doors for an array of interventions aimed at increasing and enhancing agricultural production and gender equality in parallel, thus normalizing an instrumental approach to gender in agriculture.

From this time onwards, USAID has championed the approach of pursuing more gender equality and empowerment for rural women in developing countries to obtain higher agricultural productivity. The rationale presented is as follows: increased investments in agriculture, including public investments in foreign aid, could bring know-how, technology, and infrastructure, and support value chain development. At the same time, women farmers can be targeted and empowered, reinforcing their productive and commercialization capacity, and increasing harvests, food availability, commerce, and trade. This linkage established between gender, equality, and trade – framed in policies and programs – had the effect of bringing the attention of gender equality champions to focus on key actors in agricultural investments. Furthermore, both *Feed the Future* and the UN Food and Agriculture Organization flagship publication *State of Food and Agriculture 2010* (FAO, 2011), have successfully brought to the attention of the broader international development community some of the key aspects of gender inequality as experienced in the lives of rural women, including lack of secure land tenure, lack of knowledge and inputs, and lack of access to markets and to the credit required for advancing individual access to technology and assets. As we will argue later, despite these seemingly positive outcomes, the efficiency approach is not without significant negative consequences.

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It was within this dominant discourse, that the AWARD program strategically reshuffled the deck, and while keeping in line with the overall narrative most prevalent at the time of its inception, it opted for an original combination of research, gender, and agriculture, by pursuing gender equality through support to individual women's careers in scientific research for agriculture.

While the system of fellowships for supporting career development is not innovative *per se*, the synergistic set of activities offered to each fellow to promote their self-empowerment through reinforcement of their scientific and leadership capacities, as well as the provision of a mentor, is a unique approach.

Situating AWARD in the global scientific gender gap

The fellowship has chosen to tackle a structural gap that is relatively unfilled in both the Global North and in the Global South: lack of women in science, and in scientific/academic decision-making roles. Global comparative data (World Economic Forum, 2016), show that while in OECD countries the percentage of girls completing high school is higher than boys, at global level we observe that only 62 countries succeeded in closing the gap at primary level. Surprisingly though, in 96 countries the gender gap in tertiary education is now closed, and now girls enrolling in tertiary education globally are outnumbering boys, with effects that will be visible in the workforce in the next decade. Nevertheless, the percentage of girls pursuing scientific careers in the so-called Science, Technology, Engineering, and Mathematics (STEM) disciplines is almost half that of boys (16% of female students towards 30% of male students (World Economic Forum, 2016).

Regardless of geography, the number of women in advanced academic or scientific positions is proportionally inequitable. UNESCO Statistics (2014) show that the region with the smallest gender gap among researcher is Central Asia (47% of researchers are female, but overall the number of researchers is very small in comparison to Europe), with significant intraregional differences which also account for a reverse situation (above 50% women in research) in Georgia, Kazakhstan, Armenia, and Azerbaijan.

Men in scientific disciplines and in academia in general outnumber women in a direct relation to the level of seniority – the higher the rank, the lower the number of women. Female researchers in science applying as principle investigators might experience discrimination in comparison to their peer male researchers. For example, findings from a study conducted as a meta-analysis of research proposals submitted for public Italian grants concluded that "proposals led by males exhibit very low or even negative risk differences. Stated otherwise, they have been favored in comparison to similar projects led by women" (Romei, Ruggieri and Turini, 2012, p.7).

In this global context, the aim of having more women in science in Africa, especially if advancing on a career and leadership path, may seem to be an unquestionably desirable goal, with several positive cascading effects. If the focus of scientific research is – as in AWARD's case – agricultural research and development with food security so evidently (but complexly) reliant on agricultural outcomes, the program seems to be justifiably focused on a critical point for development. The gendered nature of the agricultural sector seems to provide an even stronger rationale for the chosen focus. One could further argue that, if successful, such an initiative would stand as a powerful symbolic intervention if it was done in countries of the Global North, and even more so as it was developed in Africa.

However, although the program has been identified as unique, and has the potential to be an international exemplar in the international science community, we argue that any gender initiative needs to look beyond the superficial shifts in numbers towards a transformative impact. In Part 2 we explore perspectives to situate the AWARD Program within a feminist epistemological framework

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to assess whether the Program is gender transformative.

In the next second part of the paper, we contend that the vision, mission, activities, and underlying values of the AWARD initiative consistently define an effort towards gender equality that is not gender transformative. We propose two key arguments to support this assertion, each presented in one of the two following paragraphs.

Smart economics vs. gender equality

The first argument is that the Program maintains, although significantly more elegantly framed and articulated than other examples, a 'smart economics' approach. It does not have a purely gender equality approach, as it aims at both improving the number of women in scientific careers with a leadership role *and* at the same time at developing agriculture through research. This double objective resounds very much in tune with the neoliberal economy agenda (epitomized in the instrumental approach described above) which is very explicitly proposed by the World Bank as the mainstream to the international development community. Already in 1995, the World Bank proposed:

> Investing in women is critical for poverty reduction. It speeds economic development by raising productivity and promoting the more efficient use of resources; it produces significant social returns, improving child survival and reducing fertility, and it has considerable intergenerational pay-offs (World Bank, 1995, p. 22).

According to Chant & Sweetman (2012), who quote this passage from a chapter titled "The Pay-offs to investing in Women", the rationale for gender equality has shifted from being justified on a rights-based perspective, to being a goal that made economic sense and was therefore referred to as 'smart economics'.

This declared two-fold agenda cannot be fully trusted in a feminist perspective. For several decades, a 'feminization of poverty' has been recognized and conceptualized (Pearce, 1978). The fast transformation of economies and society, based on neoliberal ideologies and practices, have been only superficially corrected by positive actions to help women fill the gender gap. This approach might seem effective in the short-term but is fundamentally flawed in that it accepts the underlying systems of power and does not challenge the primacy of economics in societal governance, which is a value deeply entrenched in patriarchy. The approach tends to look at the problem as if women had to be adjusted and 'fixed' to fit the existing machine from which they have been excluded (Chant and Sweetman, 2012).

Although greatly simplified, like all schematizations tend to be, it could be argued that Figure 1 is a very basic synthesis of the theory of change that AWARD is aligned with.

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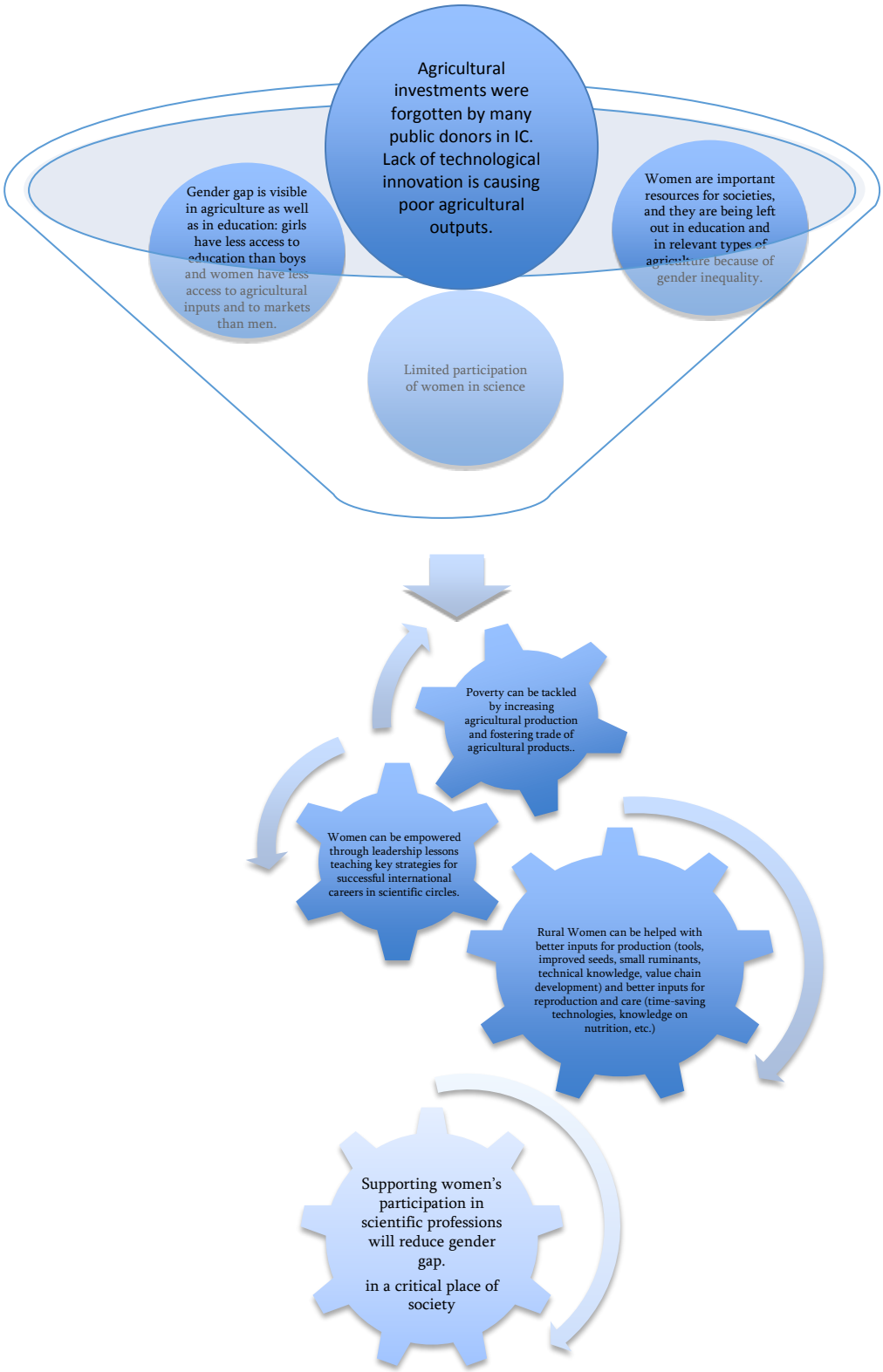

Figure 1: Schematic representation of key problems and solutions as identified by a line of development thought to which AWARD program can be compared

As noted in Part 1, the 2007 to 2008 food crisis led to several constituencies calling for channeling investments and planning technology transfer for a new "green revolution" wave to develop a more industrialized, trade-oriented, agribusiness model for agriculture in Africa. The first vehicle for this agenda became the Memorandum of Understanding between Alliance for a Green Revolution in

Africa, Food and Agriculture Organization (FAO), World Food Program (WFP), and IFPRI (FAO, 2008). However, when the economic creed of a green revolution (Figure 1) adopted by AWARD is projected at a global scale, we cannot ignore the reality of its negative consequences in the United States, South America, and India, where there is now abundant evidence and experience-based critiques of the effects of private capitals-led industrialization of agriculture. This view has also been expressed by the former UN Special Rapporteur on the Right to Food, who has been giving voice to civil society and small farmers' organizations (Navdanya, 2012).

Despite the monetization of virtually every aspect of human life, and free trading rules expanding to almost all commodities, including agricultural ones, poverty is not eliminated. It is re-growing where it was once reduced, while economic inequality is reaching astonishing proportions with even developed countries like Japan experiencing an absolute reduction in income (OECD, 2011). Industrial capitalism evolved into financial capitalism based on debt and wealth extraction to the benefit of 'rentiers', not producers (Bezemer & Hudson, 2016). Furthermore, as a result of the neoliberal model of economy and trade, resources (natural and financial) are being drawn from the countries of the Global South to the Global North, with the latter currently receiving 24 times as much as they invest in the former (Schjelderup *et al*., 2015).

AWARD takes a clear stance in understanding gender inequality in a very specific way, quite resonating with the XIX century liberal feminist tradition (focused on the belief that solutions for women's condition is in the reinforcement of their individual capacity), as a problem that can be solved by *adding* women to contexts in which they are excluded, and by providing them (*adding on to* them) with skills and knowledge for navigating those contexts. This discourse is accompanying development initiatives towards a risky junction in Africa's agriculture scenarios. Supporting an excluded group to increase their chances of career and success in a society – in this case female researchers in science for agriculture – can hardly be considered a neutral intervention aimed at obtaining gender justice and capable of impartially answering women's (female researchers in science) needs, as well as addressing causes of food insecurity. Supporting the empowerment of an advanced subgroup within an excluded group is a solution focused on what is lacking in the selected target life, not on the system of exclusion around. On the other side, the fact that the program supports women interested in agriculture does not mean the program targets are *per se* interested in the gender aspects of food insecurity, nor that they will be loyal to championing solutions to overcome gender inequality to obtain universal food security.

Dr. Wangari Maathai, environmentalist and first African woman to be awarded the Nobel Peace Prize, synthesized the weakness of African development as being the result of dynamics and strategies initiated by the Global North to continue controlling the Global South (Maathai, 2009). This is done by ensuring that few leaders get coopted into agreements and activities, which is not beneficial for the whole population, but very favorable for those trying to continue economic, political, and technical power over former colonies. Large development plans involving technology transfer in combination with foreign financing through loans (instead of grants) create a debt – both financial and symbolic – which is impossible to redeem. It is important to keep this example in mind and ensure that promotion of gender balance and participation in scientific enterprise applied to agricultural development does not result in gains that are a two-edged sword: a limited number of women scientists supported in their careers in exchange for a larger loss – the enabling of a model of agriculture potentially counterproductive to the livelihoods of small farmers.

The central focus of this first point of critique is that the smart economics approach applied to agriculture embraced by AWARD (as by other programs) might be against the best interest of women as a collective category, as the plan for equality suggests the need to add something missing to women, rather than changing what is wrong with the system.

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Beyond hetero-normativity of needs: allowing for gender epistemic needs to arise

The second point of critique intends to reposition the analysis of the Program from the perspective of gender needs. As presented by Moser (1989), there is a substantial difference between the practical gender needs and the strategic gender needs of the group with a lessened gender identity. The practical needs can be satisfied in the short term and directly; relief can be provided to the group discriminated against, while the roots of the discrimination are neither eliminated nor challenged. Strategic needs must be addressed with more long-term interventions and are satisfied when more substantial equality is reached for the disadvantaged group, so that their rights emerge and are respected at the same level as the other group. Addressing practical needs might, to some level, compromise the effective consideration of strategic needs. For example, the distribution of high efficiency cooking stoves to poor rural women: they aim at reducing environmental impact as well as the time burden for cooking, but at the same time they recognize and further sanction a rigid and unequal division of labor within the household, confirming that women are the ones expected to provide fuel for the cooking for their family.

According to Moser's division, an intervention cannot aim at transformative effects if it only tackles gender practical needs, and fails to address gender strategic needs. Our assessment is that the AWARD program is focused primarily on gender practical needs, rather than strategic needs. The Program is supporting female researchers in their careers as scientists in order access greater equality of opportunities; this is a way to answer specific gender practical needs. Leadership development is very needed, as women often experience a lack of self-esteem or deem their wellbeing secondary to that of others. The Program appears to be successfully bolstering fellows' leadership development. Based on the narratives of the fellows we examined, they consistently report a sense of confidence and self-empowerment, independent from the scientific results achieved, which are all attributed to the training and support received from mentors and trainers during the program. The fellows underline what an unanticipated difference the program made in their lives in terms of skills developed, opportunities encountered for learning, public participation at the international level as well as in their home countries, contacts retrieved for self-placement in research-related jobs, prestige acquired, along with publicity obtained for their own work.

However, ultimately these lines of action try to supplement what is lacking by intervening at an individual level.

It can be argued that the leadership course is the part of the program more oriented at answering strategic needs, as it equips women to challenge the system they are in – which to some extent it does. However, though it fills the gendered lack of confidence of individuals to 'fight back' and enter into an exclusive society, it does not challenge the order itself. Even if AWARD's work on empowering women through leadership development is considered as tackling strategic gender needs, there is another and more substantial level according to which we cannot evaluate the structure of the program as being gender transformative.

We call this the level of *gender epistemic needs.* With this expression, we integrate the Moser (1989) framework of practical versus strategic needs with feminist epistemologies. This level of needs consists of those which, to be answered, require strategies for challenging a patriarchal system of values underpinning a dominant rationality, which in turn structures a self-reproducing, dominant hierarchical system of knowledge that comes with criteria to define and measure success. Gender epistemic needs are feminist in their nature, as they seek to change women's collective normative minority status, and claim the right of expression of fundamental values, including those defining what truth looks like and how it can be best attained or approached. Gender epistemic needs are prompted by the awareness of the flawed ethic underpinning a system of knowledge

which purports to be universal but does not afford equal status to all humans, specifically women. Gender epistemic needs are also elicited by reflections on the mainstream leadership model in society, where models of leadership are deeply connected with the idea of virtue and truth that a community holds; therefore, these models are connected with, and are supportive of, the underlying epistemic frameworks.

Deconstructing dominant epistemologies

In the last 50 years, feminist thinkers have contributed to the intense critical epistemological work which has deconstructed the mythology of the scientific enterprise portrayed as a self-founded, neutral, and rational activity. This mythology was rooted in classic western philosophers' thinking, and was perfected during the scientific revolution as a narrative that allowed the institutionalization of the role of the scientist as opposed to other authoritative characters with a share of epistemic power conferred by societies, as explained by Feyerabend (1975): the theologian, the healer, the alchemist, the witch. The witch hunting starting in parallel to the scientific revolution is a very graphic demonstration of the need under patriarchal order to mark the difference between epistemic models, as explained in Mies (1986) and Chiaramonte, Frezza, and Tozzi (1992). That narrative used to present and shape the scientific method exemplified and utilized a type of rationality that was founded on values discriminatory against women, in an attempt to consolidate and rationalize women's dependence on men as a quintessential trait in the identity of women. As Caroline Merchant (1980) exposed, within modern science (in addition to the exclusion of women) the overarching images of nature as a woman to dominate (put forward by Francis Bacon – considered the founder of the scientific method) or as a machine to deconstruct and control, were emerging and guiding the discourse on true method for knowledge was a fit metaphor to support the epistemic need to have full intelligibility and ultimately control of nature. Galileo Galilei, Renée Descartes, Julien Offrai de La Mettrie, and Robert Boyle all found the metaphor of the machine effective for the analysis they wanted to develop, and elaborated around that idea, often referring to the specific image of the clock (McReynolds, 1980).

This general discrimination, with women relegated to a state of minority and of dependence on men, pre-exists the western scientific revolution (Engels, 1884); but with the scientific revolution, the discrimination became more explicit and totalitarian, as it crystallized the identity of women in symbols and institutions as belonging to the realm of irrationality, and sanctioned women's extraneity to the places of science and real knowledge (Noble, 1992). The scientific revolution narrative depicted the scientist as he who is elevated through the exercise of rationality, understood as an exclusively masculine attribute, and seen as the instrument to discover true knowledge, the hidden rules of nature. The opposite conceptual couple of empathy (seen as subjective and epistemically irrelevant) against rationality (seen as universal and capable of generating knowledge), as male against female, created that ethical and epistemological tension that Evelyn Fox Keller (1983) explained while narrating how the work of biologist Barbara McClintock could challenge that dichotomy and reclaim epistemic power to empathy.

The scientific method created by the 17th century's scientific revolution was the rationale through which the actors of the revolution claimed to have an invincible alternative to seeking the Truth, which superseded theology and dogmatism: observation, experimentation, non-interference with the object of observation, clear hypothesis being tested, refuted by counter evidence, and only finally selected as valid when also verified as capable of predicting some part of some process. While the scientific method was identified with neutrality, objectivity, and reiteration, and was supposedly progressive and cumulative within a substantial theoretical continuity, it was a pivotal element for modern (classic) science to achieve social power and influence – over both women and nature (Le-May Sheffield, 2004).

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During the second part of the 1800's, the dominance of the machine metaphor began to be questioned by scientists interested in studying living beings, and the principles of the neutrality of the observer and non-interference started to lose their validity and status as unchallengeable. Both these elements have been analyzed under a feminist critique during the past century, in an attempt to understand the interconnection between (a certain type of) science and technology on one side, and the pattern of power structures of knowledge on the other. Emerging in the century of deconstruction of western rationality and emanating from the real-life experiences of female scientists encountering constant bias, the tenets of feminist epistemology are numerous, multifold, and create a dis-homogeneous complex whole (Anderson, 2011; Doucet and Mauthner, 2006). The central question that the feminist poses is: "is the sex of the knower epistemologically significant?" (Code, 1981). A long line of researchers answered positively, uncovering bias not only in data collection, but also in the type of research questions asked.

As in the case of non-feminist philosophers of science (Kuhn, 1962), feminist epistemologists have very carefully criticized the unreal ideal of science being able to create a universal discourse based on the supposed neutrality of the scientific observer. From a feminist perspective, Donna Haraway unpacked the logical omissions that created the myth of observing a scientific subject neutrally (Haraway, 1988, 1991). Her critique of the universality and neutrality of the observer produced a critique of classic epistemology which resulted in a positive evolution in the debate. Her concept of 'situated knowledge' (Haraway, 1988) and Sandra Harding's 'standpoint theory' (Harding, 1987; Harding & Hintikka, 1991), initiated and fine-tuned alternative notions to deconstruct the possibility of full objectivity in knowledge which is part of the establishment of power in societies. This is what Michel Foucault throughout his work, in his meta-analysis of rationalities, referred to as the changing condition for truth (Foucault, 1966).

The basic idea behind the standpoint theory is that discourses and explanations, including to some degree modern scientific knowledge, are an act of reconstruction, and provide a cut within the continuum of reality which is necessarily partial. The point of observation of any scholar, independent of the field of research and discipline, is a given, to which the final description is ultimately anchored. Socio-economic conditions, and cultural and political references, shape the perspectives of our understanding and at a very deep level are incorporated in the discourses and analyses we formulate. Harding (1986, 1992) intended to draw strong attention to preserving a consensus on the importance of reconstructing and maintaining for science a ground for 'objectivity' beyond neutrality. She called 'strong objectivity' the cognitive advantage that categories of the marginalized and oppressed in a given society or a given socio-economic-cultural system – including women as a political subject – have in providing their account and description which is not biased, supposedly, by the interest of maintaining a given status quo, but has a margin of representative freedom as an outsider observing from within.

Another relevant question in feminist epistemology is to what extent the modern scientific quest to dominate nature has to be put in relationship with the traditional patriarchal disvalue and domination of women? A central claim in the line of thought known as ecofeminism, is that negative ecological and socio-economic consequences of the industrialized, global model of production are produced by technology that is inspired by an exploitative approach to and mechanistic representation of nature – characteristics that stem "from the mutually reinforcing oppression of humans and the natural world" (Gaard and Gruen, 1993:7). Among many authors in this stream, Caroline Merchant became very influential. She expanded the parallel between the deeply rooted ethics of man dominating nature, and that of man dominating women (Merchant, 1980). She first developed a thorough analysis of how modern science developed from a key shift in attitude towards nature, when animistic assumptions about nature and the cosmos started to be looked at as non-rational, resulting in a symbolic 'death of nature'. She explained how the appeal of

the new materialistic metaphor of nature as a complicated combination of mechanisms, ultimately led to the cancellation of interest for previously established sources of knowledge, which could afterwards not be founded and persuasive any longer. She considered to be exemplar the change in perception of herbalist women (also documented by Brian, 1980), who were progressively transformed into dangerous 'witches' and then physically exterminated. She then illustrated the essential features of the mechanistic representation of nature and explained how this image was and still is very functional to a science posited as solution-oriented knowledge for providing the necessary 'fixes' to nature's (supposed) inefficiencies through technologies; a productive system that is fundamentally based on extracting and monetizing resources from nature.

Other ecofeminists, such as Maria Mies (1986; 1993), have explored the connection between patriarchy and capitalism which made possible, and is in turn sustained by, the alliance of patriarchy and techno-science, including the industrialization of agriculture. She has explained the inner consistency by following the interconnections between values, processes, and effects, like the thread connecting gender inequality, control of knowledge and technology, production and accumulation obsession (perceived as more elevated than re-production and self-sufficiency), and patterns of growing poverty and ecological disasters.

Feminist epistemologies explored and unveiled the tight and symbolically consistent connections between at least three key societal functions with interlocking sets of values and activities: *patriarchy* (implying subordination of females), *globalized economy* (implying subordination of other races/nations/ethnic groups), *technology-and profit-driven science* (where scientific research is not only heavily led by proprietary technology but aims at discoveries that can be turned into patented technologies).

Based on a large basis of work of feminist epistemologists (larger than here presented) it can be claimed that discourses presenting scientific research aproblematically – as if it were a continuum discourse universally valid and independent from the specific individual and social identity of the scientist – are flawed. If an honest intention exists to connect a discourse on gender inequalities with an intervention to expand the presence of the underrepresented gender within the endeavors of scientific research (which is not only a place of discrimination, but the *locus* in the classic modern era where the feminine is cynically lowered and hierarchically stabilized) it is important that we make space for some questions that a dominant rationality of development might consider 'irrational'. Therefore, a ground-preparing work to do, in combination with other actions, is to foster and facilitate epistemological reflections – including those inspired by feminist thinking – to allow gender epistemic needs to emerge.

An examination of the program strategic documents, as well as narratives from the fellows, provide no evidence to suggest that AWARD intentionally creates spaces for gender epistemic needs to emerge.

What intervention could transform deeply stratified gender inequality?

Considering the concept of gender epistemic needs, the question must be asked: "What essential concepts proceeding from feminist epistemological critique can be useful to AWARD in attempting to provide space for epistemic gender needs to emerge?"

The answer "can't be just add women and stir", as feminist writer Charlotte Bunch famously uttered (Bunch, 1987:1). As expressed above, it is clear that AWARD is providing women scientists with self-development opportunities, leadership skills, and science skills in a manner that would be understood and accepted by the international scientific community. But given the deep root of gender inequality in science, this might not be sufficient. The intervention takes, in light of feminist epistemologists' expanded awareness, a 'women in development' type of approach, with no interest in transforming the system that excluded women to begin with. In order to design a truly

transformative intervention, even on a small scale, a space has to be created to let gender epistemic needs emerge.

Patricia Hill Collins (1990) unpacked the dynamics and risks of introducing subjects into an environment from which they have been purposefully excluded in a historical and epistemological sense. Their introduction might be done in a very selective manner by the dominant elite of a system. She contends that when the overall goal of an institution is to preserve existing power structures and systems of knowledge, increasing the presence of outsiders is achieved by accurately identifying and coopting individuals from the excluded group who are not interested in challenging the founding values which determine what research questions are worthy of being asked, as well as acceptable methods of research.

On the contrary, to let epistemic gender needs emerge, epistemic discomfort has to be recognized. This brings the conversation back to the risks of development, and compels another reference to Wangari Maathai's reflections (Maathai, 2009). Bringing women, as the subject excluded from science *par excellence*, into communities of intent built on anti-feminine values, might risk being more of an attempt to co-opt women – intended as a socio-political subject – into a model of development built on a paradigm of science and of governance of knowledge, which denies power to women, and which is instead conducive to neoliberal economies and environmentally unsustainable agriculture. In other words, the approach of promoting gender equality by selecting researchers who will follow lines of research tightly encapsulated in the system of values mentioned above, could resemble the approach – unveiled and denunciated by Maathai (2009) – of bringing development to Africa by co-opting key leaders who inadvertently disadvantage their countries by not having questioned the basic values upon which the proposed agreement is based.

As a final synthesis of the two arguments presented in Part 2, it can be said that from a radical feminist perspective, the program's overall architecture to promote gender equality cannot be at present considered gender transformative. Indeed, the risks currently embedded in its structure might jeopardize the program's intent to empower women within a system whose pillars are imbued with discriminatory and exclusive attitudes. Those risks are derived from the fact that the planned actions either use women as vehicle for a secondary agenda (first argument); or they do not understand scientific research as a complex, diverse, and deeply androcentric endeavor (second argument).

If true empowerment and transformed gender equilibrium are sought, it is necessary to create the preconditions for feminist epistemological awareness to spread and allow women scientists to revisit the epistemic standard that is concerned with inclusiveness and elimination of systems of oppression and exploitation. The type of scientific questions, the methodologies chosen, the ultimate purpose envisaged for research, the use of results, the accountability of the scientist, and the model of ideal interactions with the rest of the scientific community: all these are foundational areas where interventions have the potential for great transformation. Moreover, from a feminist standpoint, it could be said that a program intended to pursue gender equality that does not structurally incorporate research questions interested in unveiling patterns of powers and in identifying answers for transforming relevant dynamics of oppression, cannot be seen as a program that can truly promote gender equality.

In an effort to connect feminist reflections on science with thinking about the advancement of gender equality in international development, Londa Schiebinger (2010) developed a synthesis which identifies three main approaches in the critical dialogue between feminist thinking, policy, and institutions. The first is referred to as the *gender-neutral approach* (from the 1970s to present), which considers science and technology as unbiased, objective, and universal, and aims at equal access to education and employment for all, operating positive action on the excluded group to

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increase their numbers and level percentages. The second group of positions is labeled the *difference approach* (late 1980s to present). The key points maintained are: a strong emphasis on the biological (sex) as well as on the socially constructed (gender) differences between men and women. The third approach, named the *equality approach through gender analysis* (extending from 2000 to present), assumes that gender analysis is a resource to enhance scientific excellence, and therefore it mainstreams sex and gender analysis in science and technology policy and research. It refutes the notion that augmenting women's participation in science and technology will *per se* result in gender-sensitive science and technology. Instead, this approach recognizes the need for an intentional introduction of training on sophisticated methods of sex and gender analysis. For each of these approaches, Schiebinger pinpoints the limitations and the risks, concluding that the third approach has the best chance of achieving deep gender transformation.

If we try to place AWARD in this schema, the Program can most likely be classified within the first group. Following the classification, the Program does support the presence of more women in science, but it has two of the shortcomings noted by Schiebinger:

1) It neither questions the universality nor the gender neutrality of science and technology as a relevant domain of enquiry.

2) It indirectly locates the problems of gender imbalance in science within women's education, socialization, and values. Participants are seen as requiring training – in which they are taught leadership skills (typically considered male attributes), and must rethink their behaviors and life rhythms – to achieve success.

The synthesis and classification work of Schiebinger (2010) not only bridges the feminist analysis of science with international development categories and tools, but also provides for a conceptual opening to a way forward. She sees the *equality approach through gender analysis* as being implemented through gendered innovations, which "employ gender analysis as a resource to stimulate gender-responsible science and technology, and by doing so enhance the lives of both men and women around the world" (Schiebinger, 2010, p. 25). Following this direction, some proposals for practical incorporation of gender strategic needs into the AWARD program are outlined.

Operational propositions to strengthen AWARD's gender responsiveness

In this third part of the paper we argue that AWARD cannot be considered gender transformative for two main reasons. First, it relies on a theory of change and expresses a set of values that are not deeply feminist, as it does not value women empowerment *per se* through support to the rights of women in science, but it connects that value to the economic benefits that improved agriculture can provide. The inclusion in the agricultural sciences system aimed for by the program is achieved by 'modifying', through capacity building, the skills of those women the initiative has selected, in order to equip them and make them fit for the very system of power they were excluded from. Second, the type of research supported is mostly applied, and it frames food and nutrition security within the perspective of contemporary globalized agribusiness, which, according to many, creates economic exclusion and ecological damage.

We propose some suggestions which could foster a transformation of the Program and position the Program to meet not just practical, but also gender strategic and epistemic needs. In particular, actions are suggested with two main objectives in mind: creating a sense of *normality* for women to be in high ranks in science and academia (gender strategic needs); and the creation of conditions conducive to innovative research by positing new types of questions and by fostering new types of utilization of discoveries, inspired by feminist thinking (gender epistemic needs). These suggestions are aimed at reinforcing the inner strength of the women beneficiaries, and at supporting them to

discover sound modalities (as defined by themselves) to foster research and its application, potentially including caring for the destiny and health of the end users.

As a general addition to current activities, the Program could foster internal dialogues and establish a place for group self-reflection among current and previous fellows. The purpose would not only be to present and debate actual results of research, but also to create a space to explore meta-analysis of research projects which includes epistemological debates. This facilitative space, focused on inclusivity, could enable reflection on how the fellowship has contributed to gender equity and to what extent it enhanced gender equality. Of particular interest is what opportunity was available to redefine the norms and boundaries that fellows might have encountered on their research path. Facilitators should be familiar with the diversity of positions on food security and agriculture existing across civil society, and with multilateral actors in international development.

A second exercise could be to institute a midterm learning evaluation, informed not just by solid gender responsive terms of reference, but thoroughly guided by a purely feminist evaluation approach. Feminist evaluation is rapidly gaining interest and has a growing community existing in several evaluation societies. Key elements characterising a feminist evaluation approach are described by Podems & Negroustoueva (2016) who clearly articulate the important differences between gender responsive and feminist evaluation:

> Feminist evaluation (FE) emphasizes participatory, empowering, and social justice agendas. While all evaluation approaches are laden with their own, often implicit, values, few assert their values as openly as feminist evaluation. Unlike most gender approaches, feminist evaluation does not provide a framework or advocate a precise approach; rather, feminist evaluation is often defined as a way of thinking about evaluation (Podems & Negroustoueva, 2016, online).

Among the specific key differences that the authors propose, two are particularly relevant to AWARD. First, feminist approaches "[c]hallenge women's subordinate position; empirical results aim to strategically affect women's lives, as well as the lives of marginalized persons." They also "[a]cknowledge that women may not want the same things as men and design and value evaluations accordingly" (Podems & Negroustoueva, 2016, online).

The proposed evaluation would look at specific situations in which the fellows were supported in putting into use the *epistemic advantage* envisioned by Narayan (2004): women's unequal position and overall exclusion from power centers they relate anyhow with, *may* provide, through an intentional process of self-awareness, a broader understanding of different points of observation, of different practices, and of values. The mere exposure to two 'incommensurable' worlds, as the gendered sphere of male and female experiences can often be, is though not enough to trigger critical thinking, which can more likely emerge if this function is felt to be safe, and sufficiently supported. Indeed, it is a delicate and non-predictable outcome, as individuals – be they women in men's contexts or non-westerners in a western environment – "may try to reject the practices of their own context and try to be as much as possible like members of the dominant group" (Narayan, 2004, p. 222).

Provided that sufficient resources, space, and time are allocated, a mild facilitation process (point 1), in combination with a thorough feminist evaluation (point 2), could verify if there is any interest in observing, analyzing, and articulating real, concrete, embodied, everyday research-related behaviors which might be different between male and female scientists. In other words, it could be insightful to research and document if there is a perception of different practices and different theoretical and strategic dynamics while researching for fellows, compared to their male colleagues.

In the former case then, if there is critical self-awareness of differences, it will be important to unpack and formalize them, understand the arguments across fellows, and support the emergence of

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a new stream of debate on experienced women's specificity in the production of scientific knowledge. This could add a structured and African-based voice to the abundant literature on the specific issue of gender and science, producing echoes in the global community. The topic has indeed been of recurrent interest since the early 90s. A special issue of the journal *Science* (1993) was dedicated to "Women in Science", with space given to authors inclined to explore the difference that women bring to the "style" of doing research and science (Barinaga, 1993; Morell,1993). Other more recent work looks at the power dynamics in collaborative scientific work through a gender lens (Gaugan and Bozeman, 2016), and highlights gender-based diversity in experiencing power dynamics in academia, as well as in expressing power and offering and receiving collaboration. Helping recognize the validity of and supporting the collection of information by providing the resources and a locus for articulating the emerging awareness on possible forms of discrimination, would mean encouraging concrete changes towards a new and more equal-gendered order in science, specifically in the concerned African scientific endeavors.

A potentially rich learning experience could be provided by purposefully exposing fellows to a broader variety of international forums where they could connect to first-hand accounts of farmers from a variety of regions in the world experiencing economic, health, environmental, legal, and psychological impacts of scientific inventions utilized to forward green revolutions, as for example the Food Sovereignty Summit, or the Terra Madre biannual meeting. By being present in thematic seminars they could interact with a constituency who are the end-users of their research, which creates a feedback mechanism that provides inputs for research and for the meta-research level. They would also get broadly exposed to the agro-ecology model of production, and to debates on the growing legitimacy that the connected agricultural methods are gaining among multilateral actors as a key to food security[2].

Funding for the Program is currently proceeding from agribusiness companies or private international actors with clear vested interests in the sector. In their approach to resources and research, scientific knowledge is invested in as it can provide a comparative advantage over competitors, as well as more profit and ultimately accumulation. A diversification of funding sources, which the program director is actively working on, is a strategic step for future sustainability, enhancing the resilience of the program and decreasing its accountability to actors whose interests might be predominantly economic.

Reading through the narratives of the AWARD grantees reports, it emerges that the female scientists' positive career evolution comes at the cost of time 'subtracted' from the tasks that gender roles expect them to cover. The allocation of funds for each participant to contribute towards covering the costs for outsourcing (or increasing the outsourcing) of some of the unpaid daily care work most women, irrespective of their position or education, are expected to put into their family, extended family, and community, could be an effective answer to some practical gender needs, as well as a strong statement indicating recognition of an important aspect of the discrimination experienced by women in science and academia. It will help women to have more dedicated time to research and perform better, reduce family pressure, and at least in that specific intersection of sex and class will modify expectations and gender norms (even if most likely the care workers hired will be women, typically from a group already considered and self-portrayed as less powerful in comparison to the group hiring for housework help).

Conclusions

In 2006 the AWARD Program entered the dialogue on sustainable development and improvement of food and nutrition security with a declared objective of contributing to women's empowerment through facilitating female scientists' careers in research for development in agriculture. AWARD

emerged out of a context that prioritized the instrumentalist 'smart economics' rationale for bridging the gender gap in African agriculture by addressing the practical gender needs ahead of strategic ones. This is how what seems to be an apolitical program aimed at improving science capacity and increasing gender equality, can be understood from a feminist perspective as having been designed in a way that cannot be gender transformative.

The Program's most recent (AWARD strategy 2017-2022) framing of the gender gap issue in development seems to break away from its initial approach. First, it places the focus on women's agency as opposed to being focused on women's constraints and inequality status. Though it still embraces a 'smart economics' approach, it does so in a more nuanced fashion. As the introduction to the new Gender in Agribusiness Investments For Africa (GAIA) initiative states:

> Without concerted effort, ongoing efforts to increase the productivity of African agriculture risk exacerbating already existing gender inequality and leaving African women worse off. However, with proper attention, agricultural growth could be the lever to unlock inclusive, agriculture-driven prosperity for the continent (AWARD, 2017, online).

Secondly, a focus on agricultural research institutions and the broader enabling environment seems to hint at a more structural approach to gender equity. It remains to be seen whether, as it unfolds, the program's new strategy will remain vulnerable to the critiques articulated in this paper.

Gender transformation must take place in the very values and dynamics of the places in which discrimination originates, and where gender inequality is repeated over time. More than an instrument to facilitate the conforming of women scientist to the logic and values of a specific field of research, the program can become a space to foster autonomous reflections on gender epistemic needs and on African-led meta-research inquiry into science and development.

To win the challenge of gender transformation, real innovation, and sustainability, AWARD might need to make explicit the values on which the science that is being promoted and the type of agriculture that is being shaped rely, and furthermore, carefully reconsider its ultimate objectives.

The potential of the AWARD program to become gender transformative might be fully unleashed through the incorporation of several new activities. They are of two main types. The first is to harvest self-reflections of participants and managers to inform epistemological transformation. The second is to differentiate sources of funding to aim for greater independence from the assumptions and approaches of any singular funder.

Endnotes

[1]In the development economics discourse, food security moved away from the pure dimension of availability to focus more on accessibility and then utilization, over the 80s and the 90s research on the household level initially considered as a unitary model and then complexified as attention for gender patterns developed (for a review of household economy see Maxwell & Frankenberg (1992); and for a gender critics of household economy in the theoretical space of A.Sen see Kabeer (1991). Some of the most influential studies providing evidence-based knowledge on the interplay between gender and food security at intra-household level are the International Food Policy Research Institute (IFPRI) multi-year studies on Strengthening Food Policy through Intra-Household Analysis (conducted between 1994 and 2003), with key contributions by J. Haddinot and A. Quisumbing. The author, during 2016, was part of a CGIAR research team exploring the pathways of influence on development actors in this very line of study.For a historical reference to reflections on improving effectiveness of agricultural programs for women farmers, and a rich bibliography on women, agriculture, and food security in the 80s and 90s, see Dutta Das (1995).

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[2]Intersections between agro-ecology and multilateral food security strategies have been growing mainly after the seminal and watershed recognition provided by the (at the time) Special Rapporteur on the Right to Food, Oliver de Schutter, to agro-ecology as a scientific domain for exploring ecologically and socio-economic sound and inclusive models. See Oliver De Schutter. (8 September 2008) .Building resilience: a human rights framework for world food and nutrition security : report of the Special Rapporteur on the Right to Food, A/HRC/9/23. Also Oliver De Schutter (08 March 2011). "Agroecology and the Right to Food", Report presented at the 16th Session of the United Nations Human Rights Council [A/HRC/16/49]; or for the larger public: 22 June 2010. Press release "Agroecology out performs large-scale industrial farming for global food security". See also: International Symposium on Agroecology for Food Security and Nutrition http://bit.ly/2bXFjAO.

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