



ANNOTATED BIBLIOGRAPHY
**GENDER and INNOVATION with a focus on
energy and agricultural fields**

Maria Martina Marchesotti

Research Intern, 2020-2021, AfricaLics Aalborg University, Denmark

Introduction

Under the banner of AfricaLics,¹ this annotated bibliography was prepared with a view to give an insight into the existing literature about gender and innovation, through the lens of work conducted on women/gender and innovation in the fields of energy access and agriculture. It sheds light upon how the different approaches of women/ gender and development have influenced the discussion on women/gender and innovation. Additionally, it explores through a semi-systematic literature review critical review, women and gender in the fields of energy access and agricultural innovation. In so doing, some of the gaps in research and policy programmes on gender and development are identified. The results are presented in the form of an annotated bibliography.

This brief is inspired by AfricaLics' overall vision - to facilitate the production and use of high-quality research in the field of innovation and development with a view to promote inclusive and sustainable development in African countries. Towards this end, AfricaLics aims at contributing to academic capacity building in Africa linking the field of innovation studies with development studies. The focus of the paper is inclusive innovation processes allowing women to be included in and benefit from increased energy access, innovation systems and agricultural innovations.

How to cite: Marchesotti, M. (2020). Annotated bibliography: Gender and innovation with a focus on energy and agricultural fields [Briefing Note]. AfricaLics

AfricaLics engagement in gender and innovation

The formation of AfricaLics in 2012 was based on the need to understand innovation and learning in the context of Africa – both from theoretical and practical perspectives and the need to build research. Gender and innovation has been one of the major thematic areas that have been advanced over the years. In this regard, between 2012 and 2020, AfricaLics has organized three conferences focussing on innovation, development including sessions with a specific focus on gender issues:

- i. The 2nd AfricaLics Conference in Kigali, Rwanda in 2015
- ii. The 3rd AfricaLics Conference, Oran, Algeria in 2017
- iii. The 4th AfricaLics Conference in Dar Es Salaam, Tanzania, in 2019

The main theme of the International Conference held in Kigali was *'Unpacking systems of innovation for sustainable development in Africa'* and had a special session about gender, youth and the disabled in inclusive innovation. The following papers were presented in the session and explored the different understandings of inclusive innovation in different contexts in relation to marginalized groups.

- The role of youth in innovation in Kenya
- The persons with disability - disabled in income generating activities: challenges and opportunities
- Role of youth and disabled in STI and development in East Africa
- Gender concerns in banana production and marketing: their impacts on resource poor households in Kenya.

The 3rd International AfricaLics conference in Oran was organized around two macro topics sustainable development related issues and

enabling environment. The main theme was *'Emerging innovation systems for sustainable development in Africa'*. In “sustainable and development related issues” there were four presentations about gender analysis of technological innovations:

- Gender analysis of introduction of technological innovations in rice sector of Ghana
- Gender analysis of on-farm trial and demonstration in technological innovation: A case study of stress tolerant maize seed production industry in Nigeria
- Indigenous Beverage Production and Economic Empowerment of Rural Women in Rwanda
- Indigenous Vegetable Production and Rural Women Economic Empowerment in Africa.

Whereas, in the “enabling environment” paper sessions during the 2017 conference, there were two presentations about gender inclusiveness and gender diversity:

1. Policy Analysis of Gender Inclusiveness in Security and Health System in Nigeria: System Dynamics Approach
2. Gender Diversity and enterprises' innovative capability: Evidence from mediating effect of women educational level in Nigeria.

The fourth AfricaLics Conference in Tanzania was organized around the theme *"Innovation and transformative capacities for growth and sustainable development in Africa."* Three papers presented had an explicit focus on women and gender:

- Innovation and the performance of informal micro, small and medium scaled enterprises (MSMEs) in Ghana: A gender perspective
- Gender Dynamics in Agricultural Innovation Systems in Zimbabwe. Implications for Policy

- The role of trademarks in empowering rural women through their traditional knowledge: The case of Nigeria.

Overall Approach

In addition to meeting the AfricaLics' inclusivity goal, this annotated bibliography was pursued to meet the interests of the author, which are the outcomes and the impacts of accessing energy on women's everyday lives and how innovation processes shape gender roles within the households.

The overall presentation of the paper begins the methodology used followed by a bibliography section that presents selected articles and finally a short summary of the analysis and conclusion. The bibliography section is divided according to the main topics of the articles that have been analyzed and concludes by presenting the findings on the different topics. It is important to mention that although this review summarizes and includes a significant number of the existing literature, it is not comprehensive of all the knowledge produced in the field of gender, energy issues and innovation.

Methodology

This annotated bibliography was the result of a semi-systematic literature review. This method helped the author of this review to look at how research within a specific field and/or topic has progressed over the years and across research traditions. Furthermore, it contributes to the provision of a historical overview (Snyder 2019). In both cases, it contributes to looking at how approaches to women and gender have progressed over the years and takes a look at the historical overview about the three different concepts of WID, WAD and GAD.

Additionally, the semi-systematic review helps in "detecting themes, theoretical perspectives, common issues within a specific research discipline or for identifying components of a theoretical concept" (Snyder

2019:335). Furthermore, one contribution could be "the ability to map a field of research synthesize the state of knowledge [...]" (Snyder 2019:335). In this case, by examining all the articles presented in this paper, common issues about gender and innovation have been identified. These include, men and women have different energy needs, and women roles in participating in decision making about agriculture is lower than in men.

The literature search process

At the beginning of the process, the author identified keywords such as gender, women, innovation, energy access and technology which were transformed into search strings as follows:

- Gender AND innovation
- Gender AND energy
- Gender AND technology
- Women AND energy access

The search string is the combination of different words and/or keywords that make up the search being conducted. This combination is further put into the search box of a database, in this case SCOPUS. The largest database for peer-reviewed literature, was used as a search engine – in this case Google Scholar, which was employed to search for literature in the field.

The first stage of the search entailed scanning the title and abstracts to understand which articles were more relevant. After the first stage, other synonyms were included. Thus, new search strings were created:

- Gender OR women AND energy
- Gender OR women AND "innovation studies"
- Gender AND "renewable energy"
- Women AND "agricultural innovation"

All the articles found with these search strings were selected based on the relevance of the papers' titles and abstracts. By examining the different abstracts of the articles, some

recurring strings of words were identified such as:

- mainstreaming gender,
- women and resources,
- access to energy,
- gender inequalities in energy provision,
- women's empowerment,
- energy poverty.

Furthermore, some articles were found by looking at the references of other articles thereby generating a snow-balling effect. In addition, this annotated bibliography examines articles from 2013 to 2020. However, in order to shed light upon the literature on WID, WAD and GAD, articles from 1989 and 1990 are presented. In fact, these articles contain common knowledge on WID, WAD and GAD and they all agree, for example, that the book "*Women in Economic Development*" (1970) by Ester Boserup, is the "milestone" with regards to gender in development studies (Moghadam 1990; Moser 1989; Rathgeber 1990). Lastly, the criteria for including the articles in the bibliography were whether their content were relevant to the main topics of this annotated bibliography and to the interest of the author which is mentioned in the introduction.

Results

Format of the annotated bibliography

This annotated bibliography contains a total of 23 studies conducted on the topic of gender/women in the development field, gender/women, energy issues and inclusive innovation and women/gender in agricultural innovation. The articles present both theoretical perspectives and/or empirical case studies. The bibliography begins with a brief introduction to three main concepts relating to development studies and gender: the women in development approach (WID), the women and development approach (WAD) and finally, the gender and development

approach (GAD). It is important to take into consideration these concepts in order to understand how these have influenced the discussions of women and gender in the development field.

The bibliography continues by presenting articles about women and innovation and health; women and innovation and energy, considering women both as users of energy and as employers in energy related jobs. However, it was not possible to divide the literature according to these macro topics because some articles include more than one insight, and the topics are interconnected and intertwined. Thus, the articles are divided as follows:

- Articles about WID, WAD and GAD approaches. This distinction was clear because the articles in this section present theoretical concepts about women/gender in/and development.
- Articles about women and/or gender in energy issues.
- Articles about women and/or gender in agricultural innovations.

Each article is presented by a short description of the main contents, theories, and findings in order to help the reader to get a better understanding and an overview of each article.

Bibliography

The WID, WAD and GAD approaches

Moghadam, V. M. (1990). WID, WAD, GAD: integration of women, women's concerns, and gender issues in the development process: a review of literature and policy debates.

The article is an introduction of the topic of women and gender in development. It gives an insight on the three different approaches: WID, WAD and GAD. It claims that the WID approach was developed in the early 70s

when Boserup found out that there were inequalities between men and women in economic processes. In fact, the main focus of the WID approach was related to economic development. Secondly, the WAD approach was born as a critique of WID because critiques on both mainstream development and liberal feminist assumptions emerged. WAD also influenced the policy and programmes of many NGOs and became the basis of their activities. Lastly, the GAD approach rejects the liberal and radical emphasis on women, and it focused on gender, gender roles and their relation and hierarchy. GAD's main point was that both women and men must be integrated in development.

Moser, C. O. (1989). *Gender planning in the third world: meeting practical and strategic gender needs. World Development. Vol. 17, No. 11, 1799-1825.*

This article presents the main components of a planning approach that takes into consideration gender issues. It provides the conceptual framework and the methodological tools for incorporating gender into planning, analyses the triple role of women in development and provides a critique of different policy approaches to women in development from a gender planning perspective. It describes a gender planning approach that takes into account the fact that women and men have different roles. Additionally, it claims that gender interests can be either strategic and practical. Strategic needs are formulated from the analysis of women's subordination to men and they vary depending on the particular cultural and socio-political context within which they are formulated. Whereas practical needs are those which are formulated from the concrete conditions women experience in their engendered position. They are formulated by women and are a response to an immediate perceived necessity.

Rathgeber, E. M. (1990, July). *WID, WAD, GAD: trends in research and practice. The Journal of Developing Areas, Jul., 1990, Vol. 24, No. 4, 489-502.*

The article examines the origins of the terms WID, WAD and GAD, and it looks at the assumptions embedded. It claims that the WID approach is understood to mean the integration of women into global processes of economic, political and social growth. Whereas the GAD approach began from the assumption that women always have been part of the development processes, and it focused on the relationship between women and development processes. The GAD approach focused its attention on the social relation and construction of gender and it is concerned with the assignment of specific roles both to men and women. The article presents the relationship between WID, WAD and GAD and how they have influenced the policy, research and international agency. The aim of the paper is to present the link between theory and practice and to show the different projects which may be associated with the three concepts. Lastly, it focuses on the more effective implementation of GAD by illustrating it through different examples of research projects in Africa.

Women and gender, energy issues and inclusive innovation

AfDB (2016). *Empowering women in African through access to sustainable energy: a desk review of gender-focused approaches in the renewable energy sector. Abidjan, Côte d'Ivoire: The African Development Bank (AfDB).*

This desk review presents the AfDB's initiatives that are concentrated on technology projects to provide energy for growth in the formal sector of economy. The project presented, about clean water, bioenergy, electrification and clean cooking around Africa, aim at improving women's conditions through clean and renewable

energy. It claims that women are affected by the unequal access to energy, even though accessing energy has increased the number of people with access to energy. The review identifies gender-specific problems in relation to role and energy production and use: women and men have different energy needs, women are poorer than men, and many women are disadvantaged in economic terms. Lastly, these AfDB projects are taking into account the gender dimension of energy in order to ensure women's equitable participation.

Baruah, B. (2017, February). *Renewable inequity? Women's employment in clean energy in industrialized, emerging and developing economies. In Natural Resources Forum Vol. 41, No. 1. Oxford, UK: Blackwell Publishing Ltd, 18-29.*

The article reviews existent academic literature on women's employment in renewable energy in industrialized nations, emerging economies and developing countries. It reveals similarities and differences in occupational patterns in women's employment in the renewable sector in different countries: in order for women to gain from renewable energy initiatives, more transformative shifts in societal attitudes about gender roles is needed in industrialized, emerging and developing countries. Additionally, it claims that there is still a strong inequality between men and women in energy related jobs: women are already underrepresented in the sector of energy related jobs and if gender equity policies and programs are not planned and implemented, women will become even more marginalized.

Johnson, O. W., Gerber, V., & Muhoza, C. (2019). *Gender, culture and energy transitions in rural Africa. Energy Research & Social Science, 49, 169-179.*

The article uses an Energy Culture Framework (ECF) in order to incorporate a gender dimension into the framework and it applies this framework in new context such as the case of the Mpanta solar mini grid in rural northern Zambia. The paper presents research aimed at exploring the gender implications of a transition from traditional to modern energy services using an energy cultures framework to understand how the introduction of a solar mini grid in Mpanta has disrupted or reinforced gendered practices and norms. The framework centres on how the interactions between practices, material culture, external influences and norms serve to reinforce and, on the contrary, destabilise the energy behaviour of a determined group. There are few considerations of how local culture might mediate the distribution of electrification benefits across different genders and social subgroups. The article's analysis found out that the transition to a more modern energy services is not gender neutral: it provides broad benefits within the community, but these benefits are not distributed between men and women equally because of the broader socio-cultural practices and norms.

Khaemba, W., & Kingiri, A. (2020). *Access to renewable energy: a gender and inclusivity perspective. Affordable and Clean Energy, Encyclopedia of the UN Sustainable Development Goals.*

The article focuses on the dynamics of gender and inclusivity linked to renewable energy for "excluded people." It claims that access to renewable resources is highly gendered and there are differences between men and women because women do not own any lands or houses and lack access to capital. In addition, the article takes into account the Sustainable Development Goal (SDG); in particular SDG 7 (access to clean, affordable and renewable energy) and SDG 5 (achieve gender equality and empower all women and girls) which would be essential in order to

reach sustainable development for all. Energy poverty exists at micro-level because governments prefer to invest in a large-scale project rather than at household level. This leads to a gender inequality in the energy sector. Lastly, it has been noted that in low and middle income countries, energy and poverty are correlated and that there is a need to include a gendered approach that can contribute to energy access for all, health benefits and other socioeconomic gains.

Khamati-Njenga, B., & Clancy, J. (2005). *Concepts and issues in gender energy. ENERGIA.*

This text is divided into two parts. The first one presents the concept of: gender, gender roles, gender norms and gender relations. In doing so, it gives empirical cases as example of the concepts in different parts of the world. Secondly, it relates gender with energy, and it analyses the different gender approaches used in the development sector such as the WID approach, the WAD approach, the GAD approach. The second part aims to investigate and examine gender and energy issues using the concepts described in the first part. The second part concludes by giving to the readers a better understand of the gender- energy issues. It is said that gender and energy should not be focused on cooking, as previously, but the focus should be addressed on the many barriers women face in relation to the energy needs.

Listo, R. (2018). *Gender myths in energy poverty literature: a critical discourse analysis. Energy Research & Social Science, 38, 9-18.*

The article aims to address the gap between energy and gender in energy poverty literature from a feminist perspective. Secondly, it presents the findings of a gendered or feminist Critical Discourse Analysis (CDA) of energy poverty scholarship. It argues that, at present, energy poverty

discourse in academic literature constructs problematic 'gender myths' of women, gender equality and its relationship with energy. In doing so, the discourse instrumentalises women and gender for particular energy interventions and does so at the expense of gender equality outcomes. As such, it highlights the need for greater attention by energy scholars, policymakers and practitioners to feminist literature and concepts in both research and practice, and the continued inclusion of feminist scholars in interdisciplinary energy research teams.

Pearl-Martinez, R., & Stephens, J. C. (2016). *Toward a gender diverse workforce in the renewable energy transition. Sustainability: Science, Practice and Policy, 12(1), 8-15.*

The article presents the value of women's participation in sustainable renewable energy systems. Women are less involved in the energy workforce and in energy decision-making and this may strengthen gender inequality. Because of the energy sector transitions from fossil-fuels dominated systems to renewable energy systems, new opportunities for a more inclusive energy workforce is emerging. If gender diversity is not taken into account in the process, then the sustainable-renewable energy systems could be affected by gender inequalities. In addition, it describes the benefits of gender diversity in the sector of energy highlighting the importance of inclusivity. Finally, the article suggests looking at research on energy-system change and energy transitions applying a gender lens.

Pueyo, A., & Maestre, M. (2019). *Linking energy access, gender and poverty: a review of the literature on productive uses of energy. Energy Research & Social Science, 53, 170-181.*

This article examines the empirical literature about gender and productive use of electricity for income generation. It looks at literature on

gender and labour markets and it recommends a mixed method approach in order to advance the research agenda about gender and Productive Use of Electricity (PUE) and to implement interventions on gender mainstreaming in PUE. It has found out that women and men benefit differently from PUE. The article uses a neo classical approach to entrepreneurs by defining them as rational entities looking for profit maximization. In conclusion, it recommends further emphasis on enterprises as institutions bearers of gender.

Clancy, J., Skutsch, M., & Batchelor, S. (2003). *The Gender - Energy- Poverty Nexus. Finding the energy to address gender concerns in development.* Accessed from https://www.researchgate.net/publication/237232946_The_Gender-Energy-Poverty_Nexus_Finding_the_Energy_to_Address_Gender_Concerns_in_Development

This paper explores current ways of thinking about the gender-energy-poverty nexus. It explores energy as a strategic issue in poverty and it discusses the difficulties in the provision of energy service for the poor. Then, it continues by considering the gender aspects in the energy-poverty link. Lastly, it concludes by presenting some areas where research still is needed to improve the understanding of the role of energy in poverty and in meeting women's needs.

Wickramasinghe, A. (2003). *Gender and health issues in the biomass energy cycle: impediments to sustainable development.* *Energy for Sustainable Development, 7(3), 51-61.*

The article presents an empirical case study from Sri Lanka and aims at examining the self-perceived health problems described by the

actors (women) engaged with the biomass energy cycle (procuring, carrying spheres) in the household sector. The energy cycle is gendered, and it is influenced by social, practical, political realities which are influenced by women's roles. In addition, it claims that gender and health are key factors of the energy development sector.

Winther, T., Ulsrud, K., & Saini, A. (2018). *Solar powered electricity access: implications for women's empowerment in rural Kenya.* *Energy Research & Social Science, 44, 61-74.*

The article presents how various types of electricity access can contribute to empowering women in rural Kenya. In doing so, it uses a framework for analysing women's empowerment through electrification which draws on different disciplines such as anthropology socio-technical system theory as well as practice theory. This framework identifies three generic empowerment dimensions: rights, norms and social position, access to resources and influence over decision (agency). It compares the gender set-up, organization, and effects of the solar powered electricity (off-grid) with the central grid. It does so by using qualitative data collected in two different counties in Kenya. The results show that people prefer solar-based solutions, while the grid is perceived to be costly, unreliable, and unavailable. The paper also demonstrates that men dominated within the grid systems. Access to electricity is also gendered on the user's side. Lastly, the article finds that if policy, projects, and programmes adopt a gender-neutral approach, they will likely produce a system dominated by only men where women's specific needs will miss.

Women and gender and agricultural innovation

Bergman Lodin, J., Tegbaru, A., Bullock, R., Degrande, A., Nkengla, L. W., & Gaya, H. I. (2019). *Gendered mobilities and*

immobilities: women's and men's capacities for agricultural innovation in Kenya and Nigeria. Gender, Place & Culture, 26(12), 1759-1783.

The article analyses the intersection between gender, mobility and agricultural innovation drawing on a case study in Southwestern Nigeria and Western Kenya. In doing so, it uses a geographic approach in order to explore how gender norms shape mobility and immobility patterns of women and men in ways that may influence their capacity to innovate in agriculture. The paper tries to understand how gender norms frame spatial and temporal movements of women's capacity to engage with agricultural innovation processes within their communities. It concludes by highlighting the importance of understanding the socio-cultural factors that influence group participation.

Bullock, C., & Tegbaru, A. (2019). Women's agency in changing contexts: A case study of innovation processes in Western Kenya. Geoforum, 105, 78-88.

The article describes the social change and the potential of agricultural innovation processes to shape, create and expand spaces for women where they can exercise agency in economic and agricultural decision-making in Kenya. It examines the hybrid maize innovation processes focussing on understanding how decisions are made about women's participation. In fact, it claims that there are gender differences in women and men's participation and access to agricultural knowledge. It uses feminist geographic perspectives in order to understand the global processes, that create local economic and agrarian change, through exploring everyday practices and qualitative data. The article presents different results. First, urbanization and commercialization have influenced household livelihood strategies and have had

gendered impact on paid work opportunities. Secondly, women are more engaged in civic groups in order to gather information and have opportunities; women and men gain access to agricultural knowledge through informal (women) and formal (men) sources. Agricultural innovation processes create and restrict spaces for women's agency. Lastly, men's experiences with social and agrarian change is important in shaping and reshaping gender relations.

Fisher, M., & Carr, E. R. (2015). The influence of gender roles and responsibilities on the adoption of technologies that mitigate drought risk: the case of drought-tolerant maize seed in eastern Uganda. Global Environmental Change, 35, 82-92.

The article addresses the causes of the character and causes of apparent gender gaps in the adoption of modern seeds. It tries to understand how gender roles and responsibilities influence the adoption of drought-tolerant maize in Sub-Saharan Africa. It claims that women are engaged in agricultural production, but that agricultural decision-making falls outside their roles and responsibilities in many contexts. Thus, women are unable to adopt new technologies. The article presents four hypotheses for how gender influences the adoption of new agricultural technologies. Lastly, the paper presents three main findings. First, women and men do not have equal opportunities to adopt drought-tolerant maize because they have different access to resources. Secondly, considering gender as a binary division between men and women does not capture the dynamics that shape patterns of drought-tolerant maize adoption. Thirdly, wives can influence the adoption of drought-tolerant maize on plots controlled by their husband. It is also claimed that policies must go beyond the binary classification of gender and use more intersectionality-based approaches which consider how gendered

roles and responsibilities influence agricultural practices by taking into account other social distinctions such as age, race, ethnicity etc.

Iradukunda, F., Bullock, R., Rietveld, A., & van Schagen, B. (2019). Understanding gender roles and practices in the household and on the farm: Implications for banana disease management innovation processes in Burundi. Outlook on Agriculture, 48 (1), 37-47.

The aim of the article is to understand the role of gender in innovation processes drawing on a case study of banana disease in Burundi. According to this paper, innovation processes shape and are shaped by interactions which are conditioned by social and economic institutions. Through an analysis of the qualitative data, the article presents some results which are common to some of the articles here presented. Thus, the household structure influences gender roles because women and men's roles are gender differentiated because of culture which, in this case, reinforces men's identity and role. In fact, men manage, control and invest more labour than women in banana farming system and they are also responsible for managing the banana disease. Additionally, it is claimed that gender influences the knowledge acquisition and on-farm decision-making. For this reason, women have less agency when it comes to manage banana farming system.

Kantor, P. (2013). Transforming gender relations: Key to positive development outcomes in aquatic agricultural systems.

The article talks about Aquatic Agricultural System (AAS) and is concerned with improving equity of the social, economic and political structures that influence the livelihood of poor households dependent on AAS. In fact, it identifies inequalities for being key factors.

However, little progresses have been made for integrating gender in AAS. It claims that there is a need to rethink how agricultural researchers and practitioners conceptualize gender, values, what women and men do, know and own. The article states that in order to address gender inequality in agricultural agenda is essential to invest on social analysis and a political understanding of gender that explore all the different dimensions of gender and take into account power relations and social changes. In fact, it addresses operational weakness of mainstream approaches to gender integration in agricultural agenda.

Kingiri, A. (2013). A review of innovation systems framework as a tool for gendering agricultural innovations: Exploring gender learning and system empowerment. The Journal of Agricultural Education and Extension, 19(5), 521-541.

The article presents a review of gender and innovation discourses and it asks how women, men and socially excluded groups of agricultural innovators, are represented and their interests safeguarded in innovation. It focuses on understanding the different potentials and capabilities that women and men have in order to influence economic change. The aim of this paper is to reflect on the opportunities that a system understanding of innovation provides for addressing gender issues. The article first presents an introduction of gender concepts and an analysis of gender and agricultural debates. Then, it provides a background on emerging debates around agricultural innovation. Lastly, it concludes with an attempt to understand the sort of analytical framework that would accommodate different elements of gender and innovation.

Ragasa, C., Osorio, M., OurabahHaddad, N., & Mathieson, K. (2014). Gender-specific approaches, rural institutions

and technological innovations. Rome, Italy: Food and Agricultural Organization of the United Nations (FAO); International Food Policy Research Institute (IFPRI) and Global Forum on Agricultural Research (GFAR).

This book reviews and integrates findings from different empirical studies in order to identify demand and supply side constraints and opportunities to the adoption and impact of range of technological innovations. It explores the evidence in gender gaps in technologies and access to economic opportunities. This paper adds value to existing literature on gender in agriculture and rural development by looking closely at agricultural and rural technologies, rather than a generalized and broad discussion on these technologies. It develops a framework that looks at supply and demand sides of technology and service provision and then, it applies this framework to rural projects and programmes using a gender lens. Lastly, it finds that women have much lower observed rates of adoption of a wide range of technologies than men due to differentiated access to complementary inputs and services.

Tegbaru, A., & Hillbur, P. (2015). Resolving the gender empowerment equation in agricultural research - A systems approach. Journal of Food, Agriculture & Environment Vol.13 (3&4), 131-139.

The article provides an approach that addresses marginalized groups, particularly rural women, and their access to and ownership of agricultural intensification processes. Its aim is to bridge the socio-technical divide in agricultural system research. It reviews social-systems theory and the evolution of social gender approach. In addition, it explores an inclusive Consultative Group for International Agricultural Research (CGIAR) systems research in the light of the

ambitions to alleviate poverty, improve nutrition and income without compromising the long-term productivity of the natural environment. In conclusion, this paper has emphasised the role of innovative and socially inclusive processes in the form of actor platforms (public and/or private institutions) with women as key players.

Wakhungu, J. W. (2019). Gender dimensions of science and technology. African women in agriculture (Policy Brief). Retrieved from https://www.acts-net.org/images/Pubs/Policy_Briefs/Gender_Dimensions.pdf.

This policy brief is concerned with the plight of African women in agriculture. It claims that women manage natural resources but they are disadvantaged compared to men in terms of land ownership, access to education and services. It is said that there is a potential for improving women's roles and participation in agricultural research and development. Although women are managers of the household and of agricultural production, their decision-making is still subordinated to men. In fact, women are underrepresented in scientific and technologic research and institutions. This may result in technical innovation which does not take into account women's needs and perspectives.

Conclusion

This annotated bibliography is an overview of the knowledge that has been produced on the topics of gender and energy access, gender and innovation and gender and agricultural innovation. Specifically, the paper explores articles that present both theoretical perspectives and empirical case studies. This paper focuses mainly on three areas of interest: theoretical perspectives of WID, WAD and GAD; women and/or gender in energy issues and finally, women and/or gender in agricultural innovations. The findings presented in this conclusive section are not comprehensive of all the knowledge

around the concepts of WID, WAD and GAD, gender, energy issues and inclusive innovation and gender and agricultural innovations. However, they reflect the aforementioned topics of interest of this paper. Accordingly, the findings will follow the same division made in the bibliography section.

The first group of findings is related to the WID, WAD and GAD approaches. The Women in development approach (WID) emerged during the 70s thanks to Boserup's work: *Women's role in economic development* (1970). She looked at the inequalities between women and men focusing on the economic development. The WID approach tried to highlight how the focus on women could contribute to the implementation of the dominant development strategies for integrating women. In addition, pre-WID approach to women in development was a welfare-oriented one that it primary focused on women's roles as mothers (Moghadam 1990). The WAD approach questioned the idea that women should simply be integrated in development and that there was also a need to review what kind of development was desirable. It tended to group women together in one category without taking into account other social construction such as class, race, ethnicity etc (Rathgeber 1990). It influenced policies and programmes of many NGOs by becoming the basis of their activities Lastly, when it was clear that there was a need to take into account not only women but also men in development processes, the GAD approach emerged. Its emphasis is on gender and on the social construction of gender roles. In this approach, gender is perceived as being the process by which people who are born into the biological categories of male and female, become the social categories of men and women (Moghadam 1990). There has been a shift from biological to social construction.

The second group of findings is related to the topics of women and/or gender, energy access and inclusive innovation. It is argued

that women and men have different energy needs within the household and different access to manage the resources. This is influenced by the different roles women and men have. In fact, while the primary role of women is concerned with the management of the house, men are perceived as breadwinners (Bullock & Tegbaru 2019). In this case, women are disempowered, and disadvantaged compared to men because of the perception of gender roles within a society, the limited access of land ownership and the customary law within a community. In order to overcome these inequalities between women and men in energy access, policies and projects should address the specific needs of both women and men (Winther et al. 2018). Additionally, women are disadvantaged in energy related jobs (Pueyo & Maestre 2019). According to Pueyo and Maestre (2019) women employees and entrepreneurs face multiple challenges compared to man to use and benefit from electricity. This is because women and men work in different types of productive activities.

Furthermore, it has been found out that implementing women's capacities in accessing resources will help women to gain access to products and services that will help them in increasing their opportunities. According to Khaemba and Kingiri (2020), the concept of inclusiveness is important for gender and science technology and innovation in order to improve women's livelihood.

Finally, the third group of findings is related to women and/or gender and agricultural innovations. Women and men's responsibilities in agricultural innovations differ because innovation processes shape and are shaped by the interactions which are conditioned by social and economic institutions and by gender roles (Iradukunda et al. 2019). Gender influences the acquisition of knowledge and women's participation and access to agricultural knowledge. Even though women's participation level and decision-making is

increasing, there is still a strong tendency for men to be the primary decision-makers in many households and communities.

The majority of the articles agree that there is a lack of research on the topic of energy issues and women and a lack of empirical data to examine whether women's life has improved as a result of increased access to energy.

Key reference

Snyder, H. (2019). Literature review as a research methodology: an overview and guidelines. *Journal of Business and Research*, 333-339.

AfricaLics Briefing Notes are a series of documents that focus on key messages related to Innovation and Development in Africa - a multi-disciplinary social science research area that includes elements of innovation studies and development studies. The Briefing Notes aim to provide insights useful for policymakers, research, private sector actors and civil society on how science, technology and innovation can help solve real-life problems and promote long-term development in Africa.

Contacts

AfricaLics Secretariat
African Centre for Technology Studies (ACTS)
ICIPE, Duduville Campus, Kasarani
P.O. Box 45917 - 00100
Nairobi - Kenya
Email: secretariat@africalics.org
Tel: +254 710 607210



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