منظمة الأغذية والزراعة للأمم المتحدة
联合国粮食及农业组织
Food and Agriculture Organization of the United Nations
Organisation des Nations Unies pour l'alimentation et l'agriculture
Продовольственная и сельскохозяйственная организация Объединенных Наций
Organización de las Naciones Unidas para la Alimentación y la Agricultura

Viale d Terme di Caracalla, 00153 Rome, IT www.fao.org 27 November 2018

Submission by the Food and Agriculture Organization of the United Nations (FAO) to the United Nations Framework Convention on Climate Change (UNFCCC) in relation to Activity D.2, Priority Area D: Gender Responsive Implementation and Means of Implementation of the Gender Action Plan, as mandated by Decision 3/CP.23.

A. Introduction

The Food and Agriculture Organisation of the United Nations (FAO) supports the establishment of the Gender Action Plan (GAP),[1] and welcomes the opportunity to submit its views on the incorporation of gender into Technology Needs Assessments. Gender is an important cross cutting theme for FAO and through its Gender Equality Policy[2], mandates the mainstreaming of gender into all areas of its work. Achieving gender equality is essential for attaining food security and nutrition, meeting all sustainable development goals (SDGs) and scaling up climate action in the agriculture sector to achieve the Paris Agreement. This submission builds on previous inputs made by FAO towards the activities of the GAP, including those on the Koronivia Joint Work on Agriculture.

Evidence shows that women and men experience climate change impacts differently due to their socially constructed roles and responsibilities and climate change can exacerbate existing gender inequalities in agriculture and beyond. For example, in developing countries, climate change affects the availability of surface water, and as a result rural women, who are usually given the task of fetching water, have to cover greater distances to collect water, increasing their already substantial workload.[3] Studies have also shown strong links between climate-related disasters and female mortality, with women, boys and girls more than 14 times more likely than men to die during a disaster.[4] The differentiated impacts are also more pronounced among rural women, as they rely more on biomass than men for their energy needs and livelihoods; depend more than rural men on ecosystem services for food security and are often heavily involved in agricultural production and the management of natural resources.[5] Livestock is an asset that women in developing countries often can own and control more easily than other assets such as land, property, or financial assets. The benefits of livestock ownership can include the income earned from animals and animal products as well as the improvements in nutrition and health that result from consuming animal products. Mobile application has been piloted in several countries to improve livestock production. There is a need for better understanding of how these factors determine the differences in the specific constraints men and women smallholder farmers[1] and fisher folks face when making choices concerning climate change mitigation and adaptation actions and the adoption of climate-smart agriculture practices and technologies.[6]

Understanding men and women farmers and fisher folks' climate technology needs is an important part of effective action on climate change and will assist them to determine how to reduce GHG emissions and adapt to the impacts of climate change. This is where gender responsive Technology Needs Assessment is key to

[1] Decision 3/CP.23.
[2] http://www.fao.org/docrep/017/i3205e/i3205e.pdf
[3] Climate Smart Agriculture Sourcebook (2017).
[4] See Peterson, 2007; and DFID, 2013.
[5] Climate Smart Agriculture Sourcebook (2017).
[6] Climate Smart Agriculture Sourcebook (2017).

identifying the technology needs of both men and women, including the facilitation of capacity building and the implementation of prioritized climate smart agriculture practices and technologies. FAO is therefore advocating that gender issues be prioritised when identifying technology needs and introducing technologies and this is included in a recently released framework[7] for sustainable agricultural mechanization and in a forthcoming policy brief on women's adoption of technologies, which suggests that such an assessment be systematically applied.

B. Gender Responsive Technology Needs Assessment in Agriculture

Rural women and men are increasingly facing the challenges of having to adapt their production systems in the context of climate change. Ensuring equal access to productive resources, climate resilient, labour saving and production improvement technologies and practices, are at the core of FAO's approach to enhance the sustainability of agriculture.[8] Research[9] shows that experiments based on innovation using local resources were more relevant and more likely to be adopted by men and women to improve their own situations, such as improving labour burden, saving time and energy. The following provides some examples of gender responsive Technology Needs Assessment in agriculture projects, including the use of technology to reduce work burden and health and safety risks for women.

1. Gender Responsive Climate Smart Practices and Technology in FAO's Projects

An example of such practices is the Climate Smart Agriculture (CSA)[10] approach that involves different elements embedded in local contexts and relates to actions both on-farm and beyond the farm, incorporating technologies, policies, institutions and investment. FAO has embraced the climate-smart agriculture (CSA) approach to support actions aimed at achieving sustainable agricultural development for food security and nutrition under a changing climate.

FAO is mandated to assist its Member Countries, in line with its Policy on Gender Equality. Part of its gender equality minimum standard is the country gender assessment, which assesses the gender dimensions of agriculture and rural development sectors. For example, a Livelihoods and Food Security Project in Zimbabwe[11] carried out a gender assessment, which included technology analysis using a gender strategy developed specifically for this project. In addition, FAO's Water for Poverty in Africa Project[12] carried out Technology Needs Assessments in Tanzania[13], Mali[14], Rwanda[15], Ethiopia[16], Madagascar[17] and Niger[18]. The project aimed to develop new models of planning and implementing agricultural water management investments and to improve and apply knowledge on which practices and approaches work best to suit the needs of local farmers.

The following examples provide further details on how gender responsive Technology Needs Assessment are incorporated into projects:

a) Investing in Sustainable Energy Technologies in the Agrifood Sector (INVESTA)[19]

The INVESTA[20] project developed a methodology for a comprehensive cost-benefit analysis of energy technologies, which allowed for the incorporation of gender into the Technology Needs Assessment, and to

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[7] For more information on this framework see also http://www.fao.org/3/CA1136EN/ca1136en.pdf
[8] Meeting our Goals: FAO's progamme for gender equality in agriculture and rural development (2016).
[9] Climate Smart Agriculture Sourcebook (2017).
[10] http://www.fao.org/climate-smart-agriculture/knowledge/practices/en/.
[11] http://www.fao.org/zimbabwe/programmes-and-projects/project-list/en/.
[12] http://www.fao.org/in-action/water-for-poverty-in-africa/overview/about-the-project/en/
[13] http://www.fao.org/in-action/water-for-poverty-in-africa/countries/tanzania/background/en/.
[14] http://www.fao.org/in-action/water-for-poverty-in-africa/countries/mali/background/en/.
[15] http://www.fao.org/in-action/water-for-poverty-in-africa/countries/rwanda/background/en/.
[16] http://www.fao.org/in-action/water-for-poverty-in-africa/countries/ethiopia/background/en/.
[17] http://www.fao.org/in-action/water-for-poverty-in-africa/countries/madagascar/background/en/.
[18] http://www.fao.org/in-action/water-for-poverty-in-africa/countries/tanzania/needs-assessment/en/.
[19] Information on the INVESTA project can be found here: http://www.fao.org/energy/agrifood-chains/energy-sustainable-technologies/en/; http://www.fao.org/3/i8017en/I8017EN.pdf; http://www.fao.org/3/i9077en/I9077EN.pdf.
[20] The methodology has been published by FAO and GIZ in a report (*Costs and Benefits of Clean Energy Technologies in the Milk, Vegetable and Rice Value Chains*) which contains six case studies of technologies in the milk, vegetables and rice value chains, addressing case studies on the following technologies:

assess the different impact of clean energy interventions on men and women in a specific value chain. This was done by means of four gender-disaggregated indicators: health risks due to indoor air pollution; access to energy; household income; time saving and employment. The aim was to assist farm businesses, farmer associations, practitioners, training institutions, food processing companies, policy makers and other stakeholders in the agrifood industry to reduce the dependence on fossil fuels, and reduce related GHG emissions in a sustainable way. The INVESTA analytical approach has been applied in four pilot countries: Kenya, Philippines, Tanzania and Tunisia. The two main dimensions of women's economic empowerment (WEE) (i.e. access to productive resources and power and agency) were included in the gender-sensitive value chain mapping and analysis in order to make women's work and participation more visible. INVESTA's gender-sensitive value chain analysis went one step further, using indicators and gender-disaggregated data to measure the impact of introducing clean energy solutions into the agrifood value chain. For this reason, several social indicators in the cost-benefit analysis (CBA) of the technologies were measured using gender-disaggregated data whenever possible.

The gender-sensitive mapping and analysis identified the roles and main activities of men and women in a given value chain, the activities that would be influenced by a given energy intervention, and the gendered impacts of those interventions. For instance, if a milk cooling facility allows a reduction from three to two milking per day, the time spent on this activity would be reduced. It would therefore have a positive impact on the time saved by women, where milking is typically performed by them. Where milk is traditionally sold by men, the impact of increased household income from more milk reaching the collection centre may benefit men more than women. On the contrary, if the milk cooling technology reduces the time spent transporting the milk to milk collection centres by having one trip per day instead of two, and this is a remunerated activity performed by men, it could have a negative impact on men's employment. Lessons were identified from the project on the impact of the clean energy interventions in agrifood value chains on gender issues, as well as the main instruments to promote gender equality and women's empowerment.

b) Agricultural Services and Digital Inclusion in Africa Project[21]

Gender consideration in the assessment of digital inclusion technology has been an important part of this project from its design, formulation and appraisal through the inclusion of gender experts in the Project Task Force. The possibility of using community radio and Farmer Field Schools[22] in this project were discussed widely with representatives of both the Dimitra Clubs[23] and Farmer Field Schools. They have been selected to participate in the Human Centred Design workshops to design and test the digital services. An extensive study was also conducted to provide strategic recommendations for mobile communication opportunities in the rural project areas[24] in Senegal and Rwanda. The project aimed to increase access of women and men to relevant, reliable, timely and actionable information to take better decisions about their lives, the management of their assets and their families. For each of the applications, a specific strategy to reach the maximum possible number of women and girls was adopted in collaboration with local organizations, made possible through the network of Dimitra Clubs. In the pilot phase, the test groups have been instructed to guarantee that 50% of the test users would be female, who have been involved through Human Centred Design workshops to ensure that their expectations, needs and capabilities were taken into account since the initial service design phases.

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biogas for power generation from dairy cattle manure; domestic biogas-powered milk chillers; solar milk coolers; solar-powered water pumping; solar cold storage for vegetables; rice husk gasification; and solar-powered domestic rice processing.

[21] Additional Information on Gender in Technology Needs Assessment in Agricultural Services and Digital Inclusion in Africa Project: www.giccprinciples.org/the-principles; https://static1.squarespace.com/static/5b6425a9cc8fedfd2457a16b/t/5b6b05ab8a922da5f0556673/1533740466939/GSMA-Women-and; Internet-Research-Toolkit_Needs+Assessment.pdf; https://static1.squarespace.com/static/5b6425a9cc8fedfd2457a16b/t/5b6b05c8f950b7b48c36da2d/1533740494068/GSMA_mHealthGenderToolkit_2-08-17.pdf; http://www.fao.org/in-action/africa-digital-services-portfolio/en/; http://www.fao.org/3/i8670en/I8670EN.pdf; https://digitalprinciples.org/; https://www.gsma.com/mobilefordevelopment/magri-design-toolkit/.

[22] http://www.fao.org/agriculture/ippm/programme/ffs-approach/en/

[23] For more information see, http://www.fao.org/dimitra/dimitra-clubs/en/.

[24] The technologies used in this project include: mobile Smartphone Applications - Progressive Web Apps (PWA); SMS based applications (also capable of using USSD as well as Voice based applications (IVR) to be used with feature phones; API as a service and web services layer (APIs) is provided using "no UI".

Gender integration into Technology Needs Assessment needs to ensure accessibility, affordability, usability and skills, safety and relevance and were considered in the Agricultural Services and Digital Inclusion in Africa Project in the following ways:

- ***Adapt content so that it is meaningful for the users***: Three Human Centred Design workshops were conducted in the first phase of the project to get direct feedback on the most urgent needs for information from the farmers (50% of them being women) and their specific capabilities and expectations. Specific attention has been devoted to the creation of a context in which female farmers would feel at ease in order to express themselves freely and openly. The presence of female community leaders and extension workers contributed to the creation of this environment.
- ***Create a safe environment for them to share and learn***: Illiteracy, and limited skills in using complex devices to search for information and cultural issues, remain barriers to effectively receiving and using information delivered via ICTs, especially for women and girls. In this project, a voice service was developed in order to overcome the illiteracy barrier and training workshops have been conducted locally to train farmers on how to use the applications.
- ***Be gender sensitive*****:** The gender approach was systematically adopted throughout the whole project cycle since the planning phase, as technology is not necessarily gender neutral but can contribute to the reduction of the gender and rural divide affecting female farmers.
- ***Provide them with access and tools for sharing***: Rural women have less access to ICTs – phones, laptops, Wi-Fi – because they are confronted with social norms; reside in unconnected areas; and are usually poor. This project provided, through ad hoc agreements with local mobile network operators, free access to SIM cards, data connectivity, SMS services and free calls to the test users. This partnership would possibly continue also for the implementation phase.

2. Climate Smart Agriculture Practices and Technologies to Address Women's Work Burden, Health and Safety

The impacts of climate change through increased temperature, changing rainfall patterns and more frequent extreme events, will mean increased work burden, and exposure to health and safety risks for women. In developing countries, it affects the availability of surface water and firewood and as a result, rural women, who are usually given the task of fetching water and firewood, have to cover greater distances to collect water and firewood, increasing their already substantial workload. Labour saving technologies play an important role in reducing the work burden of women farmers and fisher folks by providing them with choices in their production which will enhance their resilience.

a) *Safe Access to Fuel and Energy for crisis-affected populations*[25]

Globally, nearly 3 billion people rely on traditional biomass, such as fuelwood, charcoal or animal waste, as sources of fuel for cooking and heating. Vulnerable populations, which include refugees, Internally Displaced Persons (IDPs) and the communities hosting them, often have very limited access to cooking fuel and other forms of energy. Access to energy, which is vital for food security, is often highly constrained in emergencies and protracted crises. Lack of access to energy can expose people to a number of risks and challenges, including malnutrition, increased vulnerability to natural hazards, the impacts of climate change and environmental degradation. Energy needs is a key factor in the perpetuation of disproportionate work burden for women, protection risks, conflict and tension, unsustainable livelihood activities and health risks[26].

Gender and the differentiated social role of boys, girls, men and women in energy access are fully integrated into the Technology Needs Assessment of the FAO SAFE programme. Based on the FAO SAFE framework and

[25] For more information see: http://www.fao.org/resilience/resources/resources-detail/en/c/1154965/

[26] Safe Access to Fuel and Energy Briefing Note on Reducing protection risks and women's work burden through improved energy access: http://www.fao.org/publications/card/en/c/CA2192EN

associated indicators[27], FAO conducts controlled cooking tests with different type of stoves and different fuels (woodfuel, charcoal, briquettes and LPG) to define: stove and fuel preferences of beneficiaries; cooking time, and fuel consumption. These technology assessments were conducted in Cote d'Ivoire, Nigeria and Somalia. The majority of the beneficiaries of cooking technologies were women and the assessment is used to define how much fuel is needed to cook but also as a proxy to define how much women and children (primarily responsible for wood collection) can save time due to a decrease of woodfuel consumption and fuel collection. The beneficiaries of cooking energy technologies most often do not have a say in decision making. Therefore, it was beneficial to integrate the gender dimension into the technology assessment to make sure it offers time-saving potential, positive benefits on health and reduce exposure to the risks of gender-based violence.

b) *Thiaroye Fish-processing Technique[28] in Sri Lanka*

A new and easy-to-assemble fish smoking and drying technology pioneered by FAO has been developed, used, tested and adapted in countries in Africa and Asia to improve energy efficiency in rural communities by using 50 percent less wood fuel compared to traditional open-type smoking rafts. The FAO-Thiaroye fish processing technology (FTT-Thiaroye) is also helping to reduce health hazards, improve food safety and quality, improve working conditions and cut down food losses in many small-scale fishing communities. This is also contributing to climate change mitigation through preservation of mangroves while building resilience to climate impacts through coastline protection. The technology reduces the release of contaminants such as carcinogens and tar directly onto the fish product, and is in compliance with international food standards and other safety requirements. In June 2017[29], FAO had the opportunity to address critical challenges to the development of inland fisheries in Sri Lanka.[30] The introduction of this technology through this project has helped poor rural women improve their work burden and exposure to health risks from smoking inhalation. It also contributed to the increase in the value and quality of the fish and increased household income.

c) EMA-I – Event Mobile Application

EMA-i Event Mobile Application (app) is a mobile application developed by FAO to support veterinary services on animal disease reporting system. This tools allow female livestock owners to provide disease information to veterinarian in the field who will then report this information with the app to the central veterinary services. The information collected is analysed and transmitted to stakeholders including decisions makers in order to mainstream gender equity. This app can be expanded to other aspects of livestock production, such as milk, livestock population and markets. EMA-i is used in Uganda, Mali, Tanzania, Lesotho, and Zimbabwe and will be scaled up in other countries.

C. Conclusion and recommendations

FAO confirms its commitment to the gender agenda and the implementation of the GAP through its work and reiterates the importance of gender responsive Technology Needs Assessment and the essential role that practices such as CSA and technology play in effective action on climate change and the empowerment of rural women and girls. For example, the introduction of climate-smart agriculture practices has direct implications on women and men welfare, working conditions, agricultural production, gender power relations and empowerment. In order to be effective and have a long-lasting impact, CSA practices and technologies must consider gender-specific vulnerabilities, needs and capabilities. FAO systematically assesses the gender-related impact of selected climate-smart agriculture practices, to ensure socially sustainable programming.

Gender responsive Technology Needs Assessment should therefore be incorporated into all stages of any project (from conception to implementation) where possible and as part of any climate action. As a result, innovative gender responsive climate smart technologies and practices can be identified and mainstreamed to ensure

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[27] The FAO SAFE Framework is accessible here: http://www.fao.org/3/CA0021EN/ca0021en.pdf
[28] http://www.fao.org/3/a-i8301e.pdf
[29] EU-funded project implemented in partnership with UN institutions – the European Union Support to District Development Programme (EU-SDDP).
[30] For more information see also: http://www.fao.org/srilanka/news/detail-events/en/c/1042565/; http://www.fao.org/3/a-i4174e.pdf; http://www.fao.org/3/a-i8301e.pdf.

maximum positive impact is created for rural girls and women. The Gender and ICTs[31] 7 critical factors provide a good basis for mainstreaming gender considerations, Technology Needs Assessment and innovation processes into all stages of the project.[32] This is why FAO has made gender a cross-cutting theme in all its work; emphasising the importance of gender in scaling up climate action in the agricultural sectors to help achieve the Paris Agreement and the SDGs.

[31] http://www.fao.org/3/i8670en/I8670EN.pdf.

[32] Refer to the Powering Agriculture gender guide on financial products for further details: Powering Agriculture guide on integrating gender in the financing of clean energy solutions https://poweringag.org/docs/guide-integrating-gender-financing-clean-solutions.