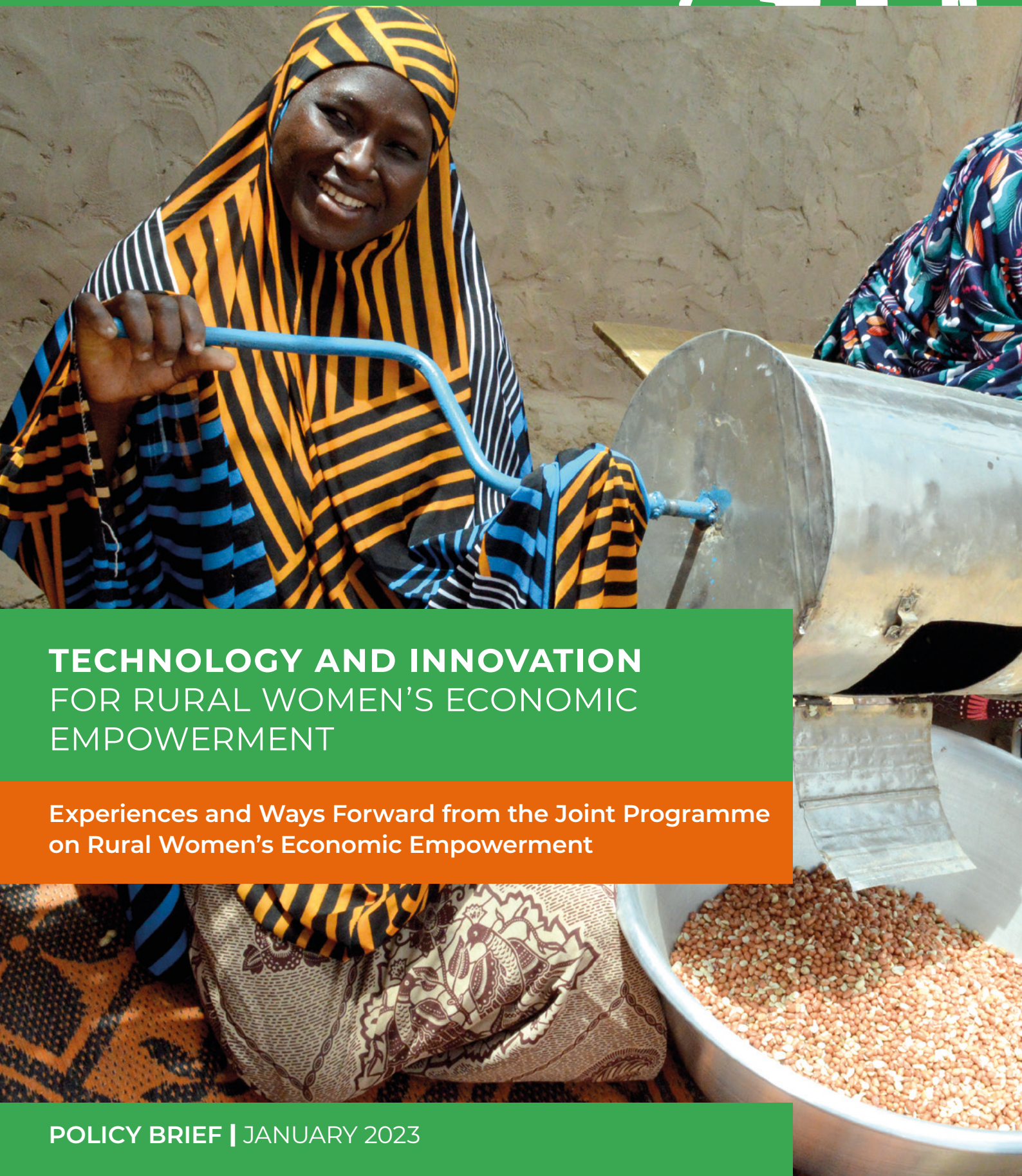


**JOINT PROGRAMME:
Accelerating Progress towards
Rural Women's Economic Empowerment**



TECHNOLOGY AND INNOVATION FOR RURAL WOMEN'S ECONOMIC EMPOWERMENT

**Experiences and Ways Forward from the Joint Programme
on Rural Women's Economic Empowerment**

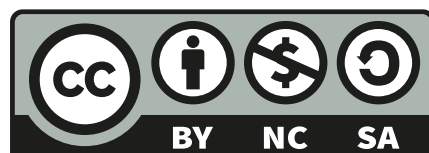
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TECHNOLOGY AND INNOVATION FOR RURAL WOMEN'S ECONOMIC EMPOWERMENT

Experiences and Ways Forward from the Joint Programme on Rural Women's Economic Empowerment

This policy brief, “Technology and innovation for rural women’s economic empowerment”, is part of a series to present evidence from the strategies and praxis of the United Nations Joint Programme on Rural Women’s Economic Empowerment (officially called “Accelerating Progress towards the Economic Empowerment of Rural Women” or “JP RWEE” in short form). Based on case studies, experiences and evaluations from the JP RWEE, the brief draws conclusions and makes recommendations to address the challenges and opportunities for advancing gender equality and rural women’s economic empowerment through increased access to and use of technology and innovation. This brief situates the experiences of the JP RWEE in the context of current policy debates and scholarship to highlight approaches to increase rural women’s access to and adoption of technology and innovation. It also identifies some of the challenges and gaps related to the integration of technology with the aim of informing international, national and local stakeholders’ formulation of evidence-based policies that build on the JP RWEE’s technology-related achievements and lessons learned so far.

The JP RWEE is a global initiative that aims to secure sustainable livelihoods and rights for rural women. The programme is jointly implemented by the Food and Agriculture Organization (FAO), the International Fund for Agricultural Development (IFAD), the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women), and the World Food Programme (WFP) in seven countries: Ethiopia, Guatemala, Kyrgyzstan, Liberia, Nepal, Niger and Rwanda (2014–2021). A second phase of the JP RWEE programme (2022–2027) will initially focus on Nepal, Niger, the Pacific Islands, Rwanda, Tanzania and Tunisia.

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Challenges and opportunities of technology and innovation for rural women

1

Technology and innovation are changing the lives of people around the globe at an ever-accelerating pace. The rapid transformation of societies that technology has spurred has generated unprecedented opportunities to improve economic and social outcomes for women and girls including their well-being, education, health and livelihoods, though such opportunities are not afforded equally to all. Digital technologies have the potential to increase access to services like health, legal and financial services, and allow traders to access global markets for their products. Digital access can also help raise women's and girls' awareness of their rights and increase their voice, agency, leadership and participation in their societies and economies. However, inequitable access to and adoption of technology and innovation has also created new challenges, gaps and exclusions that may perpetuate the multiple and intersecting forms of discrimination that rural women and girls face and deepen gender inequalities more broadly.

Despite the pivotal role that technology has come to play in many people's lives, geographical and gender gaps in access to and the adoption of technology and innovation persist. Systemic barriers continue to limit rural women's access to productive resources and opportunities, including technology and innovation. Despite some progress over the last decade, the gender digital divide persists and is increasing in many countries. In 2022, 63 per cent of women across the globe were using the Internet, compared to 69 per cent of men.¹ These averages mask significant differences across regions and within countries, with the gaps being even more acute for older women, those living in rural areas and those with disabilities. For example, a 2018 African After Access survey highlighted the urban–rural

divide showing that in 20 countries of the Global South surveyed, there was an estimated 125 per cent gap in Internet access between women in urban and rural areas.²

Challenging gender norms and stereotypes is essential to creating sustainable and equitable access to and the adoption of technology and innovation. Context-specific gender norms have a significant influence on whether and in what capacity women integrate technology into their income-generating and personal activities. Gender inequalities limits women's and girls' opportunities to engage and benefit from technology and innovation, including productive and household technologies and digital tools and services. Moreover, stereotypes rooted in gender inequalities hinder both women's use of technology and their contributions to the development of innovations.

Technology and innovation have long been portrayed as equalizers, yet the lack of women participating in the development of technological innovations has resulted in technology that is predominately gender blind. The failure to consider and address the needs of different communities has limited the accessibility and applicability of innovation in low-income contexts where technology and digital infrastructure are limited. This lack of gender-responsive innovation perpetuates and amplifies gender inequality, by marginalizing women in our digital world.

While the number of women university students has grown globally, they remain concentrated on the study of humanities. Students engaged in the study of science, engineering, technology and mathematics (STEM) continue to be disproportionately male,

1 Broadband Commission. *The State of Broadband: Accelerating broadband for new realities*. (September 2022).

2 Alison Gillwald and Andrew Partridge, "Gendered Nature of Digital Inequality: evidence for policy considerations", prepared for the Expert Group Meeting of the sixty-seventh session of the Commission on the Status of Women (2022).

contributing to the persistent underrepresentation of women working in STEM professions.³ The lack of inclusiveness in the study of STEM and employment in STEM fields limits women's ability to shape the evolution of technology. This has resulted in the prevalence of technology designed to address the needs and priorities of men, which reinforces gender inequities in access to and the adoption of technology and innovation. Designing and implementing policies to create more inclusive technology and challenge discriminatory gender norms and attitudes is integral to promoting rural women's economic empowerment.

Leveraging technology and innovation to advance gender equality

Ensuring equitable access to technology and innovation is important for rural women's economic empowerment and the achievement of substantive gender equality. The expansion of rural women's access to technology and innovation can increase access to economic opportunities and make income-generating activities more efficient. Ensuring access to productive technologies has the potential to increase women's income generation by both reducing production time and eliminating the drudgery associated with many jobs. Rural women's access to productive technology is particularly important to increase the income generated in the agricultural sector. An estimated 43 per cent of agricultural workers around the world are women, many of whom work informally for low wages with little access to social protection. An estimated 89 per cent of agricultural production occurs in rural

settings, with rural women playing an essential role in global food production.⁴ The adoption of productive technologies by rural women in the agricultural sector can improve global food security and nutrition by increasing crop yield, decreasing production time, and boosting incomes.

Closing the gender gap in access to technology can also have positive impacts on women's well-being by reducing time spent on unpaid care and domestic work. Women and girls on average spend about three times as many hours on unpaid care and domestic work as men, a figure that has risen since the COVID-19 pandemic began.⁵ Creating more equitable distribution of unpaid care and domestic work is essential to achieving gender equality. Time and labour-saving technologies can reduce the strain on women's time use by decreasing the time and energy required to undertake household tasks. Promoting the adoption of household technology can also serve as an opportunity to encourage men to challenge gender norms by undertaking more unpaid care and domestic work. Rural women often have limited access to services and adequate infrastructure, including water and sanitation, energy and public transportation. Subsequently, many rural women spend hours collecting water and firewood and travelling to purchase household goods.⁶ The adoption of time and labour-saving technologies can reduce the time rural women spend on unpaid care and domestic work. Reducing this burden enables women to dedicate more time to other activities, such as spending time with family and friends, participating in social organizations, dedicating time to their health, and engaging in income-generating activities.

3 UNESCO. Gender equality: how global universities are performing, part 1. (2022).

4 ILO STAT. International Day of Women: The unfinished task quest for decent work for all. (15 October 2020).

5 UN Women. Whose time to care: Unpaid care and domestic work during COVID-19. (2020).

6 FAO, IFAD and WFP. Rural women and girls 25 years after Beijing: critical agents of positive change. (2020).

The expansion of rural women's access to information and communication technology (ICT) can also play an important role in improving their well-being. Globally, women are 26 per cent less likely to own a smartphone than men, resulting in an estimated 327 million fewer women having access to smartphones and mobile Internet than men.⁷ Increasing rural women's access to ICTs expands their access to information, social networks, income-generating opportunities and financial services.⁸ ICTs can also be leveraged to disseminate information to rural communities regarding women's rights, environmental protection and resiliency measures. Rural women's unequal access to ICT limits their digital literacy and reinforces their disadvantage and marginalization. Implementing measures to ensure equal access to ICTs not only requires increasing access to devices and the Internet but also bridging the digital literacy gap by providing gender-responsive digital education.

This policy brief focuses on rural women's access and adoption of three types of technology in the context of the UN Joint Programme on Accelerating Progress towards the Economic Empowerment of Rural Women (JP RWEE):

1. Productive technologies related to income-generating activities.
2. Labour and time-saving household technologies.
3. ICT devices and platforms that provide access to information and facilitate communication. Such technologies have the potential to increase rural women's agricultural productivity, food security and nutrition, income generation and access to information.⁹

7 Organisation for Economic Co-operation and Development (OECD). Bridging the digital gender divide: Include, upskill, innovate. (2018).

8 UN Women. UN Women Statement for International Girls in ICT Day 2022: Access and Safety. "Ensuring every girl has safe and meaningful access to digital technology and ICTs". (2022).

9 UNESCO. *Gender equality: how global universities are performing, part 1*. (2022).

Technology and innovation for rural women: JP RWEE experiences

2

The JP RWEE has implemented numerous measures to promote rural women's economic empowerment through expanding access to and the adoption of technology and innovation. The programme provided access to improved productive technologies, time and labour-saving household technologies and ICTs. Expanded access was coupled with education and capacity-building for programme participants to promote rural women's long-term use and engagement with technology and innovation.

The JP RWEE efforts to promote the adoption of productive and environmentally safe technologies in the agriculture sector improved rural women's capacity to produce, process and store foodstuffs. The provision of household technologies to increase access to water and electricity reduced the burden of unpaid care and domestic work. Efforts to increase the availability and use of ICTs expanded women's access to information, educational opportunities and social networks.

Increasing rural women's productive capacity through the adoption of productive innovations

Improving the productivity of rural women's on and off-farm income-generating activities is essential to enhancing their livelihoods, boosting incomes and achieving food security and nutritional outcomes. The JP RWEE implemented measures to increase access to and the adoption of productive technologies to enable women to increase productivity and diversify their income streams. Programme participants received technical support and capacity-building training on integrating new productive technologies into their income-generating activities to increase their yields and sales and reduce production times.

Expanding upon these improvements will require gender-responsive policy measures to ensure that rural women continue to have the information and market access necessary to adopt future productive innovations as they become available.

To strengthen the productive capacities of rural women in Liberia, the JP RWEE provided 13,074 women with motorized cassava graters. The introduction of this innovation enabled cassava growers to expand their products to include cassava flour, bread and super gari. The production of gari—dried, ground and sifted cassava—can have a significant positive impact on food security and nutrition due to its long shelf life. Gari can also be produced when market demand is low and producers are unable to sell all their harvests, thus contributing to waste and loss prevention. Given that the unmechanized production of gari is both tedious and time-consuming, the introduction of motorized cassava graters enabled women to increase their yields to engage in larger markets. In addition, gari can be combined with other foodstuffs to create a fortified and nutrient-dense paste called super gari.¹⁰ The adoption of motorized production increased and diversified programme participants' income-generation options and increased food security and nutrition in their communities.

The JP RWEE introduced crop production and processing innovations to increase productivity and reduce crop loss in Rwanda. The programme partnered with a dozen local cooperatives to construct high-capacity drying sheds and provided two cooperatives with milling machinery to process maize and cassava. In addition, 1,382 programme participants were trained in the use of rainwater harvesting systems. Increasing access to rainwater harvesting was essential to the viability of both kitchen gardens and the local production of vegetables.

10 Peace Corps Liberia. "Super Gari: A Potential Solution to Food Scarcity, while Generating Income". (2018).

Rainwater harvesting also reduced the time women and children dedicated to fetching water, enabling them to dedicate their time to other activities.

In Ethiopia, programme participants were trained on the adoption of climate-smart agriculture approaches to improve food security and nutrition in areas vulnerable to climate crises. In partnership with the Adami Tulu Agriculture Research Centre, the JP RWEE supported women's planting of 3,044 fruit trees through the provision of various types of improved seeds. These trees will aid in diversifying the diet and consumption patterns of local communities and boosting the availability of sources of nutrients. An additional 550 rural women were provided with milk processing machines, which drastically reduced the time required to make cheese and butter.

The JP RWEE also provided rural women in Nepal with improved high-yield seeds and irrigation equipment, including electric motor pumps for shallow wells and drip irrigation systems. In total, 131 shallow tube wells were installed, resulting in the irrigation of 393 hectares of land. This provided access to irrigation for 1,310 rural women's households, which is used for farming and non-farming activities. In addition, the programme provided access to modern agricultural machinery to decrease planting and harvesting time and increase production.

Providing access to productive technologies has significant positive impacts on agricultural production. The JP RWEE programme participants that adopted new productive technologies were able to increase their yields, reduce production time and mechanize labour-intensive tasks. This expanded access to income-generating opportunities reduced the drudgery of many tasks and reduced

crop losses and waste. To ensure these positive impacts are sustained in the long term, rural women must continue to have access to innovation, machine maintenance and training opportunities.

Reducing rural women's time poverty through increasing their access to time and labour-saving technologies

Time and labour-saving household technologies take many forms and must match the needs and contexts of where their adoption is being promoted. These technologies have the capacity to address three central needs: access to water, access to cleaner cooking methods and access to electricity. The JP RWEE programme measures increased participants' access to and adoption of new technologies by addressing these areas of need through the provision of household technologies—such as stoves, rainwater harvesting equipment and solar panels. The programme also implemented measures to ensure that the use of these technologies was sustainable, which required training community members to use and maintain them.

Increasing access to electricity among rural women can increase their income-generating opportunities, reduce time spent on unpaid domestic work and expand their access to information. Access to electricity can raise women's engagement in home-based income-generating activities and reduce the time and drudgery associated with many domestic tasks—as electricity is often a prerequisite to the adoption of time and labour-saving technologies.¹¹ In partnership with the Barefoot College in New Delhi, India, the JP RWEE supported the training of two

11 Ana Pueyo and Mar Maestre. "Linking energy access, gender and poverty: A review of the literature on productive uses of energy." *Energy Research & Social Science* 53 (2019): 170–181.

women from Guatemala in the installation and maintenance of household solar power systems. Upon return from their studies, the trainees installed solar systems in 100 homes in their community and were encouraged to share what they had learned with other community members. Increased access to sustainable electricity in their community improved the welfare of the newly electrified households and served as a source of long-term employment for the new solar engineers.

The JP RWEE also implemented measures to introduce technology to expand access to water, which is not only essential to farming activities but also has positive impacts on women's time use and health. In Nepal, it was reported that the water from wells provided by the JP RWEE was used for income-generating and household activities, including crop irrigation, washing clothes and bathing. Increasing reliable access to water reduced the time burden associated with collecting water for domestic tasks. The JP RWEE also contributed to reducing the time women dedicated to fetching water in participating communities in Liberia. The programme increased the accessibility of water by installing seven standpipes and nine pulleys in community wells. Programme participants reported a 70 per cent decrease in time spent collecting water, from 5 hours to 1.5 hours. To ensure the sustainability of the new water infrastructure, the JP RWEE trained 366 women and 150 men on the management and maintenance of standpipes and platforms.

The JP RWEE promoted the adoption of fuel-efficient stoves that have positive impacts on women's unpaid care and domestic work and health. Fuel-efficient stoves reduce the amount of wood needed to be harvested and burned. Reducing the amount of firewood needed for cooking reduces the burden of collecting firewood, which is most often performed by women and children.

Beyond freeing up women's time to engage in other activities, the reduction of firewood use has positive environmental impacts, decreasing the harvesting of wood and reducing air contamination that results from its burning. This also contributes to improvements in women's health, as their repeated exposure to smoke and heat while cooking can have negative impacts on their lungs and eyes.¹² The JP RWEE provided 1,200 households in Rwanda with fuel-efficient stoves to reduce rural women's unpaid care work by reducing cooking time. To ensure the sustainability of these stoves and continue to expand access, 120 community members—85 women and 35 men—were trained in stove construction and maintenance.

The JP RWEE's implementation of measures to increase rural women's access to time and labour-saving technologies was essential to the programme's efforts to achieve women's economic empowerment. Reducing the women's time spent on unpaid care and domestic work frees up time for other activities, such as paid work, rest and socializing. The programme's implementation of measures to expand access to water, electricity and fuel-efficient cooking methods also enhances the welfare of the communities in which rural women live. The JP RWEE's integration of education and training into its promotion of the adoption of time and labour-saving technology measures will ensure the sustainability of the technologies over time.

Expanding rural women's access to opportunities and information through improving their digital literacy and access to ICTs

Engaging with information communication technology is increasingly a part of everyday life for many women, men and children around the globe. Yet many rural women

¹² FAO. "Labour-saving technologies and practices: fuel efficient stoves". (December 2020).

continue to lack both access to ICTs and the digital literacy required to engage with ICTs. This can place rural women at a disadvantage in the labour market, as many employment opportunities—including many jobs in the agriculture sector—require the use of technology. It can also inhibit women's ability to access information related to productive innovations, market demand, weather, employment opportunities and financial services, among other topics. Access to information is essential to achieving women's economic empowerment and is also integral to women's full participation in their societies.¹³

The JP RWEE leveraged ICTs during the COVID-19 pandemic to deliver information and educational materials to rural women. Pivoting to online participant engagement was essential to the programme's ability to communicate with programme participants during the pandemic. In Kyrgyzstan, the JP RWEE was able to deliver training on farming vegetables for many participants through Zoom Meetings because of the country's high level of Internet access. Training participants formed group chats using mobile telephone applications to discuss training materials and seek advice on how to address challenges they encountered. Access to ICTs was also leveraged to create sustainable income-generating opportunities for rural women in Kyrgyzstan. These efforts included providing women with vocational training on how to repair mobile phones, financial literacy and carpet making.

The JP RWEE used ICTs to engage with programme participants and national and local stakeholders throughout Guatemala. A virtual "Economic Empowerment" platform was launched to provide methodological tools for private and public actors including NGOs and government institutions to support rural women's economic empowerment. Programme participants were provided

access to the teaching modalities via the online platform. The platform is the first national knowledge repository dedicated to disseminating information and training on the implementation of women's economic empowerment methodologies. The platform's continued accessibility online will contribute to the sustainability of JP RWEE programming in Guatemala.

During the pandemic, the JP RWEE created radio programming to reach rural women in Nepal, where access to mobile phones and the Internet is limited. The programme partnered with Equal Access International to provide 1,059 radio sets to women across two districts. This enabled programme participants to receive leadership training aimed at empowering them to engage with local leaders and government officials. The programming included an episode titled "Query for My Leaders", in which local leaders responded to questions submitted by women regarding COVID-19 relief packages, local service delivery and agriculture. Rural women were also able to relay their concerns to their local leaders through an interactive radio voice response system and the mobile phone application CommCare. A total of 483 women submitted messages and questions for local leaders to answer during the radio episode.

The implementation of measures that aim to increase women's digital literacy is essential to increasing rural women's engagement with ICTs. In many contexts, improving literacy rates among rural women is the first step in promoting women's adoption of technology. In Ethiopia, the JP RWEE supported numeracy and literacy skills through an Integrated Functional Literacy programme. Nearly 2,000 participants across two regions engaged in the programme and learned to read and write. The JP RWEE also supported functional literacy and community-based literacy

13 IFAD. "10 ways in which ICTs can transform the lives of rural women". (March 2018).

programmes in Niger, including 16 functional literacy centres in 4 communes that served 25 students each. To develop community-based literacy programming, 104 women and 141 men were trained in their local language as literacy facilitators. Over 2,000 programme participants gained literacy skills from the JP RWEE's literacy programming in Niger.

ICTs played an important role in enabling the JP RWEE to support programme participants during the COVID-19 pandemic. Despite restrictions on in-person gatherings, the programme successfully leveraged women's

access to ICTs to continue engaging with rural women across the programme countries. Because there is space for it, and it feels appropriate, let's put in a line space above this paragraph. JP RWEE implementation of measures to improve rural women's access to ICTs and developing digital literacy enhances women's access to information, engagement with local leaders and the integration of technology into their income-generating activities. Programming to raise literacy levels and develop digital literacy is essential to rural women's safe and equal access to ICTs.

Lessons learned and recommendations

3

The bridging of the gender divide in access to technology and digital literacy is essential to achieving rural women's economic empowerment and their full participation in societies around the globe. The JP RWEE implemented a variety of programme measures aimed at expanding rural women's access to productive technologies and innovation, labour and time-saving household technologies and ICTs. The programme ensured that these improvements were sustainable by improving rural women's literacy, training locals to install and service new infrastructure and devices, and ensuring that women benefit directly from adopting new technologies.

While many of the JP RWEE measures to expand rural women's access to technology contributed to women's economic empowerment and enhanced their social and political voices, there remain challenges to ensuring these benefits are sustained. In many contexts, gender norms remain a barrier to women's access to and adoption of technologies and innovation. Establishing equitable gender norms requires programming that engages both women and men in the deconstruction of norms that limit women's access to technologies. Ensuring that women are encouraged and feel free to engage with technology is essential to their incorporation of technologies in their income-generating activities and personal lives.

Another challenge to rural women's access to technologies and innovation is affordability. In many cases, women are aware of the benefits of adopting productive and time and labour-saving technologies, yet the costs of such technologies are prohibitive. Equitable access to technology requires creating mechanisms that make them affordable for rural women. Ensuring the affordability of

technology will require the development of partnerships between public and private actors and considerable investments from actors in both sectors. Issues of affordability extend to the maintenance of technology made available to rural women. Training local actors to maintain technology adopted by rural women and ensuring that service parts are accessible and affordable is integral to ensuring sustainable access to technology.

A key challenge is the sustainability of rural women's access to technological innovations. While programme participants' access to and adoption of technology improved, ensuring that they have access to information about new developments is important for adopting future innovation. If women do not have adequate information about innovation, they will be unable to adopt new productive and time and labour-saving technologies. Developing partnerships with stakeholders in the private and public sectors to provide up-to-date information and promote the adoption of innovations is required to ensure rural women's engagement with technology is sustained.

The JP RWEE implemented a plethora of successful programme measures. Achieving equitable access to and the adoption of technologies and innovation requires gender-responsive measures to address issues related to inequitable gender norms, issues of affordability and lack of information. Integrating policy measures to address these issues will increase the positive impact of the programme and ensure the sustainability of the programme's achievements so far. Box 1 below sets out several policy recommendations to build on the programme's current measures and implement new measures to address policy and programming gaps.

BOX 1

Policy recommendations to achieve rural women's economic empowerment through access to technology

Challenge gender norms related to the adoption of technology by rural women

- Establish guidelines to ensure that all publicly funded technology interventions are gender-responsive and promote equitable gender norms related to the use of technology.
- Implement awareness-raising measures to engage men and boys in the deconstruction of gender norms that inhibit rural women's engagement with technology.
- Create programming that exposes rural communities to positive examples of women and men in non-stereotypical roles in the use and development of technology.

Make technology affordable for rural women

- Invest in sustainable infrastructure and technology, including safe, clean and affordable water, sanitation, energy and transport, including to reduce rural women's disproportionate share of unpaid care and domestic work.
- Encourage national and local governments to establish gender-responsive technology budgets to expand rural women's access to affordable technology.
- Engage the private sector in strategies that support the supply, maintenance and marketing of affordable technology that addresses the needs of rural women.
- Support the development of public-private partnerships to establish the gender-responsive procurement of technology to offer affordable technology to rural women.

Ensure rural women's continued access to technological innovations

- Develop rural women's literacy skills to ensure they have the skills to safely engage with productive technologies, labour and time-saving technologies and ICT platforms.
- Establish mechanisms to convey up-to-date information regarding innovation that rural women may find useful for their income-generating and personal activities.
- Create sustainable training opportunities for rural women to learn how to use new technologies to promote the adoption of innovations.



The UN Joint Programme on Accelerating Progress towards the Economic Empowerment of Rural Women (JP RWEE) is a global initiative that aims to secure livelihoods and rights for rural women. The programme is jointly implemented by the Food and Agriculture Organization (FAO), the International Fund for Agricultural Development (IFAD), the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women) and the World Food Programme (WFP) in seven countries: Ethiopia, Guatemala, Kyrgyzstan, Liberia, Nepal, Niger and Rwanda (2014–2021). A second phase of the JP RWEE programme (2022–2027) will initially focus on Nepal, Niger, the Pacific Islands, Tanzania and Tunisia.

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