Gendered Design in STEAM Sustainable Research Report

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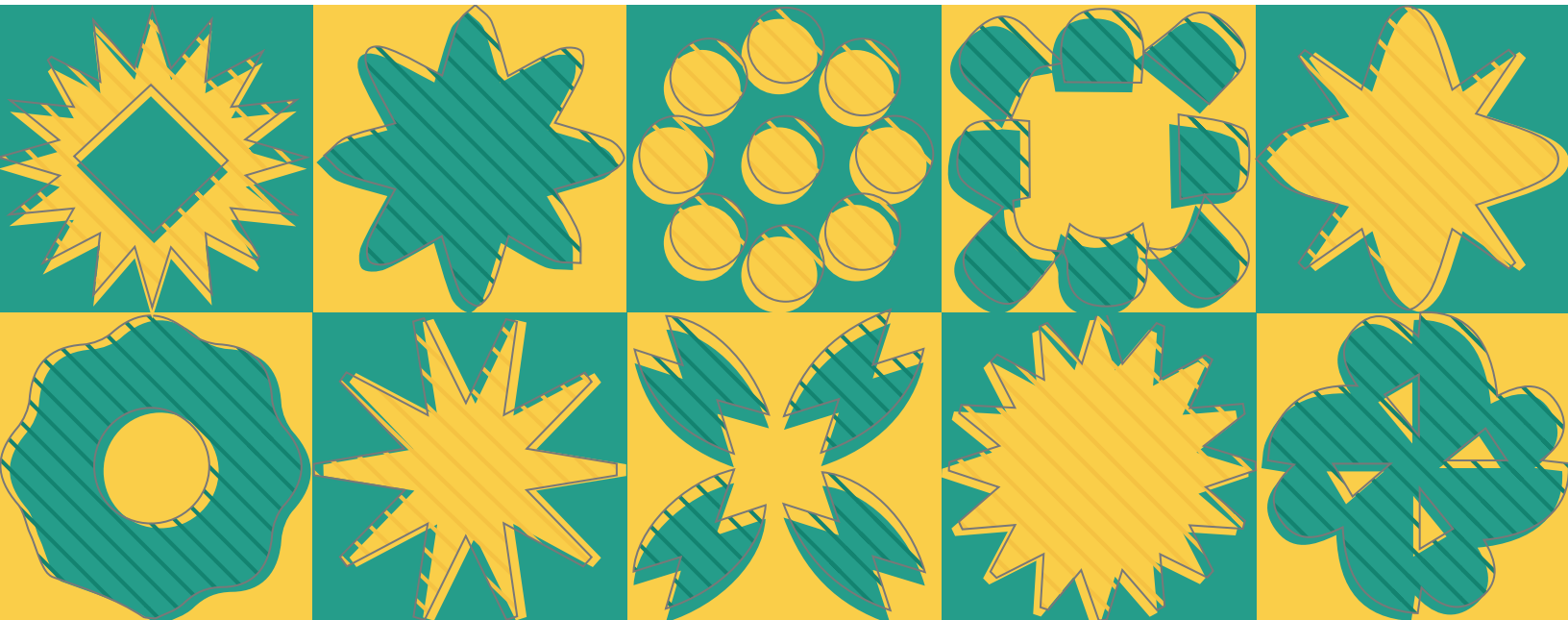
Carleton University, 2023

Project funded by the International Development Research Centre



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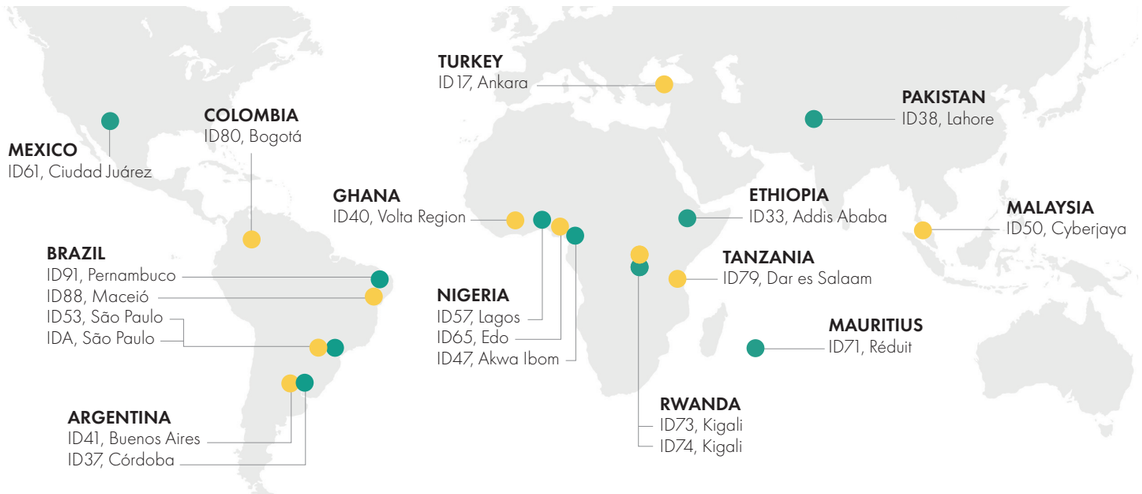
1.0 Introduction

Sustainability has become a crucial concept in many fields and has been utilized as a core theme and approach within many research ventures. The 1987 Brundtland Report Our Common Future, a pioneering report on guiding principles of sustainable development, defines sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, Ch.2, 1). This definition encompasses three main elements upon which researchers base definitions of sustainable research: continuation, orientation, and relationships (Becker, 2011). All of these elements were central to the 20 awarded projects of the four-year long Gendered Design in STEAM (GDS) program at Carleton University. It is possible to identify aspects of sustainability within the 20 projects which had focused on maintaining and improving various systems, entities and processes, while adapting to changing circumstances so as to benefit the current population, and enable long-term action for the future (Becker, 2011). In the context of the concluding months of the GDS program, the two researchers utilized the interpreted data, such as interview transcripts, project proposals and final reports, to investigate how the 20 awarded projects incorporated sustainable research within their own frameworks. The two significant themes that were identified were short-term actions for the future of the individual projects, and long-term strategies to realize sustainability in a broader sense. The following report presents the process of data analysis, interpretation and synthesis to determine the short term and long term sustainability goals of each project. The report then explains the various themes that were identified in the data based on short term actions such as the immediate futures of the projects, and long term strategies that discuss sustainability of the projects on a broader scale. The report concludes with a summary of final considerations and a discussion on strategic directions.

Map of the 20 Awarded Projects



2.0 Research Process

The research process undertaken in this project was divided into three main phases: **planning, analysis, and synthesis**.

Planning

The planning phase involved organizing data and determining the steps and methods for data analysis and synthesis. The data used for this project was drawn from the final research reports and interview transcripts (stored on the Carleton Research Computing Services ShareFile Repository) of the 20 international GDS projects which summarized their research process, findings, gender outcomes, and recommendations for the future. The interviews were conducted in English, Portuguese, or Spanish (depending on the region and language spoken by the project) by three researchers from the GDS program at Carleton University, i.e., Co-PI, Dominique Marshall, Investigator, Chiara Del Gaudio, and Research Assistant Coordinator, Ona Bantjes-Ràfols. They were translated and transcribed for data analysis. The interviews consisted of discussions about the research project, process, gender design perspective and challenges. One discrete section of the open questionnaire was devoted to future directions, possible and imagined.

At the closing of the project, the core team decided to devote its remaining resources to a systematic review of this material around the most important and practical theme: the future and legacies of the GDS. Given the limited time frame and size of the research team, the researchers decided to use the method of split coding, detailed below, where the transcripts and reports were divided among the two coders to allow for a more efficient process. The transcripts and reports were distributed evenly by region and topic to ensure diversity and to promote the incorporation of different perspectives and interpretations.

Analysis

The researchers used two different softwares, namely Obsidian and NVivo, to analyze the data. These programs were chosen based on their flexibility and data analysis features and the researchers' proficiency and expertise with the programs. During the analysis phase, to complement the split coding approach, provisional coding was used as an initial coding method to analyze the transcripts and reports. According to coding expert Saldaña (2021), provisional coding uses a deductive approach, that is, a predetermined code list was defined by the researchers before data analysis occurred. These codes were determined by referencing previous knowledge about the project as well as literature regarding the research topic. This method was an appropriate choice to explore the specific topic of sustainable research and to account for coder variability among the two coders. While the predetermined code list provided the researchers with initial categories to organize the data, the researchers allowed for flexibility to modify and add additional codes that emerged while analyzing the data. To account for the modifications and additions, the researchers frequently met to discuss and cross-check their codes and align their coding decisions. The coding process resulted in the emergence of several themes and sub-themes which will be discussed in the next section.

Synthesis

To inform discussions on strategic directions to sustain future research, the synthesis phase involved combining the findings from the data analysis phase. The two researchers engaged in several discussions regarding the findings and insights from the analysis which prompted additional organization and refinement of the sub-themes identified in the previous phase. Two tables were created to summarize the findings from the analysis of each project transcript and report. The tables were organized by theme and sub-theme to compare and synthesize the data.

3.0 Themes

The analysis of the codes revealed patterns, recurring statements, and similar experiences that were then categorized and organized under higher-level thematic umbrellas. To ensure continuity and reliability, the two researchers engaged in extensive discussion to compare and synthesize the interpreted data. In doing so, the data was separated into two major themes: short-term goals which encompassed the future of the projects, and long term goals that discussed sustainable research on a broader scale. They were further organized around sub-themes. The theme "short-term actions" includes all the statements and ideas that were situated in the specific context of researchers' projects and their plans for future development, continuation, and improvement. The prominent sub-themes that were identified under the first theme, short-term actions, were – in no particular order - furthering collaborations, funding, dissemination, and scope. In contrast, the theme "long-term strategies" looks at the future of research at a more abstract level. Sustainable research seeks to generate knowledge in a way that benefits the current population and contributes to a more resilient future for society. Drawing from the referenced literature on sustainable development, long-term strategies refers to ideas and approaches that consider four "pillars" of sustainability, which have been translated into different sub-themes in the context of this project. The sub-themes include human/cultural, social, economic, and environmental values, perspectives and strategies for improvement.

The following report outlines the importance of investigating both short-term and long-term aspects of sustainable development and demonstrates how these two themes work in conjunction with and inform each other. Both themes present actionable recommendations and movements towards sustainability that encompass perspectives from all "pillars" of sustainable development. This approach to research seems to be the most meaningful for the GDS findings to contribute to sustainable developments that might benefit current and future generations.

Short-Term Actions

- furthering collaborations
- funding
- scope
- dissemination

Long-Term Strategies

- human/cultural
- social
- economic
- environmental

3.1 Short-Term Actions

3.1.1 Furthering Collaborations

The sub-theme of collaborations emerged as a significant aspect during qualitative data analysis. The researchers emphasized the importance of maintaining partnerships that had been developed over the course of the projects, and expressed their aspirations to engage in new collaborations for future iterations of the research. Each project identified different levels of collaboration such as local networks, community members, institutions, and government partnerships, that had all contributed meaningfully to the research in multiple ways. Collaboration with community members, while providing research benefits for the projects, also positively impacted the participants, such that throughout the research process, the participants were able to form networks amongst themselves and with other organizations. Thus, providing a platform for participants to engage with the research facilitated other networks that were fruitful for the participants.

In addition, many principal investigators expressed that continuing to work with previously established partnerships, amongst the community, with academic institutions and with internal and external organizations, maintains and builds a level of trust that can be further utilized in the future to expand research avenues, collect more insight from various voices, and share resources more efficiently. Some projects especially noted the importance of maintaining relationships with the local community as there is a level of commitment to them that should be sustained. There was also a strong emphasis on the importance of continued collaborations with larger organizations and government institutions for funding purposes. These continued collaborations would allow the researchers to access resources from internal sources, rather than relying on international and external funds.

While there was a strong emphasis on continuing to maintain already established partnerships, many of the project researchers expressed interest in new collaborations. Researchers stated that new collaborations would involve expanding research by partnering with other communities and institutions, collaborating with other GDS teams from different regions who have similar research interests, and establishing more transdisciplinary networks so as to incorporate other necessary skills and approaches into the research. This emphasis on building new partnerships and expanding collaborative participation is considered integral to the future of the projects as the researchers look to continue with, expand on, and improve their research.

We define community as the place in which we weave, but not by consensus ... there isn't just one correct way of living in a community ... I think a sense of community is linked to communal independence.

- ID80

... by strengthening the links and connections between the universities participating in the programme, it could further boost the objective of making these research processes more visible and give more tone to the relationships between universities in the South, as a political bet for the more autonomous construction of knowledge in these territories.

- ID88

You meet new people, you have more networks, and you get to know more. I actually want to appreciate them for this opportunity, not just only for those that are releasing the grants, no, but for also giving us an opportunity to learn, to grow in our horizon. To actually spread our tentacles.

- ID65

3.1.2 Funding

Funding was emphasized as an important aspect to support the development of future research by the majority of the principal investigators. As stated by several projects, there is often a reliance on external funding for research projects rather than internal funding from within their own institution. Therefore, they emphasize the importance of the funding from IDRC and stress that to continue to develop the research and specific aspects such as prototypes, this would require more funding from IDRC, partner institutions, government, or other internal/external organizations.

For some of the projects, the funding from IDRC resulted in additional smaller opportunities for funding from other external organizations. At the same time, the funding from IDRC allowed researchers who were already pursuing work in gendered design to continue their endeavours which provided scholars with a flexible or open-ended way to allocate funds that would be useful in different phases of the projects.

Although funding is regarded as one of the most beneficial aspects of the GDS program, the PIs pointed out that several issues or challenges affected the projects in various ways. For instance, one project faced issues with receiving and transferring funds due to external bureaucratic issues that made the process difficult and strenuous for the research team. It was also mentioned that it is more difficult to receive funding without a Ph.D. Another challenge that some projects faced were difficulties with the currency exchange rate, and suggested that the funding should either be provided in the local currency of the project or be set at a fixed rate.

Being an international institution that will give it more weight. It will attract more people.

- ID65

It was extremely important to receive help for the research, since in Brazil it is difficult to obtain the necessary resources.

- IDA

3.1.2 Dissemination

Both public and academic dissemination were referred to as strategies to share knowledge and contribute to the overall advancement and societal relevance of research. Public and academic dissemination were often considered to complement each other to serve different purposes and audiences.

Something really important in these investigations is being able to spread them and that the information that we have systematized, interpreted, and analyzed is made known. Especially for those people that have a particular interest in the world of design, in the world of gender and feminism, and in the world of universities. This work has a great future regarding expansion and consolidation with others.

- ID41

Public dissemination was regarded as a way to share the research through outlets that are more accessible to the general public such as websites, newspapers, TV interviews, public workshops and talks, magazines, and through various social platforms including Instagram, Facebook, WhatsApp, and Twitter. These channels enable a wider audience to learn about the research and to engage in discussion. Some projects stated that they are expanding their reach by teaching participants to use these channels to share knowledge and experiences with other community members. Public dissemination also encourages advocacy initiatives and public discussions with government organizations to implement change. This is because many of the principal investigators mentioned the desire to reach a wider audience within the region and also internationally, possibly through the GDS program.

Academic dissemination refers to the publication of research and results in the form of reports, articles, chapters and books in scholarly and scientific journals and platforms. The majority of principal investigators expressed their interest in publishing scholarly research as a way to share their methodologies, research, and their results with a wider academic demographic. By publishing their research, many projects are contributing to data development that will act as a guide and reference to benefit others who are exploring similar research avenues. Aside from publishing, many projects have shared their research at conferences, through seminar presentations, lectures, and workshops at various academic institutions. As such, many projects have given their student researchers and their participants the opportunity to speak at these conferences, seminars, lectures and workshops as a means to network, build experience, and provide different views of the research from the various voices in collaboration.

3.1.2 Scope

Each of the awarded projects expressed the aspiration to expand the context of their research project. Many of the projects developed new ideas and different avenues of thought throughout the initial phases of their research that would either provide a continued benefit to their original research or lead them to new projects within a similar framework. These ideas had come from exploring different methodologies, new technology, and collaborations with different partners. Continuing their research endeavours, or exploring new avenues within their research was a large topic of discussion as many principal investigators emphasized the need to deploy alternative research methodologies, such as using transdisciplinary approaches, to collect more data and expand their scope of participation beyond their local communities. In addition to collecting more data, a few of the projects indicated that they will be using their research results to produce a prototype, such as mobile applications and assistive technology.

However, an important aspect of expanding context is understanding a limit and adhering to the ethical duties researchers have to their participants. One project had expressed that not continuing their research and technology building within a certain community was an important part of their project, as their research was culturally and socially significant to the community they had worked with.

I think my perspective about the communities I work with has changed. That's been an evolution in and of itself because I think that just because I grew up in Pakistan, does not mean I understand the context. It does not mean I understand the challenges of the communities I work with or their aspirations.

- ID38

What I noted is gender innovation and gender design needs to be considered as an ongoing global movement.

- ID33

Although it is true that there is no specific process to address a transdisciplinary approach, I think that what we are looking for is at least to generate a process with a series of strategies that we can recommend on how to work with a transdisciplinary approach.

- ID61

3.2 Long-Term Strategies

3.1.1 Human/Cultural aspects of sustainability

The initial introduction of the "pillars" of sustainability/sustainable development in the 1980s consisted of three pillars, i.e., economic, social, and environmental. However, since the 1990s, there has been a significant push for including a fourth pillar, namely, the cultural pillar (Burford et al., 2013). The cultural dimension of sustainability is concerned with the characteristics that define a society or social group and focuses on promoting local language, worldviews, and dialogues (Burford et al., 2013). In the context of this project, mentions of the human/cultural aspect of sustainable research focused on local knowledge, relationships, and gendered design. More specifically participants considered ethical commitments to the communities and ensuring their needs, cultural practices, and knowledge are embedded within the research. Traditional knowledge and methods are reinvigorated with contemporary practices and technology to achieve sustainability, continuance and futurity for further generations to learn and appreciate traditional values within contemporary contexts. For instance, one project highlighted that the knowledge, within the community that they were working with, has been passed down for generations, therefore, it is necessary to include these perspectives in present and future projects. Other projects, especially in Africa, communicated with the community in their local dialect. Another important dimension of respecting the local culture and community is the focus on ethical research practices. Multiple projects worked with sensitive topics surrounding gender inequality, therefore, building a sense of trust and a strong relationship with the community was of the utmost importance. This included sharing authority and resources, creating safe spaces, and working in a flexible manner to ensure the project is built and conducted with a collaborative approach. Using ethical approaches and building strong trusting relationships with communities ensures the longevity of the relationship, which continues to benefit both the research projects and the communities involved.

Regarding gendered design and culture, as the GDS project centers around building gendered design knowledge, many of the projects stated that their broader goal is to contribute to building a foundation of knowledge around gendered issues to make them visible, dismantle stereotypes, and create a cultural shift to address gender inequality. One PI stated that this "has to be considered as an ongoing global movement". After incorporating gendered lenses and voices within their research, many of the projects emphasized the importance of gender design in the present and for the future and will actively incorporate gender design in the next phases of their research, and in other projects that they pursue. These efforts contribute not only to creating impactful change but also creating more opportunities for future research to build on similar concepts and issues.

[in regard to gender design knowledge] also it has value not just in terms of money or just in terms of material benefits. It's also designing for a better world in the real sense of the word.

- ID71

We have this misconception and mislabelling, probably due to the culture... As much as possible what we did is to take a perspective of inclusiveness and ensure inclusiveness in all processes. If it is research, through the research process, women need to contribute.

- ID33

The aroma of our product should not smell differently from what they have had before. We were not interested in bringing scientific changes and technology to what will change their appreciation of the ... product.

- ID47

3.1.2 Social aspects of sustainability

The social pillar of sustainable research encompasses actions that continue to positively impact the livelihoods of humans and contribute to the betterment of society both in the present and for the future. Social sustainability within the individual projects of the GDS program is characterized by the desire to produce research in order to influence and affect policy, build capacity, advocate for contemporary methodologies and perspectives, and provide a platform for collaborative interactions. A sub theme within social sustainability is modernization, characterized by the integration of modern values and technology driven by political, cultural, social and economic changes, with traditional values that persist through these evolutions of society (Inglehart & Baker, 2000: 20). Modernization in the context of the GDS project means to utilize the results from the research process and put them into further action to ensure that methodologies and technological developments are compatible with changing modern standards. All GDS project teams investigated how to conduct modern research by using gender design methodology and gender-based approaches. These methods allowed researchers to identify gaps within their own societal standards, provide solutions and strategies to fill those gaps, and also focus their efforts on enhancing living standards primarily for women and vulnerable populations.

All projects were working towards a common goal to empower and achieve gender equality as per the UN Sustainable development goals using gender design and participatory research. However, all projects were affected by the Covid-19 pandemic, which forced the researchers to adapt their research and data collection to abide by social distancing rules. This caused delays as well as freezes in the research phase, as many had to navigate online platforms and rework the parameters of their research ideas and methods. Some projects had to shift their focus to larger and more important aspects of their project such as data collection and dissemination. Yet, the pandemic, and the consequential changes to their research methods, brought about different avenues of research and different fruitful outcomes.

Advocacy therefore is among the key actions to be taken to make known the importance of gender consideration towards sustainable development.

- ID73

3.1.3 Economic aspects of sustainability

The economic pillar of sustainable research refers to the active promotion of financial growth, both on individual and societal levels in the short-term and long-term, while ensuring non-consequential effects to the environment and society. All of the GDS projects, in some way, incorporated human/cultural, societal, and environmentally sustainable perspectives and practices to investigate solutions to increase human capital and promote economic growth within their regions. Researchers provided strategies to women, mostly, on how to increase their capital through modern technology, understand financial literacy, learn different perspectives and contemporary practices in regard to financial growth, and encourage collaborative and sustainable business developments. In order to conduct this research, internal and external funding was allocated for specific necessities, both in the short-term and for the long-term, that overall contributed to the growth and continuance of the research. However, while the funds benefited the projects during their initial phases of research, the majority of projects have stressed the importance of continued financial support from partners and collaborators in order to sustain and develop different aspects of their research for future exploration and implementation. Continuous funding allows the project coordinators to adapt their research to changing economic situations, and ensure their research stays relevant and provides positive improvement for those affected by economic instability.

3.1.3 Environmental aspects of sustainability

The environmental pillar of sustainable research considers maintaining and contributing to the well-being of the planet, its resources, and its biological diversity. The majority of the projects that included environmental aspects in their project focused on developing techniques and technology that are more environmentally friendly and energy efficient. One project for instance used natural resources that can be recycled to contribute to environmental sustainability. Crossing environmental sustainability with other social dimensions such as economy, traditional knowledge, and gender, was also a core aspect of understanding how to build capacity and ensure that the project and research are beneficial in the long run and have the greatest sustainable impact as the project evolves.

4.0 Final Considerations

This report utilizes data from the 20 awarded projects of the GDS program to demonstrate how international researchers are thinking about and moving towards sustainable development within their own regions. While the development of the research projects were specific to the geographical regions of study, the findings, recommendations, and strategies outlined in each project provide a theoretical and methodological framework that can be utilized and applied in many other countries facing similar issues.

Drawing from the interview transcripts and reports of the 20 awarded projects, the data collected presented a few key considerations for short-term actions and long-term strategies. In all of the projects, there was an emphasis on sustaining collaborations between internal and external organizations, partners, and communities for funding and for further collaborative projects. Many projects stressed the importance of allocating more funds, and remaining flexible in the allocation of funding that allows the project researchers to have agency over how the funds will be used and for what parts of the project. This would have benefited many of the projects that were unable to complete components of their research, due in part because of the pandemic and having to shift their strategic approach, and would have allowed them more freedom to utilize their resources to explore alternative methods of research. Many of the projects also indicated that although helpful to receive external funding, having the funding available in the local currency or at a fixed exchange rate would have been helpful for budget planning. Lastly, there were many discussions about incorporating local and traditional knowledge and culture into the research and process as a way to sustain regional values within each society.

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Appendix A

Short-Term Actions - summary of collected data from project interviews and reports

ID	Furthering Collaborations
17	Collaboration with the automotive industry to share feedback from the public and learn different perspectives. Desire to have more interactions with other regions in the GDS program.
33	Continue working with Enat Bank, different regional organizations and the public to gather more data. Partnership with publishing company to publish research on women self-efficacy.
37	Work with donors, NGOs, CISCSA and other multi-actoral networks who support similar initiatives which allow for more collaboration opportunities.
38	Work and establish trust with NGOs, universities, women's rights organizations, community leaders and other researchers to foster long-term relationships that could lead to future collaborations.
40	Importance of continuing collaborations with partners, such as external and internal organizations and institutions to develop and sustain the research further
41	Expanding research to collaborate with other communities and collect more data.
47	Work with the government and other organizations to secure funding that would help sustain the research
50	Continue to collaborate with community participants and integrate transdisciplinary approaches into research. Valued the collaboration between the projects during the workshops hosted by the GDS team and saw the potential to work with other regions who are pursuing similar research.
53	Collaborations with other women leaders.
57	Collaborate with government sectors, stakeholders, and universities to develop research trajectories and sustain the project. Communities have strong social networks, so it was important to build relationships with the communities and network with female leaders in the region.
61	Apply transdisciplinary approaches to develop new research trajectories and create prototypes. Valued the collaborative workshops hosted by the GDS team which has created opportunities to work with other research teams conducting similar research.

ID	Furthering Collaborations
65	Expanding network to include more people in the research process and project.
71	Valued the opportunities to connect with other GDS projects which have created potential future partnerships, and joint publications. Some university departments, such as the Engineering department were not supportive of gendered aspects of the research, however, working with certain departments, such as social sciences, would help sustain the research.
73	Collaborate with institutions to disseminate research.
74	Collaborate with government and external funders to support the continuation of the research and implement research results.
79	Research methods allowed participants to generate their own partnerships which would help the women in the batik industry to apply for government loans and develop their own businesses. Utilize transdisciplinary methods to help with collecting, interpreting and sharing data. Collaborations with other researchers for new projects related to textile recycling and sustainability.
80	Collaborate with other stakeholders, community organizations, and students to learn various perspectives, create more actions towards change, and continue building stronger relationships that are integral for the continuation and dissemination of the research. Valued the collaborative workshops with GDS projects which allowed researchers to learn how other regions are approaching similar research avenues.
88	The project allowed participants to network and partner with institutions to share their experiences and research results to students. Strengthen relationships between participating universities to make research more visible.
91	Work with stakeholders such as doctors and hospitals, local organizations and institutions, NGOs, other global networks, and more communities to expand research. Valued the collaborative workshops hosted by the GDS team, which allowed the projects to expand their network, contact other researchers, and collaborate with other teams on current research, future projects, and publications.
A	Future collaboration with a university in Germany to learn about their methods, such as insect adhesive and research involving the shape of a daisy similar to the mammary glands, that can be helpful in own research.

ID	Funding
37	Funding from IDRC allowed for this project to happen quickly which led to other small funds.
38	The paper that was written opened up new avenues for grants which would help expand future research on gendered design. There was a network fee for conferences and also setting up a research cluster and website.
40	Funding from the World Bank was helpful but there are certain criteria that had to be met which made it difficult to secure certain funds.
41	Funding would help maintain and further develop designs. There was some flexibility to allocate funds to support different aspects of the project.
47	There is a need for future funding from the IDRC and GDS team, internal donors, development agencies, state governments, World Bank, partner organizations, international and local organizations, and other regional and international universities to continue research.
50	More funding is needed to continue the second phase of the research project that involves developing a working prototype. Would like to further collaborate with GDS or other institutions for funding to sustain the project.
53	Few issues with the grant and securing funds on time.
65	Would like to see more funds and grant opportunities from IDRC and Carleton University to enable researchers to continue collecting data and publishing results. Suggestions for future funding are to release the funds in a timely manner, and to consider exchange rates and release funds either at a fixed rate or in the local currency.
71	Funding was extremely helpful and was used for multiple aspects of the project such as buying internet which helped in the research process and can also be used in future research projects.
74	Need to write more research grants to acquire funding for future research.
80	Funding was useful to pursue research in the field of gendered design
91	Many challenges around funding, such as going through intermediation of companies, the limitations of receiving the funds and solving bureaucratic issues in another language often got in the way of the project focus. It is difficult to receive funding for those without a PhD because of the political state and their influence on investments in education.

No significant data was collected for ID17, ID33, ID57, ID61 ID73, ID79, ID88 IDA

ID	Public Dissemination
17	Used media channels, interviews, and websites of the researchers to disseminate research findings to the public.
33	
37	Used multiple media streams such as websites, podcasts, and virtual classes to raise awareness about the project amongst different audiences and disseminate research results to influence the public agenda.
38	Set up a website to communicate research results. Held workshops to create deeper engagement with community organizations and practitioners.
40	It would be beneficial to showcase the project and communities to the public through the GDS website to reach an international audience, and highlight the research that is being conducted at the university.
41	Publicly advocating and disseminating knowledge to inform others about gender inclusive spaces that benefit the entire community. Using media outlets like newspapers and other public media sources to reach a wider audience.
47	Sharing research and teaching community members how to use technology by hosting public seminars, however this would require funding.
65	Create awareness at the local level and to the public.
71	Utilize public media sources to disseminate research findings and information. This would also create opportunities to share information with other communities that have similar potential.
73	Develop outreach programs to reach a broader public audience and discuss the importance of gender design
74	Present research to the City of Kigali in order to guide policy makers within the transportation industry to think more critically about gendered design.
79	Teach women through workshops to use the new technology so that they can in turn teach other members of their communities. This will help build a strong market, increase marketability and encourage other women to join the batik industry.
80	Using non-traditional publishing sources, such as the creation of the "feminizine", which would allow more people to access the information.
91	Disseminating information in non-academic circles. Using Whatsapp, Instagram and other websites to share information and network with collaborators, as well as recruit participants.

No significant data was collected for ID50, ID53, ID57, ID61, ID88, IDA

ID	Academic Dissemination
17	Published articles, and used networking sites such as ResearchGate and Academia to disseminate research findings.
33	Held stakeholder workshops, seminars and conferences with partner institutions to share research progress, outcomes and gauge future requirements of the project. Publish research on self-efficacy, gender design, participatory design, and information technology to address key issues surrounding gender design. Write a book chapter on gender design in computer science, gender design in software engineering, and gender design in information systems.
37	Participated in conferences and seminars to share research results.
38	Plan to publish some articles and participate in conferences to share research results.
40	Students of the project have been invited to speak at a conference in Germany.
41	Plan to publish research in academic journals.
57	Contribution to a significant book chapter to disseminate information and inform future work.
61	Publish report on research findings and methodology in both Spanish and English.
65	Publish research in international, national and local journals for others to use. Participate in conferences, seminars and workshops to share research results to academic audiences.
71	Plan to attend conferences and publish articles to share research results.
73	Produce a report for construction companies that discuss gender design and inclusivity.
74	Publishing scientific paper on results of how the gendered transport system will improve the mobility of pregnant women and vulnerable people in the Kigali transport system.
79	Publish results in regional journals that can be a resource guide for local, regional and eventually global batik industries. These publications will also help share the data collected with others who are researching the industry both locally and internationally.
88	Lectures and classes hosted by participants of the research.
91	Publish scientific articles in areas of design and social sciences. Would like to publish a book in the future to bring together the photography and the modeling workshops completed throughout the research process.
A	Research results are already published, but looking to continue publishing as the projects continue.

No significant data was collected for ID50, ID53, ID47, ID80

ID	Scope
17	Want to expand context in terms of industry or type of product by extending this research to other industries as the general method can be utilized in other contexts.
33	Further data collection through participatory research to gauge what is important to the user. This data will be used to create a design guide to develop a prototype in the form of an application or chatbot assistant. Few ongoing projects: research into predicting loan default rates and using that information to explore data, and exploring the psychosocial, political and technological issues related with the use of social media, which is funded by the Addis Ababa University.
37	Want to bring research to other territories, collect more data to generate evidence, raise more awareness around gender urbanism and planning in terms of women and feminism, and reach more publics. Another component of the research is to explore more dimensions of vulnerabilities beyond gender.
38	Conduct a follow-up to include male participants since the research takes on a different meaning and context for men.
40	Continue working on the research and collecting more data with community members
41	Continue with research to further develop designs and expand and incorporate different methods and avenues, and different communities and their opinions about their relationships with space.
47	Expand research further and cover a wider area with innovations. Share knowledge with other regions in Africa who share similar problems, but working with the communities and incorporating their local culture and languages.
50	Continue with research and data collection, and investigate different factors that contribute to telecommunication developments. This research will also incorporate different demographics. Move on to the second phase of the project which would be to create a product or prototype.
53	Expand the project and to increase data and incorporate more participants in the research. Having large data samples provides stronger research which can then be disseminated to the industry.
57	Want to expand research to a global scale. Continue with the project to look at higher level research interests and improve designs.

ID	Scope
61	Continue to research different avenues and collect more data from different regions to reach a broader demographic. Build a prototype. Write a report that reflects on the process and methodology, the benefits of transdisciplinary approaches to research, and provide strategies that will guide others on how to conduct transdisciplinary research.
65	Continue with the research but compare research results to conventional generators.
71	Plan to continue with research and follow-up after the final stages of the GDS project.
73	Potential future of the project is to incorporate rapid urbanization, urbanization form, gender theories, gentrification, informality, inequality, power structure, social and cultural structures and more into the research.
74	Continue research and data collection.
79	Branching off into a new direction with a future project focused on recycling textile materials to reduce waste.
80	Continue the research to maintain relationships with the community. Research projects like this are an ongoing process.
88	Decision was made to not further develop the pana as the design and process is culturally significant to the community who made it.
91	Host future workshops to share research methods and results.
A	Research, design and produce more upper limb mechanical prosthesis with different drives and sizes, upper limb aesthetic prosthesis, breast prosthesis, and donate more. Divulge and disseminate the research projects to involve more people. Test and improve the developed prototype for the Mariana Project. Test and finalize prototype for perineal elasticity meter. Expand research to look at insect based adhesive for breast prosthesis.

Appendix B

Long-Term Strategies - summary of collected data from project interviews and reports

ID	Human/Cultural Aspects
17	Developing gendered design knowledge, expertise and new approaches should be emphasized. Research should focus on finding out valuable insights about the gendering of products and design and how we can really contribute to solutions of gender issues through design. One difficult area in this project was discussing sensitive topics with participants because online environments were not as safe since there is not a level of immediate trust. Using subtle language and questions was an approach to help mitigate this.
33	The goal is to provide theoretical contributions that can be added to create a knowledge base. This can act as a guideline for other researchers who are interested in gendered design. Gender design needs to be considered as an ongoing global movement and we must incorporate more gender design in future research. Using gender design and participatory design can be create inclusiveness and change negative connotations of gender inequalities within the culture of Ethiopia. More specifically, the research not only contributes to improving financial literacy but also focusing on cultural aspects of gender equality within Ethiopia and trying to change the misconceptions of women's roles in society by enhancing their economic literacy. Ethics clearance was required for the project to ensure ethical approaches to research, ensuring participant anonymity and privacy
37	The researchers stressed that the project is contributing to develop design knowledge on urban services and infrastructure and that there will be a continuation of work to deepen knowledge production. Furthermore, there is a commitment to the local community that should be sustained.
38	Building a knowledge base and ensuring that students have access to local and indigenous knowledge and examples is very important. Making gendered issues more visible in general is the ultimate goal. There is often a condescending nature when working between the Global North and Global South (there was not in the GDS interactions). Co-designing to amplify the things that the women are already working on was key and communication barriers with low-literate women created opportunity for new participatory methods. This was also important when dealing with sensitive topics, building trust with participants was crucial, and keeping everything relatable and relevant. Also maintaining safe spaces to interview and ensuring that all participants were compensated.
40	The dream is to have this project sustained and to continue the work on gendered design research. Additionally, building long-term relationships with the communities helps strengthen trust and future work. One important aspect to consider to build these relationships is speaking in the local language, this was important.
41	The researchers would like to continue with research to affect policy change in regards to building spaces with gender design approaches.
47	The community is not interested in bringing scientific changes and technology that will change the appreciation of the fish product after drying therefore it is crucial to stay true to local knowledge and practice - the aroma of the product should not smell differently from what they had before. Obtained ethics clearance to ensure confidentiality among participants.
50	Breaking the boundaries of traditional qualitative research design was beneficial. The project was able to contribute mainly to sustainable development goals for achieving gender equality, empowering all women who can participate, and giving voices for better policies and development of tech. Students graduating from the program were involved and it was important to nurture the talent of these students through the research project. Ensuring participants are comfortable participating in the research and adapting methodology to accommodate their privacy needs was essential.
53	Building knowledge in this context and highlighting issues and breaking stereotypes was one of the main focuses. Additionally, building trusting relationships with participants was also important.
57	Knowledge and methods have been handed down after generations and have improved along the way - it is vital to include these perspectives and local knowledge into the design because there are also multiple traditional methods amongst the communities and women. Speaking the local language helps support this. Promoting gender design (externally and learning within the team and community) is emphasized. Women participants felt more comfortable when there was a female researcher interacting with them. Some participant communities were difficult to get a good response so field workers were sometimes relocated to another community. With this they had to meet people where they were and ensure they understand that the project will benefit them not just the researchers.

ID	Human/Cultural Aspects
61	What the PI has learned now is to be a bit more patient, to be able to understand that they cannot get results overnight and that they cannot change people's perception. Just because they are very enthusiastic and want to spread it to their students, does not mean that they are going to change their way of thinking. They live in an environment, they have their own problems so, this impetus that the PI had when they were young, this project has taught them to be able to observe how people think from other points of view.
65	Native dialect was used which was key and local knowledge from the community is important and necessary to consider. Others can improve upon what they have done which is important for sustaining and expanding this knowledge. It was also difficult to communicate with low-literate participants so they made the interviews simple and straightforward.
71	"Traditional knowledge in Africa is very strong". This is why speaking in local language was emphasized. New ways of working and thinking were discovered. Also, building knowledge from masters/PhD research was helpful to expand on existing . There is added value to design through new approaches - not just monetary value or material benefit but promoting designing for a better world.
73	Ethical clearance was obtained. Further research to incorporate different avenues can influence inclusive policies in house design. The goal is to develop research using modern thinking and contemporary technology, to improve public spaces, while incorporating gendered perspectives and Indigenous/cultural aspects to their design
74	Strategic planning and executed research has taken into account women's vulnerabilities and gender issues - women and vulnerable abilities are essential contributors to development process. It was hard to connect with certain demographics- i.e., pregnant women. They tried to reach out to pregnant women in hospitals but were not able to do that. So they had to adapt ways to gather research and data by asking people at bus stops and on the bus, and riding the bus with them and providing people with a QR code so that they can access the survey from their phone and fill it out on the go. Ethics clearance was obtained. The goal is to influence policy change.
79	Making more comfortable and modern solutions for women is the goal. Working with the local method and working collaboratively to improve it. They initially wanted to introduce a brand new method but figured it would take away from the cultural and traditional ways women produce batik. University programs on textiles- reviving a dying industry - initiative of the government. Had to build trust with the participants and show them that this research is to benefit them, not that they were trying to steal their designs. Also, they were working towards modernizing the technology and producing tangible products for women in the batik industry to work more efficiently and sustainably.
80	Transversal approach to build new knowledge with multiple disciplines. Thinking about deconstructing patriarchy and redesigning the idea of femininity. Contributing to knowledge from community voices was an important aspect to emphasize on and also respecting local knowledge and conditions conversing as equals. On this, also bringing local indigenous knowledge to forefront in the project was key. This also supports in building long-term relationship with the participants and communities.
88	Mobilize local knowledge and powers that impacted the perceptions of what was understood of gendered design. The pana as a bag is a feminist technological tool that has become a materiality from which these women can recognize and disseminate the ancestral knowledge of their territories. Ethical decision to not replicate the pana elsewhere as there are significant cultural ties to the community in which it was produced with.
91	Gendered knowledge was important and there was an emphasis on deconstructing conventional ways of thinking. Using smaller groups to create safe spaces to share sensitive information was also a strategy that was used in data collection.
A	Supporting other institutions with resources to carry out more research projects in this field.

ID	Social Aspects
17	Working on building capacity of the research team - both academically and networking skill, develop students' research skills. This increases researchers' visibility and recognition at the national and international level - the "impact of being part of an international project is undeniable". (COVID) posed challenges because no one was talking about public transit anymore, the project had to shift the focus a bit to university students.
33	Using resources the community is already familiar with such as mobile phones.
37	Interacting with policy makers to share results and work and create dialogue. There is also a formal agreement with the city - entry point to dialogue and exchange to contribute to design of policies. The pandemic highlighted many social, political, economic issues. Lockdown was a challenge but shifted to phone interview, focus or virtual groups, desk jobs. Miro was an important tool for women's organizations that had access to internet.
38	Providing evidence to show at the policy level in order to support women's access to digital tech. The project focused on creating a policy brief with community organizations to discuss where government should work to build capacity of low-income, low-literate women (translated in multiple languages). This means that there will be policy implications for the long-run. This project supported the researcher who supported two other female researchers and their careers. Furthermore, students and recent grads were trained and taught about gendered research and its advantages which helped them apply to other universities - professional training. COVID affected meetings with participants since the work had to be done in person (sensitive information, safe spaces, no access to internet, etc.)
40	Hope to influence policy and reach the local and central government to build more strategies and national frameworks. COVID delays in the project field work, and therefore had to revise the budget to obtain masks, sanitizers, etc.
41	Publicize gendered spaces through periodic communication campaigns- emphasis on the positive impact gendered spaces have on the campus. Also the project aimed to raise awareness for the university community to avoid ghettoization of gendered spaces. Being able to be flexible and listen to the needs of each team was important, especially in a context as complex as the pandemic, where flexibility was essential and resilience and the ability to be able to listen and adapt to problems that were not foreseen when the program was designed. All this methodology that they planned to implement was impeded by the pandemic. So quickly what they did was understand that they had to apply another methodology that, while sustaining the perspective and approach of ethnography, had to be focused on digital ethnography. In the context of the suspension of classes due to the pandemic in which the research was carried out, the ethnography sought to investigate the feelings and perceptions about university spaces from the communication and exchange in social networks. The change in circumstances led them to think about the new ways that gender express in social media, considering resistance and hate speech phenomenon.
47	Research donors and implementation organizations, institutions and individuals should plan for sustainability of sponsored projects involving governments and people. Provisions were made within the budget to buy some consumables like the face mask and the pump to wash their hands with soap and the sanitizers and all of those. The problem was there, but they had to comply at least to some extent to the rules of COVID. It did not stop them, it was not an obstacle. They pulled through the case studies and all of those exposures, means to continue as normal.
50	Research outcomes will be used to inform policy makers, including government at all levels. This will also inform tech innovators and designers for greater impact in regard to societal development and gender- which align with the UN sustainable development goals to empower and achieve gender equality that is also an important agenda of development in low-to-middle income countries. (COVID) the team was required to adjust the research questions, moving from traditional ways of data collection to online research methods. All data collection were conducted online and remotely due to the impact of an unprecedented pandemic (COVID-19) where mobility restrictions and social distancing practices were imposed in Malaysia in March 2020 until the fourth quarter of 2021 with various level of restrictions. The social distancing measure had impacted on the data collection procedures for Phase 2. Interview, mobile walkthrough, diary writing guide and protocols were designed carefully for online data collection with female elderly. Senior learning community has helped advance and support certain skills and knowledge (including digital skills), especially during the pandemic that has created a digital/virtual environment for the elderly to practice their digital skills.

ID	Social Aspects
53	Covid affected the timeline of the project.
57	There is hope to drive policy reforms. Training the students and team members in computer assisted survey tools for future research was important. Also training fish processors and fishers to build autonomy. COVID affected the research, but everything is trying to return to normalcy.
61	They want other students from other institutions and countries to know and learn from project- advise them. They were still in a pandemic, so, when talking about social problems, they always thought about an approach, about personal work, field observations, interviews, and how they were going to do it.
65	This project gave them the opportunity to learn and grow - "spread our tentacles". Knowledge was acquired about Miro tool to collaborate in an online environment and is still used by the team members. COVID affected timeline and physical meetings - participants used zoom, letters, phone calls.
71	Training women in renewable energy is a key step to promote gendered design. There is hope to create impact on a larger scale. The team also benefited from learning from gender knowledge, two students continue to work in this field and will be able to work on gendered design research locally or international in the future. Influencing policy makers in the future - how can this happen not only through publication.
73	Research brings attention to government policy makers and housing beneficiaries, the importance of understanding gender based issues related to construction activities. There is a need to make known the importance of gender consideration towards sustainable development. Advocacy- there is a misunderstanding on inclusiveness at the workplace and at home- awareness programs and examples to share with the society. (COVID) communication fees helped us to have a strong internet connection that allowed to discuss and work on the project remotely. Some discussions were difficult to manage online and to create a collective dialogue, which would have been easier with a physical meeting. They also created a project 'WhatsApp' group to use in emergency or when decisions needed to be made quickly as it was not always possible to schedule an online meeting. That was one of the solutions to adapt to COVID-19 challenges.
74	Gender sensitive tools in this research can lead to more effective and sustainable development of policies and programs.
79	Through research they are trying to encourage girls that science is for everyone. Organization for Women in Science for the Developing World (OWSD) which is in Italy- using the organization as base to reach out to young women in schools to talk about their opportunities in STEM.
80	Developing a long-term solution not only to improve environment but to sustain a way of living. Students and Aisha women's collective, students trained as community managers of social networks with an editorial line based on political subjectivity, activism, and practices of female resistance. Pandemic has posed some challenges to community work. Miro was used, took advantage of virtual spaces to plan and make prototypes
88	The project composed of people from different areas has created a permanent process of dialogue between the university and the communities- reflection and intervention in gender design. Relationships between academics and community was important because of how the community presented lessons on life of forest peoples and their worldviews which were invaluable for thinking about the future of cities on the planet.
91	Training researchers and workshop volunteers, learnings related to platforms and digital communication tools - Miro, google meet. (COVID) progress was challenging with online work, many women do not have access to a computer and those who do, do not have the skills. Gendered issues are also exacerbated.
A	Building capacity by training other university programs (University of Londrina) how to build prototypes that now they can make them and work with the women in their own region.

ID	Economic Aspects
33	Working with and getting support from a local bank was key, directing participants to a trusted partner to continue their banking with was also important.
37	Does not want collaboration with current funding to stop, more resources are required to do more in-depth work.
38	There should be more allocation of funding to female researchers in STEAM in general and from larger organizations. If there is a way to support female researchers to do this kind of work or to do their PhDs that would be a great area to focus on. This is also because the local university is not supplying grants so they have to apply for external grants such as these ones. Another note is that when funding is giving, the diversity of funding is important, this gives agency in spending the money in different ways that fits the context.
40	Funding in cash is favourable (previous funding came in the form of equipment which was quite limiting). The university has to look for funds and is constantly looking to win more projects like this one, so it is a challenge.
41	Invest in infrastructure and cleanliness- improve material conditions, maintenance schedules, more frequent monitoring during the day, imovie material and hygienic conditions of classrooms, labs and workshops, light fixtures, implementing accessibility features in courtyard to encourage outdoor activity, promote actions to improve safety conditions for walking, improve parking lot lighting and access. All of these recommendations are ways the research conducted can be utilized
47	Due to lack of funds the prototype was constrained to a construction of a table craft model only. There was also an introduction of charges for people that are coming to get market spaces, the entrance pricing policy will help to sustain and maintain the technology.
65	Funding and association with international institutions (IDRC) gives the project more weight and more attention which is beneficial for future work.
71	Internet is quite expensive in small islands in Africa, this is why allocating funding to this helped with necessary online work.
74	With association and collaboration, the skills gained from this research can help to keep applying for funding and projects that will support women
79	Using modernized methods and natural dyes will allow batik producers to produce batik with improved qualities and potential repeatability. This will attract more customers and allow batik producers to access new markets. Successful batik industry will bring positive impact to Tanzania's textile industry and cotton sector as more yarns and fabrics will be required for the batik, this will positively impact other sectors of the textile supply chain and provide more income for the country- improving economic situation. There is more of a focus then on the Batik market within the country rather than relying on imported batik from other countries where the quality might not be as good.
80	An important aspect is not only focusing on economic resources but also receiving support from others and networks that think the same to sustain the work. Gendered topics are sensitive in universities and issues in management and politics, hence this support is crucial to secure these projects.
A	It is extremely important to secure funds from an external source as there are not many opportunities for funding within Brazil. In turn, with the funds from GDS, they were able to build up partnerships and resources so that they could be a distributor for other projects. For example, they allocated funds to buy a 3D printer to send to research partners at Curitiba Hospital where they can now provide assistance to a series of women who were on a waiting list and no prospect of being assisted before.

No significant data was collected for ID17, ID50, ID53, ID57, ID61, ID73, ID88, ID91

ID	Environmental Aspects
40	Use of solar panels to build capacity and provide accessible energy for all.
47	Use of traditional sources of energy like firewood or coal to promote community acceptance and adoption of method. There is also a emphasis on the elimination of drudgery, smoke, heat and burns during fish drying and the facilitation fish dry duration, as well as the improvement of drying control, and environmental sanitation.
71	The project focused on wind turbines to provide a sustainable and efficient source of energy.
79	Develop a technique that uses less chemicals and auxiliaries - utilizing natural materials such as turmeric and onion peels. In this way the project also focused on eliminating issues associated with synthetic dyes which tends to affect skin and health in general (fumes). This in turn will also reduce the amount of chemical waste.
80	The use of Miro to save on printing costs and paper.
88	Focused on a way to build that is not polluting the environment.

No significant data was collected for ID17, ID33, ID37, ID38, ID41, ID50, ID53, ID57, ID61, ID65, ID73, ID74, ID91, IDA

Appendix C

Short-Term Actions - overall summary of collected data from project interviews and reports

Themes	Quick Summary	Regional Comparison- Africa	Regional Comparison- Latin America	Regional Comparison- Asia
Further Collaborations	- Continuing partnerships that were established during the program (participants, stakeholders, organizations, universities) - Continuing research by partnering with internal (regional), external (international) and government organizations and institutions who will provide resources and funds - Expanding research by partnering with other local and regional communities - Establishing transdisciplinary networks to incorporate other skills into research - Interest in collaborating with other GDS projects - Projects allowed participants to establish own networks amongst themselves or with other organizations which will help create collaborative businesses, allow participants to disseminate knowledge and experience to other communities, and participate in further research	- Continue working with global and regional organizations, project stakeholders and government to acquire more resources and funding, and implement research results - Continue to work with local community to gather more data, and building partnerships with more universities for research purposes, expansion and networking opportunities - Collaboration with local communities gave the participants a chance to network amongst themselves and develop their own partnerships for the future. - Partnerships with publishing companies to disseminate research - Would like the opportunity to further collaborate with Carleton University and the GDS program, as well as networking possibilities with other GDS projects to develop more international project outreach, and more opportunities for South-South cooperation - Transdisciplinary approaches to research requires skills and competencies that come from collaborating with other institutions, organizations and communities	- Emphasis on the importance of the Global North's (GN) role in pushing funding and research agendas forward. More collaboration with the GN to be able to pursue research with GN influence and resources. Connections to a global network - Collaborations with donors and partners that support similar initiatives, continue to work/develop partnerships with other regional organizations, stakeholders and institutions that can provide resources, funding, and other networking opportunities. - Importance of nurturing bonds with communities and other partner organizations for the sustainability of the research, networking for researchers and for participants with other institutions, and overall to receive different viewpoints from multiple voices that could create more powerful research and visible research - Collaborations with other communities to collect data and expand scope of research participation and to create movements within the community without having to publish results in an academic sense - Liked the ability to collaborate with other GDS teams in Latin America to see what else people are researching. Easier to understand research and method because of the similarities in political language. Networking with other GDS programs gives opportunities to collaborate with each other in the future - Applying transdisciplinary approaches to develop new research avenues through the use of collaboration	- Collaborations with regional organizations to receive resources for continuation of research, and a way to connect to the public to receive feedback - Collaborations with NGOs and other women's rights organizations to foster long term partnerships - Expand partnerships - Incorporating transdisciplinary approaches through collaboration to develop research further - Valued the labs hosted by GDS as there is potential to collaborate with other international projects, however would have liked more opportunities to connect through GDS. Interest in further collaborations with GDS program
Scope	- Continuation of research to explore new avenues and ideas that had come about during the initial research phase. - Continuing research to collect more data on a broader scale and using transdisciplinary methods - Development of prototypes, or building technology based on prototypes that would be ready to be used - Pursuing new projects that have developed from partnerships and new research questions throughout the project - Not continuing any future research or prototype building because of the cultural significance the product and research has to a specific community	- Continue to collect data through participatory design - Continuing to collect data in order to improve current data, and stay up to date - Exploring new research avenues that had come about during the initial phases of the research project - Creation of a prototype - Expanding research by covering a wider area and sharing knowledge/research with other regions who share similar problems- looking beyond local and seeing global opportunities	- Collect more data internally and externally to generate more evidence, and broaden scope of research - Exploring more dimensions of research including gender - Continuing with research and incorporating different methods and research avenues, as well collecting more research to further develop initial designs - Build a prototype, and enhance current prototypes with more research, more resources and different materials - Deployment of transdisciplinary approaches and create a guide for others to follow the research process	- Expand research to other industries to have a greater impact of the benefits of the research - Follow-up studies, and continued research, investigating different avenues that have come up during the research phase - Development of a product or prototype
Funding	- Continuation of research projects and building of prototypes require funding either from GDS, IDRC, partner institutions, government or internal/external organizations - Writing funding applications and grant proposals to receive further resources before continuing with projects - Faced a few challenges in terms of external funding and internal funding opportunities that delayed the projects - made recommendations for future funding allocations, to release funds in a timely manner, to take into account currency exchange	- Acquiring funding from regional organizations and partners, as well as global organizations to continue research, however some cases may be difficult - Funding from GDS, internal donors, government agencies, and other international/local organizations and academic institutions to continue research, or move into next phases of research proposals - Allocation of funds were used for different aspects of the project to help long term sustainability of research- buying resources that could be used for the current project and beyond, but also allocating funds to apply for other funding opportunities to acquire resources necessary - Challenges associated with funding, such as currency exchange rate caused issues with receiving and using funds.	- Funds for the project were allocated for different aspects of the projects, which led to more opportunities to acquire more funding from other places - The need for funding to maintain and develop research further - Challenges associated with receiving funding and grants from global north, including miscommunication and currency exchanges. These challenges slowed the progression of the research, however external funding is highly in demand, as internal funding is influenced by political affairs.	- The research conducted and published created new avenues for research and opportunities to apply for grants and funding - Allocating funds for different aspects of the projects, including ways to disseminate research to a wider audience through conference presentations and a website - Funding is needed to continue into next phases of the projects - Collaborations with other internal/international organizations, including GDS for further funding and resources
Dissemination	- Publicize research through more public media channels such as websites newspapers, TV interviews, public workshops and talks, magazines, Instagram, Facebook, Twitter, Whatsapp - Teach participants so that participants can share knowledge and experiences with other community members - desire to reach a wider audience within the region and also internationally (possibly through GDS) - Advocacy initiatives and publicly discussing research with government to affect policy changes - Publish scholarly/scientific articles, book chapters, books, and manuals in established, regional and international journals - Researchers and participants presenting research at conferences, lectures and seminars at various institutions	- Emphasized the importance of GDS and publications through GDS program to more international audience - Sharing research through public seminars and workshops, and looking at outreach opportunities to reach more communities with similar potential for research progress. Utilizing these opportunities to teach participants, who can then host public workshops by themselves and disseminate information more locally - Use of public media avenues to reach larger community - Advocacy amongst the community to create awareness at a local and public level especially in terms of educating on the importance of gender design. - Workshops, seminars and conference presentations with partner institutions and stakeholders to share results, progress and interim solutions - Publications in scientific journals, and publishing articles, books and chapters for academic use and future research- international, national and local - Producing reports for policy makers to inform them of the research, and influence development/changes in different policies, as well reports are used as guides for other organizations on a local and international scale	- Use of public media sources and non-traditional publishing platforms to reach wider audience - digital and printed media - Advocacy and dissemination to public and non-academic circles on research and benefits of gender design - Participation in conferences and seminars - Publishing research in academic journals and in multiple languages (Spanish and English) for broader reach - Having the participants give lectures and classes within academic institutions	- Use of various media channels to disseminate research findings to the wider public and more engagement with community members - websites - Publishing research through journal articles and academic platforms - Dissemination of research through conference presentations

Appendix D

Long-Term Strategies - overall summary of collected data from project interviews and reports

Themes	Quick Summary	Regional Comparison- Africa	Regional Comparison- Latin America	Regional Comparison- Asia
Human/ Cultural Aspects	- Developing research methodologies that incorporate gender design and participatory design to gather inclusive data and research to destigmatize traditional views of cultural gender inequalities and break stereotypes - Ethical commitments to the communities, and ensuring their needs, their cultural practices and knowledge are embedded within the research - traditional knowledge and methods are reinvigorated with contemporary practices and technology to achieve sustainability, continuance and futurity for further generations to learn and appreciate traditional values within contemporary contexts - Mobilization of local knowledge and language. Focusing more on the sustainability of the community, rather than research for scientific purposes. Focusing more on listening to what the people need and want, not what the researcher thinks the people want. - Building trust with participants and communities, sharing authority and resources to ensure the project is built and conducted on collaborative approaches - Using ethical approaches and building relationships/trust with participants ensures longevity of the relationship, which continues to benefit both the research projects and the communities involved - Incorporating more gender design approaches in the future to improve and modernize research and prototypes - Maintaining technology to keep up with modern standards - Using research and resources obtained through project to support other organizations	- Develop a theoretical framework of knowledge and practice to act as a guide for other researchers both regional and global, pursuing studies in gendered design. - Utilize gender design and participatory design to create collaborative and inclusive research designs that gather and incorporate community perspectives, local knowledge, local language, and traditional practices to change connotations of gender inequalities and develop strategies and technology to assist in bettering the working and living conditions of women. - Emphasis on the importance of local and traditional knowledge to ensure that modern science and technology is not imposing on tradition and listening to what the community needs and wants. - Develop programs to teach the younger generations about gender design, traditional knowledge and new approaches to research with contemporary technology - Continuation and sustainability of the projects in the future to continue developing strategies and promoting gender design at a regional and global scale. - Utilizing research projects to change the narratives around the roles of women in society by working with women to teach them financial literacy, how to use contemporary technology, and working together to develop sustainable strategies for their own work. - Essential to build trust between the researchers and participants that would allow for long-term relationships and future collaborations beyond the research projects. By building a sense of trust, the researchers were able to demonstrate the ways in which their research would benefit the community, and contribute to bettering their society. - There was a need to adapt to changing circumstances and find new methods to work with low-literate communities and specific demographics of people while still conducting research ethically. - Ensuring that both the participants and researchers felt safe during the research process. - Essential to obtain ethics clearance when working with participants to ensure their anonymity and privacy	- Contribute to developing a framework of knowledge about gendered design and femininity, urban services and infrastructure that incorporates multiple disciplines, community voices, and traditional knowledge - Continuation of research projects to deepen the knowledge production, develop new strategies, and continue to develop new ways to improve the livelihoods and working conditions of women, and break gender stereotypes - Sustain relationships with the community to continue working and supporting them beyond the project. - Essential to build trusting relationships with the participants to create safe spaces for the community to learn and share their experiences and knowledge. - Doing research with the community has taught the researchers patience and limitations of research. Part of the research process is learning different perspectives from the participants, and understanding boundaries. - Making ethical decisions to best benefit the communities the research teams are working with, and ensuring that cultural and traditional values are held in the highest regard.	- Developing knowledge framework around gendered design to make gendered issues more visible, and utilize new approaches and field expertise to investigate gendered design challenges and solutions. - Ensuring that younger generations have access to local and indigenous knowledge. - Breaking boundaries of traditional qualitative research design and utilizing methods that engage the community, contribute to sustainable development goals to achieve gender equality, empower women, and produce research that encourage better policies and development of technology. - Moving to online methods to collaborate with participants was difficult because of the sensitive nature of the discussions. The online environment did not feel safe, and there was not an immediate level of trust. The research teams used subtle language, and asked questions to establish a relationship with their participants and build trust in order to create a safe space and conduct their research ethically. - Although there were a few communication barriers with low-literate women, it gave the research teams the opportunity to utilize new participatory methods to engage with the community. - Utilizing research skills and expertise to co-design and amplify things that women in the community are already working on, whether it be modernizing traditional practices, building new technology or contributing to more sustainable work. - Often there is a condescending nature when work is being conducted between the Global North and the Global South, however there were no such interactions throughout the GDS project, which made the research experience better for the research teams.
Social Aspects	- Training students and community participants to develop networking, researching, presenting and other valuable skills so that the research from the projects can be shared in multiple ways- through institutions in an academic framework, and through public interactions through local communities - Research used to inform policy makers and technology developers, and influence policy changes/ technological development for the betterment of society being inclusive of gender and age. Research identifies areas that the government and other organizations need to focus on and provides recommendations and strategies to implement change that will help increase the livelihoods of the current and future generations - Empower and achieve gender equality as per the UN Sustainable development goals by using gender and participatory research - Public advocacy to encourage the current population of the benefits of gendered design, as well encouraging younger generations to be involved in sustainable research to continue to fight challenges and create change - Adapting research methods such as gathering data to comply with COVID restrictions, using digital platforms of communication and reworking parameters of research ideas - The pandemic highlighted different social, economic and environmental issues that became areas of focus throughout the research projects and affected the overall research outcomes - COVID caused delays in the projects meaning that some were unable to complete all stages of their research within the proposed time frame, which meant to focus on larger and more important aspects of the projects such as data collection and dissemination - COVID actually brought about different avenues of research and prompted certain studies	- Utilizing the resources, knowledge and methods that the community is already familiar with to conduct research and facilitate workshops that teaches both academic researchers and community members about gendered design to encourage sustainability of the projects, continuation of the research, and actions to impact gendered design on a larger scale. - Building strong research foundations to influence policy and inform local and central governments to develop more strategic initiatives that incorporate gendered design. - Raise awareness and advocate for gender inclusivity in the workplace and at home by engaging the community in programs that discuss these issues and gender considerations that support sustainable development. - Utilizing research to encourage younger generations, especially girls, towards science, technology, engineering/economics, arts, and mathematics. - COVID-19 pandemic delayed the fieldwork of many projects causing projects to reconfigure research ideas, and revise their budget to include funds spent on masks and sanitizers that would allow them to carry out their research in person, and using funds for technology and internet connection to conduct research online. - Adapted to the COVID rules by using online platforms to stay connected throughout the projects. Using online methods did not stop the projects from continuing, but instead the projects found new ways to conduct their research.	- Present research to policy makers to influence changes in policy that can benefit both men and women - Raise awareness and advocate for gendered spaces among the community through programs, campaigns, public lectures, workshops and other collaborative efforts. - Utilize research projects to develop long-term solutions for sustainable development that continues - The pandemic highlighted many social, political and economic issues which the research teams were able to incorporate into their project, which provided new avenues of research, and future iterations of the project. - There were many delays in the projects, however each project adapted to COVID rules by conducting research online and through phone communications. The pandemic brought on the opportunity to be flexible with the research, and created stronger collaborative teams as they worked through the many issues that the pandemic brought about. - Shifting focus to online methods meant exploring other digital avenues such as Miro, and utilizing social media for research purposes, as well as dissemination of information. - Issues with conducting research online meant that not everyone had access to the necessary technology or internet, so research teams had to come up with new ways to approach their research.	- Building capacity of the research teams to improve networking and research skills that are beneficial both for the individual projects and personal development. - Working with communities and organizations to influence policy changes and inform government and policy makers of the research conducted in order to enact policy changes better reflect the needs of women. - Using research and results gathered to encourage technology innovators to factor in various stages of societal development and gender which aligns with the UN Sustainable Development goals to empower and achieve gender equality. - Many challenges arose with the COVID-19 pandemic which caused shifts in research goals. Research teams had to adopt new methods and reconfigure their research goals to work within COVID protocols, which meant moving most of their projects online. Moving to online methods affected conversations with participants as not everyone had access to technology and more importantly there was sensitive information being shared and online spaces did not feel secure. The move to online methods meant that in person training sessions were postponed. - Moving to online methods however did provide some positive results as researchers saw it as an opportunity to teach participants how to use the technology and become more technologically literate. During the pandemic, this allowed participants to gain digital knowledge and skills that they could use beyond the projects.

Themes	Quick Summary	Regional Comparison - Africa	Regional Comparison - Latin America	Regional Comparison - Asia
Environmental Aspects	- importance of continuing relationships with partners and collaborators to ensure funding is available. Allocations of funds can help sustain and develop different aspects of the projects for future exploration and use - increase individual capital through advancements in technology, learning opportunities and contemporary practices to encourage efficient and sustainable business development - ensuring that resources are available for participants and continuing research by maintaining partnerships for funding, or finding ways to be self-sufficient	- Research on gendered design impacts economic growth for women. Using participatory methods, women are able to learn financial literacy throughout the research process, and develop strategies to grow their business and increase their income. - Emphasis on the need for funding to continue researching, but finding it difficult to apply for external funds with currency exchanges and delayed wiring transactions which negatively impact the research projects. - Utilizing research to implement pricing policies in public spaces such as markets that will help sustain and maintain newly developed technology without having to apply for external funding. This will ensure that the use of technology brought on by gendered design research can be self-sustaining without external or institutional funding. - External funding, especially from IDRC, has helped each project adapt to COVID procedures, which meant allocating funds to transition to more online methods of research. The partnership with IDRC has been beneficial for the projects as they are gaining more international attention, as well the skills learned through workshops with IDRC members have initiated a sense of confidence in many research projects that have encouraged the researchers to apply for other larger grants to aid in furthering their research.	Emphasis on more funding to continue the research and invest in infrastructure and technology which will in turn provide more positive outcomes that can affect human/cultural, social, economic, and environmental sustainability. - Using the skills learned throughout the research projects, in collaboration with IDRC to apply for more grants and resources from other networks, internally and externally, that can financially sustain the research projects. - Allocating funds for different aspects of the project that fulfill short term research goals as well as investing in technology that can sustain the research and the work for the future.	- Emphasis on allocating more funding for female researchers in STEAM to encourage more women to pursue research, and to support further research on gendered design. - A need to apply for external awards and grants as local universities are not supplying funds to pursue this research. - There should be some flexibility to how the funds are spent during the research that allows for both short-term action and long-term sustainability.
Environmental Aspects	- developing techniques and technology that are more environmentally friendly and energy efficient - utilizing natural resources that can be recycled that also contribute to environmental sustainability	- Research on building technological solutions that provide accessible energy for all, as well as being environmentally friendly and sustainable. - Incorporating traditional sources of energy into modern energy efficient and environmentally sustainable solutions. This approach is inclusive of community voices and traditions, while eliminating harmful toxins that affect human health and the environment.	- Learning new ways of conducting research that is more environmentally friendly, such as using online methods of sharing research amongst the teams rather than printing physical reports. - Discovering ways to utilize technology to build infrastructure that is more environmentally sustainable and does not contribute to pollution.	