

AidData gender research initiative

Increasing women's economic empowerment is a crucial component of development. Not only does economic empowerment directly improve women's autonomy and wellbeing, but it also creates indirect benefits for child health, community engagement, and education. Women face a host of problems in developing contexts, including a lack of household decision-making power, insufficient land rights and control of agricultural resources, and high barriers to labor market entry and free mobility. In response, a number of public policies, legal frameworks, and programs have been proposed to enhance women's empowerment. However, understanding which policies and programs are most effective is incredibly difficult, due to the challenges inherent in measuring women's empowerment and the difficulty of properly evaluating the impact of programs and policies designed to boost women's empowerment.

AidData, an international development research lab based at William & Mary, seeks to utilize its proven track record of expertise and innovation in Geospatial Impact Evaluations (GIEs), geospatial data, machine learning, remote sensing, causal impact evaluations, and policy research to address these hurdles inherent in gender-based research. We will capitalize on our expertise in measurement, machine learning, and remote sensing to provide better and more cost-effective measurement of women's economic empowerment, decision-making, and control of resources. We will utilize our expertise in GIEs and causal impact evaluations to provide a more comprehensive understanding of the policies and programs that can boost women's empowerment. Finally, we will employ our expertise in policy research to ensure our findings are policy-relevant and actionable.

The seven research concepts below are currently in development. Both partners and funding are being sought to conduct this groundbreaking work.

Prospective research streams

Improved measurement of gender-related outcomes

Successful gender-related research requires effective and efficient measurement of key outcomes, such as female decision-making power, control of resources, and exposure to violence. However, measuring gender-related outcomes accurately and precisely is difficult due to the correlation of women's empowerment and willingness to participate in surveys, as well as the complicating role of concealment and information

asymmetry in household decision-making. Without effective measurement of gender-related outcomes, policymakers and practitioners remain unsure about the full effect of a particular intervention. Our research team is interested in improving the effectiveness of these measurements by first characterizing the inherent measurement error and then by considering methods that could reduce this error. Many of the key outcomes used in gender-related research suffer from measurement error for a variety of reasons, including recall bias, social desirability bias, and correlation of women's empowerment with willingness to participate in surveys. Reducing this type of error allows researchers to anticipate when measurement error is likely to be large, design better surveys to prevent or reduce measurement error, and account for measurement error in the analysis stage.

Gender and geospatial measurement

Measuring women's empowerment using traditional survey techniques may be insufficient in contexts where on-the-ground methods are too costly to implement, or where it is unsafe or difficult for women to participate freely and respond honestly to surveys. Satellite imagery and remotely sensed data have the potential to supplement on-the-ground measurement of women's empowerment, as machine learning techniques can be used to detect outcomes correlated with women's empowerment from space. Such correlates could include the presence of traditionally women-farmed crops, gendered investment in agricultural fields, the number of traditionally women-held assets, and ease of travel. Identifying remotely sensed correlates of women's empowerment could potentially reduce costs of measuring women's empowerment and allow measurement in difficult to reach communities. We aim to provide comprehensive information and guidance on which measures of women's empowerment can or cannot be predicted using information from satellites, in order to improve the efficiency of traditional survey techniques.

Intra-household dynamics

Intra-household bargaining is a powerful dynamic that impacts not only how much control over resources a woman has, but also her level of personal independence and her risk of experiencing intimate partner violence. Female bargaining power and incidence of intimate partner violence are therefore key indicators of women's empowerment. Many development projects have improving women's empowerment as a central aim, but they lack the

baseline and follow-up data to conduct an evaluation. Other projects do not have women's empowerment as a specific goal but unintentionally affect women's empowerment. We seek to utilize our expertise in geospatial impact evaluations (GIEs) to geospatially link development projects with existing secondary data that measures bargaining and intimate partner violence. This will give funders and development partners greater insight into how their programs have impacted household dynamics over time and provide valuable evidence for future program planning.

Geospatial insights into gendered farming experiences

Rural households in developing countries often rely heavily upon agriculture for food and income, but men and women do not sit equally within the agriculture sector. Women often own less arable land and have less formal training, weaker land rights, and access to fewer agricultural inputs than men. Utilizing a combination of household surveys and high-resolution historical satellite imagery, we can assess past field usage to understand how land rights, relationships, levels of empowerment, and access to agricultural inputs can impact current and future yields for women and men. Knowing how past patterns and behaviors have impacted current yields, as well as providing insights into the nuances that current data sources lack when it comes to women's farming, can give funders insight into how best to increase future yields through the improvement of policies or programs.

Gender and land rights

Women's land rights play an important role in farming and other sectors. Laws regarding property ownership for women vary significantly across the world, and women's land rights are often curtailed by local practices and customs that limit a woman's ability to own property in her own name, include her name on titles with her husband, and limit the types of crops she can grow. The research team is interested in exploring how policies aimed at increasing women's property rights—such as programs to add the wife's name to a joint title, education programs to help women understand their rights, etc.—affect a variety of outcomes for women and their families, including agricultural production, crop selection, household bargaining power, and intimate partner violence. The team will deploy a combination of methods to analyze these outcomes. Household surveys will be used to measure livelihood outcomes, household bargaining power, and intimate partner violence, while satellite imagery will be used to detect changes in agricultural production and crop selection.

Reducing barriers to women's employment

Despite the importance of female employment for women's empowerment and wellbeing, women's participation in skilled and formal employment remains low in developing countries. Helping women enter skilled and formal employment can not only increase income and resources within their households, but it may also increase their bargaining power and allow them to exert more control over household resources. Employment can also make women more resilient in the face of shocks, increase their independence, and give them access to more support and resources outside of their household that could help reduce intimate partner violence. Our research team is interested in learning how to improve women's skill accumulation and how to better market those skills to increase formal employment opportunities. Our goal is to apply geospatial impact evaluation (GIE) methods—which can be employed even in the absence of baseline data—to better understand the causative factors hampering women in their search for employment and find solutions to reducing those barriers to increase women's ability to obtain employment. We hope this research will help programs focus their resources on more accurately and efficiently reducing and removing these barriers to maximize their positive impact on women's lives.

Women's mobility in urban public spaces

Physical mobility and freedom of movement, particularly in densely populated urban areas, is not only a basic human right but also a fundamental building block of the economy, as it enables productive human interactions. Research shows that in Asia's largest cities, for the same origin-destination combinations, women spend more time and money traveling from place to place than men do and endure a number of threats to their health and safety, especially at night. In many planning agencies around the world, there is a dearth of appropriate female representation in transit planning and operational design conversations, which in turn reduces the possibility of public transport systems fulfilling women's unique needs. AidData seeks to generate novel evidence on the specific ways in which women's lack of security in urban public spaces stifles productivity of regional economic systems. By using mobile technology and forging data partnerships, location- and time-specific insights could enable cities to improve street lighting and undertake smarter police patrolling.

Meet the team

Katherine Nolan is a Senior Research Analyst in AidData's Research and Evaluation Unit, where she conducts impact evaluations on a variety of development topics, including health and governance. Katherine's current work includes a retrospective evaluation of a child and maternal health project in Bangladesh utilizing geospatial matching techniques and household surveys, as well as a retrospective evaluation of the impact of small earth dams on gender dynamics in Northern Ghana. Her expertise lies in household surveys, data management and analysis, retrospective evaluations, and geospatial analysis.

Rachel Sayers is a Senior Research Analyst at AidData's Research and Evaluation Unit, where she conducts impact evaluations on a number of development topics. She combines econometric and GIS analysis methods to design and conduct rigorous evaluations with an emphasis on causal identification. Her primary research interests are labor markets, human capital, household bargaining, and gender. Rachel received her Ph.D. in Economics from Duke University.

Jessica Wells is a Senior Program Manager in AidData's Research and Evaluation Unit, where she is the lead program manager for numerous awards from funders, including USAID and the Hewlett Foundation. Jessica conducts research on the intersection of gender and development. She works on projects analyzing gender-based violence in schools throughout sub-Saharan Africa. She is also conducting a retrospective evaluation of a small earth dam project in Northern Ghana in relation to gendered household dynamics. She is a co-creator of AidData's new gender and development initiative, which focuses on bringing AidData's geospatial and research expertise to gendered development research. Her expertise lies in program management, geospatial analysis, and econometric methods.

Ariel BenYishay is Chief Economist of AidData and Associate Professor of Economics at William & Mary. He has published papers examining the determinants and impacts of women's inheritance rights, as well as work identifying gender gaps in the diffusion of agricultural practices in sub-Saharan Africa. His work encompasses randomized control trials as well as quasi-experimental studies using satellite imagery and surveys. Ariel holds a Ph.D. in Economics from the University of Maryland.

Ammar Malik is Senior Research Scientist at AidData, where he leads the Chinese Development Finance Program. His team uses pioneering methods, such as the Tracking Underreported Financial Flows methodology, to track and analyze underreported financial flows from non-traditional donors to developing countries. He has undertaken award-winning research on the disproportionate impacts of environmental degradation on women's wellbeing in slums across South Asia and applied smartphone technology to collect and analyze information on sexual harassment of women in public transit. Ammar received his Ph.D. in Public Policy from George Mason University.

About AidData

AidData equips policymakers and practitioners with better evidence to improve how sustainable development investments are targeted, monitored, and evaluated. We use rigorous methods, cutting-edge tools, and granular data to answer the question: *who is doing what, where, for whom, and to what effect?* Among other projects, AidData has analyzed intra-household gender dynamics and gender-related measurement error by utilizing a combination of surveys and satellite imagery. AidData is also working on analyzing survey data on violence against children to identify the prevalence of gender-based violence in schools. AidData's current funders include USAID, Innovations for Poverty Action, the Millennium Challenge Corporation, the IMF, the Hewlett Foundation, the Ford Foundation, and the German aid agency DEval, among others.

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