WORLD RESOURCES INSTITUTE

Joint Learning Initiative on Faith & Local Communities

WORKING PAPER

Emissions and environmental surveys with faith actors: A pilot project with the Episcopal Church in the Philippines

Jodie Salter, Dr. Florencia Pulhin, Dr. Olivia Wilkinson, and Chendan Yan

CONTENTS

Executive summary 1
Introduction 3
Developing an emissions survey collaboratively 6
Results and recommendations 9
Conclusions and next steps 15
Appendix A 15
Appendix B 16
Appendix C 18
Endnotes 19
References 21
Acknowledgments 23
About the authors 23

Working Papers contain preliminary research, analysis, findings, and recommendations. They are circulated to stimulate timely discussion and critical feedback, and to influence ongoing debate on emerging issues.

Suggested Citation: Salter, J., Dr. F. Pulhin, Dr. O. Wilkinson, and C. Yan. 2023. "Emissions and environmental surveys with faith actors: A pilot project with the Episcopal Church in the Philippines." Working Paper. Washington, DC: World Resources Institute. Available online at doi.org/10.46830/wriwp.22.00066.

HIGHLIGHTS

- Faith actors[1] have a role to play in addressing climate change by measuring, reporting, and reducing the emissions of their assets.
- This paper outlines the development process of an emissions survey tool for faith actors and presents the results of its pilot study with the Episcopal Church in the Philippines (ECP).
- The survey presents opportunities for the ECP and can guide other faith actors in terms of mapping assets, building capacity, and starting the process of developing emissions measurements.
- The pilot study provided an estimate of the carbon dioxide equivalent (CO_2e) emissions for the ECP, and an overview of the existing emission reduction strategies and environmental activities already practiced by a majority of ECP assets.
- The ECP will repeat the survey annually and we hope the model will be adapted and implemented by other faith actors. To support this process, this paper includes a step-by-step guide.
- Recommendations for survey adaptation and implementation by other faith actors include factoring in adequate resources, developing an inventory of assets, instigating early internal communications to explain the survey tool, and conducting training with nominated survey coordinators.

EXECUTIVE SUMMARY

Introduction

Faith actors have increasingly been recognized for their role in environmental initiatives and addressing climate change. With access to and ownership of significant physical assets, they have the potential to drive change through measurable, evidence-based reductions in emissions. Yet without the appropriate methodology to track and measure emissions, faith actors' ability to realize their potential in this area is limited. The aim of this project was to develop and test a tool that faith actors can adopt to measure the greenhouse gas (GHG) emissions of their institutional assets.

This working paper outlines the development process of an emissions survey tool for faith actors (See Box ES-1 for definitions) as well as the results of its pilot study. The Episcopal Church in the Philippines implemented the project in collaboration with the Joint Learning Initiative on Faith and Local Communities (JLI), the University of the Philippines Los Baños (UPLB), and the World Resources Institute (WRI) Faith and Sustainability Initiative. The paper has three aims:

- Outline the development and design process of an emissions and environmental survey for faith actors
- Report on the results of the pilot emissions survey with a specific faith actor
- Act as a guide for other faith actors that wish to adapt and implement the survey tool to measure their emissions

The research process

The ECP, JLI, and UPLB conducted the survey development and research design processes collaboratively. The ECP is a network of churches with 170,000 members spread across 700 congregations in seven dioceses. Its assets include church buildings, but also hospitals, schools, administrative offices, and agricultural cooperatives. The JLI, which coordinated and mediated the research process, is a research network that focuses on strengthening evidence-based engagement with faith actors and has a long-standing relationship with the ECP.

Box ES-1 | **Key terms**

Faith actor

In this paper, we use "faith actor" as an umbrella term intended to cover a range of groups at local to international levels, including religious institutions, faith-based service providers, formal and informal religious leaders, faith-based organizations, local faith communities, and interfaith or religious councils and networks.[a]

Religious institution

We use "religious institution" to refer to a specific type of faith actor, in this case the Episcopal Church in the Philippines. It indicates a type of faith actor whose primary functions are religious activities or places of worship.

Assets

In this paper, "assets" is primarily used to refer to the land and buildings owned by faith actors.

Note: [a] See Tomalin 2020; Wilkinson et al. 2022.

Source: Compiled by authors.

The methodology for this pilot study used a mixed methods approach by developing a survey with primarily quantitative but also more open-ended, qualitative questions. Based on an analysis of previous emissions calculators, the project team designed the survey tool to be both appropriate for and usable by faith actors and in line with the Greenhouse Gas Protocol (WBCSD and WRI 2004) on collecting Scope 1 and 2 emissions.[2] The survey tool itself is divided into five main sections: energy, water consumption, waste, land, and environmental awareness and practice. Following a pretest, we rolled out the survey to all ECP assets using nominated and trained survey coordinators.

The survey represents an important opportunity for the ECP, and for other faith actors, in terms of mapping assets and developing emissions measurements that may be used to support future projects, including the development of baseline emissions measurements for emission reduction targets. This survey does not establish science-based targets (SBTs) but demonstrates the processes and practical considerations needed when SBTs for faith actors are developed. In addition, the implementation process, during which training was delivered for nominated survey coordinators, resulted in capacity building by raising awareness of the language of environmental sustainability and of possible emission sources.

The challenges that emerged through the research process provide lessons learned for future implementation by the ECP and other faith actors. Key challenges included the sporadic retention of emissions data by ECP assets as the survey covered the previous year (2021); the language used in the survey, which required additional support and training; the need for a handwritten survey format resulting in a more arduous data collection and analysis process; and the diversity of assets and emission sources, which complicated both the sampling strategy and the decisions around the scope of data collected.

Key findings from the pilot study

Responses were received from 177 out of 678 assets (26 percent) across the ECP, from which we were able to estimate the emissions for the whole ECP. For the analysis, we classified respondents into five types of assets: churches, buildings, hospital+school, schools, and church+other buildings. We calculated GHG emissions for each type of asset across four sectors: energy, water, waste, and refrigerants. We also collected data on existing measures in place to reduce carbon emissions across sectors and on other environmental activities already undertaken; for example, tree planting.

Results of the survey, based on actual data collected, show that on a per-individual-asset basis, schools emit the most emissions and churches emit the least. As data were not collected from all assets, we used the average emissions for each

type of asset to extrapolate the total emissions for each type of asset. By adding the total carbon emission value for each type of asset, we were then able to estimate the ECP's total emissions. We estimate that 9,576.27 tons of CO_2e were emitted by the whole ECP in 2021. Of this total, schools contributed around 40 percent while churches emitted 39 percent, and other buildings shared the remaining 21 percent. For churches, results show that almost all the emissions were due to energy consumption, while just 7 percent was shared by water, waste, and refrigerants. For schools, emissions were shared almost equally among water, energy, and refrigerants.

The survey highlights the mitigation and emission reduction strategies already practiced by a majority of ECP assets as well as their other environmental activities. Eighty-eight percent of the respondents cited that they already take actions to reduce their electricity consumption while a further 57 percent mentioned that they implement measures to help reduce their water consumption. In terms of land use, 79 percent of respondents reported taking part in tree-planting activities. Part of the survey focuses on the broader environmental activities of faith actors and, in this pilot study, 82 percent of respondents reported that the ECP already conducts activities to raise environmental awareness among its constituents.

Recommendations

Based on the survey development and implementation with the ECP, we have five key recommendations for other faith actors that plan to take up the survey tool model:

- Factor in adequate time and resources to adapt the emissions survey to the context and implement it—resources include researchers to analyze data and community organizers to work with faith assets to complete surveys.
- Prepare an inventory of land, buildings, and sources of emissions to demonstrate the range of your assets, which will help with faster adaptation and implementation of the survey.
- Instigate early internal communications to explain the rationale of the emissions tool and give advance notice that the survey will be distributed.
- Retain emissions data (e.g., energy and water bills) to facilitate easier survey completion.
- Conduct training with nominated survey coordinators to build capacity and ensure that the survey is understood.

INTRODUCTION

Faith actors have increasingly been recognized for their role in environmental initiatives and addressing climate change (Kearns 2011; Veldman et al. 2014; Koehrsen 2015; Jenkins et al. 2018; Ives and Kidwell 2019). With access to and ownership of significant assets, they have the potential to drive change through measurable, evidence-informed reductions in greenhouse gas (GHG) emissions. Yet without the appropriate methodology to track and measure emissions, faith actors' ability to realize their potential in this area is limited. The aim of this project was to develop an open access tool that faith actors can use to measure the GHG emissions of their institutional assets. This working paper outlines the development process of an emissions survey tool as well as the results of its pilot study with the Episcopal Church in the Philippines (ECP) in collaboration with the Joint Learning Initiative on Faith and Local Communities (JLI), the University of the Philippines Los Baños (UPLB), and the World Resources Institute (WRI) Faith and Sustainability initiative.

This section outlines the background, rationale, and significance of conducting emissions surveys with faith actors in the context of WRI's ongoing work on science-based targets for faith. The next section, "Developing an emissions survey collaboratively," describes the collaborative survey development and research design process and the analysis methodology. The final section, "Results and recommendations," outlines the results of the pilot study, reviews the challenges and opportunities for the ECP, and makes recommendations for future implementation. Appendix A, "The emissions survey tool," describes the survey tool and the recommended steps for continued use by the ECP and by other faith actors. Appendix B provides an abridged version of the survey, and Appendix C includes sample emissions calculations.

Why do faith actors need emissions surveys?

Developing a survey to measure GHG emissions can empower faith actors to respond practically to environmental issues and climate change specifically and can provide evidence on faith actors' role in climate action. Faith actors have demonstrated that they have the tools to motivate action on climate change.[3] They are mobilizing and using their social, economic, and moral resources to advocate for climate initiatives at the local, national, and global levels. Previous research has demonstrated the roles that faith actors play in translating environmental messaging into religious language, highlighting environmentally friendly religious teachings, and developing environmental religious laws, as well as their ability to mobilize communities. For example, in Indonesia, Mangunjaya and

Praharawati (2019) documented how Islamic law has been used to promote understanding of and action on environmental sustainability in Muslim communities.

Studies on the role of religion in sustainability often focus on environmentally friendly values and the environmental activities undertaken by faith communities and religious and traditional leaders (Posas 2007; Ives and Kidwell 2019; Begum et al. 2021). On an international policy level, for example, Glaab (2017) showed how faith actors use their moral frameworks and language to advocate for climate justice. Bomberg and Hague (2018) demonstrated the importance of spiritual frameworks for mobilization on environmental action in Christian congregations. Indeed, these values, beliefs, and practices are often perceived as what is distinct or unique about faith actors (Nordstokke 2013; Koehrsen 2015; Puglisi and Buitendag 2022). Yet, this may overlook the important material role that faith actors can play in addressing climate change through systematically reducing the emissions of their physical assets.

Faith actors often have significant physical assets at their disposal that can be leveraged to support emission reductions. While it is important to consider the often-significant economic assets of faith actors,[4] this pilot study focuses on physical assets specifically as an area over which faith actors have direct control. Their physical assets are diverse and are not limited to places of worship, such as churches, temples, mosques, and synagogues. They also own and run significant numbers of healthcare facilities and schools, as well as community centers, administrative offices, gardens, agricultural cooperatives, and vehicles (Kagawa et al. 2012; Kwon and Samberger 2021). As such, faith actors have the potential to reduce emissions across a variety of sources, and baseline emissions surveys can help facilitate this process. Unlike measuring the emissions of a single type of asset, such as schools, surveys for faith actors need to account for a diverse collection of assets while documenting the range of environmental activities undertaken in a survey accessible to all levels of emissions literacy.

Secular agencies and nongovernmental organizations have also recognized the role of faith actors in addressing climate change (UNEP 2016; 2018; Ager and Ager 2016),[5] and this working paper contributes to one such organization's activities in this area, those of WRI's recently launched Faith and Sustainability Initiative.[6] One of the aims of the WRI initiative is to map and measure the emissions of faith actors' assets and support them in developing science-based targets (SBTs) for emission reductions. SBTs are targets for reductions in GHG emissions that are in line with current climate science on achieving the aims of the Paris Agreement (WRI 2023). As part of this work, WRI is working collaboratively with faith actors to encourage them to commit to ambitious short- and long-term reductions in emissions. To successfully achieve these goals, baseline emissions measurements are needed, which can then be repeated on a regular basis (WBCSD and WRI 2004). This paper does not contribute to the development of SBTs but fits into the wider WRI initiative by testing an approach to measuring emissions for faith actors.

Previous emissions surveys for faith actors

To measure their emissions, faith actors need appropriately tailored surveys so that their existing environmental activities can be complemented by comprehensive emissions measurements. Previous initiatives on religious institutions and emissions have often been framed as "greening places of worship" through measures such as transferring to renewable energy sources, tree planting, carbon offsetting, and ensuring that new religious buildings adhere to environmentally sustainable building standards (Torgerson 2012; Lemche and Miller 2019; UNEP 2020).[7] While these greening measures are valuable, without a baseline measurement of emissions and a tool to repeat measurements regularly, faith actors may be limited in their ability to measure the efficacy or success of such measures.

Several tools exist to calculate GHG emissions and track environmental sustainability, some of which are specific to faith actors (IPCC 2021; GHGP 2021). Two prominent examples are the Cool Congregations Calculator[8] and A Rocha's Eco Church initiative,[9] an interfaith and Christian initiative, respectively. Later in the paper, the analysis for four emissions tools, which was conducted as part of the research design process, is presented (see "Research design"). In addition to these tools, faith actors have developed certifications to recognize assets that align with green targets and highlight the importance of environmental sustainability in the development of new assets.[10] Faith actors have also been supported in developing long-term plans for environmental sustainability. Notable examples of such initiatives include the Alliance of Religions and Conservation's 2009 faith commitments and, more recently, the work of Faith Plans and the International Network for Conservation and Religion (INCR).[11]

There is also a small but diverse pocket of research measuring the energy efficiency and environmental sustainability of religious buildings (Hui 2012; Terrill et al. 2015; Pretlove 2017; Vourdoubas et al. 2020; Yüksel et al. 2021; Atmaca et al. 2021; Azmi et al. 2021). These studies demonstrate the diversity of religious buildings, their often unique patterns of use, and the potential sources of emissions. Other studies have extended the scope of faith actors' assets beyond their land and buildings by tracking the delivery of environmental activities, researching the role that both faith leaders and communities play in sustainability, and discussing the extent to which religious beliefs and values may (or may not) translate

into action on climate change (McKay et al. 2014; Das et al. 2014; Bomberg and Hague 2018; Stork and Öhlmann 2021; Caldwell et al. 2022). While this study primarily focuses on measuring the emissions of faith actors' land and buildings, it is also important to consider the role that these less tangible assets play in promoting environmental sustainability.

These existing initiatives and studies may be divided into those that measure the emissions of a single institution, those that are designed for a large but geographically or confessionally limited group of faith actors, and those that make recommendations and plans for environmental changes but do not measure emissions, and emissions tools that are not specific to faith actors. As a consequence, this project responds to an urgent need for a tool designed specifically for faith actors, and that can usefully be replicated, adapted, or scaled up to other geographical and confessional settings.

Introducing the Episcopal Church in the Philippines

This study focused on piloting an emissions survey tool with a specific religious institution, the ECP, in a specific geographic location, the Philippines. The ECP is a network of churches with seven diocesan offices, managing seven large dioceses, across the Philippines as well as a national headquarters. It has over 170,000 members spread across 700 congregations, many of which are concentrated in the northern and southern islands of the Philippines. The ECP's assets are not limited to church buildings and include hospitals, schools, administrative buildings, and agricultural cooperatives. Environmental protection and sustainability are written into the ECP's guiding framework through the fifth mark of mission:[12] "To strive to safeguard the integrity of creation and sustain and renew the life of the earth" (ECP n.d.). Raising awareness of the need for action on climate change and environmental protection is central to the ECP's work, and this project is an extension of its existing aims.

The ECP has a record of engaging with environmental action yet had not previously conducted a mapping of its land, buildings, and sources of emissions. Historically, it has been engaged in combating environmentally destructive development projects—for example, the Chico River Dam project in the 1970s—and has pioneered the use of community cooperatives and sustainable community development programs (see USPG n.d.). More recently, the ECP's fifth mark of mission has been realized through environmental awareness-raising and tree-planting activities conducted by local churches, which, as of December 2018, had planted 167,000 trees; an incentive reward of $2,000 was offered to churches with at least 2,000 out of 3,000 surviving saplings after a two-year period.[13][13] Many environmental activities at the ECP take place at a community level and are conducted by members themselves. As a result, the ECP sees measuring emissions as aligning its assets with the existing work of its members.

Engaging with the ECP throughout the research design process and implementation fits with JLI and WRI aims to build capacity[14] with local actors and ensure that data are readily available to faith actors themselves. Previous research has demonstrated the importance of equitable collaboration and climate knowledge transfer in both faith-specific and non-faith contexts (Lyons et al. 2016; Clissold and McNamara 2020; Nago and Krott 2022). The development sector is pushing to increase capacity building with local faith actors (Wilkinson et al. 2022). Operating in a country already experiencing the effects of climate change, with high levels of vulnerability to extreme weather events (Hijioka et al. 2014), the ECP wanted to take the initiative and be a role model for similar religious institutions.[15]

Three key factors were instrumental in our choice of engaging with the ECP specifically. First, the ECP owns a variety of assets and consequently represents an ideal test case for the survey tool. Given the diversity of faith actors' assets globally, it was important that the pilot study run with a faith actor that reflected this diversity of assets; testing the survey with a much smaller faith actor would have limited the survey's scope. Secondly, the JLI has a long-standing relationship with the ECP that could be built upon to facilitate successful delivery of the project.[16] Finally, the ECP was eager and willing to engage in the collaborative research design process and pilot survey rollout, and the aims of the study aligned with both its existing work and future ambitions.

Aim of the study

The aim of this study was to develop and pilot a survey that would identify and measure the greenhouse gas emissions from the buildings and land of a faith actor; in this case, the ECP. It intends to act as a starting point from which other faith actors can implement emissions surveys.

This working paper has three objectives:

- Explain the development and design process of an emissions survey for faith actors
- Report on the results of the pilot emissions survey with a specific faith actor
- Guide other faith actors that wish to adapt and implement the survey tool to measure their emissions

DEVELOPING AN EMISSIONS SURVEY COLLABORATIVELY

The methodology for this study is split into three parts, covered in the next three subsections: "Research design," which reviews the research design and development of the survey; "Research implementation," which outlines the survey rollout; and "Data analysis," which describes the data analysis methodology. The section ends with a review of the survey's limitations.

Research design

The research took a collaborative approach between the ECP and ULBP with the JLI acting as a coordinator, mediator, and research supervisor. *Collaborative* here indicates the intention of equitable participation where all research partners had the opportunity to contribute and, in many cases, take the lead.[17] The JLI's threefold role in the process was one of coordination—that is, managing the research budget, timelines, and partners; mediation between the ECP and UBLP during the survey design and analysis; and research supervision by providing support through regular meetings during the data collection, analysis, and reporting.

The ECP's engagement with the research process was particularly important for ensuring that the survey would be relevant and sustainable for future use and that the ECP would retain full access to and ownership of the survey data. Having a research partner from UPLB with country-specific knowledge and experience conducting emissions measurements for other organizations in the Philippines was essential for ensuring that the survey would be designed and analyzed appropriately. The JLI, as a shared learning and evidence network with a long-standing relationship with the ECP and experience working with local faith actors, was able to support the ECP's and UPLB's subject matter expertise and local knowledge. The research process was characterized by regular meetings and reflection points.

The survey both built on and diverged from previous emissions tools; four emissions tools were analyzed to support the design process. The GHG Protocol Cross-Sector Inventory Tool[18] was taken as the benchmark for collecting comprehensive emissions measurements but was deemed too complex and detailed for participants without prior experience with emissions reporting. The Energy Star Portfolio Manager[19] was identified due to the rare provision of a specific option for "worship building" but was found to be limited given its focus on emissions from energy alone, therefore excluding waste and water, key areas of interest for the ECP. The Cool Congregations Calculator, developed by Interfaith Power and Light, was identified as a user-friendly tool designed specifically for faith actors that collects Greenhouse Gas Protocol–aligned emissions measurements, but its scope is geographically limited to faith actors in the United States and Canada. A final tool, also specifically tailored to faith actors, is A Rocha's Eco Church, which demonstrates a similarly user-friendly approach and provides tailored guidance on environmental sustainability, though it does not provide emissions calculations.

UPLB designed the survey (see Appendices A and B) to be in line with the GHG Protocol on collecting data for both Scope 1 and 2 emissions (WBCSD and WRI 2004)[20] and primarily focused on collecting quantitative emissions data in four main sections: energy; water consumption; waste; and land (including forests). The Cool Congregations Calculator and Eco Church were both valuable in demonstrating the importance of ensuring relevance and user-friendliness for faith actors and their assets, and regular consultation between UPLB and ECP during the survey design process supported this. The ECP's existing environmental activities, as well as previous research on faith actors' tangible and intangible assets,[21] highlighted the need to include data collection measures on (faith-based) environmental activities. Building on this knowledge, the survey also included qualitative questions to enable reporting on environmental activities.

Research implementation

As part of the research process, the ECP produced an inventory of 678 assets, including churches (593), schools (25), and hospitals (3), as well as offices, agricultural cooperatives, and commercial buildings. We conducted a pretest with a sample of 11 assets, which were given the opportunity to provide feedback to check the comprehension and logistics of conducting a self-administered emissions survey and to assess what amendments or additional support mechanisms would be needed for the full rollout.

The complex structure of the ECP and its assets, whereby each asset, such as a church or school, may own and manage several individual buildings or areas of land, complicated the sampling strategy. Rather than focusing on disseminating the survey to a smaller sample of assets, which may have resulted in a higher percentage of return rate, we sent out the survey to all assets across the ECP, taking a non-probability sample design. Although this would result in a lower percentage rate of completion, it meant that all assets of the ECP would have access to the survey and would be able to review it for future use, even if completion would not be possible within the time scale of the pilot study. The ECP was keen to encourage as many people as possible to be involved in the process to help ensure that the practice could become annual going forward. Given the wide survey dissemination and practicalities of data

collection within the project timeline, the aim was to collect responses from at least 20 percent of the 678 identified assets.

We rolled out the main survey from March 18 to April 23, 2022. The survey was self-administered on paper—that is, a PAPI (pen and paper personal interview)—by a participant from each asset. Staff from the ECP central administrative office and ULPB held meetings with a nominated survey coordinator from each of the seven dioceses to ensure that survey coordinators were trained, understood each question of the survey, and were able to communicate the questions to the participants in their area. Including the initial meeting, three orientations were held with the survey coordinators for progress updates and to check survey comprehension. The ECP took the lead during the data collection through the central administrative office and through diocesan coordinators. ECP staff members disseminated the survey, collected the responses, and shared the data with UPLB. We received 177 responses from 26 percent of ECP assets, which were categorized, based on their self-description in the survey, into churches (117), schools (12), buildings (8), "hospital+school" (3), and "church+other buildings" (34).

Data analysis

Following the data collection, UPLB researchers encoded and analyzed the data. We classified ECP assets into five categories based on the responses indicated in the survey (churches, buildings, hospital+school, schools, church+other buildings). We determined the GHG emissions for each type of asset using the calculation below:

GHG Emissions = Consumption Data × Emission Factor

"Consumption data" represent data related to activities that produce emissions—for example, amount of fuel (in liters or gallons); weight of fuelwood, liquified petroleum gas, or charcoal (kilograms); and amount of electricity (kilowatt-hours).

"Emission factor" is the coefficient that quantifies the emissions of a gas associated with a certain activity. UPLB researchers sourced values of emission factors from the 2006 Intergovernmental Panel on Climate Change *Guidelines for National Greenhouse Gas Inventories* and WRI/World Business Council for Sustainable Development GHG Protocol Emission Factors from Cross-Sector Tools and were not specific to the Philippines (IPCC 2006; GHGP 2021). GHGs in this study included carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_20), which were all converted to carbon dioxide equivalent (CO_2e).

Sectors considered in the GHG emissions assessment were energy, water, waste, and refrigerants (i.e., air conditioners). The energy sector includes electricity, fuel used for transportation, and cooking and equipment utilized in stationary activities (e.g., grass cutting, lawn mowing). We also noted different types of fuel used for transportation and cooking since emission factors vary by type of fuel. We measured emissions from water by collecting water consumption data and based this measurement on the energy used in producing water. We determined emissions for each sector by computing the corresponding carbon emissions, and calculated the total emissions of each type of asset by adding all the emissions of the different sectors. We then compared and analyzed the GHG emissions of the assets. To compute the carbon emission per individual asset, we divided the total emissions of each type of asset (e.g., church) by the total number of respondents belonging to each type of asset (e.g., 117 churches). We estimated the total emissions of the whole ECP by summing the carbon emissions of all assets. Reported measures to reduce carbon emissions across sectors and other environmental activities were analyzed using frequencies and percentages. We analyzed these measures for the whole ECP and not by asset type.

Limitations

Recordkeeping

As the survey covered the previous year (2021), successful completion relied on recordkeeping and retention of energy data, such as utility bills or fuel purchasing records, by each of the assets. Records were not retained in all cases or required additional time to retrieve, leading to the omission of assets that did not have access to the relevant data or that did not have the capacity to retrieve them within the response period. As the survey is repeated and emissions data are built into the annual parochial reports submitted by assets, we anticipate that recordkeeping will become standard practice.

Language

The pretest process revealed challenges in terms of the environmental language and measurements used in the survey. While these issues were mitigated with additional training and communication with the lead survey coordinator before the full pilot rollout, it remains a possible limitation that not all survey participants comprehensively understood the scope and meaning of all survey questions. In addition, the survey was written and delivered in English, and some respondents required additional support from ECP coordinators with translation. The ECP supported this process through online communication with individual assets, which often included translation or clarification of specific questions.

Survey format

The survey was conducted on paper, and was self-administered by assets, which led to a more arduous data collection process. It was difficult for the ECP survey coordinators to review the surveys for full and correct completion and for the research-

ers to encode them. The inclusion of handwritten qualitative responses also increased the encoding time given the range of often detailed responses.

Diversity of assets and emissions sources

The variety of assets in the ECP meant that there was a range of emissions sources, and divergent levels of experience measuring emissions. Larger ECP assets, such as hospitals, had existing processes in place to track energy use, whereas smaller assets did not. The variety of emissions sources, though accounted for in the pretest, required additional amendments to the survey, such as electricity consumption measurements for running deep-water wells. The "waste" category proved challenging given the difficulties in reporting general waste and the lack of waste characterization. In addition, we excluded some assets because of the complexities of their operations and the independence of their respective managements.[22]

Scope and range of data collected

The survey design process posed challenges in deciding on the scope of data to collect and meant balancing pragmatism with research quality. As the survey is intended to be sustainable and usable by a range of faith actors, we focused on collecting accessible emissions information. Additional details, such as on the specific size, location, function, and use pattern of assets, were not built into the analysis, which means we cannot offer asset-by-asset emissions measurements. While this is a limitation of the pilot study, the ECP and other faith actors may not have the support of a research team going forward, and building an adaptable and useable tool is key for the success of this model. Other faith actors that take up the tool may choose to include additional information (e.g., location, size, use pattern) and build it into the analysis.

Sampling and response rates

Challenges arose around balancing the need for a representative and significant sample across asset categories with the capacity and complexity of ECP assets. It was important for ECP to offer the survey to the entirety of its identified assets, but as a first attempt at such a survey it also needed to be opt-in to give potential ECP participants the chance to consider how and if they could complete it. As a consequence, this is not a randomized sample and cannot claim representativeness. With 177 respondents from an overall possible 678, this would represent a +/- 6 percent margin of error at a 95 percent confidence level in a randomized sample, which is a reasonable value to demonstrate confidence in the results. As this is a nonrandomized sample, however, it is not appropriate to assign a margin of error. However, with the mitigation strategies listed below and the size of the sample as it stands, we were in a good position to be able to estimate for the entire population (i.e., the 678 assets) using the data from our sample. Therefore, we must note that all figures given in the results are estimates, but ones based on a good sample size and significant work to minimize biases.

Potential for self-selection bias

As the survey was opt-in, there is the potential for self-selection bias; that is, those who were motivated and had the capacity to be involved in the study participated, leaving out those in the population who were not motivated or did not have the capacity to participate. To mitigate potential bias in response rates, for example, where assets with more experience in emissions measuring or environmental activities may be more likely to respond, we reached out early to a range of assets across the ECP and provided additional support and training during the survey implementation. The ECP led this through regular communication with diocesan coordinators and assets, particularly those with less experience taking emissions and environmental surveys. These efforts aimed to reduce the self-selection bias and ensure that those with fewer resources and capacity were still able to participate in the survey.

Potential for bias or overclaiming

When conducting surveys, there is the potential for overclaiming and bias, wherein participants may wish to present themselves or their institutions in a more socially or environmentally positive light or may feel compelled to respond in a particular way (Vonkova et al. 2018; Bensch et al. 2019). The quantitative elements of this survey are unlikely to be affected by overclaiming as it was the first year the survey was taken by the ECP and there were therefore no quantitative targets known to participants against which participants could shape or compare their responses. However, there is potential for the qualitative responses to have been affected as participants may have wished to present the environmental activities of their assets and of the ECP positively. We mitigated the potential for external bias by building the survey into church operations, which meant that there were no external incentives to participate or overclaim.

Potential for SBT development

We designed the study with the aim of testing an emissions and environmental survey and to collect emissions measurements with and for the ECP. A limitation of the data and results is that they do not provide a sufficient baseline to meet the requirements for developing SBTs; these are being developed in another project with Georgetown University. However, the emissions and environmental survey resulting from this pilot project has demonstrated how to undertake the exploratory work needed to develop SBTs, including the development of an assets inventory and reflection on the diversity of measurements needed in complex religious institutions.

RESULTS AND RECOMMENDATIONS

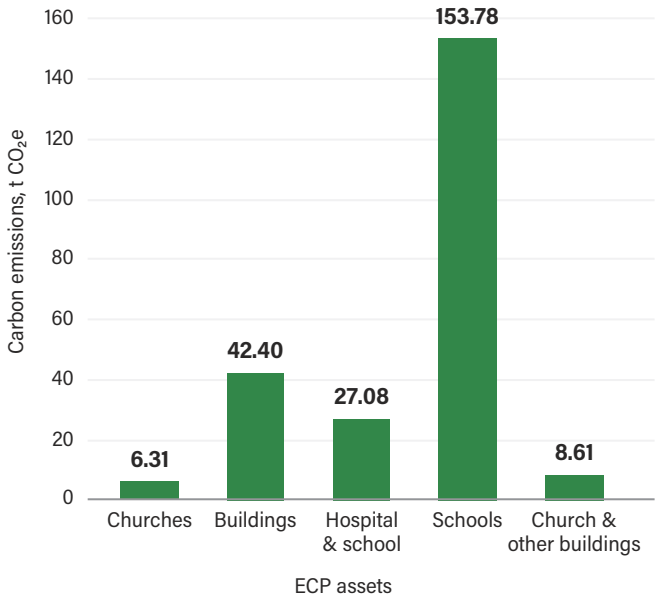
Analysis of results

Surveys were received from 177 assets (26 percent), exceeding the 20 percent target. We categorized respondents into five asset types to estimate the ECP's total emissions. Churches accounted for 67 percent of the 177 respondents. The remaining 33 percent was shared by church+other buildings (19 percent), schools (7 percent), buildings (5 percent), and hospital+school (2 percent). The sources of emissions of the assets that were identified include energy (i.e., use of electricity, fuel consumption for vehicles, use of equipment, and cooking), water (i.e., water consumption), waste, and refrigerants. Response rates varied across asset categories and were received from all hospitals, 48 percent of schools, 19 percent of buildings, and 25 percent of churches and church+other buildings together.[23]

Results of the survey show that on a per-individual-asset basis, schools emit the most while churches emit the least (see Figure 1). While we did not collect data on the specific function or use of assets, this trend may be explained by the fact that schools generally cater to large numbers of people, particularly during school days, and run for almost 11 months in a year. Churches, on the other hand, primarily use energy during religious and other services and events, which may run for only a few hours per day. Ranking second in terms of total carbon emissions are "buildings," which include national and diocesan offices and centers, commercial buildings, lodging centers, dormitories, and columbarium/memorial gardens. "Hospital+school" ranks third while "church+other buildings" ranks fourth. "Church+other buildings" here refers to churches that also own other buildings—for example, multipurpose cooperatives; these do not tend to require a significant use of energy, water, and refrigerants and do not generate substantial waste.

Using the derived carbon emission value per asset, we estimated the carbon emissions of each type of ECP asset by multiplying the carbon emission value with the total number of each type of asset in the ECP. By adding the total carbon emission value for each type of asset, we were then able to estimate the total emissions of the ECP. We estimate that 9,576.27 tons of CO_2e were emitted by the whole ECP in 2021. Of this total emissions estimate, around 40 percent was contributed by schools while 39 percent was emitted by churches (see Figure 2). The large carbon emissions from all churches can be attributed to the large number of member churches (593), representing 87 percent of ECP assets. Emissions from buildings were around 19 percent while only 2 percent was contributed by church+other buildings and hospital+school. The total estimated emissions figure

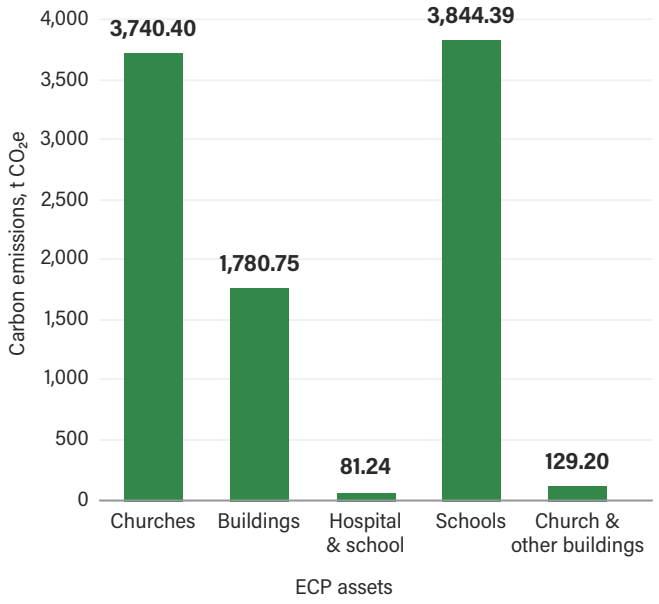
Figure 1 | **Reported *actual* carbon emissions in 2021 per individual asset type**



Note: t CO_2e = tons of carbon dioxide equivalent; ECP = Episcopal Church in the Philippines.

Source: Compiled by authors from ECP emissions survey data.

Figure 2 | ***Estimated* total carbon emissions by asset type**



Note: t CO_2e = tons of carbon dioxide equivalent; ECP = Episcopal Church in the Philippines.

Source: Compiled by authors from ECP emissions survey data.

represents only a small percentage (0.004 percent) of the total carbon emissions of the Philippines as of 2019 (Climate Watch 2022).

Based on actual emissions data collected, the analysis also broke down the percentage share of emissions across four sectors (energy, water, waste, refrigerants) for each type of asset. For churches, results show that almost all the emissions were due to energy consumption, while just 7 percent was shared by water, waste, and refrigerants (see Figure 3).

For buildings, refrigerants and the energy sector had almost the same share in the total emissions. Emissions due to water consumption contributed 16 percent while waste contributed less than 1 percent (see Figure 4).

Energy also contributed the most to the total emissions of "hospital+school" assets. Surprisingly, waste did not contribute at all as only food and garden waste were reported, all of which were used for composting. A considerable volume of water was consumed in the hospital+school category resulting in substantial emissions. Similarly, the use of air conditioners, refrigerators, and freezers, essential to their operations, resulted in a higher share of the emissions (see Figure 5).

In schools, refrigerants ranked first in terms of the contribution to total emissions. This can be attributed to the use of air conditioners, particularly during school days. Schools also used large amounts of water and energy, resulting in significant emissions. Waste accounted for just 0.02 percent of total carbon emissions, indicating that minimal waste was generated in 2021 (see Figure 6).

Energy use contributed 71 percent to the total emissions of "church+other buildings" while the remaining 29 percent was shared by water, refrigerants, and waste (see Figure 7); as expected, these types of assets use only minimal water, and a small number of appliances require refrigerants.

Mitigation strategies

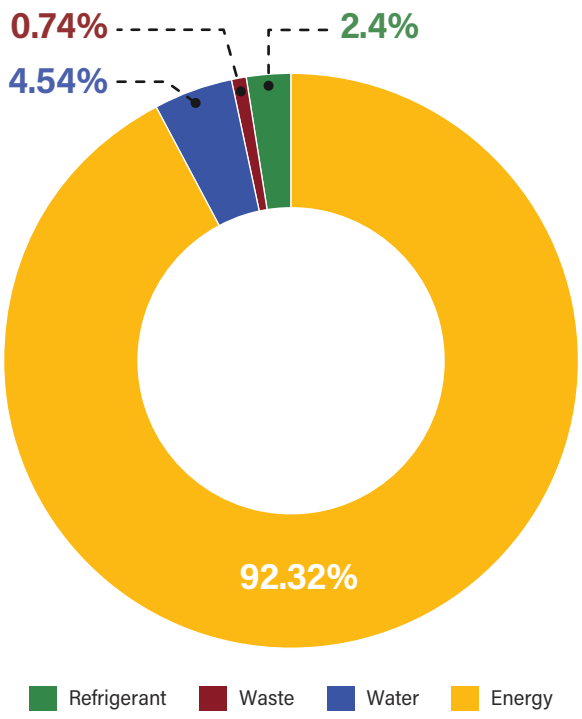
Part of the survey collected data on the current mitigation and emission reduction strategies practiced by ECP assets. This section describes these strategies by sector.

Energy

One way of mitigating emissions is through renewable energy; 4 percent of respondents reported using solar (four respondents) and hydropower (one respondent) for 100 percent of their energy needs. As respondents reported using a significant number of electrical appliances, increasing the use of renewable energy would enable the ECP to reduce emissions.[24]

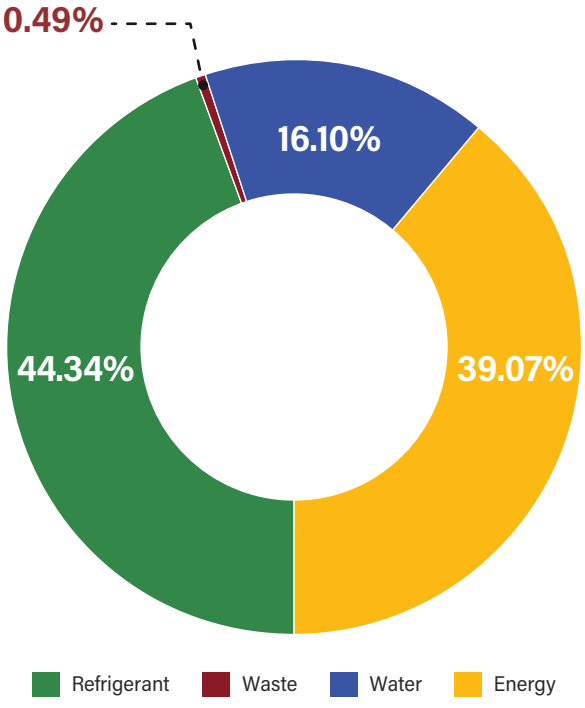
Nevertheless, 88 percent of the respondents cited that they already take actions to reduce their electricity consumption.

Figure 3 | **Emissions by sector: Churches**



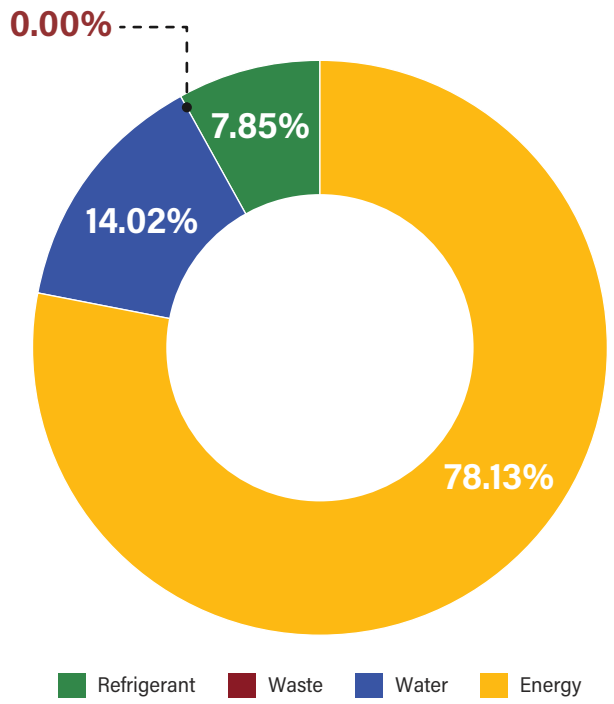
Source: Compiled by authors from ECP emissions survey data.

Figure 4 | **Emissions by sector: Buildings**



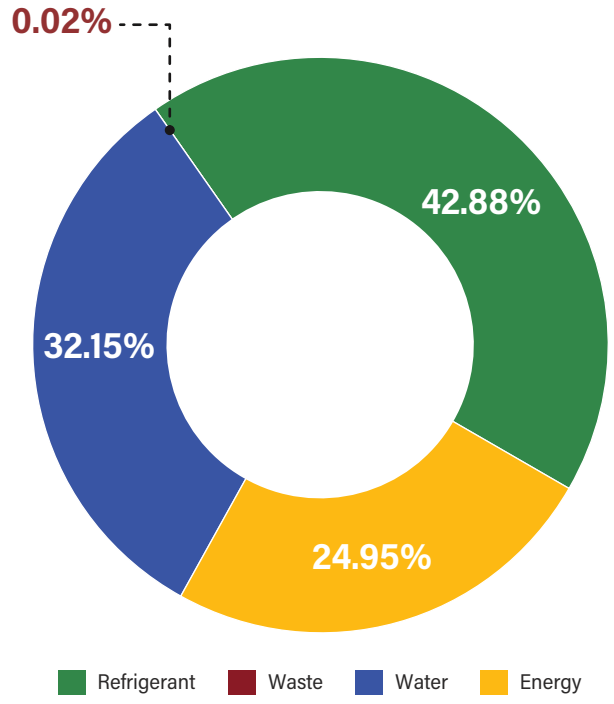
Source: Compiled by authors from ECP emissions survey data.

Figure 5 | **Emissions by sector: Hospital+school**



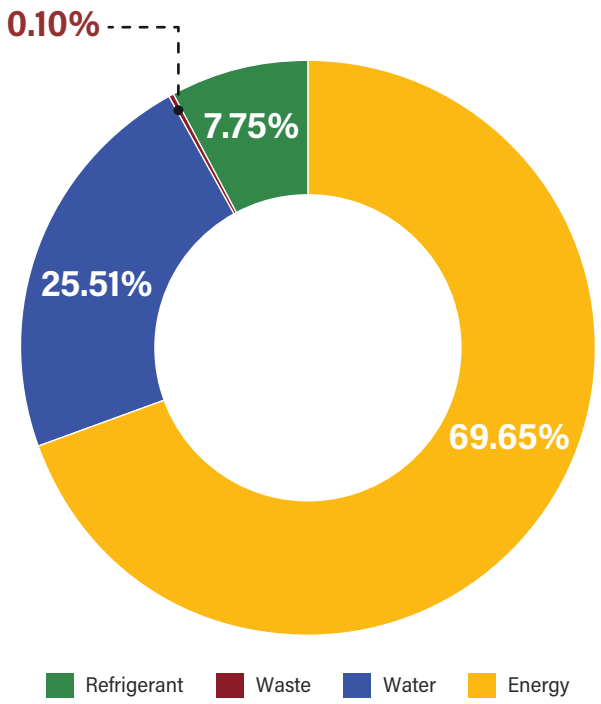
Source: Compiled by authors from ECP emissions survey data.

Figure 6 | **Emissions by sector: Schools**



Source: Compiled by authors from ECP emissions survey data.

Figure 7 | **Emissions by sector: Church+other buildings**



Source: Compiled by authors from ECP emissions survey data.

Three of these actions relate specifically to the use of light: turning off lights (88 percent), prioritizing the use of natural light (56 percent), and using light-emitting diode (LED) bulbs (41 percent). The percentage of bulbs replaced with LED bulbs ranged from 4 percent to 100 percent. About 50 percent of the respondents who reported using LED bulbs cited that all their bulbs had been replaced with LEDs while 24 percent had replaced fewer than half. Just 17 percent of respondents reported using energy-saving appliances, which may be attributed to their high upfront cost.

Other reported actions to reduce energy consumption included minimizing the use of air conditioners (97 percent); minimizing the use of electric fans (49 percent); opening windows to cool the area (68 percent); turning off computers when not in use (54 percent); promoting vehicle sharing to the office (92 percent); encouraging bicycle use among employees (18 percent); and encouraging employees to walk short distances (93 percent).

Water

In a country where rain is abundant, especially during the wet season, harvesting rainwater is important to help reduce emissions from the energy used in water production and to minimize the pressure on dwindling water sources. About 56 percent of the respondents indicated that they harvest

rainwater. In addition, 57 percent of respondents mentioned that they implement measures to help reduce their water consumption. Measures cited included closing the main valve when not in use; ensuring faucets are properly turned off; using a pail and dipper; using a basin for dish washing rather than continuously running water; regularly checking for leaks; collecting laundry water for toilet flushing and plant watering; and manually flushing toilets.

Waste

Respondents reported implementing several waste reduction measures. Fifty-seven percent reported that they recycle disposables such as spoons, forks, and glasses, and 55 percent reported that they use recycled materials. While 44 percent reported that they compost disposables, 37 percent reported that they do not compost this type of waste. To reduce food waste, around 97 percent of the total respondents reported buying and cooking only the food that they need, while just 3 percent said that they store the leftovers in the fridge and reheat them for consumption during the next meal. In addition, about 71 percent of respondents cited that in ECP offices they ensure that both sides of paper are used to reduce paper waste, and 50 percent said they try to minimize document printing altogether. While not a direct reduction measure, about 63 percent of respondents emphasized that the ECP encourages proper waste disposal by posting notices in its assets.

Forest and other land use

While the ECP is not primarily engaged in maintaining a tract of forestland, it has engaged in many tree-planting programs. Seventy-nine percent of respondents reported participating in tree-planting activities, with 62 species of both forest and fruit trees represented across assets. For those assets where tree planting is conducted, the number of trees ranged from 1 to 300, though 3 percent of respondents reported that there are too many trees to be usefully counted. While the areas of reported tree cover range from 13 to 80,000 square meters (m^2), the majority have less than 1,000 m^2.

A wide variety of tree species were reported, of which 56 percent were fruit-bearing trees. Respondents mentioned 38 reasons why these species were planted, with the most popular reasons including "for food consumption" (20 percent) and "to help address climate change/carbon offset" (16 percent). In addition to the ECP's participation in tree-planting activities run by other organizations, the ECP itself also organized tree-planting activities as attested by some 78 percent of respondents. About 56 percent of the respondents said that they do not seek technical assistance from forestry experts when conducting tree-planting activities. Some 51 percent claimed that ECP assets use harmful chemicals such as pesticides, herbicides, or fertilizers in taking care of the plants and trees around their premises.

Eighteen kinds of wildlife were observed to be present on ECP land. Of the wildlife present, the most sighted were birds (58 percent), while the least sighted were dragonflies, eagles, wild chickens, and wild monkeys. Half of the respondents mentioned that the ECP does not conduct biodiversity assessments. Respondents mentioned 11 environmental practices that they undertake specifically to protect land and preserve the diverse floral and faunal species present in their areas. Of these, the three most cited were organic farming, planting trees and ornamental plants, and ensuring appropriate waste management.

Good practices for environmental protection

True to the ECP's fifth mark of mission, about 82 percent of respondents mentioned that the ECP conducts numerous activities to create environmental awareness among its constituents. Activities include annual clean up drives, creating guidelines on proper waste usage and disposal, integrating responsible stewardship of God's creation in ECP curricula, emphasizing during sermons the important role of ECP members in protecting the environment, conducting seminars or forums on environmental issues at least once a year, engaging in tree-planting activities, and producing and distributing brochures and posters on environmental issues. Of these activities, the delivery of seminars or forums was mentioned the most, by 54 percent of the respondents.

In addition, respondents indicated that the ECP instigates discussions on environmental issues, participates in environmental events, and engages in environmental campaigning. Topics mentioned in environmental discussions included anti-mining, blast/dynamite fishing, climate change, dams, fire prevention, illegal logging/deforestation, pollution, tree planting, and waste management. Of these, illegal logging/deforestation was mentioned the most. Discussions on fire prevention and climate change were reported to be held twice a year, while the other topics were discussed annually. ECP attendance at national and global environmental events was reported by 77 percent of respondents, and the ECP's participation in campaigning on national environmental issues was mentioned by 71 percent of respondents.

The survey also demonstrated the ECP's use and promotion of organically grown products. About 50 percent of the respondents mentioned that the ECP showcases organic products through trade fairs, and 64 percent of respondents stated they use organic fruit and vegetables in their cafeterias and in catered meals at events.

Potential mitigation measures

Based on the results of the survey, we've identified actions that the ECP can implement to further reduce its emissions across sectors, through strengthening current practices and implementing additional mitigation measures. This section discusses the mitigation measures that the ECP assets can undertake by sector.

Energy

Three ways that the ECP could reduce emissions from energy use are investing in energy-saving appliances,[25] transitioning to renewable energy, and reducing car use. The reported use of energy-saving devices was low among respondents, but the high upfront costs would be offset by lower monthly electricity bills, resulting in lower emissions. Four assets currently use renewable energy sources; increasing this number would significantly reduce overall emissions. While some respondents already reported that the ECP encourages employees to avoid traveling to the office by car, this could be increased by providing incentives to those who choose to cycle or walk.

Water

One way to reduce water consumption is by using water-saving devices in toilets. Just 11 percent of respondents reported using such devices, while 87 percent reported that they do not. In the case of assets with older buildings, this may be because water-saving devices were unavailable at the time of construction. Alternatively, the ECP could install waterless toilets, though these are less common in the Philippines. Based on the survey, 92 percent of respondents mentioned that they do not have waterless toilets, and just 3 percent claimed that they have them installed. The ECP could consider both of these measures to save substantial amounts of water and reduce its emissions from water use.

Waste

While the study provided an estimate of the emissions from waste based on data reported by the respondents, it would be a good practice for ECP assets to conduct waste characterization. This would improve future carbon emission values derived from the survey. Other studies conducted in the Philippines have shown that waste contributes a large percentage of carbon emissions, but this is contrary to the result of the study in which respondents primarily reported producing compostable and recyclable waste. Through waste characterization, the ECP would be able to measure its waste-based emissions more accurately. In addition, composting would be an ideal way for the ECP to reduce emissions from waste. Currently, only 39 percent of the respondents reported that they have composting facilities while 59 percent specifically mentioned that they do not.

Forest and other land use

The ECP already uses some of its land for tree planting, as evidenced by the responses to this survey. By maintaining and increasing current tree plantations, combined with other emission reductions, the ECP would be able to offset its carbon emissions. Related to offsets and beyond maintaining existing tree cover, the ECP could also investigate carbon stocks and PES (payments for ecosystem services). The ECP could undertake a combination of both forest protection and reforestation. Reforestation areas should be planted with fruit trees mixed with forest tree species. In addition, the ECP could conduct a carbon stocks assessment in its existing mini forests to determine the amount of carbon in the trees already planted by its constituents.

Lessons learned and recommendations

The survey represents an important opportunity for the ECP, and for other faith actors, in terms of mapping assets and developing baseline emissions measurements for science-based targets. Yet there were several challenges that emerged through the research process that act as lessons learned for future implementation by the ECP, by other faith actors, and others wishing to work on SBTs and related emissions surveys for faith actors. This process of developing the survey tool and piloting it has led to several reflections on the potential for emissions surveys with faith actors, including unexpected possibilities tied not only to eventual survey results but also asset mapping and capacity building as part of the preparation for a survey.

Mapping

The ECP was able to develop an inventory detailing all its assets (i.e., land and buildings) and identifying possible sources of emissions that can be used and built on for future emissions-related projects.

Emissions measurements

The results of the survey provide a baseline from which the ECP can measure percentage reductions in emissions across assets. Thanks to these baseline measurements and with plans to repeat them yearly, the ECP is well-prepared to engage with other programs including, for example, the Science-Based Targets for Faith project of the WRI Faith and Sustainability initiative. While this study does not support the development of SBTs, the experience of creating an inventory of assets and emissions sources will be valuable for work on such a project. Based on the emissions measurements collected, and building on the interest from the survey, the ECP is already aiming to transfer diocesan offices to solar power.

Capacity building and awareness raising

The collaborative research and survey design process and survey rollout represent key capacity-building opportunities for the ECP. Training provided by the diocesan coordinators and completion of the survey were ways to raise awareness of the language of environmental sustainability and of possible sources of emissions. Separately, the qualitative sections of the survey helped make the ECP aware of the environmental activities already taking place.

Knowledge sharing

The results of the emissions survey will be shared internally and externally. As a result of the survey, the ECP planned to share feedback on the process with the wider Anglican Communion at the Lambeth Conference.[26] The ECP also sees the survey as a way to encourage other faith actors in the Philippines and in the global communion to commit to conducting emissions surveys.

Recommendations

The ECP plans to repeat the survey annually by building it into its annual parochial reports and has discussed plans to digitize the data collection process going forward. Each parish will contribute emissions data for its respective assets, and the ECP will then be able to report on its total annual emissions. The network is particularly interested in tracking which assets have high consumption and how sectors with high sources of emissions may be adapted to be more sustainable going forward. Building on existing incentives in place for tree planting, the ECP has also discussed implementing incentives for measurable reductions in GHG emissions across its assets.

Key recommendations for implementation by other faith actors are as follows:

FACTOR IN ADEQUATE TIME AND RESOURCES

The adaptation, implementation, and analysis of an emissions survey requires a time and resource commitment by faith actors that may not have the necessary resources or the support of a research team. Before starting the process of adapting and implementing the survey, we recommend that adequate time is set aside for preparing an inventory of assets, training survey coordinators, adapting the survey, and calculating the results. However, based on the needs and interests of a given faith actor, parts of the survey can be omitted to reduce the potential for survey fatigue and streamline the analysis. After the first rollout of the survey, and as it becomes standard practice for faith actors, the resources required for future implementations are likely to decrease. Parts of the survey that may require more time on the part of participants—for example, reporting on land, trees, and wildlife—could be adapted into an annual tree count or wildlife review.

PREPARE AN INVENTORY OF ASSETS AND SOURCES OF EMISSIONS

To ensure that an emissions survey addresses sources of emissions across varied and diverse assets, it is important to first prepare an inventory to assess the types of assets and sources of GHG emissions. The inventory of assets and emissions sources can be used to check which parts of the survey may be omitted and support any further adaptation of the survey. Writing any additional sources of emissions from the inventory into the survey would also streamline the data collection and analysis process. This could then be written into the survey as questions so that it is appropriately tailored to each faith actor.

ADAPT THE SURVEY TOOL AND DECIDE ON SCOPE

Faith actors will need to adapt the survey tool to be appropriate to their specific context. Future versions of the survey could incorporate more specific questions to collect data on which theologies or religious concepts of faith actors are used to inform environmentally sustainable behaviors and how they do so. Future studies may likewise wish to include more comprehensive data on the size, location, and use patterns of assets. If the scope of the survey is amended, it is imperative to report comprehensively on the changes made to ensure comparability of emissions year to year. The survey tool in this study was conducted on paper, but future surveys could be adapted either to an online survey platform or mobile phone application or even be disseminated via text to facilitate quicker survey deployment and response.

EARLY INTERNAL COMMUNICATIONS

The ECP found that early communication with diocesan offices to explain the rationale for the survey and give advance notice that the survey will be distributed led to a smoother rollout process.

Respondents should be made aware as early as possible of plans to conduct an emissions survey so that time can be set aside for completing it and to enable any feedback on the survey to be addressed before a full rollout.

RETAIN EMISSIONS DATA

It is imperative that early communications indicate the need to retain all energy bills, water bills, and any other relevant emissions data. This helps ensure that the survey data are comprehensive and that individual respondents are able to retrieve the data and fill out the survey.

CONDUCT TRAINING WITH NOMINATED SURVEY COORDINATORS

Conducting orientations with survey coordinators is key for ensuring that all elements of the survey are understood by those undertaking it. The survey must be filled out correctly if collected emissions data are to be relevant and useful. Survey encoding and emissions calculations are made simpler when there is less room for interpretation of survey answers. Delivering training has the added benefit of building capacity and improving understanding of emissions sources among participants.

CONCLUSIONS AND NEXT STEPS

The development and pilot run of this survey demonstrated that faith actors have the desire and capacity to conduct emissions and environmental surveys. The survey tool can support faith actors in measuring the emissions of their varied assets and documenting their environmental activities. The challenges that arose throughout the pilot act as important lessons learned for future adaptation and implementation. The pilot also highlighted key opportunities, beyond measuring emissions, in terms of inventorying assets and capacity building around environmental awareness.

Once faith actors calculate emissions measurements, they can use these measurements to develop targets for emission reductions that can then be tracked with annual repetition of the survey. The process of establishing regular emissions surveys will also help prepare the ECP for involvement in the development of further SBT tools, which will align ECP measurements with the full SBT structure. Furthermore, faith actors with asset inventories and emissions measurements in place will be well-prepared to engage with and evidence their contribution to climate action. The ECP plans to rerun the survey annually and report on emissions measurements in its annual parochial reports. We hope that other faith actors that want to measure their emissions and eventually work toward science-based emission reduction targets will take up the model.

APPENDIX A. THE EMISSIONS SURVEY TOOL

Having outlined the development of the survey and results and analysis of the pilot study, the following section explains how to practically use and apply the tool (see Appendices B and C for the survey tool and sample calculations). We hope that the model will be taken up by other faith actors that want to measure their emissions and create baseline measurements for science-based emission reduction targets.

How to use the tool

The survey tool consists of seven sections. It includes four sections to collect data from which emissions measurements can be calculated: energy, water consumption, waste, and land. The section on environmental awareness and practice is not designed to produce emissions data, but instead collects information on existing environmental activities and mitigation strategies. The introduction includes questions to collect basic asset data and help categorize assets. The feedback section, which proved useful in this pilot study, was included to understand the experiences and comprehension of respondents and to support any amendments in future implementations.

To use the tool to measure emissions, faith actors may use the steps detailed below and should also refer to the recommendations included in the subsection "Lessons learned and recommendations."

1. **Identify land, buildings, and sources of emissions**

To use the survey tool, faith actors need to ensure that an inventory of assets is created and that sources of emissions are identified before adapting the survey. While some faith actors may already have this information at their disposal, others may need to consider and count the types of land and buildings they own to ensure that all possible sources of emissions are captured. For this pilot study, sources of emissions included electricity use, water use, deep water wells, vehicles, refrigerants, various fuels for cooking, and waste.

2. **Adapt the survey**

The next step is to adapt the survey to the particular faith actor, based on the inventory of assets and emissions sources. It is useful to reflect on how best to categorize and identify the potential respondents; in this study, we identified 11 types of assets, from which we devised five overarching categories for the purposes of analysis (see "Results and recommendations"). The questions in this survey cover a wide range of emissions sources, so based on the assets and interests of different faith actors some questions may be omitted or added. Faith actors may wish to include additional details, such as the specific size, location, function, and use of assets, where useful and feasible. The section on environmental awareness and practice may also be adapted to

be attentive to the religious and cultural context. It is anticipated that Christian faith actors in the Philippines will be particularly well placed to adopt this model with very little adaptation, while faith actors from other traditions or in other parts of the world may need to adapt the survey in line with the context in which they operate.

3. **Deliver training sessions**

From this study, the importance of delivering training sessions in advance of the survey as well as during the implementation phase was demonstrated. It is useful to nominate survey coordinators to assist with the survey rollout and ensure that the survey is completed accurately. At this stage, faith actors will also be able to estimate how long the adapted survey may take.

4. **Roll out the survey tool**

Survey implementation can be conducted by sending the survey out to parishes, individual assets, or in person via the nominated survey coordinators. Though the delivery of this survey was conducted on paper and survey results were handwritten, building the survey into an online form may significantly reduce the time needed for data collection, analysis, and emissions calculations.[27] Using survey coordinators or enumerators to conduct the survey in person may result in more accurate data collection but requires additional resources so may be more appropriate for smaller faith actors with less assets.

5. **Collate survey data**

For quantitative data (i.e., emissions measurements), data from individual assets do not necessarily need to be collated and can be calculated directly from the survey. For qualitative data (i.e., descriptions of environmental activities and feedback on the survey), it is useful to collate and report on these. Careful consideration should be given to how to store and maintain asset inventories and measurement data, particularly where this information may be sensitive; to support this, the local team may consider developing a data management plan.[28]

6. **Calculate emissions**

Emissions calculations can be conducted using the calculations detailed in subsection "Data anaylsis." More details on the calculation process can also be found in Appendix C.

7. **Standardize for future use**

Once the survey has been completed, it is important to consider the ways that it may be improved and standardized for continued use—for example, by incorporating it into annual reporting processes. Repeating the survey annually allows for emissions data to be captured and tracked over time and can provide a baseline for science-based targets to be set and met.

APPENDIX B. ECP EMISSIONS AND ENVIRONMENTAL SURVEY

Readers who wish to obtain a full version of the survey may do so at the following links:

Word Document: https://files.wri.org/d8/s3fs-public/2023-08/template-emission-survey-instrument.docx

PDF: https://files.wri.org/d8/s3fs-public/2023-08/ecp-emissions-and-environmental-survey.pdf

We include a shortened version of the survey here with headline questions only.

Introduction

This survey tool aims to evaluate your institution's greenhouse gas emissions and environmental awareness. The ECP is interested in collecting this information to help reduce its overall environmental impact across the country. The survey will give you an idea of how much greenhouse gas your institution emitted from January 2021 to December 2021, which will help you decide if and how you need to reduce certain emissions.

A. Energy

1. What are your operating hours?

2a. What do you use for your electrical power needs?

2b. Do you use electricity for water/well pumping?

3. If your power is sourced from a generator, how much fuel did you consume in 2021?
4. Do you have any other sources of energy that we have not covered (e.g., on-site boilers for hospitals)?
   If yes, please identify other sources of energy and their corresponding percentages (for example, solar or hydro power)
5. What types of fuel do you use for cooking and other purposes?
6. Please fill the table below with the type of fuel you use for cooking.
7. What types of appliances/equipment that consume electricity are used in your ECP-owned institution?
8. What refrigerants do you use?
9. Do you undertake actions to reduce your electricity consumption (e.g., using LED bulbs, turning off lights or appliances when not in use)?
10. What type of energy-saving appliances/equipment do you use? Please specify what type of appliances or systems you use.
11. Does your ECP-owned institution post notices about turning off lights, appliances, and/or equipment when not in use?

12. What type of vehicles does your ECP-owned institution own? Please list and provide the number of vehicles per type of vehicle and the amount of fuel used per year.
13. Do employees use public transportation when traveling to your ECP-owned institution?
14. If an employee uses their own vehicle, what types of vehicles do employees use when traveling to the ECP-owned institution?
15. Do you practice methods to encourage vehicle sharing, such as carpooling or a shuttle bus for employees?
16. Does your ECP-owned institution encourage employees to use a bike instead of a car when reporting for work?
17. Does your ECP-owned institution provide cycle racks/ bike parking spaces where cyclists can park their bicycles on the premises?
18. Does your ECP-owned institution encourage employees to walk when traveling short distances?

B. Water consumption

1. What do you use for your water needs? Please indicate—you may tick both options if you use a mixture of utilities and generator(s).
2. Please indicate your monthly water consumption
3. Do you practice rainwater harvesting?
4. How many toilets does your building have?
5. Have you installed water-saving toilets or water-saving devices on toilets, such as dual flush buttons?
6. If yes, how many toilets have water-saving devices?
7. Do you have a waterless toilet/pit latrine on your premises?
8. Do you undertake measures to reduce your water consumption?

C. Waste

1. What are the common types of solid waste in your ECP-owned institution?
2. How much waste do you generate in one week?
3. Does the ECP take steps to reduce food waste?
4. How is the waste of your ECP-owned institution disposed of/managed?
5. Does your ECP-owned institution provide recycling bins on its premises?
6. What do you recycle?
7. Does your ECP-owned institution use recycled materials?
8. Does your ECP-owned institution use disposables?
9. Does your ECP-owned institution recycle disposables?
10. Does your ECP-owned institution compost disposables?
11. Does your ECP-owned institution use environmentally friendly cleaning products?
12. Does your ECP-owned institution use both sides of the paper when printing?
13. Does your ECP-owned institution have composting facilities?
14. Does your ECP-owned institution post notices about disposing of waste properly?

D. Land

1. Have you observed the presence of any wildlife on the ECP-owned institution premises?
2. Are there trees present on the ECP-owned institution premises?
3. What tree species are present on the grounds of the ECP-owned institution?
4. Does your ECP-owned institution participate in tree-planting activities?
5. Why do you plant these types of trees?
6. Is this tree planting part of an ECP tree-planting program?
7. If not, does your ECP-owned institution intend to plant trees in the future?
8. Does your ECP-owned institution participate in tree-planting activities of the government (e.g., National Greening Program)?
9. Does your ECP-owned institution seek technical assistance from forestry experts when planting trees on its premises?
10. Does your ECP-owned institution conduct floral and faunal biodiversity surveys of its land?
11. Does your ECP-owned institution use harmful chemicals such as pesticides, herbicides, or fertilizers in taking care of the plants and trees on its premises?
12. Are you implementing any other environmental practices to protect the land and its flora and fauna? Please describe/ explain any other practices.

E. Environmental awareness and practice

1. Is creating environmental awareness among employees, members, and students part of the ECP's church/school/ hospital goals?
2. If yes, what environmental awareness activities are undertaken by your ECP-owned institution?
3. If your ECP-owned institution holds fora/events on the environment, what are their frequency?
4. If your ECP-owned institution holds fora/events on the environment, what topics have been covered so far (e.g., climate change, biodiversity, conservation)?
5. If your ECP-owned institution produces print materials on environmental conservation, which topics have been covered? Please list the topics.

6. Does your ECP-owned institution participate in a community clean-up drive?
7. Does your ECP-owned institution host a trade fair showcasing organically grown products?
8. Does your ECP-owned institution participate in global and national environmental events such as the annual Earth Hour event or the Philippines National Environmental Awareness Month?
9. Does your ECP-owned institution participate in campaigning activities around national environmental issues?
10. Indicate the frequency of the ECP's participation in environmental activities.
11. Are constituents of your ECP-owned institution aware of the impact of climate change and environmental degradation?
12. Have you conducted a perception and awareness survey among constituents of your ECP-owned institution?
13. Does your ECP-owned institution provide financial support for activities that promote environmental protection?
14. Does your ECP-owned institution use organically produced vegetables and fruits in the meals they serve in their cafeterias/ catered meals at events/occasions?

15a. Has your ECP-owned institution set targets to reduce emissions?

15b. If not, do you intend to do so or would you like to set targets?

F. Feedback

This survey is part of a pilot program to build a useful and usable tool for the ECP to understand its institutions' emissions and level of environmental awareness. We greatly value your feedback on this survey to help us understand how to improve it in the future.

1. Could you easily understand the questions in this survey?
2. Were there any questions that you found particularly difficult to answer in this survey?
3. Why did you find these questions difficult to answer?
4. Are there any additional topics or questions you think we should include? Please specify.
5. Would you like to add any other overall feedback on this survey?

APPENDIX C. SAMPLE CALCULATIONS

A. Electricity

Given: 132,000 kilowatt-hours (kWh)

Emission factors:

CO_2 = 0.609 kilograms per kilowatt-hour (kg/kWh)

CH_4 = 0.0000093594 kg/kWh

N_2O = 0.00000712544 kg/kWh

Emissions =

CO_2: 132,000 kWh × 0.609 kg/kWh = 80,388.00 kg × 1 ton/1,000 kg = 80.39 tons

CH_4: 132,000 kWh × 0.0000093594 kg/kWh = 1.23544080 kg × 1 ton/1,000 kg = 0.001235 ton

N_2O: 132,000 kWh × 0.00000712544 kg/kWh = 0.94055808 kg × 1 ton/1,000 kg = 0.00094056 ton

Convert CH_4 and N_2O to CO_2 to get the CO_2e

CH_4: 0.001235 ton × 44/16 = 0.00258653 ton

N_2O: 0.00094056 ton × 44/44 = 0.00094056 ton

Total emissions in CO_2e = 80.39 tons + 0.00258653 ton + 0.00094056 ton = 80.39352709 tons

B. Gasoline

Given: 100,000 liters

Emission factor: CO_2 = 8.599 kg/gallon

Emissions =

CO_2: 100,000 liters × 8.599 kg/gallon × 1 ton/1,000 kg = 227.16 tons

3.78541 liters/gallon

C. Diesel

Given: 100,000 liters

Emission factor: CO_2 = 10.131 kg/gallon

Emissions =

CO_2: 100,000 liters × 10.131 kg/gallon × 1 ton/1000 kg = 267.63 tons

3.78541 liters/gallon

D. Kerosene

Given: 100,000 liters

Emission factors:

CO_2 = 2.519 kg/liter

CH_4 = 0.0003504 kg/liter

N_2O = 0.000021024 kg/liter

Emissions =

CO_2: 100,000 liters × 2.519 kg/liter × 1 ton/1,000 kg = 251.9 tons

CH_4: 100,000 liters × 0.0003504 kg/liter × 1 ton/1,000 kg = 0.03504 tons

N_2O: 100,000 liters × 0.000021024 kg/liter × 1 ton/1,000 kg = 0.0021024 tons

ENDNOTES

1. While WRI uses the term "faith-based organization" as the umbrella term, "faith actor" is used in this paper as it is the more commonly used term in the sector, including by the JLI. See Box ES-1 for definitions of key terms.
2. Scope 1 emissions are from sources that an organization has direct control over or ownership of, and Scope 2 emissions are from indirect sources, such as externally purchased electricity, fuel, waste, or vehicles.
3. Numerous studies demonstrate how faith actors use their resources to advocate for climate action at local, national, and international levels (see Kearns 2011; Veldman et al. 2014; Glaab 2017; Hulme 2017, among many others); others focus specifically on the way that faith actors may translate or adapt climate messaging by using religious frameworks and language (see Rollosson 2010; Lyons et al. 2016; Ali 2016; Bomberg and Hague 2018; Mangunjaya and Praharawati 2019); and many studies address how and the extent to which faith actors mobilize communities for climate action (see Lysack 2014; Mangunjaya et al. 2015; Koehrsen 2015; Haron 2017; Glaab and Fuchs 2018; Torabi and Noori 2019; Koehrsen 2021).
4. Though not directly relevant to this paper, which focuses on land and buildings, faith actors also have significant economic resources at their disposal. For example, a 2016 study estimated that religion contributes about $1.2 trillion of socioeconomic value to the US economy (Grim and Grim 2016).
5. Including the United Nations Environment Programme's Faith for Earth Initiative, WWF's Beliefs and Values Programme, and Greenpeace MENA's Green Mosques project, among others.
6. See more about WRI's Faith and Sustainability initiative at https://www.wri.org/initiatives/faith-and-sustainability.
7. For example, the United Nations Environment Programme's 2020 Guidelines on Green Houses of Worship; Greenpeace and Ummah for Earth's Green Mosques report; various Green Mosques initiatives in Morocco, Lebanon, and Indonesia; A Rocha's Eco Church program; the Green Temple guide produced by Alliance of Religions and Conservation in 2015; Eco-Congregation Scotland's guidelines on Greening Church Buildings; and the Eco-Temple Community Development Project run by the Inter-religious Climate and Ecology Network and the International Network of Engaged Buddhists, among many others.
8. Cool Congregations is a program and emissions calculator developed by Interfaith Power and Light. For more, see https://www.coolcongregations.org/.
9. Eco Church is a tool developed by A Rocha, a Christian environmental organization, which rewards churches for their environmental sustainability via the Eco Survey and provides recommendations for improving sustainability. For more, see https://ecochurch.arocha.org.uk/.
10. For example, Hazon's Seal of Sustainability, Faith & the Common Good's Greening Sacred Spaces Certification, The Eco-Synagogue Environmental Awards, and the Eco Church Award scheme.

11. In 2009, more than 60 faith groups developed long-term commitments on the environment as part of the Many Heavens, One Earth program initiated by the (now defunct) Alliance of Religions and Conservation. See also Faith Plans (https://www.faithplans.org) and the International Network for Conservation and Religion (https://incrworld.org).
12. The Five Marks of Mission, developed by the Anglican Consultative Council, provide the framework for ministry work, church activities or programs, and the activities of individual congregants.
13. In conjunction with Episcopal Relief & Development, the ECP ran a carbon offset program between 2013 and 2018 resulting in an estimated carbon sequestration from tree planting of 22,649 tCO_2e (Climate Stewards n.d.).
14. "Capacity" may include organizational or operational capacity, in this paper, the capacity to develop, conduct, and analyze emissions surveys, but the term also includes skill- or knowledge-based capacity; that is, the language of environmental sustainability and sources of GHG emissions and scopes. See Barbelet (2019) and Wilkinson et al. (2022) for more critical discussions on the notion of "capacity."
15. The ECP has a record of responding to natural hazards and committing to action on climate change. See, for example, its involvement in climate commitments in 2009 (Davies 2009), response to Typhoon Haiyan (Anglican Alliance 2020), and experience dealing with increasingly frequent natural hazards (Anglican Alliance 2014).
16. Floyd P. Lawlet, provincial secretary of the ECP and a lead partner in this pilot study, is a JLI board member.
17. For more discussion on collaborative research with local faith actors, see Casale et al. (2011), Cochrane et al. (2011), and Trotta and Wilkinson (2019).
18. To use the GHG emissions calculation tool, visit https://ghgprotocol.org/calculation-tools-and-guidance.
19. The Energy Star Portfolio Manager is an interactive tool that commercial buildings in North America can use to "benchmark" their energy use; that is, develop baseline emissions measurements. For more information, see the Energy Star Portfolio Manager web page: https://www.energystar.gov/buildings/benchmark.
20. Scope 1 emissions are from sources that an organization has direct control over or ownership of, and Scope 2 emissions are from indirect sources, such as externally purchased electricity, fuel, waste, or vehicles.
21. A previous project that mapped the health assets of faith actors emphasized the need to consider the scope of what is meant by "assets," both "tangible" and "intangible" (Cochrane et al. 2011; see also Olivier et al. 2006; Gunderson and Cochrane 2012; Haron 2017). "Tangible" assets are those that can more easily be measured. In the case of health assets, this may be the number of patients supported by a given faith actor. "Intangible" assets are resources that cannot be simply quantified, such as the role that trust or spiritual support plays in faith actors' service provision. In the case of environmental sustainability, the tangible assets may be the physical land and buildings owned by a faith actor, the area of land used for activities such as tree planting, or the number of congregants in attendance at an environmental awareness training. Intangible assets may be the beliefs and values used by faith actors to promote environmental protection or the use of prayer and theological reflection on climate change.
22. For example, the ECP established St. Luke's Medical Center, but its operations are too complex to be included. Some clinics and facilities are owned and operated by medical doctors and not the ECP directly. Another example, Brent International School, has three campuses that are managed by independent boards and as such could not be included in this survey.
23. During the survey encoding, some churches were recategorized as church+building when it became apparent that their land included additional buildings.
24. Renewable energy produces far less emissions than fossil fuel and reduces air pollution. For instance, 15 million kilowatt-hours of electricity produced using renewable energy will result in carbon savings of 6,182.85 tCO_2e compared with energy produced from the grid.
25. For guidance on energy-saving appliances and their labeling in the Philippines, see https://www.enerhiyangatin.ph/program/02-philippine-energy-labelling-program.html.
26. The Lambeth Conference is a decennial meeting of bishops in the Anglican Communion. In 2022, a day of the conference was dedicated to Environmental and Sustainable Development and the prime bishop of the Episcopal Church has been invited to present on the ECP's emissions survey tool. For more about the Lambeth Conference, see https://www.lambethconference.org.
27. At the time of writing, examples of free online survey tools included Epicollect, SurveyMonkey, and Google Forms.
28. Guidance on research data management and template data management plans can be found at the following links: https://ukdataservice.ac.uk/learning-hub/research-data-management/#plan-to-share; https://www.ukri.org/publications/outline-data-management-plan-template-and-guidance/.

REFERENCES

Ager, A., and J. Ager. 2016. "Sustainable Development and Religion: Accommodating Diversity in a Post-secular Age." *The Review of Faith & International Affairs* 14 (3): 101–5. doi:10.1080/15570274.2016.1215813.

Anglican Alliance. 2014. "Church in the Philippines Helps Communities Gain Greater Resilience after Typhoon Haiyan." Anglican Alliance, January 29. https://anglicanalliance.org/church-in-the-philippines-helps-communities-gain-greater-resilience-after-typhoon-haiyan/.

Anglican Alliance. 2020. "Anglican Churches in the Philippines Respond to Multiple Disasters with Characteristic Resourcefulness, but Capacity Is Now Stretched by Number and Scale of Emergencies." Anglican Alliance, January 27. https://anglicanalliance.org/anglican-churches-in-the-philippines-respond-to-multiple-disasters-with-characteristic-resourcefulness-but-capacity-is-now-stretched-by-number-and-scale-of-emergencies/.

Ali, S.H. 2016. "Reconciling Islamic Ethics, Fossil Fuel Dependence, and Climate Change in the Middle East." *Review of Middle East Studies* 50 (2): 172–78. doi:10.1017/rms.2016.135.

Atmaca, A.B., G. Zorer Gedik, and A. Wagner. 2021. "Determination of Optimum Envelope of Religious Buildings in Terms of Thermal Comfort and Energy Consumption: Mosque Cases." *Energies* 14 (20): 6597. doi:10.3390/en14206597.

Azmi, N.A., M. Arıcı, and A. Baharun. 2021. "A Review on the Factors Influencing Energy Efficiency of Mosque Buildings." *Journal of Cleaner Production* 292 (April): 126010. doi:10.1016/j.jclepro.2021.126010.

Barbelet, V. 2019. "Rethinking Capacity and Complementarity for a More Local Humanitarian Action." Humanitarian Policy Group. https://cdn.odi.org/media/documents/12957.pdf.

Begum, A., L. Jingwei, I.U.K. Marwat, S. Khan, H. Han, and A. Ariza-Montes. 2021. "Evaluating the Impact of Environmental Education on Ecologically Friendly Behavior of University Students in Pakistan: The Roles of Environmental Responsibility and Islamic Values." *Sustainability* 13 (18): 10188. doi:10.3390/su131810188.

Bensch, D., D.L. Paulhus, L. Stankov, and M. Ziegler. 2019. "Teasing Apart Overclaiming, Overconfidence, and Socially Desirable Responding." *Assessment* 26 (3): 351–63.

Bomberg, E., and A. Hague. 2018. "Faith-Based Climate Action in Christian Congregations: Mobilisation and Spiritual Resources." *Local Environment* 23 (5): 582–96. doi:10.1080/13549839.2018.1449822.

Caldwell, C., N. Probstein, and T. Yoreh. 2022. "Shades of Green: Environmental Action in Places of Worship." *Journal of Environmental Studies and Sciences* (April). doi:10.1007/s13412-022-00760-2.

Casale, M.A.J., S. Flicker, and S.A. Nixon. 2011. "Fieldwork Challenges: Lessons Learned from a North-South Public Health Research Partnership." *Health Promotion Practice* 12 (5): 734–43. https://doi.org/10.1177/1524839910369201.

Climate Stewards. n.d. *Estimation of Carbon Sequestered in Trees in the Philippines*. New York, NY: Episcopal Relief & Development; Quezon City, Philippines: The E-Care Foundation.

Climate Watch. 2020. "Climate Watch Historical GHG Emissions." Washington, DC: World Resources Institute. https://www.climatewatchdata.org/ghg-emissions.

Clissold, R., and K.E. McNamara. 2020. "Exploring Local Perspectives on the Performance of a Community-Based Adaptation Project on Aniwa, Vanuatu." *Climate and Development* 12 (5): 457–68. doi:10.1080/17565529.2019.1640656.

Cochrane, J.R., B. Schmid, and T. Cutts, eds. 2011. *When Religion and Health Align: Mobilising Religious Health Assets for Transformation*. Pietermaritzburg, South Africa: Cluster Publications.

Das, S., M. Haigh, and S. Chauhan. 2014. "Communicating Sustainability within Britain's Hindu Community." *Sustainability* 6 (2): 718–40. doi:10.3390/su6020718.

Davies, M. 2009. "In East Asia and the Pacific, Anglicans Commit to Action on Climate Change." Episcopal News Service, March 30. The Archives of the Episcopal Church. https://www.episcopalarchives.org/cgi-bin/ENS/ENSpress_release.pl?pr_number=033009-02.

ECP (Episcopal Church in the Philippines). n.d. "Five Marks of Mission." Quezon City, Philippines: Episcopal Church in the Philippines. https://ecphilippines.wordpress.com/five-marks-of-mission/. Accessed July 2, 2022.

GHGP (Greenhouse Gas Protocol). 2021. "The GHG Emissions Calculation Tool." Greenhouse Gas Protocol. https://ghgprotocol.org/ghg-emissions-calculation-tool.

Glaab, K. 2017. "A Climate for Justice? Faith-Based Advocacy on Climate Change at the United Nations." *Globalizations* 14 (7): 1110–24. doi:10.1080/14747731.2017.1308060.

Glaab, K., and D. Fuchs. 2018. "Green Faith? The Role of Faith-Based Actors in Global Sustainable Development Discourse." *Environmental Values* 27 (3): 289–312. doi:10.3197/096327118X15217309300840.

Grim, B.J., and M.E. Grim. 2016. "The Socio-economic Contribution of Religion to American Society: An Empirical Analysis." *Interdisciplinary Journal of Research on Religion* 12 (3).

Gunderson, G., and J. Cochrane. 2012. "Religious Health Assets: What Religion Brings to Health of the Public." In *Religion and the Health of the Public: Shifting the Paradigm*. London: Palgrave Macmillan. doi:10.1057/9781137015259_3, 41–58.

Haron, M. 2017. "Drawing on African Muslims' Intangible Assets: Doing Jihad against Climate Change: African Muslims' Intangible Assets." *The Ecumenical Review* 69 (3): 348–61. doi:10.1111/erev.12298.

Hijioka, Y., E. Lin, J.J. Periera, R.T. Corlett, X. Cui, G.E. Insarov, R.D. Lasco, et al. 2014. "Asia." In *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, United Kingdom; New York, NY: Cambridge University Press, 1327–70.

Hui, S.C.M. 2012. "Energy Audit and Energy Management for Church Buildings in Hong Kong." Pokfulam, Hong Kong: University of Hong Kong.

Hulme, M. 2017. "Climate Change: Varieties of Religious Engagement." In *Routledge Handbook of Religion and Ecology*, edited by W. Jenkins, M.E. Tucker, and J. Grim. New York, NY: Routledge, 239–48.

IPCC (Intergovernmental Panel on Climate Change). 2006. "2006 IPCC Guidelines for National Greenhouse Gas Inventories." Intergovernmental Panel on Climate Change.

IPCC. 2021. "Inventory Software—IPCC-TFI." Task Force on National Greenhouse Gas Inventories. https://www.ipcc-nggip.iges.or.jp/software/index.html.

Ives, C.D., and J. Kidwell. 2019. "Religion and Social Values for Sustainability." *Sustainability Science* 14 (5): 1355–62. doi:10.1007/s11625-019-00657-0.

Jenkins, W., E. Berry, and L.B. Kreider. 2018. "Religion and Climate Change." *Annual Review of Environment and Resources* 43 (1): 85–108. doi:10.1146/annurev-environ-102017-025855.

Kagawa, R.C., A. Anglemyer, and D. Montagu. 2012. "The Scale of Faith Based Organization Participation in Health Service Delivery in Developing Countries: Systematic Review and Meta-analysis." Edited by E.J. Beck. *PLoS ONE* 7 (11): e48457. doi:10.1371/journal.pone.0048457.

Kearns, L. 2011. "The Role of Religions in Activism." In *The Oxford Handbook of Climate Change and Society*, edited by J.S. Dryzek, R.B. Norgaard, and D. Schlosberg. Oxford University Press, 414–29.

Koehrsen, J. 2015. "Does Religion Promote Environmental Sustainability? Exploring the Role of Religion in Local Energy Transitions." *Social Compass* 62 (3): 296–310. doi:10.1177/0037768615587808.

Koehrsen, J. 2021. "Muslims and Climate Change: How Islam, Muslim Organizations, and Religious Leaders Influence Climate Change Perceptions and Mitigation Activities." *WIREs Climate Change* 12 (3): e702. doi: https://doi.org/10.1002/wcc.702.

Kwon, T., and V. Samberger. 2021. "Unleashing the Potential of Faith-Based Investors for Positive Impact and Sustainable Development." University of Zurich: Center for Sustainable Finance & Private Wealth and the Initiative for Blended Finance.

Lemche, J., and J. Miller. 2019. "Global Capital, Local Conservation, and Ecological Civilization: The Tiejia Ecology Temple and the Chinese Daoist Association's Green Agenda." *Religions* 10 (10): 580. doi:10.3390/rel10100580.

Lyons, K., P. Walters, and E. Riddell. 2016. "The Role of Faith-Based Organizations in Environmental Governance: The Case of Forestry in Solomon Islands." *Journal of Environmental Policy & Planning* 18 (3): 342–60. doi:10.1080/1523908X.2015.1098524.

Lysack, M. 2014. "Stepping Up to the Plate: Climate Change, Faith Communities and Effective Environmental Advocacy in Canada." In *How the World's Religions Are Responding to Climate Change: Social Scientific Investigations*, edited by R.G. Veldman, A. Szasz, and R. Haluza-DeLay. London: Routledge, 157–73.

Mangunjaya, F.M., and G. Praharawati. 2019. "Fatwas on Boosting Environmental Conservation in Indonesia." *Religions* 10 (10): 570. doi:10.3390/rel10100570.

Mangunjaya, F.M., I.S.L. Tobing, A. Binawan, E. Pua, and M. Nurbawa. 2015. "Faiths from the Archipelago: Action on the Environment and Climate Change." *Worldviews: Global Religions, Culture, and Ecology* 19 (2): 103–22. doi:10.1163/15685357-01902003.

McKay, J.E., F.M. Mangunjaya, Y. Dinata, S.R. Harrop, and F. Khalid. 2014. "Practise What You Preach: A Faith-Based Approach to Conservation in Indonesia." *Oryx* 48 (1): 23–29. doi:10.1017/S0030605313001087.

Nago, M., and M. Krott. 2022. "Systemic Failures in North-South Climate Change Knowledge Transfer: A Case Study of the Congo Basin." *Climate Policy* 22 (5): 623–36. doi:10.1080/14693062.2020.1820850.

Nordstokke, K. 2013. "Faith-Based Organisations (FBOs) and Their Distinct Assets." *Svensk Missionstidskrift* 101 (2): 185–202.

Olivier, J., J.R. Cochrane, and B. Schmid. 2006. "ARHAP Literature Review: Working in a Bounded Field of Unknowing." African Religious Health Assets Programme.

Posas, P. 2007. "Roles of Religion and Ethics in Addressing Climate Change." *Ethics in Science and Environmental Politics* 7: 31–49. doi:10.3354/esep00080.

Pretlove, S.E.C. 2017. "An Evaluation of Heating Strategy, Thermal Environment, and Carbon Emissions in Three UK Churches." *International Journal of Architectural Heritage* 11 (7): 913–32.

Puglisi, A., and J. Buitendag. 2022. "A Faith-Based Environmental Approach for People and the Planet: Some Inter-religious Perspectives on Our Earth-Embeddedness." *HTS Teologiese Studies/Theological Studies* 78 (2). doi:10.4102/hts.v78i2.7582.

Rollosson, N. 2010. "The United Nations Development Programme (UNDP) Working with Faith Representatives to Address Climate Change: The Two Wings of Ethos and Ethics." *CrossCurrents* 60 (3): 419–31. doi:10.1111/j.1939-3881.2010.00140.x.

Stork, J., and P. Öhlmann. 2021. "Religious Communities as Actors for Ecological Sustainability in Southern Africa and Beyond." Humboldt-Universität zu Berlin, November. doi:10.18452/23587.

Terrill, T.J., F.J. Morelli, and B.P. Rasmussen. 2015. "Energy Analysis of Religious Facilities in Different Climates through a Long-Term Energy Study." *Energy and Buildings* 108 (December): 72–81. doi:10.1016/j.enbuild.2015.08.049.

Tomalin, E. 2020. "Global Aid and Faith Actors: The Case for an Actor-Orientated Approach to the 'Turn to Religion.'" *International Affairs* 96 (2): 323–42.

Torabi, M., and S.M. Noori. 2019. "Religious Leaders and the Environmental Crisis." *The Ecumenical Review* 71 (3): 344–55. doi:10.1111/erev.12434.

Torgerson, M.A. 2012. *Greening Spaces for Worship and Ministry: Congregations, Their Buildings, and Creation Care*. Lanham, MD: Rowman & Littlefield.

Trotta, S., and O. Wilkinson. 2019. *Partnering with Local Faith Actors to Support Peaceful and Inclusive Societies*. Washington, DC: Joint Learning Initiative on Faith and Local Communities; Bonn, Germany: International Partnership on Religion and Sustainable Development (PaRD).

UNEP (United Nations Environment Programme). 2016. *Environment, Religion and Culture in the Context of the 2030 Agenda for Sustainable Development*. Nairobi: United Nations Environment Programme.

UNEP. 2018. "Faith for Earth: An Ethical Approach to Global Challenges." United Nations Environment Programme, August 22. http://www.unenvironment.org/news-and-stories/story/faith-earth-ethical-approach-global-challenges.

UNEP. 2020. *Guidelines on Green Houses of Worship*. United Nations Environment Programme, Faith for Earth. https://www.unep.org/resources/publication/guidelines-green-houses-worship.

USPG (United Society Partners in the Gospel). n.d. "The Episcopal Church of the Philippines: Asset-Based Community Development." https://uspg.org.uk/our-partners/programmes/asia/philippines/philippines-9323.php. Accessed July 2022.

Veldman, R.G., A. Szasz, and R. Haluza-DeLay, eds. 2014. *How the World's Religions Are Responding to Climate Change: Social Scientific Investigations*. London: Routledge.

Vonkova, H., O. Papajoanu, and J. Stipek. 2018. "Enhancing the Cross-Cultural Comparability of Self-Reports Using the Overclaiming Technique: An Analysis of Accuracy and Exaggeration in 64 Cultures." *Journal of Cross-Cultural Psychology* 49 (8): 1247–68.

Vourdoubas, I., A. Kalogerakis, and K. Zorbas. 2020. "Sustainability Assessment: Offsetting Carbon Emissions from Energy Use at the Orthodox Academy of Crete (OAC)." *American Scientific Research Journal for Engineering, Technology, and Sciences* 72 (1): 15.

WBCSD and WRI (World Business Council for Sustainable Development and World Resources Institute). 2004. *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (Revised Edition). Washington, DC: World Resources Institute; Geneva: World Business Council for Sustainable Development.

Wilkinson, O., K.H. Logo, E. Tomalin, W.L. Anthony, F. De Wolf, and A. Kurien. 2022. "Faith in Localisation? The Experiences of Local Faith Actors Engaging with the International Humanitarian System in South Sudan." *Journal of International Humanitarian Action* 7 (1): 4. doi:10.1186/s41018-021-00113-8.

WRI. 2023. *SBTi Corporate Manual*. Version 2.1. Partner organizations CDP, United Nations Global Compact, World Resources Institute, and WWF. https://sciencebasedtargets.org/resources/files/SBTi-Corporate-Manual.pdf.

Yüksel, A., M. Arıcı, M. Krajčík, M. Civan, and H. Karabay. 2021. "A Review on Thermal Comfort, Indoor Air Quality and Energy Consumption in Temples." *Journal of Building Engineering* 35 (March): 102013. doi:10.1016/j.jobe.2020.102013.

ACKNOWLEDGMENTS

This pilot study would not have been possible without the collaboration and work of the ECP, as well as the support of the JLI and WRI. The authors would like to extend their gratitude to the following people for their invaluable roles in each stage of the research process:

Collaborative development of the research design: Dr. Olivia Wilkinson, Dr. Jennifer Philippa Eggert, Susanna Trotta, and Kirsten Laursen Muth (JLI); Floyd P. Lalwet (ECP); Chendan Yan and Alberto Pallecchi (WRI)

Research supervision and oversight: Dr. Olivia Wilkinson, Dr. Jennifer Philippa Eggert, and Susanna Trotta (JLI)

Data collection: Rachel Beleo Cabulong and Betsy Reodica (ECP)

Data encoding: Angela Marie Alducente and Reuel Allan Tandang (UPLB)

Administrative support: Florine De Wolf (JLI)

We would also like to thank the following internal and external reviewers for their valuable and constructive feedback on the report: Cosmas Ochieng, Emily Matthews, Jordano Roma Buzati, Serena Li, Zola Berger-Schmitz, Carrick Reddin, Gloria Ferreyra, Aarushi Rai, Pratik Dattani, Carlos Salvador Zepeda Castillo, Edward de Quay, and Moises Neil Seriño. We also thank Sarah DeLucia for copyediting and LSF Editorial for proofreading.

ABOUT THE AUTHORS

Jodie Salter is a research advisor for the JLI, where she supports its work on the role of faith actors in climate action and environmental sustainability. She is also a PhD researcher in the Centre for Religion and Public Life at the University of Leeds.

Dr. Florencia Pulhin is a researcher in the Resilience Institute at UPLB, specializing in forestry and natural resources research and conducting carbon stocks assessments.

Dr. Olivia Wilkinson is director of research for JLI. She directs JLI's research work and collaborates with partners from UN agencies and governments, faith-based organizations and NGOs, and universities.

Chendan Yan was a research associate for WRI's Faith and Sustainability Initiative when this paper was being written. She has since then joined the European Climate Foundation as senior associate for the Climate Finance Program.

ABOUT JLI

The Joint Learning Initiative on Faith & Local Communities is an international network of researchers and practitioners that aims to build fair and equitable spaces to create and share evidence on religions' roles in the humanitarian and development sectors.

ABOUT ECP

The Episcopal Church in the Philippines became an autonomous Province of the Anglican Communion in 1988. The church in the Philippines is committed to sustainability with a very active outreach program, Episcopal Community Action for Renewal and Empowerment (E-CARE), which works to support community programs across the province.

ABOUT WRI

World Resources Institute is a global research organization that turns big ideas into action at the nexus of environment, economic opportunity, and human well-being.

Our challenge

Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

Our vision

We envision an equitable and prosperous planet driven by the wise management of natural resources. We aspire to create a world where the actions of government, business, and communities combine to eliminate poverty and sustain the natural environment for all people.

Our approach

COUNT IT

We start with data. We conduct independent research and draw on the latest technology to develop new insights and recommendations. Our rigorous analysis identifies risks, unveils opportunities, and informs smart strategies. We focus our efforts on influential and emerging economies where the future of sustainability will be determined.

CHANGE IT

We use our research to influence government policies, business strategies, and civil society action. We test projects with communities, companies, and government agencies to build a strong evidence base. Then, we work with partners to deliver change on the ground that alleviates poverty and strengthens society. We hold ourselves accountable to ensure our outcomes will be bold and enduring.

SCALE IT

We don't think small. Once tested, we work with partners to adopt and expand our efforts regionally and globally. We engage with decision-makers to carry out our ideas and elevate our impact. We measure success through government and business actions that improve people's lives and sustain a healthy environment.