

10
GREEN
GUIDE TO



ORGANIZATIONAL OPERATIONS

GREEN RECOVERY AND RECONSTRUCTION: TRAINING TOOLKIT FOR HUMANITARIAN AID





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The Green Recovery and Reconstruction Toolkit (GRRT)
is dedicated to the resilient spirit of people around the world
who are recovering from disasters. We hope that the GRRT
has successfully drawn upon your experiences in order to
ensure a safe and sustainable future for us all.

.....

ORGANIZATIONAL OPERATIONS

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NOTE TO USERS: The Green Recovery and Reconstruction Toolkit (GRRT) is a training program designed to increase awareness and knowledge of environmentally sustainable disaster response approaches. Each GRRT module package consists of (1) training materials for a workshop, (2) a trainer's guide, (3) slides, and (4) a technical content paper that provides background information for the training. This is the technical content paper that accompanies the one-day training session on greening organizational operations.

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MODULE 10: GREEN GUIDE TO ORGANIZATIONAL OPERATIONS

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1 INTRODUCTION

1.1 Module Objectives

The purpose of *Green Guide to Organizational Operations* (G2O2) is to provide a clear pathway to improve the environmental performance of an organization's operational activities. The Guide contains steps that can be used by managers or operations staff to establish a greener, more environmentally friendly operation by making adjustments to different aspects of an organization's operation including energy use, heating and air conditioning, travel, water use, waste management, infrastructure, and paper consumption. The G2O2 is therefore a guide for helping organizations to establish their own green "standard operating procedure." Operational functions are the focus of many of the action areas of the Guide because these areas have a significant impact on local environments, and a cumulative effect on the regional and global environment.

Operational improvements apply to all organizations, regardless of their mission, area of business, or sector. Whether a humanitarian aid organization, supermarket, legal office, or government ministry, every organization can take steps to improve its environmental performance. The framework provided by the G2O2 is meant to be flexible so it will be useful to any organization, but detailed enough to provide concrete examples for organization-specific greening practices. The G2O2 is also geared toward office environments, but the principles apply to industrial and other workplaces as well. The practices may be implemented in a formal way, through an environmental management system for tightly controlled and regulated performance, or in an informal but systematic way that allows results to be monitored. Another aim of the G2O2 is to institutionalize the principles of greening and to promote the integration of greening in all appropriate areas of an organization's work.

The Guide is based on the World Wildlife Fund's (WWF's) experience working with humanitarian organizations and on WWF's internal greening practices, and contains fully functional, accessible ideas for reducing an organization's environmental footprint, presented in a systematic way. Information about guidelines from other organizations is contained in Annex 2.

There are many generalized environmental standards systems that offer a certification or official recognition, such as the US Green Building Council's Leadership in Energy and Environmental Design (LEED) standard or the Organization for International Standards (ISO) 14000 series. These systems present formal standards and targets for organizational greening. These environmental standards systems can complement the G2O2 guidance described here and are a source of additional ideas.

The G2O2 is set up in the approximate chronological order for creating a green standard operating procedure at your workplace. It begins with the establishment of a baseline of environmental performance from which to improve (Section 2). Then it helps organizations set goals and describe the strategies that will be used to reach them (Section 3). The next section covers methods to establish responsibility for executing green practices to be sure they do not get lost in the shuffle of our busy workplaces (Section 4). Monitoring takes place throughout the life span of green practices and ensures that we meet our targets, understand our results, and continue to raise the performance bar (Section 5). The body of suggestions for green practices is contained in the Action Item section and the final section concludes with some of the additional benefits that come with successful institution of green practices, and ways to take advantage of them (Section 6).

Specific learning objectives for this module are as follows:

1. Describe the three core strategies of Green Organizational Operations and how they can be used to implement a plan for reaching greening goals and targets.
2. Assess opportunities for improving the environmental performance of the operational aspects of organizations and identify specific areas to address.
3. Describe three examples of “action items” for greening and discuss how they can be instituted within each of the core strategies.
4. Assign responsibility, motivate staff, and develop a green team to participate in greening efforts.

1.2 The Green Recovery and Reconstruction Toolkit

This is Module 10 in a series of 10 modules comprising the Green Recovery and Reconstruction Toolkit (GRRT). Collectively, the GRRT modules provide information and guidelines to improve project outcomes for people and communities recovering from disaster and conflict by minimizing harm to the environment and taking advantage of opportunities to improve the environment. Module 1 provides a brief introduction to the concept of green recovery and reconstruction to help make communities stronger and more resilient to future disasters by integrating environmental issues into the recovery process. GRRT Module 2 provides guidance on how project design, monitoring, and evaluation can better incorporate and address environmental issues within the typical project cycle. GRRT Module 3 builds upon Module 2, focusing specifically on assessment tools that can be used to determine the environmental impact of humanitarian projects regardless of the type of project or sector. GRRT Modules 4, 5, and 6 pertain specifically to building construction, with Module 4 focusing on site planning and development, Module 5 on building materials and the supply chain, and Module 6 on building design and construction management. GRRT Modules 7 through 10 provide sector-specific information to complement Modules 2 and 3, including livelihoods, disaster risk reduction, water and sanitation, and greening organizational operations.

1.3 Intended Audience

The audience includes humanitarian aid workers, conservation practitioners, local communities, government, and donor organizations that are interested in improving the environmental performance of their operations. Office and facilities managers, procurement officers, administrators, project managers, and office assistants are all target audiences for this module.

The GRRT focuses on those people working on the ground as part of disaster recovery and reconstruction efforts and includes staff involved in the design, implementation, and management of recovery and reconstruction. This module, however, has a broader application and is intended to be a resource for any organization that has headquarters and field offices with staff who have decided to apply the principles of sustainability to their own work environment.

The implementation and modeling of sustainable environmental practices is a particularly valuable opportunity for humanitarian organizations. In order to provide appropriate assistance to survivors of disasters and conflict, organizations have a special responsibility to model principles of sustainability as a disaster response strategy. Humanitarian organizations can then encourage their partner organizations to adopt similar behaviors and technologies. Lastly, they have an additional responsibility to their donors to be good stewards of the donors' resources, beginning with good stewardship of the environment.

1.4 Module Key Concepts

1. **Implementing greening plans:** Implementation of a greening plan begins with articulating an interest in and establishing overall objectives for greening. It is necessary to establish a starting point by assessing current green practices, environmental performance levels, staff knowledge, and current monitoring mechanisms.
2. **Strategies and action for greening:** Three strategies for greening are 1) establishing organizational policy, 2) making operational investments, and 3) changing employee behavior. These strategies are used to implement a plan through the action items that fall within each one. Action items represent the technical core of greening efforts. They represent policies, investments, and behavior changes that generate improvements in environmental performance. They are manifested in a variety of categories such as energy, water, operations, and so on.
3. **Setting objectives for greening:** Objectives for improved environmental performance should be clearly defined and based on the established baseline. Specific targets should be measurable and confined to a defined performance period.
4. **Working with staff:** Managers should provide motivation and education to staff so they can successfully participate in greening efforts. Responsibility for greening should be clearly assigned and may be formalized into job descriptions or green teams.
5. **Sharing results:** Well-organized monitoring systems will measure results in a quantifiable way. Data from monitoring is important to adjusting objectives and to ensuring the success of greening efforts. Longer-term reporting can capture broader changes in environmental performance and can be used to demonstrate the benefits of greening for recognition in a more public way. This recognition can bring about positive public relations and demonstrate corporate social responsibility.

1.5 Module Assumptions

This training module assumes that participants are familiar with organizational operations, processes, procedures, and activities. As this module focuses on how to integrate sustainability into these processes, it is also assumed that participants are committed to the goals of this integration and will continue learning about and advocating for such integration after the close of the training.

1.6 Key Module Definitions

The following are key terms used in this module. A full list of terms is contained in the Glossary.

Carbon offset: A financial instrument aimed at a reduction in greenhouse gas emissions. Carbon offsets are measured in metric tons of carbon dioxide-equivalent (CO₂e) and may represent different types of greenhouse gases. One carbon offset represents the reduction of one metric ton of carbon dioxide or its equivalent in other greenhouse gases.

Greening: The process of transforming artifacts such as a space, a lifestyle, or a brand image into a more environmentally friendly version (i.e., “greening your home” or “greening your office”). The act of greening involves incorporating “green” products and processes into one’s environment, such as the home, workplace, and general lifestyle.

Green purchasing: Often referred to as environmentally preferable purchasing (EPP), and is the affirmative selection and acquisition of products and services that most effectively minimize negative environmental impacts over their life cycle of manufacturing, transportation, use, and recycling or disposal. Examples of environmentally preferable characteristics include products and services that conserve energy and water and minimize generation of waste and release of pollutants; products made from recycled materials and that can be reused or recycled; energy from renewable resources such as biobased fuels and solar and wind power; alternate fuel vehicles; and products using alternatives to hazardous or toxic chemicals, radioactive materials, and biohazardous agents.

Life Cycle Assessment (LCA): A technique to assess the environmental aspects and potential impacts of a product, process, or service by compiling an inventory of relevant energy and material inputs and environmental releases; evaluating the potential environmental impacts associated with identified inputs and releases; and interpreting the results to help make a more informed decision.



An example of green purchasing is the selection of energy efficient, compact fluorescent light bulbs to replace less efficient incandescent bulbs. Energy efficient products not only reduce the emission of greenhouse gases, but they can also lower an organization’s energy expenses. © Bruno Arnold/WWF-Canon

2 INITIAL ASSESSMENT – HOW GREEN ARE YOUR OPERATIONS CURRENTLY?

2.1 A First Step

The first step in greening organizational operations is to take stock of how your organization is doing right now. This will allow you to establish your starting point, from which you can later set goals to improve and measure results. The initial assessment step should help you get a sense of your organization's environmental performance and areas that can be improved. An articulation of the organization's intent and overall objectives will frame the greening work that you do.

Ask yourself: What are my organization's "green" policies and practices? You may already be using some, such as recycling, turning off electrical equipment at night, or buying used furniture instead of new. If you aren't sure, it may be helpful to review some of the action items in Section 6 and see if you practice any of them already. This will give you an idea of your needs and priorities for greening.

SUMMARY OF INITIAL ASSESSMENT STEPS

1. Ask yourself: What are the organization's current green practices?
2. Catalog current green practices.
3. Assess staff knowledge.
4. Review monitoring mechanisms, establish performance baselines, and set up a simple monitoring system to get started, if necessary.
5. Determine and write up the organization's overarching objectives.

Next, catalog your current practices. These will be integrated into your overall plan in the next few steps. For larger organizations, many of these practices will likely be related to the work of your operations or facilities and administration department and possibly the procurement or purchasing department. For other or smaller organizations, these may be practices carried out informally for environmental stewardship purposes or to limit costs of utilities and supplies.

Informal greening practices may be carried out by individual departments or staff without the knowledge of others. It may be helpful to distribute a questionnaire to the organization's employees to assess their knowledge of, interest in, and individual participation in greening practices. This will reveal informal green practices and the level of awareness of your staff, and can help identify staff members who can take on responsibilities for implementing your greening plan. Understanding staff awareness is important for training and motivating those who will be carrying out green practices and policies.

INITIAL ASSESSMENT: SAMPLE EMPLOYEE QUESTIONS

- ☐ Would you be interested in joining an internal committee that is looking for ways to improve our organization's environmental performance (i.e., becoming a member of our "green team")?
- ☐ Do you know how to print double-sided from your printer?
- ☐ Do you know what items or materials can be recycled in this area? Do you know how?
- ☐ Do you turn off any electrical equipment such as computers or copiers when you leave?
- ☐ How far do you commute to work? Do you drive? Would you consider public transportation?
- ☐ What are some areas of environmental interest to you?
- ☐ How do you think our organization affects the environment and how can we improve this?
- ☐ What do you do at home to reduce your environmental impact?

2.2 Investigate Current Monitoring Procedures

Investigate any monitoring procedures that are currently in use for measuring your organization's environmental performance, whether they pertain to greening or not. Electricity, paper, fuel, and water consumption may be tracked by your operations, purchasing, or other departments for financial purposes. This information can be easily converted into a set of performance indicators for greening practices; you will be able to set a baseline and analyze your potential objectives.

2.2.1 An Example of Monitoring Procedures

For example, if you know that your office uses 1000 kilowatt hours (kWh) of electricity on average in one month, you can set this as your expected performance baseline if you were not going to make any changes. When you begin your effort to reduce electrical consumption by installing more energy-efficient appliances or instituting limits on air-conditioning use, you can measure your results against this baseline by absolute amount saved and by percentage. If your consumption drops to 900 kWh per month, then you have succeeded in reducing electrical use by 10% or 100 kWh. After a year, you can compare results to last year's period performance and gain perspective on the bigger picture of your conservation effort.

2.2.2 Establishing a Quick Baseline

If you don't currently have any monitoring procedures in place, it will be helpful to set up a simple system to determine a baseline of current organizational practices that have a bearing on environmental performance. For example, a running tally of reams of paper used per week can be posted in a copy room or employees can track the number of miles driven on the company car. This system can be fine-tuned later but you need to know where you stand now.

2.2.3 Consider Your Intentions and Goals

When you have assessed your organization's current environmental performance, it is a good idea to step back and consider your overall intentions and objectives in greening your organization. Why are you interested in greening your organization's operations? What do you hope to achieve and how much are you willing to commit to greening in terms of staffing, time, and funds? Articulation of these general reasons for greening creates a guiding direction and rationale for your greening plan and will contextualize individual practices. You will need to draw on this when you set objectives, engage staff, set up monitoring mechanisms, pursue specific

practices, and express your commitment to making positive environmental changes. Your interests may also change over time and it is useful to have a record of intentions for progressive adjustments. Remember also that many improvements can be accomplished with minimal (or zero) resource commitment.

2.2.4 Examine Your Motivations

Motivations for organizational greening vary. You may be motivated purely by environmental concerns or you may be interested in reducing your firm's costs in innovative ways. You may have the goal to "practice what you preach" if you are an organization working on natural resources issues or sustainability. Some states or countries may have tax incentives for going green. Displaying leadership in environmental awareness, global citizenship, or corporate social responsibility may be other motivations.

2.2.5 What Is the Appropriate Level of Institutional Integration?

During the process of defining overall goals, your organization should decide on the level of institutional integration that is appropriate. This question asks how your organization will commit to greening practices and to what degree these greening practices will be built into the structure of the organization. Some organizations set official organization-wide policies, create a formal Environmental Management System (EMS), or draft a mission statement or letter of commitment to their board, donors, or shareholders. You may want to institutionalize green practices in job descriptions and employee performance evaluations. Certain departments, such as the operations or facilities departments, may take the majority of the responsibility. Some organizations may decide that informal systems are more appropriate and office volunteers will oversee greening in their unspecified time allotments.



One way to cut your workforce's carbon emissions is by making informed decisions regarding company travel and transportation. When leasing or purchasing vehicle fleets, procurement staff might consider hybrid gas/electric vehicles or vehicles that use alternative fuel sources, such as natural gas. © Edward Parker/WWF-Canon

3 GOAL SETTING

In this section, goals will be established and used to determine what action items are most useful to your organization and how you can strategically plan for their implementation. With the work you have done in assessing the current status of your organization's green operations, you can identify opportunities for improving environmental performance. When these are combined with your overall goals for greening operations, you will be able to make decisions about what action items to implement.

SUMMARY OF GOAL-SETTING STEPS

1. Choose target areas.
2. Choose performance targets and time period.
3. Create SMART indicators.
4. Use core strategies to formulate a plan for implementation.
5. Assess staff knowledge.

3.1 Choosing Targets

Using your overall goals and your itemized baselines, you can identify specific areas of greening interest. You may note that your office consumes a lot of paper or electricity and produces a lot of waste. You may decide that your carbon footprint is an area of interest and choose to limit employee airplane travel. You may want to reduce the impact of a new satellite or field office being opened in the local watershed and habitat. These concerns will become your priority areas and will be addressed by specific action items with defined performance goals.

3.2 Set Performance Goals

Set a performance goal and time period for each area identified for improvement so that real progress will be evident as you continue to track performance. Many goals will have a baseline to work from, such as past electrical power usage, and will have periodic performance measurements. Others will be new activities, such as creating the first recycling program in your office or purchasing less-harmful chemical cleaning products. The performance goals for these activities might be a deadline for implementation instead of a numerical quantity.

3.2.1 Look at SMART Indicators

When setting objectives, it is helpful to have an organizational planning framework to make goals clear and realistic. One such framework is referred to as "SMART" indicators or indicators that are "Specific, Measurable, Attainable, Relevant, and Time-bound." A SMART indicator could be "Reduce paper consumption of our headquarter (HQ) office printers and copiers by 10% between April 1 and June 1 of this year based on our current usage of 200 reams per month." This indicator is specific to the HQ office equipment; it can be measured against the established baseline of 200 reams per month; it is realistic to reduce paper consumption by this amount given the type of work conducted by the office and its financial constraints; it is relevant to the objective of reducing paper consumption; and it sets a realistic and defined time period over which to implement the plan and judge success. Remember to document your objectives and indicators clearly.

3.3 Core Strategies: Policies, Investments, and Behaviors

Once goals and indicators have been set, project planners must develop strategies for achieving these goals. There are three core strategies to implement the goals: **organizational policies**, **operational investments**, and **behavior changes**. Each goal can be addressed in one or more ways depending on your organization's culture, institutional integration, and financial resources for green practices, as further described below.

3.3.1 Organizational Policies

Organizational Policies are official procedures used to achieve greening goals that affect all relevant departments and employees. By creating an organizational policy, office managers will formalize and systematize greening practices. Establishing a formal policy demonstrates a commitment to greening and offers the potential for comprehensive planning. Depending on the type of policy, there may be organizational cost savings (e.g., reduction in heating and air-conditioning costs because of a policy that sets limits on heating and air-conditioning usage), new investments (e.g., policy requires the purchase of energy-efficient appliances), change in purchasing behavior (e.g., policy requires that paper that is purchased be recycled-content paper instead of virgin paper), or changes in staff behaviors (e.g., policy requires that staff turn off computer monitors at the end of the day). The development of organizational policy to improve environmental performance may require staff time for drafting and managing policy components.

Section 6 of this module contains a set of examples of greening practices that are commonly in use at a number of different organizations. The following table, excerpted from Section 6, provides some examples of **organizational policies** related to recycling and reuse.

	ORGANIZATIONAL POLICY	
RECYCLE AND REUSE	<ol style="list-style-type: none"> 1. Institute or enhance the recycling program in your office. 2. Maximize reuse and recycling. 3. Educate employees on recycling procedures. 	

3.3.2 Operational Investments

Operational investments are financial expenditures that will reduce the organization's environmental impact. These are upfront costs but may also offer a financial return. Examples may include one-time purchases such as an energy-efficient copy machine, ongoing purchases for nontoxic biodegradable cleaning supplies, or the purchase and installation of occupancy sensor light switches.

The following table, excerpted from Section 6, provides some examples of **operational investments** related to recycling and reuse.

	OPERATIONAL INVESTMENT	
RECYCLE AND REUSE	<ol style="list-style-type: none"> 1. Provide recycling receptacles if not provided by a public agency. (Contact your recycling company to see if the vendor will provide receptacles.) 2. Negotiate with vendors or building management to recycle goods not accepted by public recycling programs, such as compost, electronics, or ink cartridges. 	

3.3.3 Behaviors

Behaviors can be changed to green the workplace. These will be carried out by staff in their daily routines and generally have no cost to implement. Behavioral green practices can be carried out by any organization and have the added advantage of transcending the workplace to influence green practices at home, which in turn brings greater environmental awareness to the workplace. An example of a behavioral green practice would be requiring all staff to turn off electrical equipment at the end of the day or promoting the use of reusable water bottles versus disposable plastic water bottles.

The following table, excerpted from Section 6, provides some examples of **behaviors** that an organization’s staff could include in regular routines related to recycling and reuse.

	BEHAVIOR CHANGES
RECYCLE AND REUSE	<ol style="list-style-type: none">1. All employees recycle paper, plastics, metals, packaging, etc. on daily basis.2. Ensure proper sorting of materials.3. Reuse packaging materials.

3.3.4 Combining Strategies: Policy + Investment + Behavior

Thinking about implementing greening practices will help you select your most appropriate practices and clearly identify the pathway and responsibilities to carry them out. This can be done with a single strategy or in combinations depending on how thoroughly you want to reduce your organization’s environmental footprint. In many cases, it may be necessary to combine several strategies in order to make significant progress in a given area of interest, such as energy conservation or recycling and reuse.

The following table is an excerpt from Section 6 that shows how the three strategies (policy, investment, and behavior) can be combined to address the various aspects of energy conservation.

ENERGY	ORGANIZATIONAL POLICY	OPERATIONAL INVESTMENT	BEHAVIOR CHANGES
ELECTRICITY	<ol style="list-style-type: none">1. Reduce heating, ventilation, and air conditioning (HVAC) hours of operation2. Require electric utility to use renewable energy sources	<ol style="list-style-type: none">1. Install solar panels2. Purchase energy-efficient equipment3. Maximize the use of natural lighting4. Purchase carbon offsets	<ol style="list-style-type: none">1. Turn off equipment, lights when not in use2. Adjust computer power settings3. Dress in layers
GAS	<ol style="list-style-type: none">1. Regulation of heating, hot water2. Switch to alternative source	<ol style="list-style-type: none">1. Purchase solar-powered water heaters2. Install superior building insulation	<ol style="list-style-type: none">1. Conservative use of the thermostat2. Climate “self regulation,” (sweaters, etc.)

ENERGY	ORGANIZATIONAL POLICY	OPERATIONAL INVESTMENT	BEHAVIOR CHANGES
VEHICLE FUEL	<ol style="list-style-type: none"> 1. Institute commuter program 2. Locate worksite near public transportation; bicycle parking 3. Develop policy on videoconferences, telecommuting 	<ol style="list-style-type: none"> 1. Use fuel-efficient vehicles 2. Purchase videoconferencing equipment 	<ol style="list-style-type: none"> 1. Use of public transport, carpool, bicycles 2. Minimize fleet use 3. Use Skype, WebEx, or other communication devices to reduce travel for meetings

3.4 Prioritizing Activities

As you begin to identify different interventions to green your organization's operation, it may become necessary to prioritize different areas of work. Should you focus on replacing your office's light bulbs with energy-efficient fluorescents? Or should you invest in more energy-efficient photocopy machines? Or should you purchase reusable utensils so that the staff does not need to use plastic disposable knives, forks, and spoons? Or should you institute a new paper recycling program?

The answers to these questions are highly specific to organizational locations, available resources, cultural settings, staff interests, and practical opportunities. In some geographic locations, such as areas with hot climates, the purchase and use of air conditioners is a necessity. In other locations, air-conditioning units are not as necessary and the decision to purchase new energy-efficient air-conditioning units may be replaced by the decision to encourage staff to open more windows or dress in layers. Similarly, depending on the locations and functions of some organizations, it is necessary to purchase and operate vehicle fleets with full-time, dedicated drivers. In other situations, these needs may be met through the periodic rental of vehicles with staff driving themselves. The decision to invest in more fuel-efficient vehicles would only be practical in certain settings. If organizations are renting cars, they may institute a policy to purchase carbon offsets for their vehicle rentals if that is an option.

In some situations, it may be useful to use a standardized assessment tool to weigh different options. One such approach is cost-benefit analysis. Life cycle assessment is another approach and is briefly explained in Annex 3.

4 ENGAGING STAFF

4.1 Assigning Roles and Responsibilities

Someone will need to carry out your plans, and it is necessary to integrate greening practices into the organization’s workforce plan. The staff of your organization must be on board with greening practices if you are to successfully reduce your organization’s environmental impact. The plan can be institutionalized in different ways, but responsibility for implementing green practices should be assigned. Otherwise, it is easy to lose informally implemented plans in the daily routine of a busy workplace.

SUMMARY OF ENGAGING STAFF STEPS

1. Identify and assign roles and responsibilities.
2. Educate and motivate staff.
3. Develop a green team.

If greening is important to your organization, individuals in the office should be assigned to carry out greening activities and receive recognition for their success. Regardless of the core strategy that is appropriate for your organization, staff will need an allotment of time and space to complete tasks and collaborate. An effective way to do this is to write responsibilities into individual employee job descriptions and performance goals. An office site manager could have the responsibility of implementing greening practices and delegating specific greening tasks to his or her employees. At the least, a responsible person should be identified for each SMART indicator.

One Example

For example, the official job description for the facilities manager at the WWF’s United States headquarters includes the responsibility for sustainable sourcing of supplies and engaging staff on office greening. Among other things, the job description states:

- The Facilities Manager of World Wildlife Fund manages all building operations at the environmental organization’s U.S. headquarters building in Washington, D.C. In addition to providing financial and leadership support to WWF’s executive team, the manager oversees the institution of successful recycling programs, the purchase of sustainable office supplies and 100 percent renewable energy offsets for building, among other projects.*
- Ensure that all services, products, materials and property improvements are designed and delivered using “Green” building concepts and strategies incorporating design techniques, technologies and materials that lessen the dependence on fossil fuels and minimize our overall negative environmental impact.*
- Measure and monitor building performance against established benchmarks. Use data to recommend initiatives that will reduce costs, increase revenues, reduce energy consumption, and improve efficiencies. Research, develop, and recommend greening practices into WWF’s facilities design and practices. Introduce those practices approved by Vice President. Pursue path to obtain and retain certifications, such as LEED certification.*

Motivating Your Staff

If changing job descriptions or employee performance indicators is not an option, some way of assigning responsibility and progress should be created. Greening may not be the primary mission of your organization and can be lost as a kind of “pet project” of just a few interested individuals. Make tasks as clear as possible and create time frames for results.

EXAMPLE: GREENING THE AMERICAN RED CROSS OFFICE IN THAILAND

One of the signature characteristics of the American Red Cross Thailand team is that they always find a way to have fun, and we’ve learned that introducing new initiatives in the office can be enhanced and ultimately more effective if we find a way to get the team more creatively involved. Since the beginning of the tsunami recovery operations, we had been working with WWF in Thailand on our green recovery program, which had focused mostly on providing technical assistance to the implementation of our water and sanitation project. In late 2008, we realized that all our staff, not just the wat-san team, had a keen interest in the environment and wanted to do more, even just around the office. So we began working more closely with WWF on how to raise awareness and change employee behavior related to green office issues in all seven of our Thailand offices.

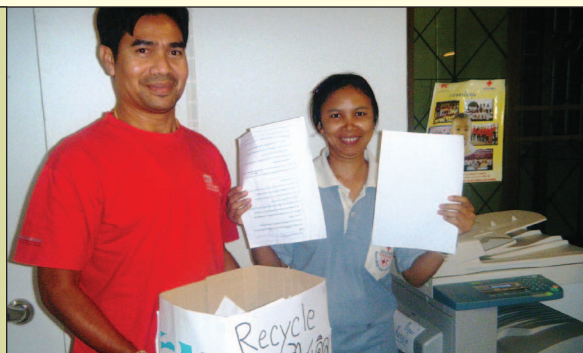
One of the most successful awareness raising and learning opportunities we implemented was to give out bright red reusable water bottles which read, “REDUCE your use of disposable bottles..... REUSE this one instead!” Since all offices already had water coolers available, we sent a strong message that staff should avoid using disposable water bottles, which is a large source of solid waste in Thailand. To date, managers and staff alike continue to self-monitor each other and point out the now “taboo” within our team of buying and using disposable water bottles.

Weeks earlier, we had announced a “Green Office Video Contest” and asked all seven offices to put together a 5-minute video illustrating what their office has been doing to become more environmentally friendly. The results were astounding; not only were the mini-movies wildly entertaining, but each team had done an extensive look at a wide variety of things they were doing to reduce their environmental footprint. Topics included: recycling paper and other materials, carpooling and biking to work, taking reusable containers to lunch places for take-out instead of accepting the usual Thai styrofoam containers, regulating air conditioner temperatures, turning off lights and computers, and keeping agency vehicles well maintained. The wide-range of activities gave each other new ideas of things they could be doing, while the fun nature of the videos not only kept everyone’s attention to raise awareness, but gave everyone imprinted memories which they use to continually self-monitor each other around the office.

The awareness raising not only led field staff to take initiative, but it also encouraged managers and the administrative team to begin tangible policy changes and tracking. We’ve realized that our next steps would be to set up a system to more tangibly track reductions in, or maintenance of, energy levels such as electricity, water and fuel use, purchasing of paper, and solid waste output, to name a few.

Source: Christie Getman, Head of Programs, American Red Cross Thailand

© Chanita Thalang/American Red Cross



In addition, depending on the results of your staff assessment, you may need to train, educate, and motivate your staff to participate in greening efforts, especially if your strategy is going to rely on behavior modification. Your staff are your vehicle for greening and you should offer them leadership and rationale for pursuing green practices. Training can come in the form of formal presentations or through a green team, which will be described below. A staff meeting and/or a “greening memo” could be distributed to kick things off. New hires at the WWF US headquarters are shown a presentation on recycling that includes the image on this page to ensure that they know what can be recycled. Letting your employees know why greening is important and why your organization is pursuing green practices is essential to a successful greening plan.

A Reward System Example

A kind of reward or recognition system may also help encourage participation in greening. American University, in Washington, D.C., for example, awards an “Apple rating” of up to four apples for each class if it meets the university’s standard on reduction of paper and energy consumption. Three main considerations are that course materials are primarily electronic or reusable, air conditioning is minimized, and natural light is maximized. The apple rating does not carry any financial or other benefits but it does present a light-hearted incentive for professors and students to consider the environmental impact of their classes.

4.2 Developing a Green Team

A green team is a group of office employees who spearhead the implementation and maintenance of greening practices. Green teams can be a highly effective way to engage staff and catalyze or generate enthusiasm for greening practices. The green team can take many forms and carry out many activities, especially those related to behavioral greening strategies or monitoring. A green team can be responsible for carrying out all of the steps of G2O2 or for focusing on the implementation aspect. It can also be a vehicle for communication, creativity, generation of new green practices, identification of new areas to target, institutional memory, or encouragement of green practices in the personal lives of employees. Depending on your approach, green teams can be formal, with meetings, agendas, and successive goals, or they can consist of volunteers who coordinate greening above and beyond their normal duties.

By providing clearly marked, separate receptacles for recycling and waste disposal, an organization can reduce the amount of waste entering into landfills. Office Green Teams can conduct training programs and develop awareness campaigns to educate employees about how to get involved in recycling. Many of the practices that are encouraged in the workplace are often transferred to people’s daily lives. © Achala Navaratne/WWF



5 MONITORING AND REPORTING

The best way to observe progress is to systematically record data in a consistent fashion at defined intervals for each SMART indicator. Periodic review of the results of each time period should be conducted so that you can analyze results, draw conclusions, and set future goals. These reports will ultimately demonstrate the effectiveness of each practice in attaining your organization's specific and overall goals.

SUMMARY OF MONITORING AND REPORTING STEPS

1. Set up monitoring system for each SMART indicator.
2. Report periodically and analyze results.
3. Adjust goals and targets

5.1 Spreadsheet Templates

Spreadsheet templates are useful tools for ongoing data collection and can be tailored for each practice with running totals and costs included. The units and frequency of measurement should be defined for each practice. Consistency and accuracy are paramount, but simplicity is also important to keep the results clearly organized and to save employee time on monitoring activities. Depending on how your organization is structured, it may be appropriate to have monitoring take place separately in each department or as a whole. Compartmentalized monitoring may allow you to tighten performance in more specific ways, but requires greater management of monitoring activities.

Spreadsheet Template Example

For example, here is a simple table that could be used for monitoring electric consumption.

MONTH	LOCATION	kWh USED	kWh MONTHLY TARGET	COST	MONTHLY BILL	MONTHLY TARGET MET? [ARE kWh USED BELOW kWh MONTHLY TARGET?]
JANUARY 2010	1st floor	4100	4000	\$ 0.06/kWh	\$ 246	No
	2nd floor	5500	5600	\$ 0.06/kWh	\$ 330	Yes
		9600	9800	\$ 0.06/kWh	\$ 576	Yes
FEBRUARY 2010	1st floor	4000	4500	\$ 0.065/kWh	\$ 260	Yes
	2nd floor	5300	5000	\$ 0.065/kWh	\$ 344.50	No
		9300	9500	\$ 0.065/kWh	\$ 604.50	Yes

Using a chart like this, the WWF US headquarters recorded a reduction of electrical consumption by nearly one-third from 1999 to 2008 as measured by kWh. Many greening practices emphasize reducing consumption, so it is important to track some quantitative element that will directly record your organization's performance, such as amount of paper used or number of pounds of trash. Microsoft Excel spreadsheets simplify the visualization

of trends and improvements through their graphing functions. If you are monitoring operational investments, you may wish to have an accounting sheet that is specific only to greening costs, and to separate it from other accounting costs sheets to measure investments and compare savings.

Another Spreadsheet Template Example

It is not always possible to calculate environmental impacts quantitatively. For example, the use of environmentally friendly cleaning supplies will not produce data to demonstrate the reduction of pollution in your local watershed. In this case it is important to remember that your green practice has lowered total contributions to pollution. Thus, your monitoring activity should emphasize the scope of use, the brands, the chemical toxicity, and any other relevant information. Such information should be available from the brands you purchase. An example of a monitoring table is shown below.

MONTH	NUMBER OF BOTTLES OF BRAND X CLEANING SOLUTION (BAD) USED	NUMBER OF BOTTLES OF BRAND Y CLEANING SOLUTION (BETTER) USED	PERCENTAGE OF BRAND Y CLEANING SOLUTION (BETTER) USED [(NUMBER OF BOTTLES OF BRAND Y / TOTAL BOTTLES PURCHASED)*100]	MONTHLY TARGET MET? [MONTHLY TARGET SET BY ORGANIZATION: 50% OF BOTTLES ARE BRAND Y (BETTER)]
JANUARY 2010	25	0	0%	No
FEBRUARY 2010	2	23	92%	Yes

It is necessary to monitor progress at the level of detail at which you are willing to make changes. For example, an organization can track electrical consumption by floor using a submetering system. Dividing in this way requires some extra time but will potentially allow much more detailed analysis and clarity for targeting adjustments. An overall statistical analysis may reveal a general reduction in electrical usage, but subdivided monitoring allows you to home in on the performance of individual areas and troubleshoot more accurately. It may help you determine how you will combine strategies. For example, you may find that purchasing energy-efficient copying equipment may save you a certain amount of electrical usage, in addition to modifying employee behavior by promoting the policy that all computers are turned off at night.

5.2 Reporting

Collecting data at regularly scheduled intervals and creating a summary report may help you capture the “bigger picture” of your efforts and analyze progress and challenges. You may find it useful to present this information to your board of directors, staff, donors, or other interested parties. Displays of the results of your work can focus on financial results, areas of lessened environmental impacts, reduction of consumption, etc.

Summary reports can demonstrate the savings created by your greening. The following table is a simple example of how you can display the results of your greening activities.

GREENING COST CATEGORIES	ONE-TIME INSTALLATION COSTS TO IMPLEMENT GREENING ACTIVITIES (\$)	DIFFERENCE BETWEEN OPERATIONAL COSTS BEFORE AND AFTER GREENING ACTIVITY (CHANGE IN \$)	OVERALL COST SAVINGS (\$)	SAVINGS %
ELECTRICITY	(For example, cost of fluorescent light bulbs = \$1,000)	(For example, costs to consider include cost difference between purchasing fluorescent bulbs and purchasing conventional bulbs, and reduced operational costs)		
GAS				
WATER				
PRODUCTION MATERIALS				

Or for demonstrating reduction of impacts, based on whatever data are available:

ENVIRONMENTAL IMPACT CATEGORY	QUANTITY PRODUCED AFTER GREENING ACTIVITY	QUANTITY PRODUCED BEFORE GREENING ACTIVITY	TOTAL REDUCTION	REDUCTION %
EMISSIONS				
TOXICS				
RECYCLING				
LANDFILL WASTE				

For example, the WWF annual report tracks the environmental impact of the paper that is used to produce the 12,000 copies of the annual report, or the equivalent of 20,000 pounds of paper. The publication is printed on 100 percent post-consumer waste, FSC-certified paper. The paper manufacturer provides an "eco-audit" that shows the conservation impact of using this paper instead of virgin fiber paper – and using emission-free, wind-generated electricity:

Trees saved	Pounds of net greenhouse gas emission prevented	Pounds waterborne waste not created	BTUs energy not consumed	Gallons of wastewater flow saved	Pounds of air emissions not generated	Pounds of solid waste not generated	Miles not driven
112	10,407	324	79,655,200	47,768	5,407	5,285	5,857

Reporting is an opportunity to stop and review progress and achievements and to identify future plans. A review should be made of the objectives, targets, and performance and should evaluate the effectiveness of your greening efforts and the need for changes. Compilation and analysis of this data allows you to identify areas for improvement of the system. It will allow you to home in on root causes of environmental impact and to implement corrective measures and preventative actions. You may want to write a short narrative that describes the results and supplement it with statistics.

5.3 Reaching Targets and Making Adjustments

There is always a certain amount of trial and error that will play into your setting of targets. G2O2 data-collection practices can help you experiment and find problem areas. As your data collection progresses and your defined performance period continues, you may be able to foresee your level of success and you may want to adjust your organization's performance. In some cases you may realize that your goal was too ambitious or not ambitious enough in terms of time or performance level. In other cases you may realize that your greening potential was much higher than you thought and you need to raise the bar! As goals are reached successfully, performance levels should be adjusted to maximize "greenness" of the workplace.

Success in this area will rely on the diligence and commitment of responsible parties and managers to proactively monitor progress, think about results and the organizational greening goals, and show leadership and creativity in making adjustments on the fly. Monitoring offers you concrete results from your greening efforts and an opportunity for praise for your organization or the individuals responsible for carrying out your greening plan. Tying these results to your greening effort is important if you are to keep them going or to make adjustments.

6 ACTION ITEMS

This section provides a variety of examples of greening practices that are widely implemented and have a significant impact on greening. They are divided and subdivided into general areas of greening on the left. Examples are given that correspond to G2O2's three strategies of organizational policy, operational investment, and operational behavior. Your creativity and budget are the only limits to what kinds of greening practices can be included here or extrapolated from these ideas.



The purchase of solar panels is an operational investment that can help reduce energy expenses and improve an organization's environmental footprint. Organizations can also implement policies, such as minimizing the HVAC hours of operation and encourage employees to turn off lights and computer monitors when they are not in use. This photograph shows solar panels in the parking lot at Jaen University, Andalucía, Spain. © Claire Doole/WWF-Canon

	OPERATIONAL POLICY	OPERATIONAL INVESTMENT	OPERATIONAL BEHAVIOR
ENERGY			
ELECTRICITY	<ol style="list-style-type: none">1. Reduce HVAC hours of operation2. Require electric utility to use renewable energy sources	<ol style="list-style-type: none">1. Install solar panels2. Purchase energy-efficient equipment3. Maximize the use of natural lighting4. Purchase carbon offsets	<ol style="list-style-type: none">1. Turn off equipment, lights when not in use2. Adjust computer power settings3. Dress in layers
GAS	<ol style="list-style-type: none">1. Regulation of heating, hot water2. Switch to alternative energy sources	<ol style="list-style-type: none">1. Purchase solar-powered water heaters2. Install superior building insulation	<ol style="list-style-type: none">1. Use thermostat conservatively2. Climate "self regulation" (sweaters, etc.)
VEHICLE FUEL (CARS, TRUCKS, PLANES, BOATS)	<ol style="list-style-type: none">1. Institute commuter program2. Locate worksite near public transportation; install bicycle parking3. Develop policy on videoconferences, telecommuting4. Require the purchase of carbon offsets for every air ticket purchased	<ol style="list-style-type: none">1. Use fuel-efficient vehicles2. Purchase videoconferencing equipment3. Negotiate with air travel vendor to purchase carbon offsets for every air ticket purchased	<ol style="list-style-type: none">1. Use of public transport, carpool, bicycles2. Minimize fleet use3. Use Skype, WebEx, or another free communication device to reduce travel for meetings
PAPER			
OFFICE USE	<ol style="list-style-type: none">1. Commit to minimizing paper use2. Set up internal recycling program and interface with public programs	<ol style="list-style-type: none">1. Maximize post-consumer content paper2. Purchase equipment for long-term electronic storage of documents3. Purchase printers and copiers that have double-sided printing function.	<ol style="list-style-type: none">1. Minimize printing and copying unless necessary, print double-sided always2. Recycle paper3. Maximize use of electronic documents instead of hard copies
PUBLICATIONS	<ol style="list-style-type: none">1. Screen paper vendors, sourcing of wood, and industrial processing methods	<ol style="list-style-type: none">1. Purchase post-consumer recycled paper2. Purchase paper processed with minimal toxic chemicals such as chlorine3. Purchase paper made from certified sustainably harvested forests, such as those under the <i>Forest Stewardship Council</i> (FSC)4. Use soy-based ink	<ol style="list-style-type: none">1. Print fewer publications2. Add line at the end of emails that says "Please do not print this email unless necessary."3. Provide access to soft copies of publications

	OPERATIONAL POLICY	OPERATIONAL INVESTMENT	OPERATIONAL BEHAVIOR
OPERATIONS			
FACILITIES AND ADMINISTRATION	<ol style="list-style-type: none"> 1. Institute environmental management system such as <i>ANSI</i>, <i>LEED</i>, <i>ISO</i> standards systems 2. Operate with environmental conservation in mind at all times 		
PROCUREMENT	<ol style="list-style-type: none"> 1. Consider the entire life cycle of all supplies and products purchased or used by vendors in house 2. Screen and contract vendors based on environmental criteria 	<ol style="list-style-type: none"> 1. Purchase energy-efficient office equipment such as <i>Energy Star</i>-rated appliances 2. Purchase nontoxic and biodegradable cleaning supplies 3. Buy goods in recycled, reusable, and recyclable packaging 4. Use reusable supplies such as washable flatware and glasses 5. Purchase recycled furniture manufactured with recycled and non-toxic materials 6. Source locally within a 500-mile radius 	<ol style="list-style-type: none"> 1. Encourage employees to reduce consumption of disposables
RECYCLE AND REUSE	<ol style="list-style-type: none"> 1. Institute or enhance the recycling program in your office 2. Maximize reuse and recycling 3. Educate employees on recycling procedures 	<ol style="list-style-type: none"> 1. Provide recycling receptacles if not provided by a public agency (contact your recycling company to see if the vendor will provide receptacles) 2. Negotiate with vendors or building management to recycle goods not accepted by public recycling programs, such as compost, electronics, or ink cartridges 	<ol style="list-style-type: none"> 1. Ensure that all employees recycle paper, plastics, metals, packaging, etc. on daily basis 2. Ensure proper sorting of materials 3. Reuse packaging materials
OFFICE ENVIRONMENT	<ol style="list-style-type: none"> 1. Regulate heating/cooling for efficiency and conservation 2. Use native landscaping 	<ol style="list-style-type: none"> 1. Design architecture of new or remodeled buildings to maximize the efficiency of light, heat, air quality, water 2. Purchase indoor plants that can naturally cool offices and reduce airborne bacteria and noise 	<ol style="list-style-type: none"> 1. Promote dressing in layers

				OPERATIONAL POLICY	OPERATIONAL INVESTMENT	OPERATIONAL BEHAVIOR
	INFRASTRUCTURE			<ol style="list-style-type: none">1. Prioritize considerations for the environmental impact of buildings2. Strive for certification by a green building system such as LEED, ANSI	<ol style="list-style-type: none">1. Invest in sustainable building design and materials2. Lower environmental impact through careful site selection for new buildings3. Follow the US or World Green Building Council guidelines on construction or remodeling	<ol style="list-style-type: none">1. Advocate for environmental design when considering remodels or new site construction
	PRODUCTION					
	PRODUCTION MATERIALS		<ol style="list-style-type: none">1. Use the <i>Life Cycle Assessment</i> methodology to make decisions about materials and processes2. Commit to using materials with the lowest life cycle impact in production possible	<ol style="list-style-type: none">1. Purchase sustainably extracted or manufactured materials such as certified timber, fly ash concrete, or water from sustainable sources		
	PACKAGING		<ol style="list-style-type: none">1. Set policy on materials used in making packaging2. Design products for packaging to be reused as a material instead of waste	<ol style="list-style-type: none">1. Purchase reusable, low-input packaging materials, such as blankets or recycled cardboard	<ol style="list-style-type: none">1. Encourage reuse/recycling of packaging2. Encourage less consumption where possible	
	PROCESSES		<ol style="list-style-type: none">1. Adopt a “waste as resource” approach to production			

7 PUBLIC RELATIONS AND CORPORATE SOCIAL RESPONSIBILITY

The opportunity to showcase operational greening may be a motivation in itself for greening or it may be an added benefit. You can show your constituents, consumers, or stakeholders that your organization values the environment and therefore respects the needs of all people and of future generations. You can demonstrate that you are proactively trying to reduce pollution, limit further environmental degradation, mitigate climate change, and take action against the exploitation of our natural heritage.

Your greening efforts may be directly tied into your organization's work and may enhance your success. For example, the work of humanitarian organizations or community development organizations should recognize that the environment plays a crucial role in disaster risk reduction and livelihood generation. By addressing environmental issues, you can help to ensure that the mission of your organization is better reflected in your operations.

Integration of your principles and mission with your operations is a sophisticated and admirable way to conduct business. With publication of your successes, not only will you gain a competitive edge, but you have the potential to become a role model for other organizations. Your experiences may be helpful for your partner organizations; they will be encouraged to undertake greening efforts and you will have promoted superior practices in your industry. G2O2 can be easily passed to the next interested party and your organization can become a vector for greening.



GUIDE TO BASIC RECYCLING

PAPER

- **Only Paper**
- **Examples:** white or color paper, sticky notes, glossy or coated paper, magazines, newspaper or clean cardboard (stapled items accepted)
- **No** used paper towels or napkins

MIXED RECYCLABLES

- **Clean plastic, cans, all clear and color glass bottles**
- **Examples:** yogurt containers, plastic food trays (frozen, or deli style), plastic bags, plastic utensils, plastic drinking cups, aluminum, tin and steel cans
- **No** dirty plastics, tinfoil, food wrappers

TRASH

- **Non-Recyclable Items**
- **Examples:** used paper towels or napkins, tinfoil or other miscellaneous food wrappers, food, biodegradable plates cups and utensils
- **No** recyclable items

ANNEX 1: ADDITIONAL RESOURCES

The following organizations and publications provide a variety of resources that elaborate on the concepts presented in this module.

Organizations

Energy Star: Energy Star connects you with a broad range of tools and resources to help you implement a successful building energy management strategy. The Portfolio Manager is especially helpful. www.energystar.gov

Green Building Programme (GBP): As part of the European Commission, GBP aims at improving the energy efficiency and expanding the integration of renewable energies in non-residential buildings in Europe on a voluntary basis. The programme asks owners of non-residential buildings to realise cost-effective measures that enhance the energy efficiency of their buildings in one or more technical disciplines. www.eu-greenbuilding.org

International Facility Management Association (IFMA): IFMA is the world's largest and most widely recognized international association for professional facility managers, supporting more than 19,000 members in 78 countries. IFMA provides a variety of tools and publications for improving sustainability in facility operations and management, especially in the area of energy efficiency. www.ifma.org

International Organization for Standardization (ISO): ISO is a network of the national standards institutes of 161 countries. The ISO 14000 family of standards addresses various aspects of environmental management including life cycle assessments, environmental auditing, and environmental performance evaluation. www.iso.org

Leadership in Energy and Environmental Design (LEED): LEED is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO₂ emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. www.usgbc.org/leed/

World Green Building Council (WGBC): The WGBC provides an international forum, and champions proven tools that significantly accelerate market transformation from traditional, inefficient building practices to new-generation high-performance buildings; provide "branding"; and transform the skills and knowledge of the industry as a whole. www.worldgbc.org

World Wildlife Fund: An international conservation organization that can assist organizations with reducing their environmental footprint and greening their operations. www.wwf.org.

Publications

American Society of Heating, Refrigerating and Air-Conditioning Engineers. 2008. *Commercial Building Energy Audits*. Atlanta.

Berge, Bjørn. 2009. *The Ecology of Building Materials, 2nd Ed.* Oxford: Architectural Press.

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Fussler, Claude, and Peter James. 1996. *Driving Eco Innovation: A Breakthrough Discipline for Innovation and Sustainability*. Washington: Pitman Publishing.

Gibilisco, Stan. 2007. *Alternative Energy Demystified*. New York: McGraw-Hill.

Glavinich, Thomas E. 2008. *Contractor's Guide to Green Building Construction: Management, Project Delivery, Documentation, and Risk Reduction*. Hoboken, New Jersey: John Wiley & Sons, Inc.

Graedel, Thomas E. 1998. *Streamlined Life-Cycle Assessment*. New Jersey: Prentice Hall.

Halliday, Sandy. 2008. *Sustainable Construction*. Oxford: Elsevier.

Hitchcock, Darcy, and Marsha Willard. 2006. *The Business Guide to Sustainability*. London: Earthscan.

McDonough, William, and Michael Braungart. 2002. *Cradle to Cradle*. New York: North Point Press.

Roseberry, Rachel. 2008. *A Balancing Act: An assessment of the environmental sustainability of permanent housing constructed by the international development community in post-disaster Aceh*. University of Sussex.

ANNEX 2: EXAMPLE ORGANIZATIONAL GUIDELINES

Mercy Corps

Mercy Corps is a global humanitarian aid agency engaged in relief efforts for communities impacted by emergencies ranging from natural disasters and war to health and environmental crises. The organization promotes access to financial services and facilitates microfinance mechanisms as a primary component of alleviating poverty and moving communities out of crisis. The following Greener Office Guide presents informal guidelines developed by Mercy Corps.

We do have a green team and this helps push forward carbon footprint mitigation, video conferencing, linking expense claims to carbon costs. We are less strong on policies. This, however, is because making a greening policy gets into the finance and operational parts of an agency, and their stability makes fast changes less quick than one would like. That said, the green team “volunteers” find it relatively easy to point to better energy behaviors, which seem to be particularly well adopted when linked to cost savings.

Dr. Jim Jarvie

Director – Climate Change, Environment and Natural Resources

Mercy Corps’ Greener Office Guide

Resource-intensive activities are readily associated with factories and manufacturing processes. However, the modern office environment also places significant demands on diminishing resources.

Obvious are the physical resources of office information and communication technology (ICT) equipment, furniture, and paper products. Less tangible are the resources of energy to power office equipment and space conditioning; water through all phases of supply to drainage; and fuel and facilities associated with travel, transport, and freight.

Attached to the everyday use and/or consumption of the resource is its carbon footprint. In other words, the manufacture or provision of any resource gives rise to greater or lesser emissions of greenhouse gases, with their far-reaching and potentially catastrophic effects on global warming and climate change.

Effective and efficient use of the planet’s finite resources contribute to a sustainable future, reducing the potential for global warming and climate change while enhancing the financial viability, the bottom line, of the organisation.

Carbon reduction and resource management are interdependent. For the office environment the following need to be addressed:

1. management commitment
2. energy
3. lighting
4. office ICT equipment
5. office furniture
6. paper products

7. heating, ventilation, and air conditioning (HVAC)
8. water
9. travel and transport
10. freight
11. waste disposal
12. carbon reduction policy statement

Occasionally the “green field” situation will arise for which all conservation opportunities appropriate to a new development can be considered for inclusion. More generally, it will be necessary to improve and conserve within the constraints of an existing imperfect office arrangement. Specific options for resource conservation under each of the above headings are considered below.

1.0 Management Commitment

1.1 Important management initiatives require authority and direction. If it is the serious intention of management to boost energy efficiency, reduce waste, increase recycling, review transport arrangements, reduce the carbon footprint of their organisation, and actively instill carbon reduction awareness among staff, careful consideration should be given to nominating someone (or a group of engaged employees) to be responsible for the management of these “Carbon Reduction” processes.

2.0 Energy

2.1 The efficient use of energy begins with the reduction in its use to the minimum necessary for the maintenance of specified systems.

2.2 The “Carbon Reduction” Manager will track energy use, research new products and promote what’s needed to take advantage of utility pricing incentives.

2.3 “Green energy” incorporating a proportion of power developed from renewable resources (such as wind-generated electricity) offers a reduced carbon footprint, normally at a modest price premium. The carbon-conscious energy manager will endeavour in a competitive energy supply market to source the highest green-energy content for the lowest price premium.

2.4 Carbon emissions from the use of electrical equipment are calculated directly from the grid electricity emission factor and the kWh annual electricity use. The emission factor for grid electricity as carbon dioxide equivalent is estimated to be around 0.6 kg CO₂/kWh. To put this into context, the electricity consumed by a 1 kWh rated electric heater running for one year will cause to be emitted to atmosphere around 5.3 tons of CO₂!

3.0 Lighting

3.1 Lighting technology has advanced significantly over the years, giving improved illumination for reduced energy consumption. Progress continues to be made. Fluorescent tubes are narrower and are available with more efficient, even dimmable, electronic ballasts.

3.2 In the “new build” situation, careful selection of lighting technology will repay dividends in terms of the annual running costs of replacement and energy consumed.

3.3 Compact fluorescent lamps (CFLs) are much more efficient than the incandescent lamps of dated technology. A 25 watt CFL has the same light output as a 100 watt incandescent lamp and will last typically 10 times longer. They do cost more than the standard incandescent lamp. They are best installed in places where the light is usually on, when their payback time is short.

3.4 An old-fashioned 100 watt incandescent lamp when lit for one year will be responsible for annual emissions of around 530 kg CO₂. The equivalent CFL uses one quarter of the electricity and causes around 130 kg CO₂ to be emitted – distinctly benefiting the environment and the bottom line!

3.5 Let's consider installing 100 CFLs in place of the old incandescents. The lamps would last 10 times longer, use only one quarter of the electricity, and substantially reduce CO₂ emissions (based on emission factor for grid electricity of 0.6 kg CO₂/kWh) as the table shows:

INCANDESCENT	POWER K/AN- NUM	EMISSIONS TONNES CO ₂ /ANNUM	EQUIVALENT CFLS	POWER kWh/ ANNUM	EMISSIONS TONNES CO ₂ /ANNUM	EMISSIONS REDUCTION TONNES CO ₂ /ANNUM
100 x 25 watt	21900	13	100 x 6 watt	5256	3	10
100 x 40 watt	35040	21	100 x 10 watt	8760	5	16
100 x 60 watt	52560	32	100 x 15 watt	13140	8	24
100 x 100 watt	87600	53	100 x 25 watt	21900	13	40

3.6 Turn off lights when they are not needed. Appropriate stickers should be positioned beside the switches to encourage this practice.

3.7 Occupancy sensors detect the presence of people in a room. When the room is unoccupied, they turn off the lights. This should definitely be considered for a "new build" situation, particularly where the room occupation is periodic.

3.8 Allow for best use of natural lighting.

3.9 Latest technology should be thoroughly investigated before exterior lighting is specified – a number of options exist (mercury vapour, high-pressure sodium, metal halide) and some may not be appropriate. Exterior lighting generally has a high energy specification. The most effective option is to use only as many exterior lights as necessary and only operate them when they are needed. A simple photocell, time clock, or both can lead to significant savings.

4.0 Office ICT Equipment

4.1 Minimise power consumption of ICT equipment by switching it off (after saving work if appropriate!) when not in use.

4.2 The "sleep mode" facility should be enabled where this is provided.

4.3 Printers, copiers, and fax machines should be specified to include "sleep mode" facility, as they are normally made available 24 hours a day but are in use only intermittently.

4.4 A typical 22" widescreen flat panel monitor in operating mode will consume around 65 watt of electricity, with an annual emission rate of 0.4 tonnes of CO₂. If a "sleep mode" of 2 watt is provided, the benefit of an emission reduction on an annual basis to around 0.01 tonnes of CO₂ is obvious.

4.5 A copier with duplexing facility set to automatically make double-sided copies will cut paper costs, improve the bottom line, and conserve trees all at the same time.

4.6 Raise staff awareness of the need to **switch off when not in use** by providing stickers, notices, and posters to spread the message.

5.0 Office Furniture

5.1 Office furniture should generally be fit for purpose and, in the case of computer stations, be compliant with the Health and Safety (Display Screen Equipment) Regulations 1992 as amended by the Health and Safety (Miscellaneous Amendments) Regulations 2002.¹

5.2 Subject to the restrictions imposed by 5.1 above, with regard to the provision of office furniture, consider the **reduce, reuse, recycle** options that may be available, taking into account possible internal and external sources of supply.

5.3 Check to ensure that furniture based on wood is manufactured using sustainable sources of supply.

6.0 Paper Products

6.1 The paperless office is still more promise than reality. With today's technology it is (almost!) possible, so "think before you print." For efficient paper use, follow the environmental standard: **reduce, reuse, recycle**. Improving in each of these areas will introduce paper cost savings and cut the need for storage space.

6.2 If hard-copy printing is unavoidable, restrict the number of copies and header pages to the minimum necessary; optimise page margins, font size, line spacing; use duplex (double-sided) printing; minimise the number of pages needed by using the "file/print review/shrink to fit" facility.

6.3 Review and edit draft documents, individually or with colleagues, on screen rather than on paper before committing to print.

6.4 Avoid the use of a dedicated fax header sheet.

6.5 Arrange with a local contractor for the collection and recycle of used paper and card stock, so you can conserve energy and natural resources. Coloured materials are less easily recycled, so keep their use to a minimum, using pastel shade colours if possible.

6.6 Consider using recycled paper.

¹ Note: these regulations are from the United Kingdom national government

7.0 Heating, Ventilation, and Air Conditioning (HVAC)

7.1 Heating with HVAC

1. take control of the HVAC time on/off and temperature controls
2. maintain the HVAC system regularly
3. consider insulation and draft-proofing
4. encourage appropriate dress

7.2 Ventilation and air conditioning with HVAC

1. take control of the HVAC time on/off and temperature controls
2. maintain the HVAC system regularly
3. maintain window openings
4. consider external window awnings, tinted window films, shading
5. consider internal window shades and blinds
6. consider reflective roof and external wall paints and coatings
7. consider deciduous tree shading and eco-roofing (vegetative material)
8. reduce heat loading by remembering to switch off when not in use
9. in extreme conditions, consider ventilating overnight
10. in extreme conditions, consider adjusting working hours

8.0 Water Conservation

8.1 The ecological and cost benefits associated with water conservation arise in a number of ways:

1. reduce water consumption, reducing the energy and cost to supply
2. reduce water consumption, reducing the energy and costs to discharge to sewage
3. take control of the water heating time on/off and temperature controls
4. consider instant water heating at point of use, with “no tank,” mains supply
5. consider use of self-close sink taps with aerators, low flush toilet cisterns
6. ensure that leaks are fixed, plumbing systems maintained

9.0 Travel and Transport

9.1 Travel to work arrangements

1. actively promote this opportunity for employees to minimise their carbon footprint
2. from most favoured to least favoured, the alternatives are:
3. home working
4. walk

5. cycle (consider visible, accessible, secure cycle parking; shower/locker facilities)
6. public bus or rail transport
7. pooled car
8. shared car
9. flexible hours of work may promote use of public transport

9.2 Work travel arrangements

1. is the work travel necessary? Consider the following alternatives:
2. email; telephone call; conference call; videoconferencing
3. while meeting the needs of commitments made, and imposed time constraints, every effort should be made to minimise the carbon footprint(s) associated with the journey(s) to be made
4. overnight stays contribute to the work travel related carbon footprint
5. all costs associated with work travel directly affect the bottom line

9.3 Carbon emissions related to travel

1. emissions associated with domestic and international flights are estimated to be as follows:

FLIGHT TYPE	AVERAGE JOURNEY DISTANCE KM	EMISSIONS AS G CO ₂ /PASSENGER KM	EMISSIONS AS TONNES CO ₂ /PASSENGER FLIGHT
DOMESTIC	425	158	0.07
SHORT-HAUL INTERNATIONAL	1200	130	0.16
LONG-HAUL INTERNATIONAL	7000	105	0.74

2. emissions associated with various petrol and diesel car travel options (based on average travel of 15000 km/annum), and medium motorcycle (based on average travel of 9000 km/annum) are estimated to be as follows:

VEHICLE TYPE	ENGINE/LABEL SIZE	FUEL CONSUMPTION KM/LITRE	EMISSIONS AS G CO ₂ /KM	ANNUAL EMIS- SIONS PER VEHICLE TONNES CO ₂
PETROL CAR	<1.4 litre/small	12.6	183	2.7
	1.4-2.0 litre/medium	10.7	216	3.2
	>2.0 litre/large	7.8	296	4.4

VEHICLE TYPE	ENGINE/LABEL SIZE	FUEL CONSUMPTION KM/LITRE	EMISSIONS AS G CO ₂ /KM	ANNUAL EMIS- SIONS PER VEHICLE TONNES CO ₂
DIESEL CAR	<1.7 litre/small	17.5	151	2.3
	1.7-2.0 litre/medium	14.0	188	2.8
	>2.0 litre/large	10.0	263	3.9
MOTORCYCLE	125-500 cc/medium	24.6	94	0.8

3. emissions associated with bus and train public transport are estimated to be as follows:

PUBLIC TRANSPORT	EMISSIONS AS G CO ₂ /PASSENGER KM
BUS	40
TRAIN	40

4. Carbon emissions that are inevitable may be offset by funding against Mercy Corps humanitarian aid projects currently taking place in those developing countries that are most at risk from the impacts of global warming and climate change.

10.0 Freight

10.1 Avoid “little and often” reinstatement of office supplies; centralise the buying function

10.2 Within the need to seek the competitive advantages of quality, delivery and price when buying, consider advantages to be gained by buying locally and in appropriate “bulk”

11.0 Waste Disposal

11.1 Source reduction is defined as making less of a product, and may be the result of (1) “lightweighting” (e.g., producing less glass or plastic because bottles are made thinner and lighter), (2) more efficient use of a material (e.g., double-sided photocopying), (3) extending the life of a product, or (4) material substitution (e.g., substituting cans for bottles, or vice versa).

Recycling is defined as remanufacturing a material to make more of the same material, or a different material (e.g., office paper can be recycled to make office paper or tissue paper).

11.2 A policy to **reduce, reuse, recycle** should be implemented by management as the necessary carbon reduction precursor to waste disposal

11.3 The management of waste is a critical business operation; recycling must be maximised at reasonable cost through accredited contractors

11.4 As appropriate, statutory legislation governing the many including technical aspects of waste disposal must be understood and adhered to

11.5 Office consumables that may be collected for recycling are as follows:

1. paper
2. cardboard
3. metal cans
4. glass containers
5. plastics containers

12.0 Carbon reduction policy statement

12.1 Saving energy, conserving water, reducing consumption, recycling waste, and reviewing transport options are individual elements of sustainability. The listing is not exhaustive. A broad policy statement that addresses how sustainability will be promoted within an organisation will make it easier to co-ordinate resources, personnel, and operations.

12.2 As a definitive measure of the extent to which the “Carbon Reduction” policy is being successfully implemented, a template for the calculation of the carbon footprint of the organisation or its functional part should be prepared and analysed annually for trends.

United Nations Environment Programme (UNEP)²

The United Nations Environment Programme (UNEP) coordinates environmental action and policy measures within the United Nations central body. UNEP currently focuses on six main environmental challenge priorities, including climate change, disasters and conflicts, ecosystem management, environmental governance, harmful substances, and resource efficiency. The following guidelines are promoted as part of the UNEP operations.

Energy efficiency measures

ENERGY DEMAND	SUGGESTED IMPROVEMENTS
LIGHTING – EXTERNAL	Standalone renewable powered lamps, security lampposts
LIGHTING – INTERNAL	Light emitting diode lighting (reduced wattage)
	Occupancy/movement sensors
	Optimal use of natural lighting
	Have lighting requirements reviewed by experts, determine if lights can be reduced in wattage and number while still meeting desired lighting levels, undertake an assessment of daylight factors
COOLING	Centralized system
	Air-conditioning key/occupancy isolators
	Temperature zoning of buildings
	Free cooling
	Use of air ducts/earth tubes
	Ensure air tightness
	Insulation on internal partitions
	Solar cooling – use photovoltaic (PV) for electricity
	Optimize building orientation (to maximize shading or passive solar)
	Solar tinted glass
	Refrigerants

2 UNEP. 2010. *Assessment of Energy, Water and Waste Reduction Options for the Proposed AMISOM HQ Camp in Mogadishu, Somalia and the Support Base in Mombasa, Kenya*. Technical Report. Geneva.

ENERGY DEMAND	SUGGESTED IMPROVEMENTS
VENTILATION	Zoning of buildings
	Use of variable-speed drives on fans
DOMESTIC HOT WATER	Use of solar heating
	Insulated thermal immersions (tanks)
	Reduced water consumption
	Use of smart controls
SERVER ROOMS	Temperature control and layout
KITCHEN APPLIANCES	A+ rated appliances
	Thermal isolation
	Kitchen energy management plan
SMALL POWER	A+ rated appliances
	Timers on printers/photocopiers and recreation equipment
	Small PV chargers for mobiles and nonessential IT equipment
CONTROLS/ BUILDING MANAGEMENT SYSTEM	Centralize control with simple management system, ensure that local controls have sufficient occupancy and temperature controls
TRANSPORT – OPERATIONAL RESTRICTIONS ON VEHICLES	Restrict vehicle idling
	Introduce speed limiters
	Regular maintenance program
PUMPS AND FANS	Any large fans or pumps should have a variable-speed drive
RENEWABLES AND LOW-CARBON TECHNOLOGIES	Photovoltaic cells (also see solar cooling), keep within draft specification
	Solar thermal (see solar cooling and hot water sections)
METERING	Install meters on main plant and across important areas of site and use of intelligent building management system
THERMAL MODELING	Use thermal modeling at key times within the design stage to ensure optimal building layout

Water efficiency measures

WATER DEMAND	SUGGESTED IMPROVEMENTS
SHOWERS	Use of aerated showerheads.
	Install mixer valves to better control temperature regulation.
TOILETS	Reduce cistern capacity.
URINALS	Use single-flush urinals.
	Use waterless urinals.
HAND WASHING	Install flow regulators.
KITCHEN WASHING	Install flow regulators.
DISH WASHING	Install A-rated machines.
FOOD PREPARATION	Install flow regulators on taps.
LAUNDRY	Install A-rated machines.
METERING	Install meters on locations within the complex where water use is prevalent – ablution blocks, kitchen, toilets.

Waste reduction and disposal measures

WASTE SOURCE	ALTERNATIVE DISPOSAL ROUTES
OFFICE – PAPER	Reduce, reuse, and recycle. Efficient use should be encouraged in printers, reuse for general use (e.g., jotting pads), education.
OFFICE – CARTRIDGES IN PRINTERS, PHOTOCOPIERS	If space allows, these should be stored and returned to the manufacturer. If no space provision, send to landfill.
CARDBOARD – OFFICE AND GENERAL	Cardboard can be bundled, compacted, and sent for recycling in return journeys of provision lorries.
DOMESTIC WASTE PUTRESCIBLE	Biodegradable waste composting, food waste macerators should be used in the kitchen module.
HAZARDOUS WASTE – BATTERIES	Use rechargeable batteries, solar power packs. Other hazardous wastes should be stored and sent for proper disposal on the return leg of provision lorries.

WASTE SOURCE	ALTERNATIVE DISPOSAL ROUTES
HAZARDOUS WASTE – PETROL PRODUCTS	Store in appropriate containers, or use incinerator. Investigate use of biodegradable products.
RECORDING	Accurately record the volumes of waste being produced, and analyze waste streams.
LANDFILL DESIGN	Make space available for a small landfill (associated with waste-reduction measures listed above).

ANNEX 3: LIFE CYCLE ASSESSMENT

Life Cycle Assessment (LCA) – The LCA refers to the idea that all the moments in the “life” of a product should be considered when assessing environmental impacts. The natural environment has survived for billions of years because of the intrasystem recycling dynamic that relieves it of the need to receive new inputs and permanently dispose of wastes. With this in mind, the most sustainable products and processes will not require “new” inputs from the natural environment and will not create any waste that cannot be reincorporated as inputs for the next product. In the LCA, one considers the choices of and extraction methods for raw materials and any environmental changes that result; the processing of extracted materials; the materials’ transport, packaging, and disposal; and the final destination of the molecules that the materials consist of.

The LCA concept applies to everything, including products such as food, resources such as gasoline or ethanol, buildings, published materials, etc. The term “post-consumer recycled content” is related to the LCA concept and has become especially popular in consideration of paper products. Post-consumer recycled paper is made of materials that have already passed through the entire life cycle of the previous paper product. That product’s disposal leads to the material’s use as an input for new paper and eliminates the need to fell additional trees. In addition, alternative methods of paper processing reduce the production of wastes and pollution during the product’s creation.

Source: Scientific Applications International Corporation. 2006. *Life Cycle Assessment: Principles and Practice*. Publication prepared for Office of Research and Development, United States Environmental Protection Agency. Cincinnati, Ohio: EPA.

GLOSSARY

The following is a comprehensive list of the key terms used throughout the Green Recovery and Reconstruction Toolkit. In some cases, the definitions have been adapted from the original source. If no source is given, this indicates that the module author developed a common definition for use in the toolkit.

Anaerobic Filter (or Biofilter): Filter system mainly used for treatment of secondary effluent from primary treatment chambers such as septic tanks. The anaerobic filter comprises a watertight tank containing a bed of submerged media, which acts as a support matrix for anaerobic biological activity. For humanitarian aid agencies, the prefabricated biofilters that combine primary and secondary treatment into one unit can provide a higher level of treatment than do traditional systems such as precast cylindrical septic tanks or soakage pit systems. Source: SANDEC. 2006. *Greywater Management in Low and Middle Income Countries*. Swiss Federal Institute of Aquatic Science and Technology. Switzerland.

Better Management Practices (BMPs): BMPs are flexible, field-tested, and cost-effective techniques that protect the environment by helping to measurably reduce major impacts of growing of commodities on the planet's water, air, soil, and biological diversity. They help producers make a profit in a sustainable way. BMPs have been developed for a wide range of activities, including fishing, farming, and forestry. Source: Clay, Jason. 2004. *World agriculture and the environment: a commodity-by-commodity guide to impacts and practices*. Island Press: Washington, DC.

Biodiversity: Biological diversity means the variability among living organisms from all sources, including inter alia, terrestrial, and marine and other aquatic ecosystems, as well as the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems. Source: United Nations. Convention on Biological Diversity. www.cbd.int/convention/articles.shtml?a=cbd-02 (Accessed on June 18, 2010)

Carbon Footprint: The total set of greenhouse gas emissions caused directly and indirectly by an individual, organization, event, or product. For simplicity of reporting, the carbon footprint is often expressed in terms of the amount of carbon dioxide, or its equivalent of other greenhouse gases, emitted. Source: Carbon Trust. Carbon Footprinting. www.carbontrust.co.uk (Accessed on June 22, 2010)

Carbon Offset: A financial instrument aimed at a reduction in greenhouse gas emissions. Carbon offsets are measured in metric tons of carbon dioxide-equivalent (CO₂e) and may represent six primary categories of greenhouse gases. One carbon offset represents the reduction of one metric ton of carbon dioxide or its equivalent in other greenhouse gases. Source: World Bank. 2007. *State and Trends of the Carbon Market*. Washington, DC

Climate Change: The climate of a place or region is considered to have changed if over an extended period (typically decades or longer) there is a statistically significant change in measurements of either the mean state or the variability of the climate for that place or region. Changes in climate may be due to natural processes or to persistent anthropogenic changes in atmosphere or in land use. Source: UN International Strategy for Disaster Reduction. Terminology of disaster risk reduction. www.unisdr.org/eng/terminology/terminology-2009-eng.html (Accessed on April 1, 2010)

Construction: Construction is broadly defined as the process or mechanism for the realization of human settlements and the creation of infrastructure that supports development. This includes the extraction and processing of raw materials, the manufacturing of construction materials and components, the construction project cycle from feasibility to deconstruction, and the management and operation of the built environment.

Source: du Plessis, Chrisna. 2002. *Agenda 21 for Sustainable Construction in Developing Countries*. Pretoria, South Africa: CSIR Building and Construction Technology.

Disaster: Serious disruption of the functioning of a society, causing widespread human, material, or environmental losses which exceed the ability of the affected society to cope using only its own resources. Disasters are often classified according to their speed of onset (sudden or slow) and their cause (natural or man-made). Disasters occur when a natural or human-made hazard meets and adversely impacts vulnerable people, their communities, and/or their environment. Source: UNDP/UNDRO. 1992. *Overview of Disaster Management*. 2nd Ed.

Disaster preparedness: Activities designed to minimize loss of life and damage; organize the temporary removal of people and property from a threatened location; and facilitate timely and effective rescue, relief, and rehabilitation. Source: UNDP/UNDRO. 1992. *Overview of Disaster Management*. 2nd Ed.

Disaster Risk: Potential disaster losses in lives, health status, livelihoods, assets, and services that could occur to a particular community or a society over some specified future time period. Risk can be expressed as a simple mathematical formula: $\text{Risk} = \text{Hazard} \times \text{Vulnerability}$. This formula illustrates the concept that the greater the potential occurrence of a hazard and the more vulnerable a population, the greater the risk. Source: UN International Strategy for Disaster Reduction. Terminology of disaster risk reduction. www.unisdr.org/eng/terminology/terminology-2009-eng.html (Accessed on April 1, 2010)

Disaster Risk Reduction: The practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events. Source: UN International Strategy for Disaster Reduction. Terminology of disaster risk reduction. www.unisdr.org/eng/terminology/terminology-2009-eng.html (Accessed on April 1, 2010)

Ecosystem: Dynamic complexes of plants, animals, and other living communities and the nonliving environment interacting as functional units. Humans are an integral part of ecosystems. Source: UN. Convention on Biological Diversity. www.cbd.int/convention/articles.shtml?a=cbd-02 (Accessed on June 18, 2010)

Ecosystem Services: The benefits that people and communities obtain from ecosystems. This definition is drawn from the Millennium Ecosystem Assessment. The benefits that ecosystems can provide include "regulating services" such as regulation of floods, drought, land degradation, and disease; "provisioning services" such as provision of food and water; "supporting services" such as help with soil formation and nutrient cycling; and "cultural services" such as recreational, spiritual, religious, and other nonmaterial benefits. Integrated management of land, water, and living resources that promotes conservation and sustainable use provides the basis for maintenance of ecosystem services, including those that contribute to the reduction of disaster risks. Source: UN International Strategy for Disaster Reduction. Terminology of disaster risk reduction. www.unisdr.org/eng/terminology/terminology-2009-eng.html (Accessed on April 1, 2010)

Embodied Energy: The available energy that was used in the work of making a product. Embodied energy is an accounting methodology used to find the sum total of the energy necessary for an entire product life cycle. Source: Glavinich, Thomas. 2008. *Contractor's Guide to Green Building Construction: Management, Project Delivery, Documentation, and Risk Reduction*. John Wiley & Sons, Inc: New Jersey.

Environment: The complex of physical, chemical, and biotic factors (such as climate, soil, and living things) that act upon individual organisms and communities, including humans, and ultimately determine their form

and survival. It is also the aggregate of social and cultural conditions that influence the life of an individual or community. The environment includes natural resources and ecosystem services that comprise essential life-supporting functions for humans, including clean water, food, materials for shelter, and livelihood generation. Source: Adapted from: *Merriam Webster Dictionary*, "Environment." www.merriam-webster.com/netdict/environment (Accessed on June 15, 2010)

Environmental Impact Assessment: A tool used to identify the environmental, social, and economic impacts of a project prior to decision making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment, and present the predictions and options to decision makers. Source: International Association of Environmental Impact Assessment in cooperation with Institute of Environmental Assessment. 1999. *Principles of Environmental Impact Assessment Best Practice*.

Green Construction: Green construction is planning and managing a construction project in accordance with the building design in order to minimize the impact of the construction process on the environment. This includes 1) improving the efficiency of the construction process; 2) conserving energy, water, and other resources during construction; and 3) minimizing the amount of construction waste. A "green building" is one that provides the specific building performance requirements while minimizing disturbance to and improving the functioning of local, regional, and global ecosystems both during and after the structure's construction and specified service life. Source: Glavinich, Thomas E. 2008. *Contractor's Guide to Green Building Construction: Management, Project Delivery, Documentation, and Risk Reduction*. Hoboken, New Jersey: John Wiley & Sons, Inc.

Green Purchasing: Green Purchasing is often referred to as environmentally preferable purchasing (EPP), and is the affirmative selection and acquisition of products and services that most effectively minimize negative environmental impacts over their life cycle of manufacturing, transportation, use, and recycling or disposal. Examples of environmentally preferable characteristics include products and services that conserve energy and water and minimize generation of waste and release of pollutants; products made from recycled materials and that can be reused or recycled; energy from renewable resources such as biobased fuels and solar and wind power; alternate fuel vehicles; and products using alternatives to hazardous or toxic chemicals, radioactive materials, and biohazardous agents. Source: U.S. Environmental Protection Agency. 1999. Final Guidance on Environmentally Preferred Purchasing. *Federal Register*. Vol. 64 No. 161.

Greening: The process of transforming artifacts such as a space, a lifestyle, or a brand image into a more environmentally friendly version (i.e., "greening your home" or "greening your office"). The act of greening involves incorporating "green" products and processes into one's environment, such as the home, workplace, and general lifestyle. Source: Based on: Glavinich, T. 2008. *Contractor's Guide to Green Building Construction: Management, Project Delivery, Documentation, and Risk Reduction*. Hoboken, New Jersey: John Wiley & Sons, Inc.

Hazard: A potentially damaging physical event, phenomenon, or human activity that may cause the loss of life or injury, property damage, social and economic disruption, or environmental degradation. Hazards can include latent conditions that may represent future threats and can have different origins: natural (geological, hydrometeorological, and biological) or induced by human processes (environmental degradation and technological hazards). Source: UN International Strategy for Disaster Reduction. Terminology of disaster risk reduction. www.unisdr.org/eng/terminology/terminology-2009-eng.html (Accessed on April 1, 2010)

Impact: Any effect caused by a proposed activity on the environment, including effects on human health and safety, flora, fauna, soil, air, water, climate, landscape and historical monuments, or other physical structures, or the interaction among those factors. It also includes effects on cultural heritage or socioeconomic conditions resulting from alterations to those factors. Source: United Nations Economic Commission for Europe. 1991. *The Convention on Environmental Impact Assessment in a Transboundary Context*. www.unece.org (Accessed June 22, 2010)

Indicator: A measurement of achievement or change for the specific objective. The change can be positive or negative, direct or indirect. They provide a way of measuring and communicating the impact, or result, of programs as well as the process, or methods used. The indicator may be qualitative or quantitative. Indicators are usually classified according to their level: *input* indicators (which measure the resources provided), *output* indicators (direct results), *outcome* indicators (benefits for the target group) and *impact* indicators (long-term consequences). Source: Chaplowe, Scott G. 2008. *Monitoring and Evaluation Planning*. American Red Cross/CRS M&E Module Series. American Red Cross and Catholic Relief Services: Washington, DC and Baltimore, MD.

Integrated Water Resources Management: Systemic, participatory process for the sustainable development, allocation, and monitoring of water resource use in the context of social, economic, and environmental objectives. Source: Based on: Sustainable Development Policy Institute. Training Workshop on Integrated Water Resource Management. www.sdpi.org (Accessed June 22, 2010)

Life Cycle Assessment (LCA): A technique to assess the environmental aspects and potential impacts of a product, process, or service by compiling an inventory of relevant energy and material inputs and environmental releases; evaluating the potential environmental impacts associated with identified inputs and releases; and interpreting the results to help make a more informed decision. Source: Scientific Applications International Corporation. 2006. *Life Cycle Assessment: Principle's and Practice*. Report prepared for U.S. EPA.

Life Cycle Materials Management: Maximizing the productive use and reuse of a material throughout its life cycle in order to minimize the amount of materials involved and the associated environmental impacts.

Life Cycle of a Material: The various stages of a building material, from the extraction or harvesting of raw materials to their reuse, recycling, and disposal.

Livelihoods: A livelihood comprises the capabilities, assets (including both material and social resources), and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and can maintain or enhance its capabilities and assets both now and in the future, without undermining the natural resource base. Source: DFID. 1999. *Sustainable Livelihoods Approach Guidance Sheets*. London: Department for International Development.

Logframe: Logical framework, or logframe, analysis is a popular tool for project design and management. Logframe analysis provides a structured logical approach to the determination of project priorities, design and budget and to the identification of related results and performance targets. It also provides an iterative management tool for project implementation, monitoring and evaluation. Logframe analysis begins with problem analysis followed by the determination of objectives, before moving on to identify project activities, related performance indicators and key assumptions and risks that could influence the project's success. Source: Provention Consortium. 2007. *Logical and Results Based Frameworks*. Tools for Mainstreaming Disaster Risk Reduction. Guidance Note 6. Geneva, Switzerland.

Primary Wastewater Treatment: Use of gravity to separate settleable and floatable materials from the wastewater. Source: National Research Council. 1993. *Managing Wastewater in Coastal Urban Areas*. Washington DC: National Academy Press.

Project Design: An early stage of the project cycle in which a project's objectives and intended outcomes are described and the project's inputs and activities are identified.

Project Evaluation: Systematic and impartial examination of humanitarian action intended to draw lessons that improve policy and practice, and enhance accountability. Source: Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP). Report Types. www.alnap.org (Accessed June 25, 2010)

Project Monitoring: A continuous and systematic process of recording, collecting, measuring, analyzing, and communicating information. Source: Chaplowe, Scott G. 2008. *Monitoring and Evaluation Planning*. American Red Cross/CRS M&E Module Series. American Red Cross and Catholic Relief Services : Washington, DC and Baltimore, MD.

Reconstruction: The actions taken to reestablish a community after a period of recovery subsequent to a disaster. Actions would include construction of permanent housing, full restoration of all services, and complete resumption of the pre-disaster state. Source: UNDP/UNDRO. 1992. *Overview of Disaster Management*. 2nd Ed.

Recovery: The restoration, and improvement where appropriate, of facilities, livelihoods, and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors. Source: UN International Strategy for Disaster Reduction. Terminology of disaster risk reduction. www.unisdr.org/eng/terminology/terminology-2009-eng.html (Accessed on April 1, 2010)

Recycle: Melting, crushing, or otherwise altering a component and separating it from the other materials with which it was originally produced. The component then reenters the manufacturing process as a raw material (e.g., discarded plastic bags reprocessed into plastic water bottles). Source: Based on: Glavinich, Thomas E. 2008. *Contractor's Guide to Green Building Construction: Management, Project Delivery, Documentation, and Risk Reduction*. Hoboken, New Jersey: John Wiley & Sons, Inc.

Resilience: The capacity of a system, community, or society potentially exposed to hazards to adapt, by resisting or changing, in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organizing itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures. Source: UN International Strategy for Disaster Reduction. Terminology of disaster risk reduction. www.unisdr.org/eng/terminology/terminology-2009-eng.html (Accessed on April 1, 2010)

Response (also called Disaster Relief): The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety, and meet the basic subsistence needs of the people affected.

Comment: Disaster response is predominantly focused on immediate and short-term needs and is sometimes called disaster relief. The division between this response stage and the subsequent recovery stage is not clear-cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage.

Source: UN International Strategy for Disaster Reduction. Terminology of disaster risk reduction. www.unisdr.org/eng/terminology/terminology-2009-eng.html (Accessed on April 1, 2010)

Reuse: The reuse of an existing component in largely unchanged form and for a similar function (e.g., reusing ceramic roof tiles for a reconstructed house). Source: Based on: Glavinich, Thomas E. 2008. *Contractor's Guide to Green Building Construction: Management, Project Delivery, Documentation, and Risk Reduction*. Hoboken, New Jersey: John Wiley & Sons, Inc.

Secondary Wastewater Treatment: Use of both biological (i.e., microorganisms) and physical (i.e., gravity) processes designed to remove biological oxygen demand (BOD) and total suspended solids (TSS) from wastewater. Source: National Research Council. 1993. *Managing Wastewater in Coastal Urban Areas*. Washington DC: National Academy Press.

Site Development: The physical process of construction at a building site. These construction-related activities include clearing land, mobilizing resources to be used in the physical infrastructure (including water), the fabrication of building components on site, and the process of assembling components and raw materials into the physical elements planned for the site. The site development process also includes the provision of access to basic amenities (e.g., water, sewage, fuel) as well as improvements to the environmental conditions of the site (e.g., through planting vegetation or other environment-focused actions).

Site Selection: The process encompasses many steps from planning to construction, including initial inventory, assessment, alternative analysis, detailed design, and construction procedures and services. Site selection includes the housing, basic services (e.g., water, fuel, sewage, etc.), access infrastructure (e.g., roads, paths, bridges, etc.) and social and economic structures commonly used by site residents (e.g., schools, clinics, markets, transport facilities, etc.).

SMART Indicator: An indicator that meets the SMART criteria: **S**pecific, **M**easurable, **A**chievable, **R**elevant, and **T**ime-bound. Source: Based on: Doran, G. T. 1981. There's a S.M.A.R.T. way to write management's goals and objectives. *Management Review*: 70, Issue 11.

Sustainable Construction: Sustainable construction goes beyond the definition of "green construction" and offers a more holistic approach to defining the interactions between construction and the environment. Sustainable construction means that the principles of sustainable development are applied to the comprehensive construction cycle, from the extraction and processing of raw materials through the planning, design, and construction of buildings and infrastructure, and is also concerned with any building's final deconstruction and the management of the resultant waste. It is a holistic process aimed at restoring and maintaining harmony between the natural and built environments, while creating settlements that affirm human dignity and encourage economic equity. Source: du Plessis, Chrisna. 2002. *Agenda 21 for Sustainable Construction in Developing Countries*. Pretoria, South Africa: CSIR Building and Construction Technology.

Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Source: World Commission on Environment and Development. 1987. *Report of the World Commission on Environment and Development: Our Common Future*. Document A/42/427. www.un-documents.net (Accessed June 22, 2010)

Tertiary Wastewater Treatment: Use of a wide variety of physical, biological, and chemical processes aimed at removing nitrogen and phosphorus from wastewater. Source: National Research Council. 1993. *Managing Wastewater in Coastal Urban Areas*. Washington DC: National Academy Press. p. 58

Vulnerability. Human vulnerability is the relative lack of capacity of a person or community to anticipate, cope with, resist, and recover from the impact of a hazard. *Structural or physical* vulnerability is the extent to which a structure or service is likely to be damaged or disrupted by a hazard event. *Community* vulnerability exists

when the elements at risk are in the path or area of the hazard and are susceptible to damage by it. The losses caused by a hazard, such as a storm or earthquake, will be proportionally much greater for more vulnerable populations, e.g., those living in poverty, with weak structures, and without adequate coping strategies. Source: UNDHA. 1997. *Building Capacities for Risk Reduction*. 1st Ed.

Watershed: An area of land that drains down slope to the lowest point. The water moves through a network of drainage pathways, both underground and on the surface. Generally, these pathways converge into streams and rivers that become progressively larger as the water moves downstream, eventually reaching a water basin (i.e., lake, estuary, ocean). Source: Based on: Oregon Watershed Enhancement Board. 1999. *Oregon Watershed Assessment Manual*. www.oregon.gov Salem.

ACRONYMS

The following is a comprehensive list of the acronyms used throughout the Green Recovery and Reconstruction Toolkit.

ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Center
ADRA	Adventist Development and Relief Agency
AECB	Association for Environment Conscious Building
AJK	Azad Jammu Kashmir
ALNAP	Active Learning Network for Accountability and Performance in Humanitarian Action
ANSI	American National Standards Institute
BMPS	best management practices
BOD	biological oxygen demand
CAP	Consolidated Appeals Process
CEDRA	Climate Change and Environmental Degradation Risk and Adaptation Assessment
CFL	compact fluorescent lamp
CGIAR	Consultative Group on International Agricultural Research
CHAPS	Common Humanitarian Assistance Program
CIDEM	Centro de Investigación y Desarrollo de Estructuras y Materiales
CO	Country Office
CRISTAL	Community-based Risk Screening Tool – Adaptation and Livelihoods
CRS	Catholic Relief Services
CVA	community vulnerability assessment
DFID	Department for International Development
DRR	disaster risk reduction
EAWAG	Swiss Federal Institute of Aquatic Science and Technology

ECB	Emergency Capacity Building Project
EE	embodied energy
EIA	environmental impact assessment
EMMA	Emergency Market Mapping and Analysis Toolkit
EMP	environmental management plan
ENA	Environmental Needs Assessment in Post-Disaster Situations
ENCAP	Environmentally Sound Design and Management Capacity Building for Partners and Programs in Africa
EPP	environmentally preferable purchasing
ESR	Environmental Stewardship Review for Humanitarian Aid
FAO	Food and Agriculture Organization
FEAT	Flash Environmental Assessment Tool
FRAME	Framework for Assessing, Monitoring and Evaluating the Environment in Refuge Related Operations
FSC	Forest Stewardship Council
G2O2	Greening Organizational Operations
GBCI	Green Building Certification Institute
GBP	Green Building Programme
GIS	geographic information system
GRR	Green Recovery and Reconstruction
GRRT	Green Recovery and Reconstruction Toolkit
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
GWP	Global Water Partnership
HQ	headquarters
HVAC	heating, ventilation, and air conditioning
IAS	International Accreditation Service
IASC	Inter-Agency Standing Committee

IAIA	International Association for Impact Assessment
IBRD	International Bank for Reconstruction and Development
ICE	Inventory of Carbon and Energy
ICT	information and communication technology
IDA	International Development Association
IDP	internally displaced peoples
IDRC	International Development Research Centre
IFC	International Finance Corporation
IFRC	International Federation of Red Cross and Red Crescent Societies
IFMA	International Facilities Management Association
ILO	International Labour Organization
IPCC	Intergovernmental Panel on Climate Change
IRC	International Rescue Committee
ISAAC	Institute for Applied Sustainability to the Built Environment
ISDR	International Strategy for Disaster Reduction
ISO	International Standards Organization
IT	information technology
ITDG	Intermediate Technology Development Group
IUCN	International Union for the Conservation of Nature
ISWM	integrated solid waste management
IWA	International Water Association
IWMI	International Water Management Institute
IWRM	integrated water resource management
IWQA	International Water Quality Association
IWSA	International Water Supply Association

KW H	Kilowatt hour
LCA	life cycle assessment
LEDEG	Ladakh Ecological Development Group
LEED	Leadership in Energy & Environmental Design
M&E	monitoring and evaluation
MAC	Marine Aquarium Council
MDGS	Millennium Development Goals
MSC	Marine Stewardship Council
NACA	Network of Aquaculture Centers
NGO	non-governmental organization
NSF-ERS	National Science Foundation - Engineering and Research Services
NWFP	North Western Frontier Province
OCHA	Office for the Coordination of Humanitarian Affairs
PDNA	Post Disaster Needs Assessment
PEFC	Programme for the Endorsement of Forest Certification
PET	Polyethylene terephthalate
PMI	Indonesian Red Cross Society
PVC	Polyvinyl chloride
PV	photovoltaic
REA	Rapid Environmental Assessment
RIVM	Dutch National Institute for Public Health and the Environment
SC	sustainable construction
SCC	Standards Council of Canada
SEA	Strategic Environmental Impact Assessment
SIDA	Swedish International Development Agency

SKAT	Swiss Centre for Development Cooperation in Technology and Management
SL	sustainable livelihoods
SMART	Specific, Measurable, Achievable, Relevant, and Time-bound
SODIS	solar water disinfection
TRP	Tsunami Recovery Program
TSS	total suspended solids
UN	United Nations
UNDHA	United Nations Department of Humanitarian Affairs
UNDP	United Nations Development Programme
UNDRO	United Nations Disaster Relief Organization
UNEP	United Nations Environment Program
UNGM	United Nations Global Marketplace
UN-HABITAT	United Nations Human Settlements Programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	The United Nations Children’s Fund
USAID	United States Agency for International Development
USAID-ESP	United States Agency for International Development- Environmental Services Program
VROM	Dutch Ministry of Spatial Planning, Housing and the Environment
WEDC	Water, Engineering, and Development Centre
WGBC	World Green Building Council
WHO	World Health Organization
WWF	World Wildlife Fund



Soon after the 2004 Indian Ocean tsunami, the American Red Cross and the World Wildlife Fund (WWF) formed an innovative, five-year partnership to help ensure that the recovery efforts of the American Red Cross did not have unintended negative effects on the environment. Combining the environmental expertise of WWF with the humanitarian aid expertise of the American Red Cross, the partnership has worked across the tsunami-affected region to make sure that recovery programs include environmentally sustainable considerations, which are critical to ensuring a long-lasting recovery for communities.

The Green Recovery and Reconstruction Toolkit has been informed by our experiences in this partnership as well as over 30 international authors and experts who have contributed to its content. WWF and the American Red Cross offer the knowledge captured here in the hopes that the humanitarian and environmental communities will continue to work together to effectively incorporate environmentally sustainable solutions into disaster recovery. The development and publication of the Green Recovery and Reconstruction Toolkit was made possible with support from the American Red Cross.