

GREEN OFFICE HANDBOOK



A Practical Guide to Running a More Cost-effective and
Environmentally Sustainable Office
“let’s lead the way”

1st Edition

This Handbook was developed by Bremen Overseas Research and Development Association (BORDA) Afghanistan in cooperation with the National Environment Protection Agency (NEPA) and the United Nations Environment Programme (UNEP) as a tool for raising awareness on the common environmental impacts of a typical office in Afghanistan.

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FOREWORD

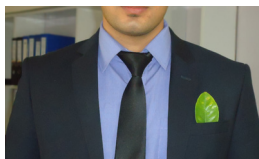
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WHAT IS A GREEN OFFICE

In the times of climate change, we need to be more aware of our impact on the environment; The Green Office initiative is one of several measures to reduce our carbon footprint to ensure that we are greener and more planet-friendly. This Green Office Handbook is a practical guide for offices. With its help, workplaces will be able to easily reduce their burden on their environment, achieve savings and slow down climate change.

Four good reasons to Green your Office

- Reduce your overall expenses
- Be a Green Office leader by setting an example
- Improve your organization's image among staff, stakeholders, donors etc.
- Reduce your organization's ecological footprint



1. OVERVIEW

Today masses of employees spend a significant part of their lives in offices. Everyday operations in offices lead to considerable environmental impact by human activities such as consumption, as well as output, such as emission and discharge.

Fact box

Worldwide, 40% of raw materials are resources consumed by offices. Offices can play a significant role in preventing and reducing their environmental impacts. To reduce this impact one of the most efficient ways is "greening" the offices.

Bremen Overseas Research & Development Association (BORDA) Afghanistan with the collaboration of National Environmental Protection Agency (NEPA) and the United Nations Environment Programme (UNEP) has developed the "Green Office Handbook" with the goal of reducing the environmental impacts of operations in offices.

The Green Office Handbook provides practical medium, low, and no cost solutions to greening your office

environment and positively change staff behavior. We cannot ignore our impacts on the environment, we must take responsibility for our own actions and strive to change some of the traditionally accepted ways of acting and thinking.

This handbook provides a package of both 'hard'¹ and 'soft'² solutions that are appropriate for offices in Afghanistan to increase energy efficiency and water conservation, develop sustainable procurement practices and Waste management procedures, and facilitate shifts in behavioral management in offices.

The objectives of this handbook are:

- To reduce the consumption of natural resources by improving offices' environmental efficiency;
- Promote sustainable practices by increasing environmental awareness of employees;
- Manage office waste in a responsible and sustainable way;
- And to support climate change mitigation and adaptation through reducing energy consumption.

2. IMPROVE OFFICE ENERGY

Energy costs have the greatest potential for reduction. Low-and No-cost improvements can reduce energy use by around 20% resulting in almost immediate savings.

2.1. Heating and cooling

Although heating and cooling systems provide a useful service by keeping employees comfortable, they also account for a significant portion of a building's energy use—typically about 25%. However, it is possible to reduce this energy use by increasing the efficiency of systems and changing habits.

¹'Hard' interventions comprise of engineering and infrastructural approaches involving construction modification of physical structures and facilities such as windows, doors, heaters etc..

²'Soft' interventions refer to both institutional and social and behavioral change.

How to reduce energy in heating and cooling your office:

- Find out how the heating and cooling systems for your office operate, and take advantage of any energy efficient functions that are built in.
- Make sure windows and doors are closed when heating or air-conditioning is on.
- When heating, reduce the temperature of a room by 1°C and you could reduce the heating bill by 10%. Most employees are comfortable at 19°C. Similarly, set air-conditioning to come on only when temperatures exceed 24°C.
- Turn off heating and cooling in unoccupied rooms.
- If your office is being refurbished, consider installing double or triple glazed windows, and encourage caretakers/cleaners to close blinds/curtains when rooms are unoccupied to prevent excessive heating in the summer or heat loss in the winter.
- In the summer it is better to open the windows early in the morning when the air outside is cooler, to cool the air inside the building. It is better to ventilate the office with fully open windows and leave them open for a shorter time (5-15 min) than to partially ventilate for a longer time.
- Install instant water boilers where possible, otherwise reduce the temperature of stored hot water (to a minimum of 60°C to avoid bacteria breeding).
- Check boilers and thermostats – a serviced boiler can save up to 10% on heating costs
- Install ceiling fans. Using a ceiling fan can help you feel up to 5°C cooler.
- Water cooling / heating dispensers consume a lot of energy, these can be used to dispense water without being plugged in.

Fact box

Windows account for almost 25% of a building's energy loss. Double-paned glass in new doors and windows may cost more initially, but can reduce heating costs by 34% in cold climates and save you 38% on summer cooling loss.

Source: Greenest City.

2.2. Lighting

Lighting represents around 10% of the residential electricity consumption. It is the third main consumer of electricity after heating and cooling appliances. LED represents one of the most efficient solutions available today for improving energy efficiency in office lighting.

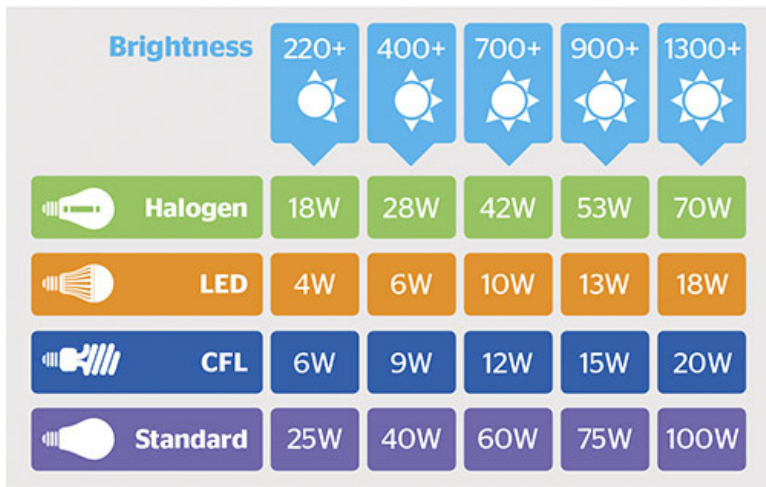


Figure 1.1: Light bulbs comparison (inlinemarker)

How to reduce energy in lighting your office:

- Replace traditional (incandescent) bulbs with energy-saving LEDs. They typically make immediate savings of up to 75% and last up to ten times longer.
- Use natural light wherever possible. Keep windows clean and encourage staff to open the curtains rather than turn on the lights.
- Only turn lights on when the natural light from windows is low.
- Run a 'switch off' campaign in the office. It is always cheaper to switch off lights no matter how short

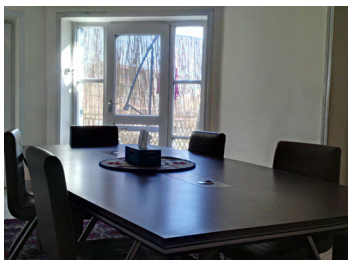


Figure 1.2: Using natural lighting

the time period. Place stickers above light switches and use posters and emails to remind people.

- When the lower running costs and reduced labor costs through less frequent lamp replacement are considered, the Life-time costs of CFLs are much lower than incandescent lamps.



Figure 1.3: Switch Off sticker

Fact box

Potential gains of replacing traditional bulbs with energy saving bulbs save 77% in electricity costs per year and 77% reductions in CO2 emissions per year.

Source: UNEP/Wuppertal Institute collaborating Center on Sustainable Consumption and Production.

2.3. Office equipment

Computers, printers and photocopiers are an integral part of offices. Running office equipment can account for up to 20%³ of your electricity usage. While the electricity that powers office equipment is a direct cost to your office budget, there are also indirect costs to consider. Office equipment generates heat which can increase the electricity usage of air conditioners by up to 25%.⁴ When you're calculating the cost of new equipment, it's important to consider 'lifetime cost'. For example, if an item is more expensive to buy but operates with one-third of the power cost, it's important to factor in how much you'll save on electricity over the equipment's lifespan.

³ ERGON ENERGY 2016, ergon.com.au

⁴ ERGON ENERGY 2016, ergon.com.au

2.3.1. Computers

- Where practical, use laptop computers which use up to 90%⁵ less electricity than desktop computers. As much of a computer's electricity usage is for the monitor, choose LCD or LED monitors which use less than half the electricity of cathode ray monitors (and also cause less eyestrain!)
- Ensure computers are turned off at night. These days, it's usually unnecessary to leave office computers on overnight for backing up data, so turn them off and save power.
- If ever you do have to leave computers on at night, such as for network applications, make sure you turn off the monitors.
- In spite of their name, screen savers are energy wasters. That's because your monitor uses almost full power when the screen saver appears – even in 'blank screen' mode. So ban those cute puppies and bouncing balls and enjoy significant energy savings.
- Instead of a screen saver, use 'power management' software that will turn off your monitor after a period of inactivity. Or if you don't have such an application, simply turn the monitor off if you know you'll be away from your computer for some time.
- Reducing your screen's brightness level to the lowest comfortable level will also save on electricity.
- Add a signature to your emails to prevent unnecessary printing. For example: " By not printing this email you've helped save paper, ink and millions of trees" or "Please consider the environment, do you really need to print this email?"

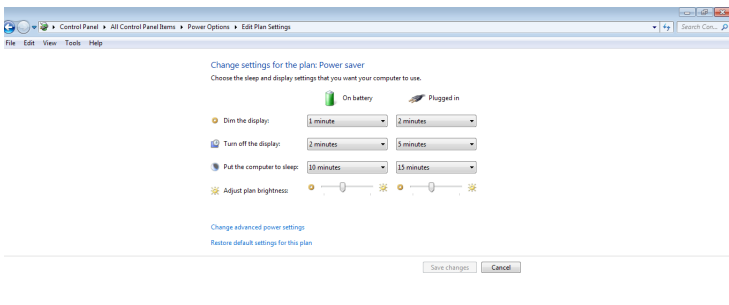


Figure 1.4. Display and power adjustment for saving energy

⁵ ERGON ENERGY 2016, ergon.com.au

2.3.2. Printers

- Use inkjet printers if possible, as they use up to 90%⁶ less electricity than laser printers because laser printers use electricity when they're switched on but not printing.
- Look for models with automatic 'power down' features to reduce their electricity usage by over 65%⁷.
- Educate staff to turn printers off when not in use, remind them with clear posters around the printing area.



Figure 1.5: Energy star printer

2.3.3. Copiers

- Instruct staff to turn copiers off when not in use.
- Turn on the energy-saving feature of your copier. Refer to manufacturer's manual or website on how to turn on your copier's energy saving mode.
- If possible, purchase a combined printer/copier/ scanner to reduce electricity usage and save both space and money.



Figure 1.6: Combined printer, copier & scanner

2.3.4. Boilers

Often water that enters water boilers contains a number of minerals, such as calcium, magnesium and silica or other minerals.

Minerals harden at certain temperatures and overtime form a dense coating over heating elements. This layer of coating is technically known as 'scale' and significantly reduces the efficiency of the heater. De-scale your water boilers at least once a year using vinegar or an acid solution



Figure 1.7: Boiler heater with 'Scale'

⁶ERGON ENERGY 2016, ergon.com.au

⁷ERGON ENERGY 2016, ergon.com.au

2.3.5. Refurbishing furniture

In comparison with purchasing new office furniture, refurbishment of worn out items can cost less than half of the price. Renovation can provide environmentally preferable alternative to purchasing new products. It is good to try and get any new office furniture made locally, this not only supports local economy but items are often better made and more easily repaired.



Figure 1.8: Local carpenter during refurbishing chairs

2.4. Using renewable energy technologies

Renewable Energy refers to energy from resources which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat. Renewable energy technologies that are available in Afghanistan are solar panels, solar water heaters, wind generators and biogas digesters. These technologies can be installed at your organization's building to supply some or all of your energy needs. Most of the time we rely on governments or large companies to help us make the shift from fossil fuels to renewable energy, but it might be great if we took matters into own hands and created energy from renewable energy resources. For example install solar panels on the roof to produce electricity or use biogas systems for wastewater treatment and production of clean biogas energy.

2.4.1. Solar Panels

Solar panels can supply the energy needs of lighting and equipment such as computers, printers and scanners, and pumping of water in offices. Solar panels are available in Afghanistan, they are affordable and there are enough technical people for their maintenance. Batteries are required to store the solar energy for lighting and other usages during the night.

Afghanistan has approximately 300 days of sunlight in a year, and the average solar radiation is 6.5 kwh/m²/day.⁸



Figure 1.9: Solar panels used for lighting and office equipments



Figure 1.10: Solar water pump

⁸Report from MEW 2014

2.4.2. Solar water heater

Solar water heaters can be a cost-effective way to generate hot water for your office needs. They can be used in any climate, are relatively easy to maintain and do not rely on an external energy source other than the sun. Non-freezing versions are more expensive and complex.



Figure 1.11: Solar water heater

2.4.3. Biogas

Connecting toilets to biogas systems could be used in offices for wastewater treatment and recovery of valuable energy in the form of biogas. Biogas can be used directly for heating water or cooking or can be converted to electricity⁹. The gas production from human wastewater alone does not produce enough energy to provide any significant energy source to an office however it does allow for wastewater reuse practices. Additionally, public health, environment as well as agriculture would benefit substantially from adoption of this technology in Afghanistan. Given the general lack of wastewater treatment systems across Afghanistan coupled with water scarcity, biogas can be a very cost effective and viable solution for offices and households.



Figure 1.12: Toilet linked biogas plant for WW treatment



Figure 1.13: Schematic view of toilet linked biogas plant

⁹When biogas is converted to electricity the efficiency is reduced to approximately 30% (personal communication Christopher Kellner, 2014)

2.5. Procurement of energy Efficient appliances

Purchasing products which meet energy efficient criteria, save energy. The purchase of energy efficient office equipment reduces electricity demand, saves money and helps your office to reduce its direct and indirect impact on the environment.

All forms of office equipment should be purchased with the intent of reducing the energy consumption of the office environment. This can lower maintenance costs (because energy-efficient products require less frequent replacement), reduce greenhouse gas (GHG) emissions, and enhance pollution prevention and resource conservation activities. Because energy-efficient product procurement helps reduce energy loads, it can also increase the cost-effectiveness of other energy efficiency activities, such as facility upgrades.



Figure 1.14: Energy efficient laptop

Best practices used for the procurement of energy efficient appliances:

- Think of longevity, reusability, refillable and recyclable when buying office equipment such as printers, scanners and photocopiers.
- All offices should ensure that all equipment conforms to at least to ENERGY STAR requirements.
- Procure office equipment which can be recycled at end of its life.

Fact box

Energy-efficient (Energy Star) products can reduce energy costs by 25 to 50 %, or even more, without compromising quality or performance.

Source: (U.S. EPA., 2008)

2.6. Energy efficient office design

If it is planned to construct a new office building, it would be better to consider a building design that is green and energy efficient. Use passive design techniques in conjunction with insulation.

2.6.1. Building insulation

Insulation acts as a wall to heat flow and is essential for keeping your office warm in winter and cool in summer. A well-insulated and well-designed office provides year-round comfort, cutting cooling and heating bills by up to 50%.

The most common insulation materials which are used are: Cellulose, Cotton and Sheep wool



Figure 1.15: External wall thermal insulation

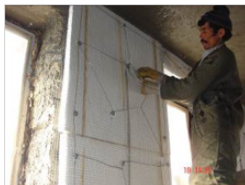


Figure 1.16: internal wall thermal insulation



Figure 1.17: internal roof thermal insulation

Where to install insulation

Roofs and ceilings work in conjunction when it comes to insulation.

- Install insulation under the roofing material to reduce radiant heat gain and loss.
- Install insulation in the ceiling to reduce heat gain and loss.
- Seal all wall holes for wires or pipes or electrical outlets
- Add additional insulation to the upper floor
- Insulation of floors is useful in really cold locations as well.
- Make door- and window-frames weather proof.

2.6.2. Passive solar office design

Ideally, the decision to build green should be made before the site is selected, as many of the green criteria are affected by site characteristics and some sites are inappropriate for certain green projects. Passive solar design takes advantage of a building's site, climate, and materials to minimize energy use. A well-designed passive solar office first reduces heating and cooling loads through energy-efficiency strategies and then meets those reduced loads in whole or part with solar energy. Because of the small heating loads of modern offices it is very important to avoid over sizing south-facing glass and ensure that south-facing glass is properly shaded to prevent overheating and increased cooling loads in the spring and autumn. Design overhangs to optimize solar penetration in winter and shut out direct penetration in summer. With this spring and autumn are not problems.



2.6.3. Site selection

If you're planning a new passive solar office, a portion of the south side of your office must have an unobstructed "view" of the sun.

2.6.4. How a passive solar office design works

In simple terms, a passive solar office collects heat as the sun shines through south-facing windows and retains it in materials that store heat, known as thermal mass. The ideal ratio of thermal mass to glazing varies by climate. Well-designed passive solar office also provides daylight all year and comfort during the cooling season through the use of nighttime ventilation.

To be successful, a passive solar office design must include some basic elements that work together:

- Properly oriented building is east-west windows. Typically, windows or other devices that collect solar energy should face within 30° of true south
- Thermal mass. Thermal mass in a passive solar office -- commonly concrete, brick, stone, and tile -- absorbs heat from sunlight during the heating season and absorbs heat from warm air in the house during the cooling season.
- Control strategies. Properly sized roof overhangs can provide shade to vertical south windows during summer months.
- Some of the elements the designer would consider include:
 - Insulation and air sealing
 - Window location, glazing type, and window shading
 - Thermal mass location and type.
 - Additional heating and cooling systems.
- The designer would apply these elements using passive solar design techniques.

3. SOLID WASTE REDUCTION AND REUSE IN OFFICE

Waste has become an increasingly difficult environmental and economic problem, one which affects us all and to which everyone contributes. Individuals, at home or at work, have a vital role to play in schemes that minimize and reduce waste.

All the waste that an office produces has both an associated financial and environmental cost, and these costs are often underestimated. However, the bigger issue is to understand where this waste is generated, and whether it is possible to eliminate this waste at source or to reduce, re-use or recycle it.

3.1. Reduce paper usages

Duplex or double-sided printing

By setting double-sided (duplex) printing as your default setting in your computers, you can save time and avoid forgetting to select double-sided each time you print:

Setting Duplex Printing as Your Default in your PCs;

1. Go to Start --> Settings --> Control Panel --> Printers or Printers and Faxes
2. Select desired printer
3. Right Click on printer and Printing (Preferences button)
4. Click on Finishing button and Check box for Print On Both Sides
5. Click OK

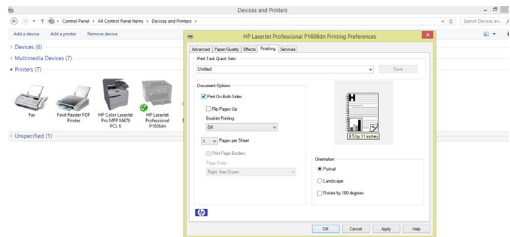


Figure 3.1: Settings for double sided default printing

if you want to select Duplex printing for a specific document

1. Go to print document and select printer properties
2. Select Finishing tab
3. Check box for Print On Both Sides
4. Click OK twice



Fact box

According to the U.S. Environmental Protection Agency, Each year the world produces more than 300 million tons of paper.

Worldwide consumption of paper has risen by 400% in the last 40 years with 35% of harvested trees being used for paper manufacture.

Source: The Paperless Project. <http://www.thepaperlessproject.com>

Duplex or double-sided Copying

Because settings are different for each copier we suggest you first refer to your copier's manual for directions. You can set double-sided copying as the default on many multi-function copiers as follows:

1. Press the System button
2. Scroll down to Job Defaults
3. Scroll Down to Copy Defaults
4. Select 1 to 2

Total reams of paper purchased per year	÷	Number of staff in your organisation	=	Total paper use (reams/person/year)
Total cost of paper purchased per year [Afn]	÷	Number of staff in your organisation	=	Cost [Afn/person/year]

Table 3.1: Calculating a baseline of annual paper use and cost per person

3.2. Reduce the use of plastic bags

Practical actions to reduce plastic



Figure 3.2: Time it takes for different items to decompose

Start a no plastic bag challenge in your office, to break the bag habit.

- If you're only buying a couple of items, consider carrying them.
- When shopping, take reusable alternatives like 'green bags', calico bags, string bags, baskets or boxes with you.
- Consolidate purchases into one bag rather than getting a new bag at each store.
- Be aware that the thicker department store bags are generally non-recyclable, so the best action is to avoid taking them.
- Count the number of plastic bags you use and aim to reduce that number each week.
- Avoid putting items that already have handles such as toilet papers and diapers into plastic bags.
- Avoid using small plastic bags as bin liners. Simply put your rubbish straight into your household bin and give the bin a quick rinse afterwards then reuse the water on your garden.
- Reuse plastic bags at home for: freezing food, packing children's school lunches, storage of clothing and other household items.
- Keep a spare reusable shopping bag in your handbag or wallet for those times when you thought you would not need a bag, but did.
- Plastic bags poison cattle and other livestock that graze along roads and in rubbish heaps.



Figure 3.3: Plastic bags on road



Figure 3.4: Green bags for shopping

Fact box

Just 9 plastic shopping bags contain enough embodied petroleum energy to drive a car 1km. Each year, over 500 billion (plastic) bags are used worldwide. Most are used for a short period of time, but a significant number end up in our environment, and are not only harmful to the environment but also make our surrounding areas look messy and unpleasant.

3.3. Waste separation

Waste separation is a highly effective way of reducing waste and controlling your waste costs. As a minimum, all clean paper/cardboard and recyclable plastic types should be separated from other types of waste so that they can be recycled rather than landfilled. This means that there must be clearly marked bins to place paper/cardboard, plastics and general waste wherever this waste is produced and near to the areas where people are working. Provide recycle bins at entrances to the building, so that staff can immediately dispose of items they have used on the commute such as empty take-away coffee cups and lids, plastic drink bottles, food wrappers, newspapers and magazines as they enter the workplace. There may also be opportunities to recover food waste for composting.



Figure 3.5: Specific bins for specific items

3.4. Waste recycling

All types of paper, recyclable plastic including plastic bags, polystyrene, glass, aluminum, and cardboard should be placed in the specific recycling bins. Avoid mixing them with non-recyclable materials.

In Afghanistan there is no national recycling plan however there is informal recycling activity that happens on the streets. People separate metals, bottles, glass and aluminum and sell to melting and recycling factories. Within this informal recycling activity people collect paper and cardboard for a variety of different uses. We can support this recycling by separating our waste into separate bins.

Recycling for special items

- Batteries: reduce the need for recycling batteries by purchasing rechargeable ones.
- Toner cartridges: use refillable cartridges for printers.

Fact box

The plastics used in printer cartridges are made of an engineering grade polymer that have a very slow decomposing rate ranging between 450 to 1000 years depending on the cartridge type.

Source: <http://www.agreenerrefill.com/the-benefits-of-recycling>

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Source: <http://www.agreenerrefill.com/the-benefits-of-recycling>

3.5. Composting of kitchen waste

One way to reduce the waste production of your office is through composting. Compost is organic material that can be added to soil to enrich it. Food scraps, tea leaves/ bags, fruit skins, are probably the main organic waste produced in your office and can comprise up to 20 to 30 % of what we throw away, and should be composted instead.

All composting requires three basic ingredients:

- Browns – This includes materials such as dead leaves, shredded papers and branches
- Greens – This includes materials such as grass clippings, vegetable waste and fruit scraps.
- Water

Your compost pile should have an equal amount of browns to greens. You should also alternate layers of organic materials of different sized particles. The brown materials provide carbon for your compost, the green materials provide nitrogen, and the water provides moisture to help break down the organic matter.

If you do not have the space in your office to have a compost pile then try to make an agreement with a local animal owner (sheep, horse, donkey etc.) to collect the organic waste to feed to their animal.



Figure 3.6: Organic wastes over road

PUT THESE IN MY COMPOST BIN:



Figure 3.7: Items for compost bins



Figure 3.8: Compost heap and growing plants from compost

4. WATER CONSERVATION AND WASTEWATER REUSE IN OFFICE

4.1. Water reduction

Reducing water usage conserves energy- both through heating of water, and the energy used to pump water around the office.

Efforts should be made to minimize the unnecessary and inefficient use of potable water at the office while maximizing the recycling and reuse of water, including harvested rainwater, storm water, and grey water.

Consider wastewater and or grey water treatment systems that allow reuse of wastewater for irrigation of the garden or vehicle washing.

Ways to reduce water consumption at the office:

- If possible use harvested rainwater or treated wastewater for office gardens.
- Check your taps and pipes for leaks – leaks waste a lot of water, can be dangerous and can also cause damage to buildings.
- Install double flushing cisterns for toilets and normally use half flushing mode.
- Use buckets when washing office cars.



Figure 4.1: Double Flushing



Figure 4.2: Self car washing with hose running uses close to hundred gallons of water to wash one car (Watersavers)



Figure 4.3: Washing car with spray gun uses 12-18 gallons per vehicle (Watersavers)



Figure 4.4: Washing car with only 3 or 3.5 buckets (wikihow)

4.2. Grey water reuse

Wastewater from the bath, laundry trough and hand basin which is called grey water is the most available source of wastewater that can be reused. Grey water harvesting utilizes a valuable on-site resource, conserves precious drinking water and reduces the load on wastewater disposal systems. If applied appropriately to gardens, grey water re-use presents minimal health and environmental pollution risks.

One simple method of grey water reuse is collecting grey water in a bucket which should be free of bleach and other caustic cleaners and using it to irrigate plants. One drawback of this method is that because of the organic particles found in grey water, this water should not be stored for longer than one day. This method is quite labour intensive. A number of more elaborate systems are now available which permit grey water to be spread through an interconnecting subsurface trench system to water your trees. Grey water re-use for garden irrigation should be encouraged in offices and it is a good solution for large ministry offices.

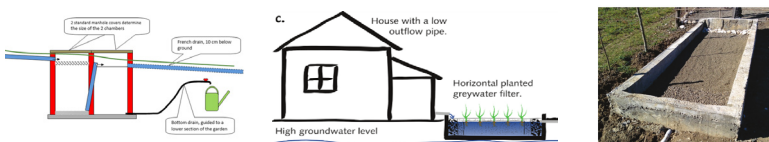


Figure 4.5: Grey water treatment systems

4.3. Black water reuse

The wastewater produced in offices in Afghanistan is not treated properly: either it goes to soak pits which contaminate the ground water or it is directly discharged to surface water. Decentralized wastewater treatment systems are the only solution for this problem in offices. These systems safely treat the wastewater for reuse as per NEPA standards.

One type of decentralized wastewater systems are DEWATS, which are appropriate for the conditions in Afghanistan and are recommended by the Ministry of Urban Development affairs of Afghanistan. DEWATS are developed by an international network of organizations and experts, which provides treatment for wastewater flows from 1 m³ to 1000 m³ per day per unit. They can be constructed from locally available materials, require less operation and maintenance and work without electricity.

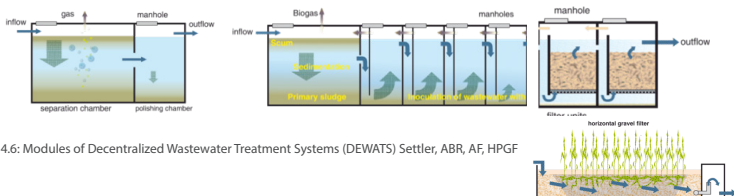


Figure 4.6: Modules of Decentralized Wastewater Treatment Systems (DEWATS) Settler, ABR, AF, HPGF



Figure 4.7: Settler, ABR and AF during construction



Figure 4.8: Settler, ABR and AF After construction



Figure 4.9: Planted Gravel Filter (PGF)

The treated effluent from DEWATS can be reused for landscaping, irrigation, groundwater recharge, fishponds etc. The sludge from the anaerobic DEWATS modules after adequate treatment can be reused for making bricks, flower pots, as well as a fertilizer and soil conditioner in agricultural fields.

5. CREATING A HEALTHY OFFICE ENVIRONMENT

5.1. Gardening/landscaping

Flowers Generate Happiness¹². Having flowers around the home and office greatly improves people's moods and reduces the likelihood of stress-related depression, since plants often are producing oxygen, they increase the O₂ levels for people near them. Flowers and ornamental plants increase levels of people happiness and help people feel secure and relaxed. An excellent mulch for garden beds and surfaces is stones, pebbles and gravel. These reflect summer heat, conserve soil moisture, reduce irrigation need and are easily available. The under surfaces of stones also collect dew on cooler desert nights.

- **Health and Recreation.** Access to parks and recreational activities is positively connected with rates of physical activity, which improves mood and contributes to overall healthiness. Health care costs are subsequently reduced.
- **Improves Relationships/Compassion.** Research shows that people who spend extended lengths of time around plants tend to have better relationships with others. This is due to measurable increases in feelings of compassion; another effect of exposure to ornamental plants
- **Improved Human Performance/Energy.** Spending time in natural environments makes people better at doing their jobs. It also increases energy levels and feelings of vitality
- **Plants can remove airborne contaminants.** We breathe the same air again and again, potentially inhaling harmful substances that are trapped inside. Indoor plants can help to remove pollutants including VOCs (Volatile Organic Compounds) that cause headaches, nausea, and more.
- **Plants can reduce carbon dioxide.** During photosynthesis, plants draw carbon dioxide from the air. Removing this substance can help prevent drowsiness.
- **Plants can make the brain work better.** Potted plants and flowers can improve your idea generation, creativity, mood, and more.



Figure 5.1: Flowers inside office



Figure 5.2: Flowers inside BORDA Office



Figure 5.3: Flowers in the garden of office

Fact box

A study by the University of Michigan published in 2008 found that the more time spent outside in close proximity to plants can help increase memory retention by up to 20 %. Studies have also shown that time spent around plants can increase an employee's attention span and improve concentration as well as productivity.

¹²Source: Emotional impact of flowers study of Rutgers University

5.2. Cleaning

There are many reasons for why you may want to keep a clean office. Not only is a neat and tidy space more visually appealing than a cluttered mess, but it also makes a good impression on visitors and clients and is more conducive to productivity in the workplace. If you are interested in maintaining order in your office, follow these steps:

■ Organize loose papers.

Paperwork that is piled up throughout the office space not only looks messy, but also makes it difficult and time consuming to refer back to important documents when the need arises. There are a number of ways loose papers can be organized during the office cleaning procedure.

■ Disinfect the bathroom.

Not only is this necessary for a clean office, but also for the safety of your employees. Restrooms are a high traffic area and need to be cleaned every day. Scrub toilet bowls with a disinfecting cleaner and a toilet brush. Wipe the seat, the lid, the outside circumference of the bowl, the tank and the base of the toilet with disinfectant. Wipe sink and counter areas with a disinfecting cleaner. Sweep and clean the floors. Refill soap dispensers and paper towel holders, and replace toilet tissue rolls.

■ Protect your electronics by keeping them clean and dust free.

Use a duster to blast dust out of tight spaces like keyboard keys, vents and fans. Wipe electronics with a soft rag moistened with a disinfectant spray.

■ Clean the break room/Kitchen.

Because food is often prepared and stored in the break room, a clean break room is necessary to your employees' health and safety. Additionally, a clean break room is good for employee morale.



Figure 5.4: Washing kitchen daily

■ Empty waste baskets every day.

This includes garbage in the break room, office spaces, conference room, public area and restrooms.

■ Ensure the public area is presentable.

If your customers or clients visit your office, then a clean office is the first impression they will get. Seating should be free of dust, crumbs and stains. If you display magazines, books, pamphlets and/or brochures for waiting customers to read, those reading materials should be tidy and up to date. Throw away ripped dirty and old reading materials.

- **Clear off desk spaces to keep clutter to a minimum for a clean office.**

Make use of organizational units like pencil holders, paper trays, standing file holders, bookshelves, baskets and drawer dividers to create a place for everything. Wipe the desktops clean of dust, food crumbs and smudges.

5.3. Indoor air quality

Below are some general tips for maintaining good indoor air quality in offices. The most effective strategy for reducing indoor air pollution is to eliminate or reduce the sources of contaminants.

- Maximize the use of natural day lighting. Optimize solar orientation and design the building to maximize penetration of natural daylight into interior spaces. Provide shades or daylight controls where needed.
- Windows tightly shut in the winter and opening the window is also not the answer because outdoor air contains gas emissions from cars and trucks as well dirt and mold so the best solution is using air filter in offices to increase the indoor air quality.
- Maximize the use of windows and natural ventilation.
- Do not smoke inside the office; use the garden area for smoking.
- Research has narrowed down which plants are the best at filtering indoor air, but certain plants eliminate significant amounts of toxic and the best plants for filtering indoor air shown in picture.¹³



Figure 5.5: Kid and pet friendly plants for filtering indoor air

¹³ Saferenvironment.wordpress.com/2009/09/05

5.4. Exercises

Simple 2 minutes exercises on sitting chair



Bend your wrist and fingers with your other hand, bending your elbow slightly at the same time, until you feel the stretch over the back of your forearm. Hold the position for 30 seconds.



Stretch your arm out in front of you with your elbow straight, palm facing away from you (fingers pointing up or down), then with your other hand, pull your fingers backwards until you feel the stretch over the front of your forearm. Hold the position for 30 seconds.



Tuck your chin down onto your chest and gently turn your head from side to side, keeping your chin on your chest. Do this ten times.



Turn your head slowly from side to side ten times.



Tall stretch:

Interlock fingers, palms up. Stretch arms above the head until they are straight. Do not arch the back.



Toe-in, toe out:

Place feet shoulder-width apart, heels on the floor. Swing toes in, then out.



Shoulder roll:

Roll the shoulders – raise them, pull them back, then drop them and relax. Repeat in the opposite direction.



Side stretch:

Drop left shoulder, reaching left hand towards the floor. Return to starting position. Repeat on right side.

6. SUSTAINABLE EVENTS

One practical step towards reducing plastic waste is for meetings or workshops to invest in some robust glasses and jugs that can be refilled from large water dispensers.

6.1. Communication

Where appropriate use email and telephone for sending invitations to events.

Banners can be a large source of plastic waste when they are just used once. One option is to not include specifics on the banner (Date, location etc.) so the banner can be reused for the next event. If this is not possible think about ways of reusing the banner in other ways or donate the banner to a school for art classes.

Printed material should be carefully considered and double sided printing should be used when possible.

6.2. Venue

The type of venue selected will clearly depend on the size of meeting. A small meeting for up to 30 people will probably not require the use of specialized meeting facilities. On the other hand a meeting for 200 participants will likely require some form of conference center and this should be chosen with care.

How to select a venue for large meetings:

- The venue should have an environmental policy and action plan, ideally covering: sustainable procurement, energy saving, transportation and waste.
- The venue should have good access (ideally within walking distance) to the main public transport connections and town center.
- The venue should be near hotels where participants can stay or even provide accommodation facilities in the venue itself.

6.3. Catering

Snacks: Choose fruit, nuts and other food items that require less or no packaging.

For meals, request that the catering company does not use disposable plates and cutlery. If this is unavoidable remember paper plates are better than polystyrene.

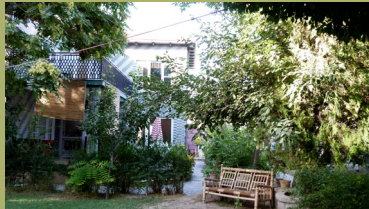


¹⁴ polystyrene manufacturing process as the 5th largest creator of hazardous waste. 57 chemical byproducts released during the combustion of polystyrene foam. The process of making polystyrene pollutes the air and creates large amounts of liquid and solid waste. This product is made with petroleum, a non-sustainable and heavily

polluting resource. Source: <http://john.harvard.edu/files/chem/csb.org/02/03/diac/PolystyreneFactSheet.pdf>

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