

Laguna Lodge Eco-Resort & Nature Reserve presents

Implementation of Sustainable Foods in Eco-Tourism – at The International Eco-Tourism Society Annual Conference ESCT15 in Quito - 2015

Laguna Lodge preserves the environment by changing mind-sets.

Despite 95% of it's guests being omnivores Laguna Lodge Eco-Resort & Nature Reserve doesn't serve any meat or fish. Its all part of it's effort to reduce carbon emissions.

Guests may not get to eat meat during their stay but they will certainly go home with plenty of food for thought. – World Travel and Tourism Council - Tourism for Tomorrow Awards Panel - 2015

From the Fringe to the Forefront

Laguna Lodge Eco-Resort & Nature Reserve is the first luxury hotel to have successfully implemented a 100% vegetarian/vegan menu into its best practice initiatives to reduce greenhouse gas emissions and move towards being carbon negative.

Collective food choices have a major impact on our environmental quality, personal health and welfare of animals grown for food. A move towards a plant based diet will be necessary for a sustainable future.

Ecological initiatives need to be implemented on a comprehensive scale which includes what is provided to others for food.

Advocating meat free food choices by offering vegetarian and vegan menus only, we are breaking the taboo that meat and fish must be part of a venue to succeed.

Livestock production as it is widely practiced today has significant negative environmental impacts on our land, water and air quality. Ecological limits are being stretched as our demand for ever more resources takes precedence over the need to protect biodiversity and the Earth's vital ecosystems.

We are challenging the status quo and encouraging others to look at their traditional eating patterns. As a primate species dependent on nature as other animals are, we need to be smarter. Radically revolutionizing the way we produce and consume animal products is crucial to preserving our planet for future generations.

Substantial Worldwide Diet Change is Needed

A United Nations Environment Program (UNEP) panel which has drawn on numerous studies including the Millennium Ecosystem Assessment (MA), cited the following pressures on the environment as priorities for action. Climate change, habitat change, wasteful use of nitrogen and phosphorous, over exploitation of fisheries, forests and other resources, invasive species, unsafe drinking water and sanitation, solid cooking fuels, lead exposure, urban air pollution and occupational exposure to particulate matter.

As the global population surges towards a predicted 9.1 billion people by 2050, western tastes for diets rich in meat and dairy products are unsustainable, says UNEP's international panel of sustainable resource management. It says "Impacts from agriculture are expected to increase substantially due to population growth increasing consumption of animal products. Unlike fossil fuels, it is difficult to look

for alternatives; people have to eat. A substantial reduction of impacts would only be possible with a substantial worldwide diet change, away from animal products. Professor Edgar Hertwich, the lead author of the report said, “animal products cause more damage than producing construction minerals such as sand or cement, plastics or metal. Biomass and crops for animals are as damaging as burning fossil fuels. Ernest von Weizsäcker, an environmental scientist who co-chaired the panel, says the report challenged the widely-held view that rising affluence leads automatically to environmental improvements, “In the case of CO₂ a doubling of wealth leads typically to an increase of environmental pressure by 60 to 80% and in emerging economies this is sometimes even higher. In the case of food, rising affluence is triggering a shift in diets towards meat and dairy products – livestock now consumes much of the world’s crops and by inference a great deal of fresh water, fertilizers and pesticides.

The panel have reviewed all the available science and conclude that two broad areas are currently having a disproportionately high impact on people and the planet’s life support systems – these are energy, in the form of fossil fuels and agriculture, especially the raising of livestock for meat and dairy products.

2015 to 2050

The Institution of Mechanical Engineers (IME) claim that water requirements to meet food demand in 2050 could reach between 10-13.5 trillion cubic meters – about triple the amount used annually now by humans. Greenhouse gas (GHG) emissions are driving climate change and its impacts around the world. According to The Intergovernmental Panel on Climate Change (IPCC 2014), global GHG emissions must be cut by as much as 72 percent below 2010 levels by 2050 to have a likely chance of limiting the increase in global mean temperature to 2 degrees Celsius above preindustrial levels. Every increase in temperature will produce increasingly unpredictable and dangerous impacts for people and ecosystems. As a result, there is an urgent need to accelerate efforts to reduce GHG emissions.

Negative Impacts of Intensive Animal Farming

- Deforestation – Land is being cleared to create new pastures and feed the world’s 1.5 billion cattle at a rate of 36 football fields of trees lost every minute, and causing accelerated species loss - World Wildlife Fund (WWF)
- Land usage – 70% of all cleared land on the planet is used for livestock.
- Global warming – High Carbon Dioxide emissions, Nitrous oxide from animal waste has 196 times the warming effect and methane gas has 23 times the warming impact of Co₂.
- Topsoil loss – The earth loses one inch of topsoil every 16 years with 85% to 90% of the loss linked directly to livestock agriculture.
- Antibiotics – Systematic dosing of animals is increasing bacterial resistance resulting in pandemics and widespread human health issues.
- Fertilizers – Over use is causing biodiversity loss, human health issues including cancer, algae blooms and dead zones in the ocean.
- Pesticides/Herbicides/Hormones – Are causing biodiversity loss, cancer and fertility issues.
- Water – Livestock are using directly and indirectly 53% of our global fresh water.

- Overfishing - Loss of biodiversity and coral reef destruction.
- Health – World Health Organization (WHO) says we need to reduce animal fats in our diet to lower incidence of heart disease, cancer, obesity and diabetes.
- Economic – Government subsidies on water and feed hide the high costs of meat to the consumer.
- Origin – Inadequate labelling keeps the consumer in the dark, for example 25% of the beef on the world market is now buffalo from India.
- Fossil Fuels - Modern agriculture and the food system have developed a strong dependence.
- Food Security – A few multi-national companies control agribusiness from seeds and genetics to breeding, processing and final merchandising.
- Desertification – Overgrazing is turning a fifth of all pastures and ranges into desert.
- Poverty – Animals are fed 40% of the worlds maize, wheat and soy beans.
- Animal Welfare – Unregulated unethical treatment of animals in CAFOs (factory farms).
- ***Emission Sources from Livestock***
 - United Nations Food and Agriculture Organization (FAO) concluded that worldwide livestock farming generates 18% of the worlds Greenhouse Gas (GHG) emissions – by comparison, all the worlds cars, trains, planes and boats count for a combined 13% of GHG emissions. They also estimate that 20% of the planets pasture land has been degraded by grazing animals.
 - The emissions associated with food for and from animal production consist mainly of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (NO₂) and ammonia (NH₃) which result primarily from agricultural practices.
 - Cows produce a vast amount of methane emissions and in terms of GHG, one cow produces the same amount in one day as an SUV driving 48.2 kilometers.
 - Meat products have larger carbon footprints per calorie than grain or vegetable products because of the inefficient transformation of plant energy to animal energy.
 - Ruminant animals such as cattle, sheep, and goats produced 141 million metric tons (mmt) in CO₂ of methane in the U.S. in 2012 through enteric fermentation (digestion).
 - Eating all locally grown food for one year could save the GHG equivalent of driving 1,000 miles,
 - while eating a vegetarian meal one day a week could save the equivalent of driving 1,160 miles.
 - On-farm production amounts to 20% of the total system energy, 40% of agriculture production energy goes into making chemical fertilizers and pesticides.
- ***Unsustainable Consumption of Sea Life***

- The Ocean and seas are our biggest ecosystem covering 2/3rds of the planet. Factory fishing ships (23,000) and industrialized trawlers are netting and scraping the bottom of the seas taking with them all living things. Currently we extract over 100 million tons of fish yearly from our oceans. There is a massive amount of bycatch netted (33 million tons) that is thrown back into the sea maimed or dead. Because of such colossal destruction and waste, the United Nations says fishing operations are “a net economic loss to society”
- Leading scientists such as Daniel Pauly suggest that if we continue to catch and eat fish at the current rate, the oceans and seas will be empty within 40 years. Marine life are being exposed to enormous threats by humans, lack of foresight and our belief that the ocean has an unlimited bounty.
- Approximately 2215 species are listed as endangered or threatened under the endangered species act (ESA). Fish including tuna, swordfish, marlin, cod, halibut, skates, flounder, herring and mackerel are being overfished and in critical decline. "From tropical groupers to Antarctic cod, industrial fishing has scoured the global ocean. There is no blue frontier left," says Ransom Myers, a fisheries biologist, Dalhousie University, Canada. "The impact we have had on ocean ecosystems has been vastly underestimated," said Boris Worm, the University of Kiel, Germany. "These are the megafauna, the big predators of the sea, and the species we most value. Their depletion not only threatens the future of these fish and the fishers that depend on them, it could also bring about a complete re-organization of ocean ecosystems, with unknown global consequences."
- ***Intensive Fish Farming is not a solution***
- Sometimes hailed as the future of sustainable food production, fish farming is actually just another form of factory farming. Farmed fish live in the same stressful, cramped conditions as land animals, and concentrated waste and chemicals from aquaculture damage local ecosystems. Escapes lead to further problems, as in the North Atlantic region, where 20 percent of supposedly wild salmon are actually of farmed origin. When genes from wild and farmed fish mix, it degrades the wild population.
- ***Sustainable Foods***
- Sustainable foods promote sustainable agriculture, production and consumption to meet the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable foods do not have negative effects on ecosystems, places and cultures. They conserve water, soil, reduce greenhouse emissions, reduce pollution from pesticides, herbicides and hormones, preserve forests, oceans, lakes, flora and fauna.
- Food's carbon footprint, is the GHG emissions produced by growing, rearing, farming, processing, transporting, storing, cooking and disposing of the food you eat.
- A carnivorous diet requires "2.9 times more water, 2.5 times more primary energy, 13 times more fertilizer, and 1.4 times more pesticides" than a lacto-ovo vegetarian one, according to a study by U.S. scientists in the American Journal of Clinical Nutrition.

- "Plant foods based on vegetables, cereals, and legumes present the lowest GHG emissions with the exception of those transported by airplanes. Changes toward a plant-based diet could help substantially in mitigating emissions of GHGs." says an American Journal of Clinical Nutrition paper from Sweden. An entirely plant-based diet, especially if locally or regionally grown, thus represents the most environmentally friendly cuisine.
- ***The Protein Myth***
- Because of proteins importance to us nature made it easy to get enough. Many people still believe that vegetarians have to create elaborate plant food combinations to get the equivalent of a steak. Pairings like beans and rice do provide complementary proteins but research has shown that in a varied nutritious diet all nine essential amino acids are provided to make complete proteins from day to day. No absolute physiological need exists for meat, since the protein of it can be replaced by other proteins of vegetable origin, as well as animal proteins in milk, cheese and egg. Meat contains about the same amounts of usable protein as cheese, soybean, rice, wheat, potatoes, oats, corn, sunflower seeds, and cashew nuts. While eggs and milk have the most protein. There is also protein in vegetables, meat products have larger carbon footprints per calorie than grain or vegetable products because of the inefficient transformation of plant energy to animal energy.
- ***Did you know....***
- Reducing energy use by buying local pales compared to going vegetarian. As the Organic Consumers put it, "It's how food is produced, not how far it is transported, that matters most for global warming", according to new research published in the Journal of Environmental Science and Technology (ES&T). The authors of the study say, "Shifting less than one day per weeks' worth of calories from red meat and dairy products achieves more GHG reduction than buying all locally sourced food."
- Eating all locally grown food for one year could save the GHG equivalent of driving 1000 miles, while eating a vegetarian meal one day a week could save the equivalent of driving 1160 miles says the Center for Sustainable Systems, University of Michigan.
- ***Fiddle While Rome Burns***
- The food that people eat is just as important as what kind of cars they drive when it comes to creating the GHG emissions that many scientists have linked to global warming. Adopting a vegetarian diet is the same as switching from an SUV to a compact car. Three times a day at meal times we have the opportunity to lower our footprint by choosing sustainable foods and favoring foods with less impact. Best practice is not only about tangible savings we can see at the destination, it must include ecological savings from the source. Passing up just one beef burger saves the equivalent of 40 low-flow showers.

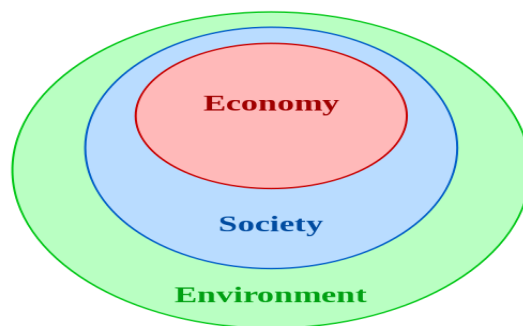
Incorporating Sustainable Foods into Eco-Tourism

Action is needed beyond solar, recycling and installing energy efficient

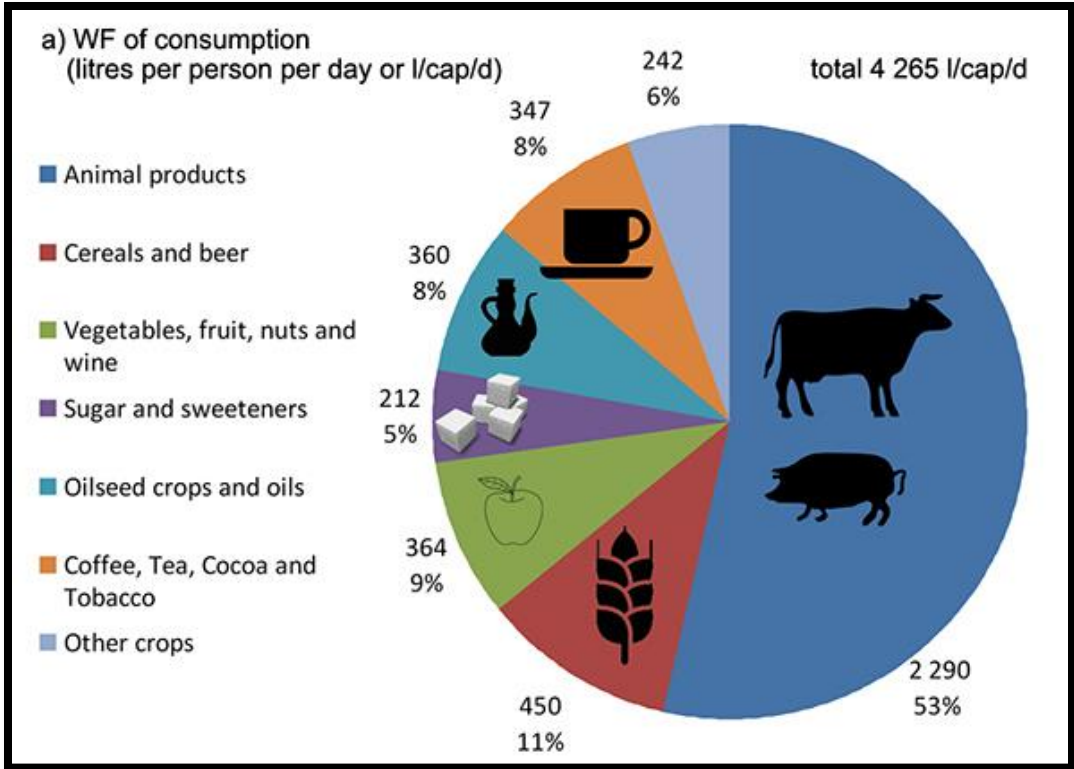
lights and appliances by making a shift to a more sustainable diet.

The operator must start to educate guests and customers by example.

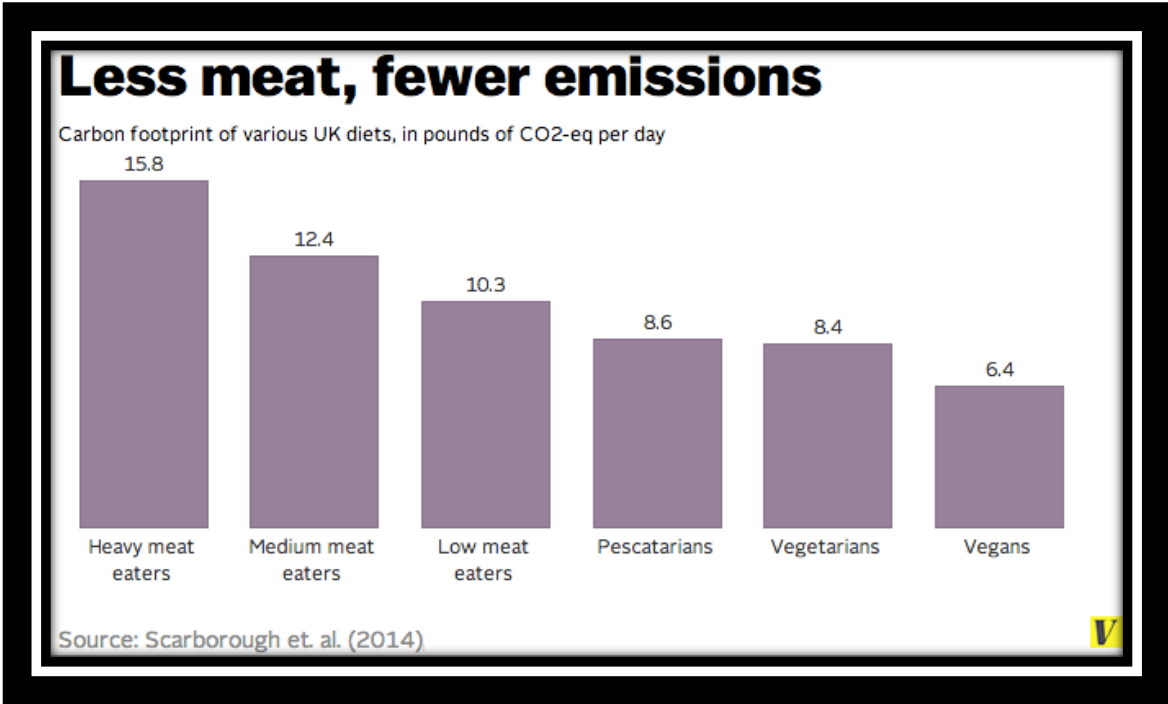
- Supply plant based proteins over animal/fish proteins.
- Choose foods with lower carbon and water footprints.
- Implementation of plant based foods is immediate with no set-up costs.
- Invest in vegetarian and vegan cooking books to find modern gourmet recipes.
- Buy organic and local, Fairtrade and certified organic even when it costs more.
- Protect indigenous peoples food by not providing diminishing supplies.
- Support small organic farmers, community supported agriculture and indigenous suppliers.
- Grow your own produce, compost and landscape with edible plants.
- Plan meals to reduce waste and refrigeration and offer fixed menus.
- Showcase heirloom and sustainable local indigenous plant foods in menus and tours.
- Provide tasteful, varied, satisfying and superior plant based food choices.
- Minimize processed foods and purchase non-perishable goods in bulk.
- Filter your own water for cooking and drinking to eliminate plastic bottles.
- Choose stove top over oven cooking and gas over electric burners/ovens.
- Co-ordinate food purchases with guest transport services to reduce trips.
- Re-use and recycle containers and use reusable bags and boxes.
- Plant-a-tree programs can utilize food producing trees.
- Consult Food Carbon Calculators for emissions and water use.
- Support lab grown meat proteins and meat alternatives such as Seitan, Tofu TVP and Tempeh.
- Educate by example and provide literature and information on the sources of the sustainable foods being served and how and why food choices impact the planet.



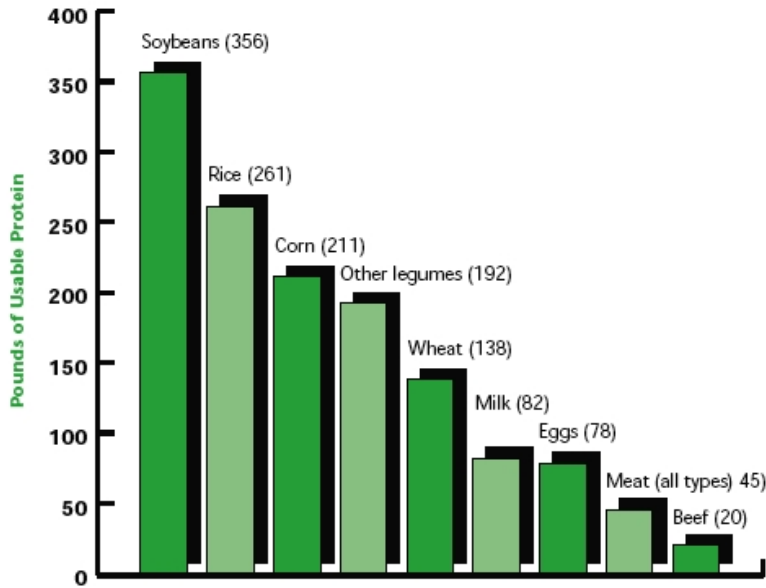
A diagram indicating the relationship between the "three pillars of sustainability", in which both economy and society are constrained by environmental limits.



This chart shows the liters of indirect agriculture-based water consumption per person, per day, per product. Meat, for example, takes up more than 50% of the agricultural water footprint (based on EU data)



LAND USE EFFICIENCY - USABLE PROTEIN YIELDS PER ACRE FROM DIFFERENT FOODS



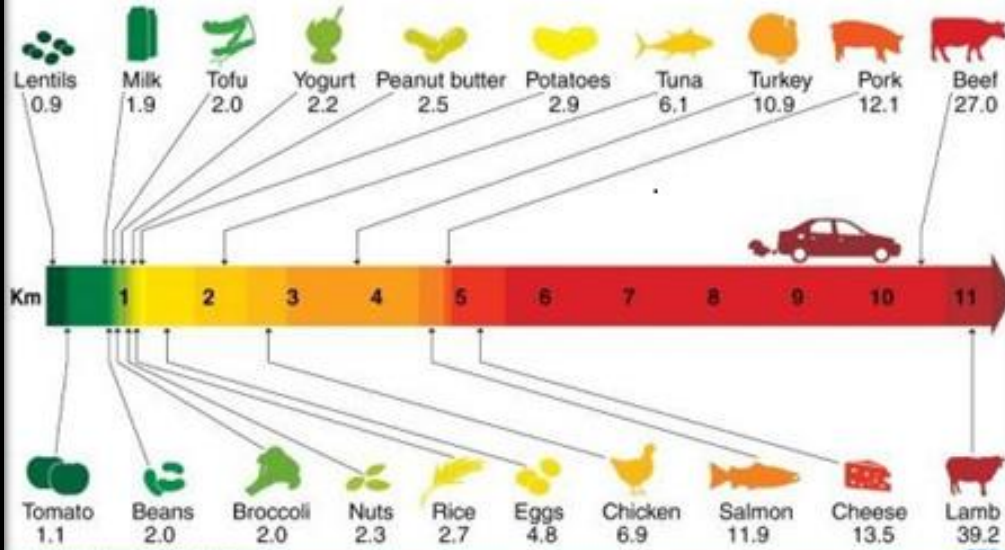
Source: USDA;
FAO/WHO/UNICEF
Protein Advisory Group.

Carbon footprint of what you eat

Calculations of greenhouse gas emissions from the production, processing and transportation of specific food items

■ Main chart compares 110g of food against a journey in a mid-sized car

■ Number shows kg of carbon dioxide equivalent produced per 1kg of food



Source: EnvironmentalWorkingGroup

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