

A young plant with two yellow-green leaves growing from a pile of driftwood on a beach. The background is a blurred landscape with green hills and a blue sky.

A Measure for Resilience

2012 Report on the Ecological
Footprint of the Philippines

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Message from the President



Benigno Simeon C. Aquino III

President, Republic of the Philippines
Chairperson, Climate Change Commission



MALACAÑAN PALACE
MANILA

MESSAGE

The world has borne witness to the overwhelming impacts of climate change on our country. Likewise, the entire international community has beheld the fortitude and solidarity of Filipinos in overcoming these challenges, rebuilding lives and communities in the most trying times. But rebuilding goes beyond repair and relocation. It entails strengthening the foundations of our country's future, and taking responsibility for our environment to meet the needs of succeeding generations of Filipinos.

Indeed, the time is right, and crucial, for ecological accounting. As the Philippines anticipates robust economic growth, stronger trade relations, rapid development, and a growing population, it is necessary to measure the ability of nature to provide for our national goals. Mitigating and adapting to the impact of a changing global climate mean pursuing prosperity in a manner that ensures the integrity of our vital natural resources and protecting our country from risk. The Climate Change Commission shows us the way forward in embarking on this critical exercise, and I thank the L'Agence Française de Développement for its crucial support for this endeavor.

The findings in the National Ecological Footprint report may be sobering, but Filipinos have shown time and again that we are a resilient people. Together, we can make the Philippines a model of true sustainable development in the region and the rest of the world.



BENIGNO S. AQUINO III

MANILA
October 2012



Message from the Agence Française de Développement

The French Agency for Development (AFD) is very proud to support the Government of the Philippines in its endeavor to respond to the challenges of sustainable development. The outcome of the National Footprint Project is expected to be instrumental in the implementation of the National Climate Change Action Plan and in its contribution to the achievement of President Aquino's Social Contract with the Filipino People.

Our support for this project, together with the National Climate Change Commission (NCCC), is consistent with our mandate to promote a green and inclusive growth. The Philippines benefits from pristine, beautiful landscapes. At the same time, because of its economic development, **its natural resources are under pressure, and the country is highly vulnerable to climate change and natural disasters.**

Incorporating the Ecological Footprint—a methodology developed by Global Footprint

Network—into their mandate is an innovative approach by the NCCC, going beyond common thinking.

It aims at addressing and mainstreaming resilient and sustainable environment and biodiversity issues within priority policies related to climate change in the Philippines.

Following upon the international agenda of climate change conferences and the dynamics of Rio+20, this initiative is the first of its kind in Southeast Asia. It reinforces public and political awareness and creates a preliminary impulse for further fostering concrete and urgent actions to be taken at the local, sectoral and national levels.

This report constitutes a significant milestone. AFD is looking forward to further collaborating with and supporting the Government of the Philippines on this agenda.



Dov Zerah
CEO
Agence Française
de Développement

Since Global Footprint Network began in 2003, our goal has been to make resource limits central to decision-making. We see ever more evidence that resource constraints have become an increasingly significant determinant of economic success in the 21st century. Yet, most economic decisions are made as if this part of the equation did not exist. This hurts countries and undermines their ability to succeed. This is why we engage with countries to address and reverse current trends and end ecological overshoot. No country can afford to wait for a global agreement before taking action. Without global agreement, action becomes even more urgent for countries since the resource situation would become more fragile more quickly.

Therefore, I am particularly thrilled that the Philippines will be among those countries leading the way. Through the leadership of the Climate Change Commission, the Philippines has emerged as the first country in Southeast Asia to adopt the Ecological Footprint, making the country a model for its neighboring countries and the world. The Philippines is a country that is facing rapid change, with an economy that is shifting from agriculture to industry and services. This shift, along with the needs of a growing population, means that the country is more dependent on biocapacity from other countries than ever before. While this is not uncommon in a global economy, this growing dependence poses risks.

Message from the Global Footprint Network

In a resource-constrained world, where more people are bidding for fewer resources, is the Philippines poised to be a winner in this global auction? This is a critical question in the new era we live in. The country has shown major gains in human development, for instance as measured by HDI. At the same time, there are large portions of the population that have yet to benefit from this progress, and do not have adequate access to resources for basic needs. In addition, the country as a whole has moved into an ecological deficit situation. There is a growing possibility that this deficit could reverse human development advancement.

If we seek development that works with nature's budget, rather than liquidating nature, progress can be sustained. Such development is possible, it merely requires a new way of decision-making—one that focuses on building wealth, including natural capital. The Climate Change Commission has exemplified this through its National Climate Change Action Plan, and with Ecological Footprint and biocapacity accounting, we believe the Philippines can build a resilient economy that will work for all—and forever.



Dr. Mathis Wackernagel
President
Global Footprint Network



Climate Change Commission



The Business of Building Resilience

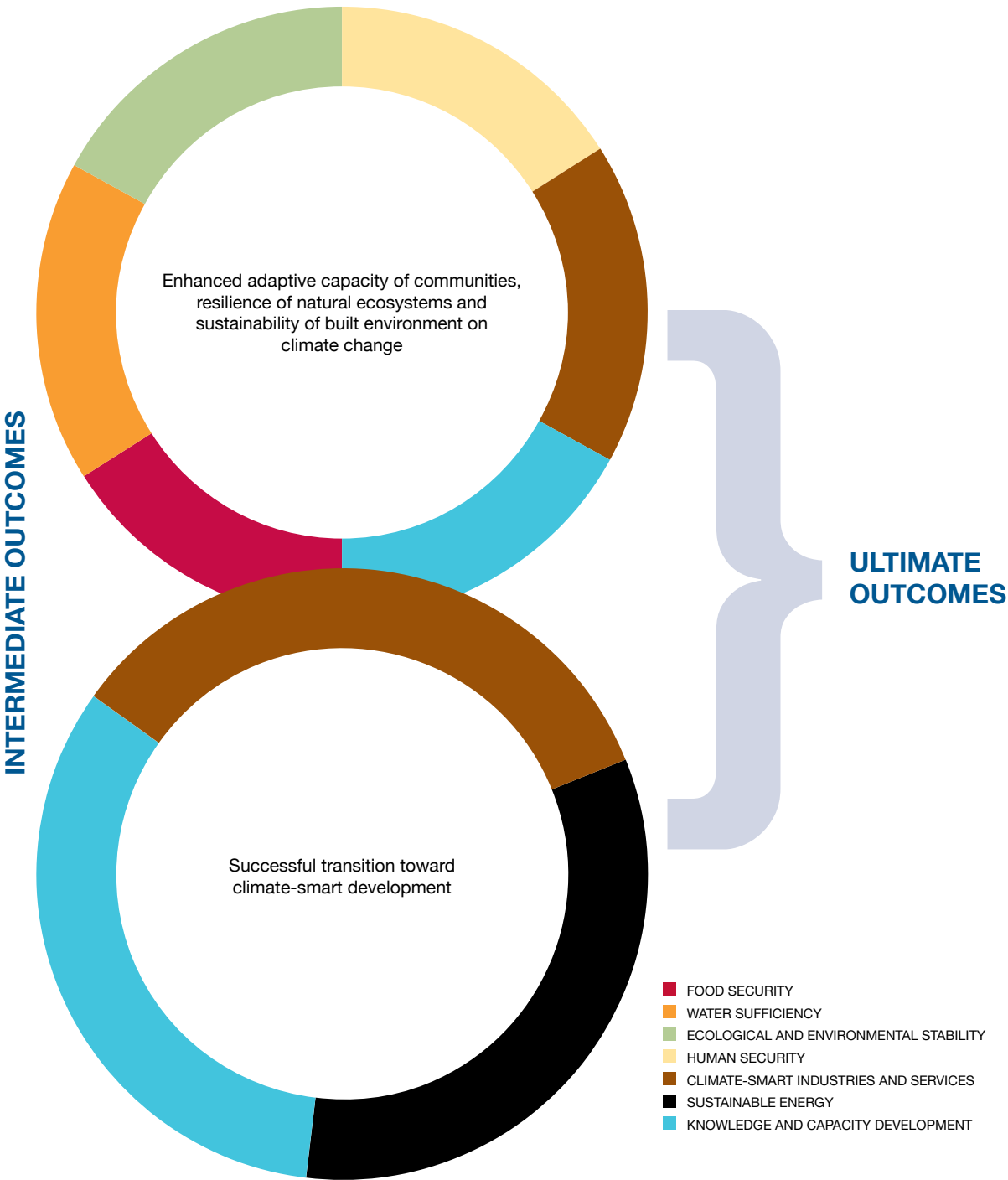
In the face of the climate crisis, the Philippines has embarked on a dynamic process toward building a roadmap that serves as the basis for the national response to climate change, establishing an agenda upon which the country confronts the impacts of a changing climate and work toward its sustainable development goals.

The Climate Change Commission, through the National Strategic Framework on Climate Change, has laid down the country's vision of a climate-risk resilient Philippines with healthy, safe, prosperous and self-reliant communities, and thriving and productive ecosystems.

In pursuing this vision, the country formulated its National Climate Change Action Plan, a groundbreaking milestone that set the Philippines' agenda for action as it confronts the climate challenge. Consistent with the framework, the ultimate goal is to build the adaptive capacities of women and men in their communities, increase the resilience of vulnerable sectors and natural ecosystems to climate change, and optimize mitigation opportunities toward gender-responsive and rights-based sustainable development. With the twin long-term objectives of building resilience and successful transition toward climate-smart

development, the country works through seven strategic priorities:

- Food Security
- Water Sufficiency
- Ecosystem and Environmental Stability
- Human Security
- Climate-Smart Industries and Services
- Sustainable Energy
- Knowledge and Capacity Development



While the world grapples to find a lasting solution to the climate crisis, the threats to countries like the Philippines have become unprecedented and climate impacts will continue to unfold in the coming decades. The Philippines, an archipelagic nation of close to 100 million people, now faces threats from more intense storms, drastic changes in rainfall patterns, accelerated sea level rise, and warmer temperatures that all contribute to serious impacts on natural ecosystems and then cascade to impacts on food security, water, health, infrastructure, energy, disaster risk, and the economy.

The key is to build resilience, and with the national consciousness to build this roadmap, the Philippines is on track to stand up to this colossal test. For the medium-term, the national plan will be anchored on the ecosystem and environmental stability agenda. There is very broad consensus that without stable and resilient ecosystems, the impacts of climate change on communities and ecosystems are expected to be more severe (as demonstrated by most recent

events in the country). Priority will be given to the establishment of ecosystem towns, or Eco-towns, an implementation vehicle for the convergence of adaptation and mitigation actions, as well as a demonstration of the integrated ecosystem-based management approach.



The Ecological Footprint

Virtually all life on our planet relies on one fundamental biological relationship:

Energy from the Sun fueling the growth of plants.
All the rest of the living world is derived from that primary productivity.

Humans continue to be fundamentally dependent on the availability of biological resources and ecosystem services for food, fiber, shelter, climate stability and many other elements of our lives.

The Ecological Footprint is a resource accounting tool, telling us how much productive land and water area is required to support our lives – and how much is available.

For most of the 20th century, resources were relatively cheap and easily available. As we surpass the limits of the planet's biological capacity, that is likely to change.



Ecological Footprint, Biocapacity, and our Global Dilemma:
The Global Context

Overharvested fisheries. Forests cleared to create cropland. Green areas paved over for roads. Fossil fuel emissions accumulating in the atmosphere. Human activity is putting increasing demands on the living planet, so much so that we now consume more ecological resources and emit more CO₂ than what the Earth can renewably provide and absorb. Earth’s ecosystems can no longer keep up with humanity’s demands. Changing course is possible, but it will require tools to track and manage our valuable natural assets.

The Ecological Footprint can help us live within our ecological budget. It measures the biologically productive land and marine area required, using prevailing technology and resource management practices, to provide the renewable resources—food, fiber and timber—that a population consumes and to absorb the carbon dioxide it emits. This demand in turn can be compared with the productive area available, or the Earth’s *biocapacity*.

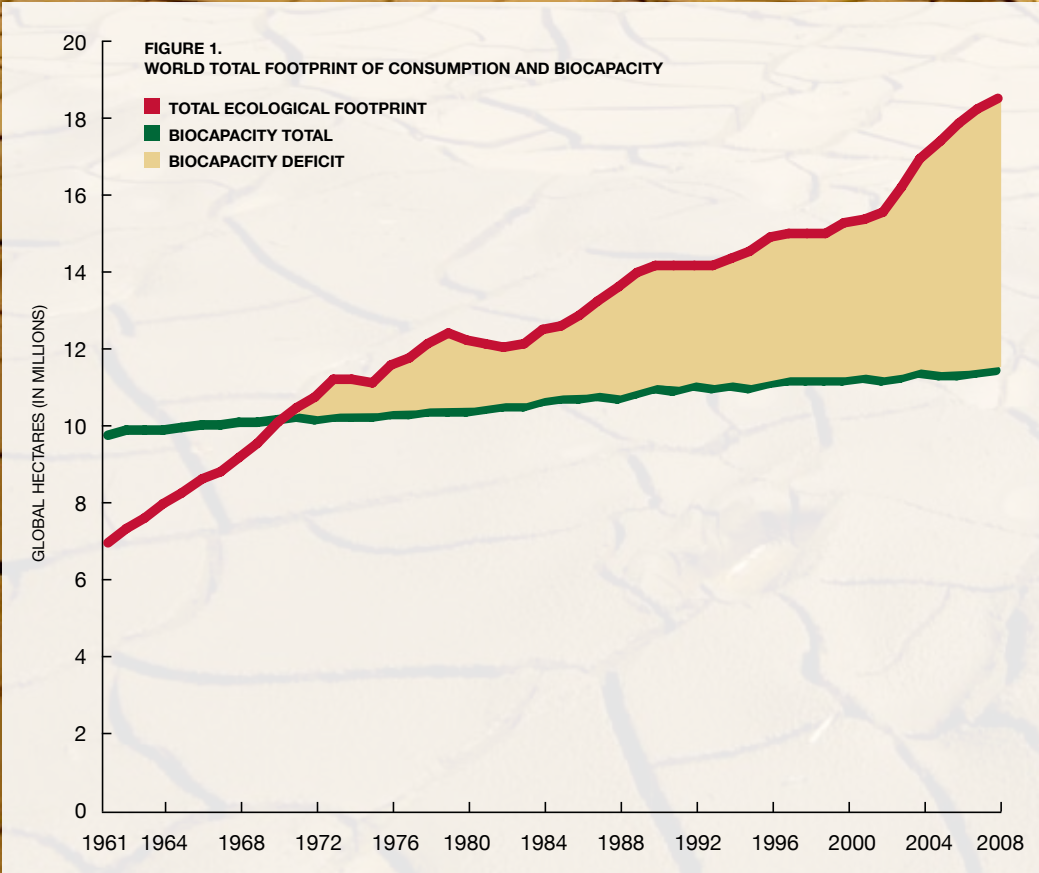
Different types of area—forest, fisheries, cropland and grazing land—vary in their inherent productivity. Within each type, some areas are more productive or higher yielding than others. After adjusting for these differences, a hectare with world average productivity, or *global*

hectare (gha), is used to measure both the Ecological Footprint and biocapacity. This unit is similar to using a standardized monetary unit, such as the U.S. dollar or Philippine peso, for financial accounts.

In 2008, the last year for which data are currently available, the Earth’s biocapacity was approximately 12 billion gha. This is equal to 12 billion gha since global hectares represent world average hectares. At the same time, humanity’s Ecological Footprint was, according to Global Footprint Network’s calculations, over 18 billion gha, more than 1.5 times the planet’s capacity to keep up with this demand. This means that biological resources were being harvested faster than they could be regenerated, and that carbon was being emitted faster than plants could remove it from the atmosphere.

See APPENDIX B for more world results.

In 2008, humanity’s demand on the planet exceeded what Earth can biologically renew by 50 percent.





Ecological Footprint accounts are primarily based on international data sets published by the Food and Agriculture Organization of the United Nations, the United Nations Commodity Trade Statistics Database and other data from the UN Statistics Division, the International Energy Agency, and the Intergovernmental Panel on Climate Change. They begin in 1961, when humanity's Ecological Footprint was only about two-thirds of the planet's biocapacity. While global biocapacity has been growing slowly, largely due to increasing agricultural yields, humanity's Ecological Footprint has been growing much more rapidly, primarily as a result of an expanding world population and increasing per capita consumption in some regions. Around 1970, humanity's Ecological Footprint began exceeding global biocapacity, and this overshoot has been increasing ever since.

The Ecological Footprint can be applied to human activity at different scales. At the national level, it is assumed that everything that is produced in a country is consumed in that country, less that which is exported plus what is imported. That *Ecological Footprint of Consumption* is the most commonly reported part of the Ecological Footprint calculation, and is commonly referred to as "The Ecological Footprint." National biocapacity, in turn, is based

on the yield-adjusted resource productivity of the forest, fisheries, cropland, grazing land and built-up areas within the country's borders.

In a finite world, overshoot means greater competition for limited resources, as well as a need to address the emerging challenges associated with climate change. What are the risks and opportunities for individual countries such as the Philippines? How dependent is the Philippines on the biocapacity of other nations? To what extent do its actions mitigate or exacerbate climate change? How sensitive is the Philippines' biocapacity to climate change? As resources become less available or more expensive, how will the Philippines remain economically competitive while continuing to meet human development goals? Ecological Footprint and biocapacity accounts provide quantitative data that begin to answer these questions, and in so doing, can help the Philippines develop policies that maintain the health of its ecological assets, promote its economic resiliency, and support the well-being of its citizens.

Refer to APPENDIX A for more detailed technical information on the Ecological Footprint.



The Ecological Footprint of the Philippines

The Philippines Since 1961

Historical Overview

In 1961, the first year for which Ecological Footprint results are calculated, a general election was being held in the Philippines. President Carlos P. Garcia lost his bid for a second term to Vice President Diosdado Macapagal, whose focus shifted toward stimulating economic development in the country. The population was 26,893,000. Two years after taking office, President Macapagal signed the Agricultural Land Reform Code, paving the way for a stronger agricultural sector. Manila became the birthplace for the Association of Southeast Asian Nations in 1967, strengthening ties to its neighboring countries and setting the stage for more robust trade relations. The country witnessed martial law, a revolution, and the restoration of democracy. In between, the country suffered and survived numerous natural disasters – from Typhoon Nina in 1987, Mike in 1990 and the Mount Pinatubo eruption in 1991, to the Guinsaugon landslides in 2006 and Typhoon Fengshen in 2008. In the 1990s, Metropolitan Manila was emerging as an economic hub for the region, with signs of large-scale development that continue to this day. But there were costs. The once-vital and resource-rich Pasig River had become one of the most polluted rivers in the country. By 2008, the National Economic and Development Authority reported

the country's highest GDP and GNP figures per person since 1977, emerging from the 1997 Asian economic crisis. The population was 90,173,000. In every aspect, the Philippines has undergone significant changes—all of which, no doubt, have served as the underpinning for the country's changing ecological landscape.

Ecological Footprint of the Philippines

The Ecological Footprint results for the Philippines show a nation that is facing a critical challenge: How to maintain and improve the well-being of its population into the near and distant future in the context of a shifting world. The recent global economic crisis has shaken core beliefs about traditional systems, and the opportunity—and necessity—for innovation and systemic restructuring is now. We are living in a new era, one in which old assumptions can no longer be relied on, and the tools of the past are no longer sufficient to meet the needs of the present, much less the future.

In this new era, leaders—and individuals—who understand their countries' resource needs, limits and dependencies will be better positioned to support the success of their economies and the

The Philippines is facing a critical challenge: How to maintain and improve the well-being of its population into the near and distant future in the context of a shifting world.

The Philippines has been in ecological deficit since the mid-1960s, using more capacity to produce renewable resources and absorb CO₂ emissions than is available domestically, and the size of that deficit has been increasing ever since.

well-being of their citizens. For too long, nature's services have been seen as infinite, but we can no longer afford to act in accordance with this erroneous assumption. The Philippines has been in ecological deficit since the mid-1960s, using more capacity to produce renewable resources and absorb CO₂ emissions than is available domestically, and the size of that deficit has been increasing ever since. In 2008, the most recent year for which the Ecological Footprint data are currently available, the nation demanded more than twice what it had in available capacity. This "overspending" can only go on for so long until signs of collapse become undeniably clear—from deforestation and depleted fisheries to growing climate instability.

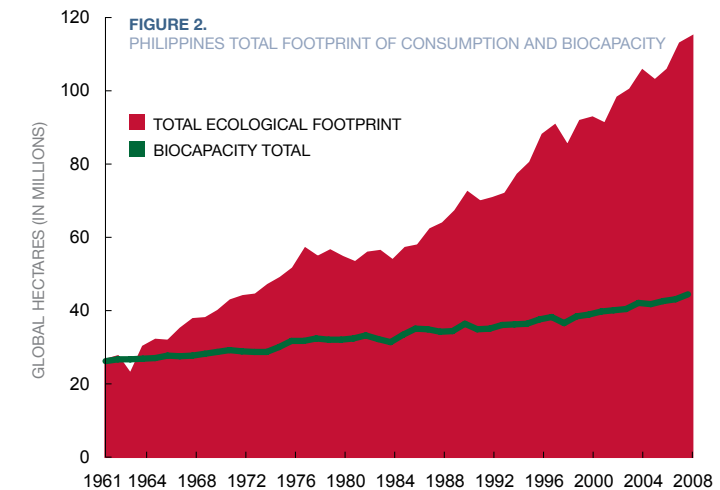
Over the same time period, the Philippines has steadily improved the average well-being of its population, as reflected in measures such as the UN's Human Development Index, while the average Ecological Footprint per person only increased

minimally. This is a remarkable achievement, with lessons for other nations as they address the key challenge of sustainable development: How to improve the lives of people while remaining within the limits of the planet. Still, other data suggest that these welfare improvements are not being shared by all residents; reducing development gaps and ensuring access to resources for all therefore remain key issues.

Other results show that food is a major component of the average household's ecological budget in the Philippines. Concurrently, the Philippines has become increasingly dependent on biocapacity from other countries, exposing a key risk that could weaken the country's ability to meet this basic need. The reliance on biocapacity from elsewhere, degradation of domestic productive areas, as well as the effects of climate change each has the potential to threaten ongoing food supply, as well as other goods and services reliant on biological productivity.



In 2008, Philippine residents' demand on nature was twice the country's own capacity to provide biological resources and absorb carbon emissions.



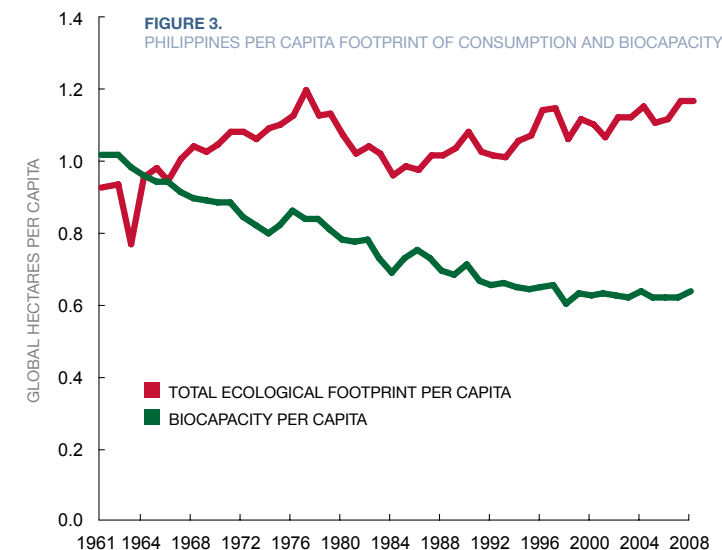
The gap between the Philippines' Ecological Footprint and biocapacity has been getting wider over time. By 2008, residents of the Philippines were using more than twice the biological capacity of the country.

A country can maintain an ecological deficit by overharvesting domestic resources; by relying on imports and the biocapacity of other nations (which may not continue to be as available over time); and by using the global commons, such as using the global atmosphere as a sink for carbon dioxide emissions. All three may be happening simultaneously in the Philippines, compounding the challenge of moving toward truly sustainable development.

Already, signs of resource degradation are appearing in the country. Deforestation and declining fish stocks due to overfishing are cited among the top environmental challenges in the Philippines. According to a report by

the Philippines' Department of Agriculture, approximately 45 percent of the arable lands in the Philippines have been "moderately to severely eroded," driving the movement of subsistence farmers to marginal lands in hope of meeting daily food requirements.

Forests in the Philippines continue to be under threat from agriculture and urbanization, illegal logging and forest fires, according to the World Bank, adding to the impact of centuries of deforestation. Other reports, most recently from the Asia Development Bank, also depict a 90 percent drop in the quantity of marine organisms found in traditional fishing areas of the country. And according to the Food and Agriculture Organization, catch rates in major fishing grounds, such as the Lingayen Gulf, reached maximum sustainable yield more than 20 years ago. The Philippines' growing population has also led to increased demands on the country's limited biocapacity.



Total biocapacity divided by the population shows that the amount of domestic biocapacity available to meet the demands of the average Philippine resident is shrinking. As more and more countries find themselves in a similar position, competition to secure the biocapacity to meet even basic needs could trigger changes in how resources are valued and traded.

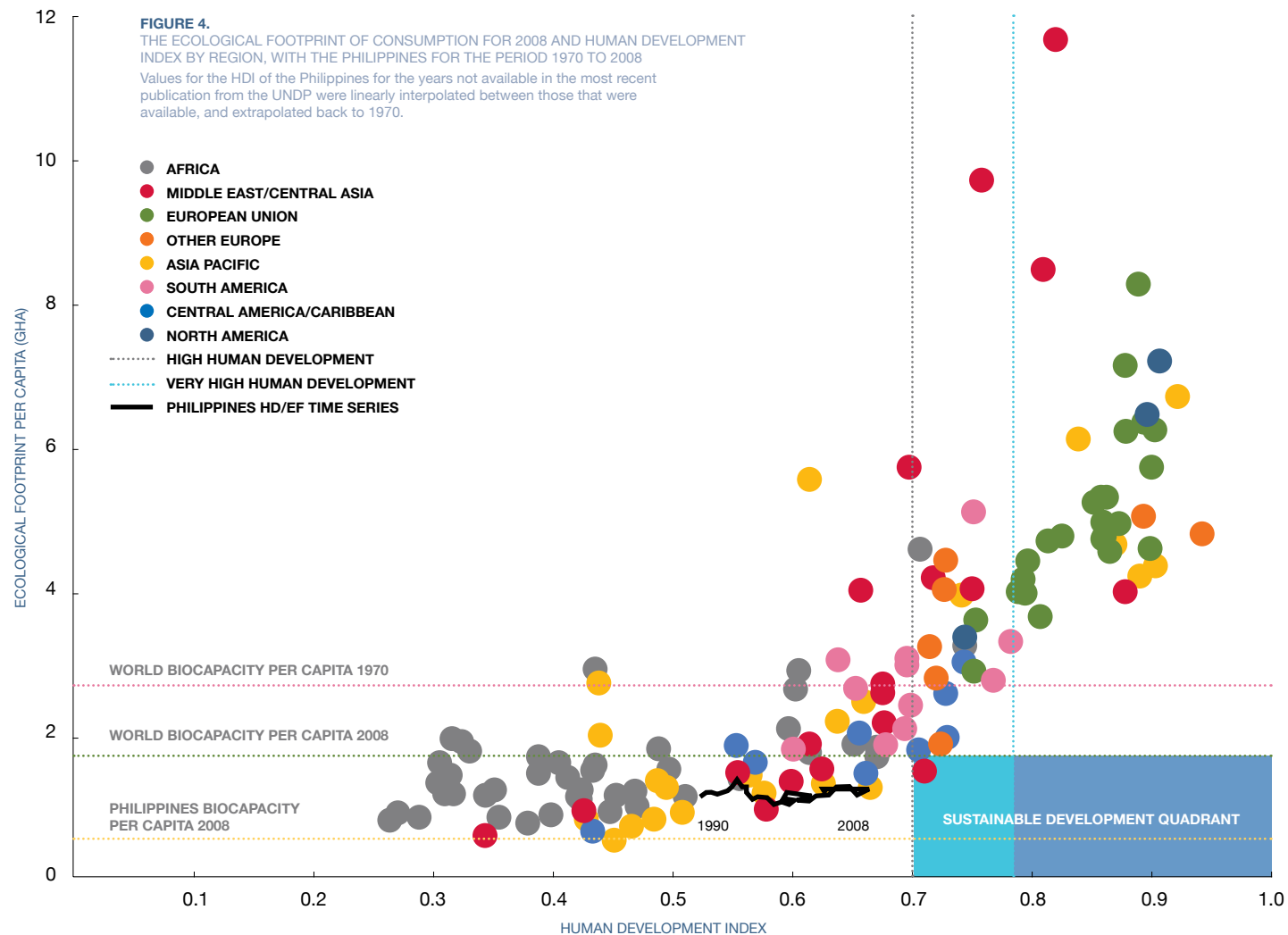
The Ecological Footprint of the average Philippines resident was 1.3 gha in 2008, within the limits of the world average available biocapacity of 1.8 gha. This means that if everyone on the planet lived like the average person in the Philippines, there would be sufficient biocapacity globally to support this total demand. However, there was only 0.6 gha of biocapacity available per person in the Philippines, meaning that its demands exceeded its own biocapacity. As trading partners face their own

ecological challenges, and as the price and effects of carbon emissions increase, both importing and exporting countries will face growing risks to their economic and social well-being.

The Philippines already faces such risks as it has grown increasingly dependent on biocapacity from other countries. This vulnerability was highlighted in 2008 during Asia's rice crisis, when many national governments around the world began restricting exports of the staple grain. As the world's largest importer of rice at the time, the Philippines was especially affected—most notably, the country's poor, who could not afford to pay the spiked prices brought on by the shortage. That crisis prompted fears that many more Filipinos would be pushed into poverty, which underscores the direct link that resource limits have on the well-being of a population.

The Ecological Footprint and Human Development of the Philippines





As the Philippines strives toward increasing economic security and improving lives of its residents, incorporating environmental realities in all its planning will help ensure continued success. Without the adequate resources, progress cannot last.

National progress toward meeting development goals can be assessed using the United Nations' Human Development Index (HDI), which aggregates education, longevity and income into one number. UNDP defines an HDI score of 0.7 as the threshold for a high level of development. The biocapacity available on the planet is calculated as 1.8 gha per person. Combining these two thresholds gives clear minimum conditions for globally sustainable human development. Countries in the bottom-right box represent high levels of development within a globally replicable resource demand.

The Philippines' trajectory over the past 40 years is moving it closer to being "in the box." Since 1970, its per capita Ecological Footprint has risen only slightly, while at the same time the country has made steady gains in its Human Development Index score. Counter

The Human Development Index (HDI) uses statistics on longevity, education and income of the average resident in a country to estimate a measure of human development. It has been published annually by the United Nations Development Programme since 1990. The HDI goes from 0.0 to 1.0. In the 2011 Human Development Report, 0.7 was the threshold for "High" development.

In 2008, world biocapacity per capita was 1.78 global hectares. This is the maximum demand that could be replicated world-wide in a given year.

"Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution" (World Bank, Development Research Group). The Gini coefficient for the Philippines was 44.04 in 2006, compared to 42.35 for Thailand, and 35.75 for Vietnam. A higher score indicates greater economic disparity within a population.

to the trend in most countries, the Philippines is finding a way to increase the average quality of life of its residents without increasing their per capita demand on biocapacity.

At the same time, ensuring progress in the well-being of all residents remains a challenge. While the HDI shows that the average resident has achieved higher levels of development, the Philippines' Gini coefficient*—an indicator of income disparity—is the highest of countries in Southeast Asia. Average measures of development may not reflect segments of the population that do not have access to the resources required to meet basic needs such as food, shelter, health and sanitation. If the Philippines is to continue making advances in human development that extend beyond short-term progress, it must find approaches that work with, rather than against, nature's budget. The country's growing population and the world's increasing resource demands are making these challenges ever more difficult.

Biocapacity: Energy, Food, Water and Land Nexus

Living within ecological limits is a necessary condition for ensuring sustained economic, environmental and social well-being, but it is not enough. As we aim at the goal of living within these ecological limits, there are complex trade-offs that have to be made, and other limits that have to be taken into account. A focus on the improvement in any one area without considering the rest risks leveraging an apparent gain against a net loss. Also note that ecological limits can be shifted by technology, management practice, climate, and water availability.

Balancing the complex and interdependent systems of the environment and the economy which relies on it is the big challenge for every country and individual. Decisions about energy, food security and water each have the power to impact the other sectors, in turn affecting the economy and the environment.

For example, the National Climate Change Action Plan of the Philippines notes that the country is one the most vulnerable to impacts of climate change, and has ranked highest in the world in terms of vulnerability to tropical cyclones and similar seasonal events. Deforestation, in part due to land conversion for agriculture, has left populations vulnerable to devastating landslides

caused by heavy rains. Such unpredictable patterns are also believed to be main drivers behind the volatility of water supply, thus leading to a threat in food security. Ecological Footprint accounts for the Philippines show an increase in biocapacity of cropland; however, this increase is partly due to conversion of lands not suitable for sustained agricultural productivity, such as rainforests. To meet the demands of the country’s growing population, farmers are more dependent on both water and energy to increase crop productivity; yet to generate energy, more water is needed.

The economic impact of this nexus cannot be ignored. An increase in energy prices leads to an inevitable increase in the cost of food production, and, hence, food prices. Alternative energy sources, such as biofuels, may be considered to stave off dependence from fossil fuels, but these too, in competing with food crop production for use of arable land, can lead to increased food prices. Clearly, policymakers cannot address one sector without looking at the effects on the others.

We all want better lives, now and into the future. A full accounting system—which includes integrated resource accounting—helps guide us to make the best decisions we can, for the future we want.

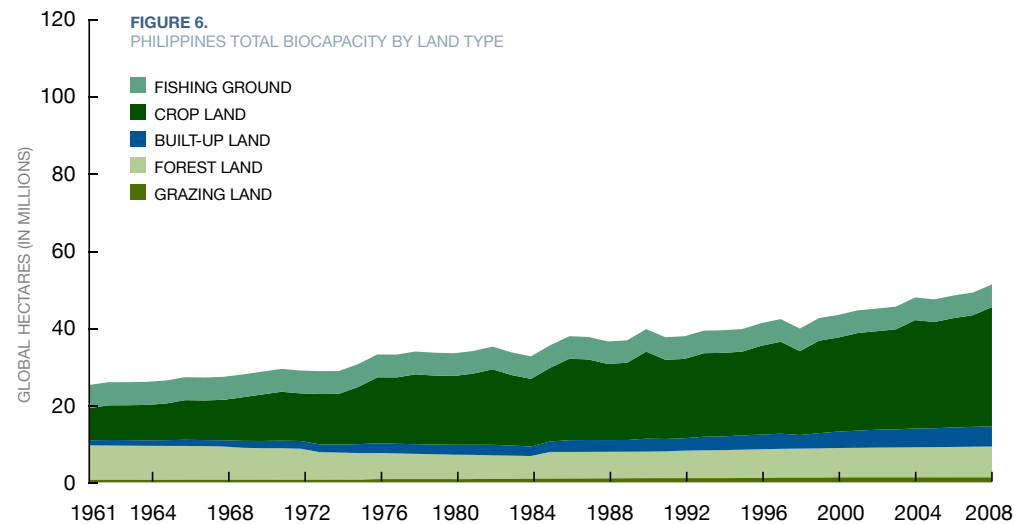
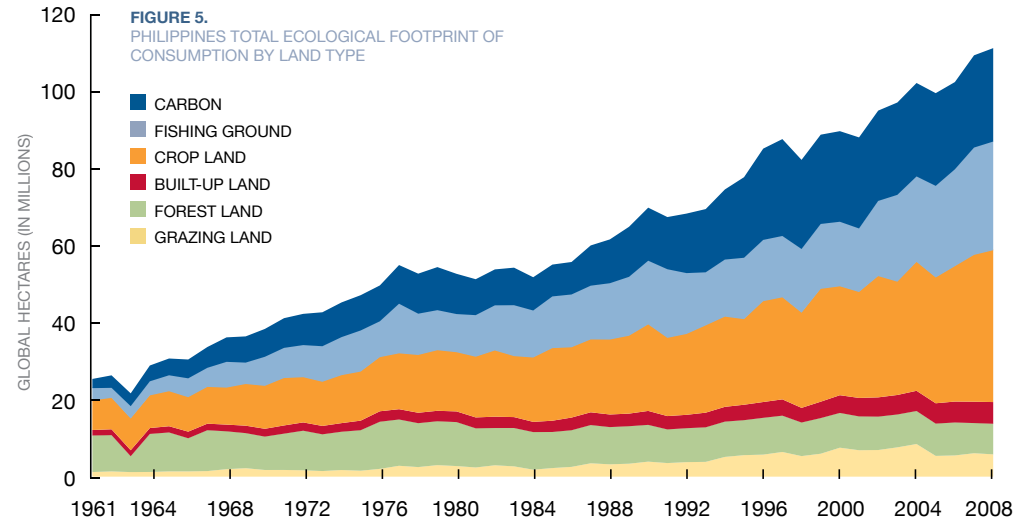


Energy, food security, water, human security, the economy and the environment are all linked. Balancing the complex and interdependent systems is the big challenge for every country and individual.



The Ecological Footprint of the Philippines: By Land Types





The Ecological Footprint includes demand on six land use types that are calculated separately. Biocapacity includes five of these land types because forest areas offer two services: Absorption of carbon and generation of forest products. Since current land-use accounts do not distinguish the purposes for which forests are used, we only report one forest biocapacity category. These five biocapacity land types account for the vast majority of the portion of the Earth's surface that is biologically productive in terms of human demand.

Cropland consists of areas used to produce food and fiber for human consumption, feed for livestock, oil crops and rubber.

Forest land is used to produce timber, pulp and fire wood, or to absorb CO₂ emissions from fossil fuel (these are two mutually exclusive uses).

Grazing land refers to grassland areas that can be used to feed livestock.

Fishing grounds are high productivity continental shelf or inland waters used to harvest fish.

Carbon Footprint land is the forest area required to absorb carbon emissions caused by human activity.

This is the only waste tracked in the Ecological Footprint.

Built-up land includes biologically productive areas covered by human infrastructure. Since the area is considered fully occupied by infrastructure, and thus not available for other use, the Ecological Footprint and biocapacity of built-up land are always equal.

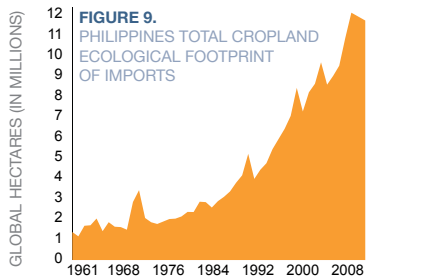
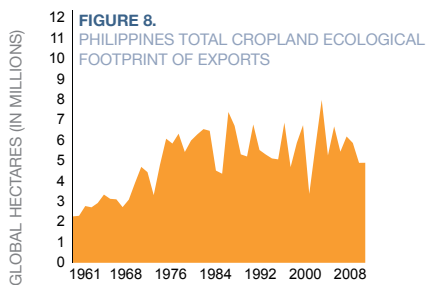
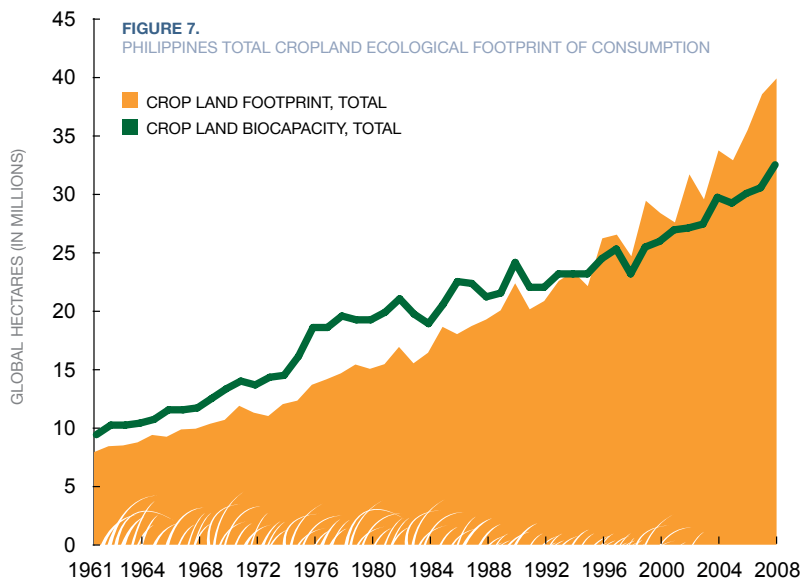
These six land types are converted into a common unit, the global hectare (gha), by applying equivalence factors and yield factors.

Equivalence factors adjust for the inherent differences in the biological productivities of the various area types. Yields factors take account of the national differences in yields within any given land area type (for example, cropland in a wet area may be much more productive than in a dry area).





Cropland Footprint of the Philippines



The cropland Footprint tracks the amount of cropland biological productivity that is used in a nation. In the Ecological Footprint methodology, the biocapacity of cropland is considered to be the same as the Footprint of production, based on the fact that cropland is highly managed land, directly devoted to growing the associated crops.

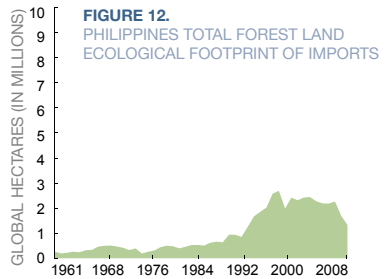
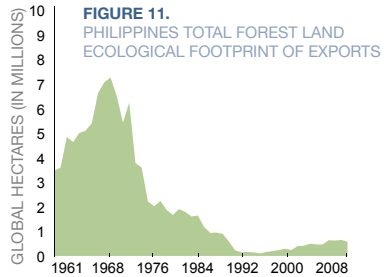
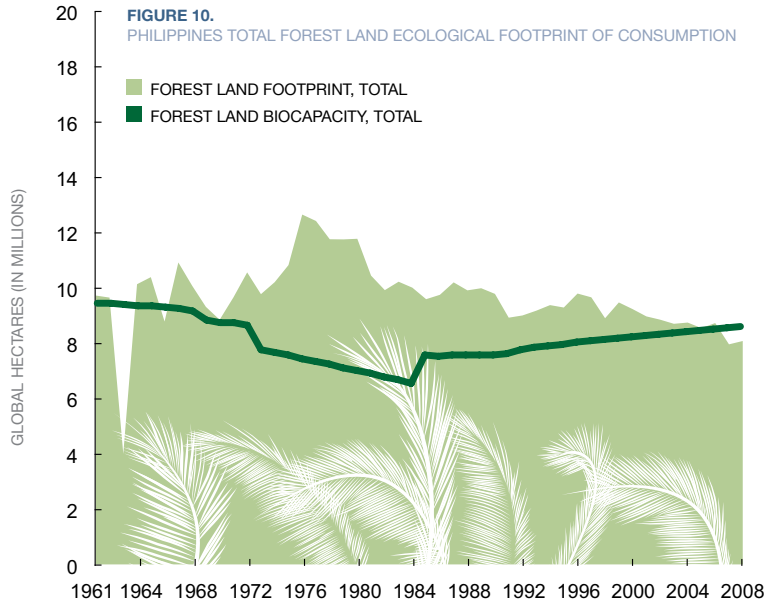
The Philippines cropland Footprint has increased by more than 400 percent since 1961. Increases in domestic cropland production have helped meet that rising demand, but it may have come at significant cost. While production gains may be partly driven by technological improvements, these often entail greater use of water and energy, and more CO₂ emissions. Land-use change can also be a factor. If land is converted from other uses to cropland, for example by clearing forests, a full accounting requires an assessment of the loss of the functions of the previous use.

The Philippines switched from being a net exporter

of embodied cropland biocapacity to becoming a net importer around the early 1990s, with milled rice, wheat and soybean cakes as the largest cropland imports in 2008. The shift from net exporter to net importer suggests that despite increases in land area devoted to cropland and increased productivity, it has not been enough to keep pace with increasing demand. Limits to production may be a sign that agriculture is hitting ecological or even social limits. The Philippines may have actively pursued a shift away from agricultural self-reliance and commodity exports, but increasing reliance on the biocapacity of other nations exposes a country to the risks of global competition for ecological resources.



Forest Land Footprint of the Philippines



The forest Footprint is calculated from the amount of wood and wood products that is consumed by a nation in a single year. Forest biocapacity is a measure of the growth of potentially useful wood fiber within a country in a year.

Though the demand for forest products has been somewhat steady, and even declining slightly over time, a rise in domestic demand for forest biocapacity in the Philippines coincided with a dip in biocapacity during the 1970s and early 1980s.

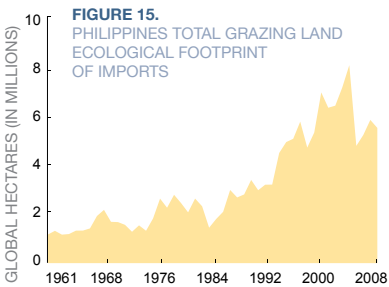
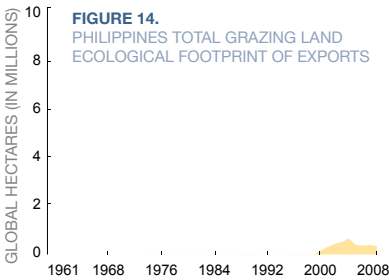
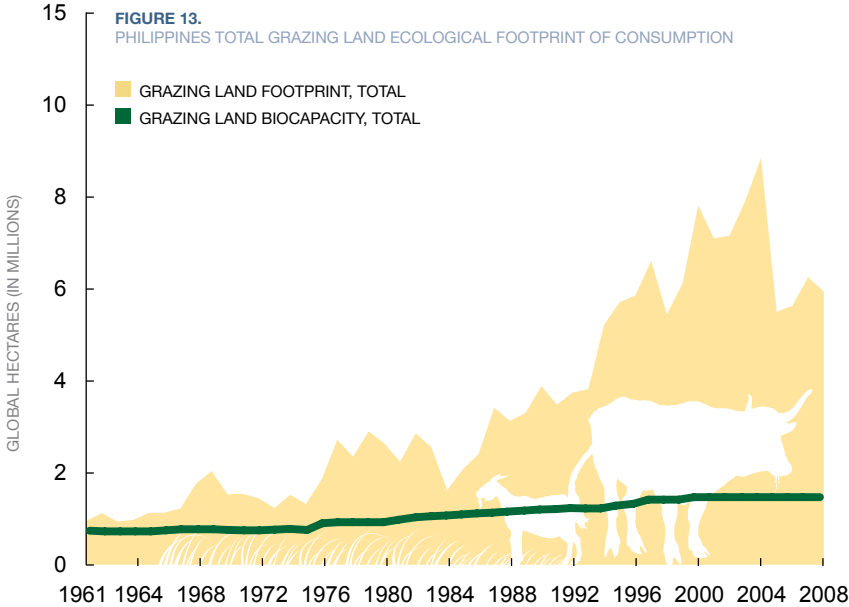
The forest Footprint embodied in trade shows that the Philippines was also exporting a significant and increasing portion of its forest biocapacity through the 1960s and 1970s. The combination of time trends shows that the peak in forest Footprint

of exports was followed by a drop in forest biocapacity, and then later by an increase in forest Footprint of imports to supplement local production for national consumption. This may be a reflection of the country hitting an ecological limit of forest biocapacity as far back as the early 1970s.

Another factor affecting forest biocapacity may be the increase in cropland area through the 1970s, which coincided with decreases in forest land area.



Grazing Land Footprint of the Philippines



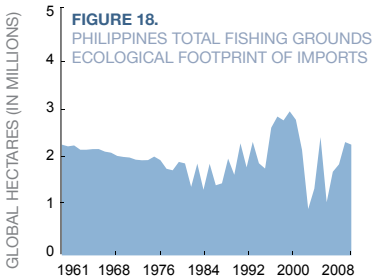
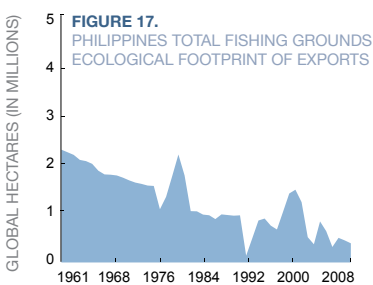
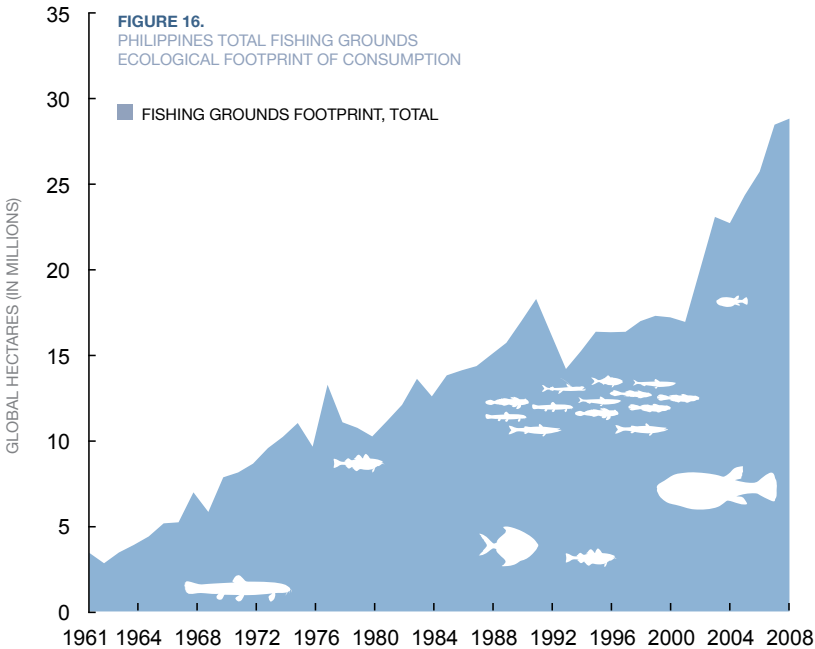
The grazing land Footprint measures the land area of biological productivity that supports livestock. It is calculated from the amount of feed required by the livestock produced, minus the feed supplied by cropland and fishing grounds.

The grazing land Footprint is relatively small in the Philippines, though it is increasing over time, along with the overall Footprint. While the grazing land Footprint accounts for just five percent of the total Ecological Footprint for 2008, it is a more significant portion (18 percent) of the Footprint of imports, representing almost a fifth of the nation's reliance on the biocapacity of other nations.

The heavy proportional dependence on imports may be due to the very small biocapacity of grazing land in the Philippines, which is only a quarter of what was needed to meet demand in the country in 2008. The grazing land biocapacity in the Philippines is increasing over time, but at only a fraction of the rate of the growth in the grazing land Footprint.



Fishing Grounds Footprint of the Philippines



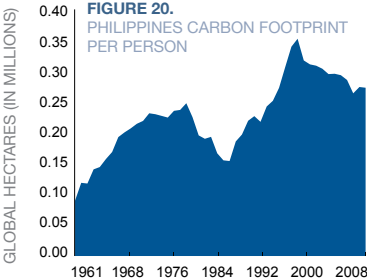
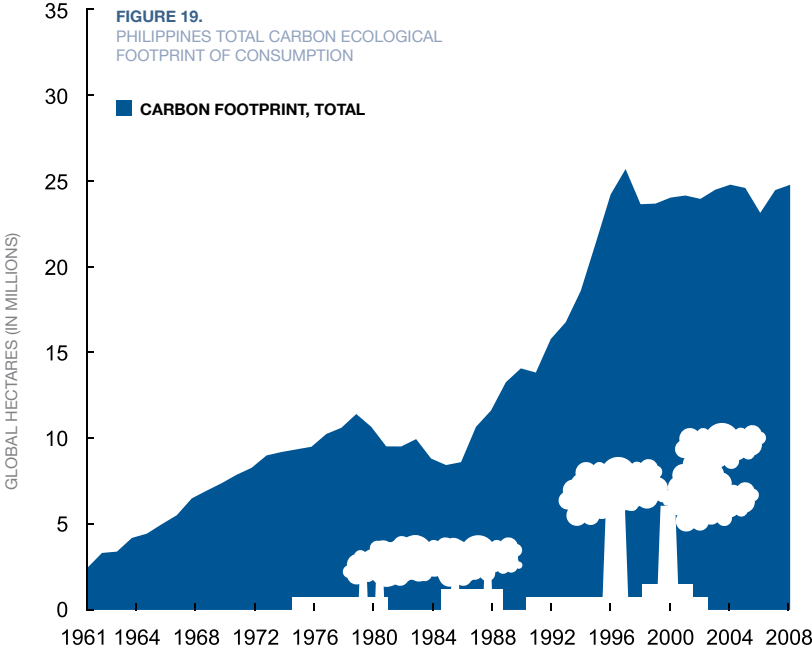
The fishing grounds Footprint tracks the consumption of fish and other marine species in a country, translated into the amount of primary productivity that would be required to support that consumption. Biocapacity of fishing grounds calculates the amount of primary productivity necessary to support an annual catch, but limited international data on the relevant values makes the results too unreliable to report time trends. More direct work with nations is needed to improve these results.

The fishing grounds Footprint has increased significantly over the 1961-2008 period. The per capita Footprint of fishing grounds increased by around 150 percent, but the total increased to more than seven times what it was in 1961. Supply for this growing demand is coming predominantly from increasing domestic production, which may be significantly increasing pressure on domestic fisheries.

The fishing grounds Footprint of exports decreased dramatically over the period of the time series, from over 2 1/4 million gha in 1961 to just under 400,000 gha in 2008. It is possible that the decline in the export Footprint is a consequence of difficulty meeting local demand.



Carbon Footprint of the Philippines



Fossil fuels are biological materials that were produced millions of years ago and “locked up” out of the atmosphere and the carbon and biological cycle. The Ecological Footprint calculates that addition of carbon to the biosphere as a demand on the biological productivity which would be required to absorb it in order not to leave a carbon debt in the atmosphere.

While carbon emissions do not rely on biocapacity within the country’s borders, the Ecological Footprint of the Philippines exceeds its available biocapacity even if the carbon Footprint is not counted. The carbon Footprint adds an additional 28 percent to the national Ecological Footprint.

Exports that embody some of the CO₂ emitted within the country are significant, but the Footprint of imports is even greater, meaning residents in the Philippines are responsible for even more CO₂ emissions than those just produced within the country. In 2008, the Philippines imported more than US\$ 7.5 billion of crude and partly refined

petroleum, over four percent of its GDP. More than 80 percent of that came from just Saudi Arabia and the United Arab Emirates.

The per capita consumption Footprint of carbon in 2008 was less than one-fifth of the global average; nevertheless, vulnerability to the effects of climate change is not determined by how much one contributes to it. The impact of climate change is likely to add pressures to the availability of biocapacity overall, both within the Philippines and in the countries that the Philippines currently relies on to supplement its national biocapacity.

Consumption Land Use Matrix

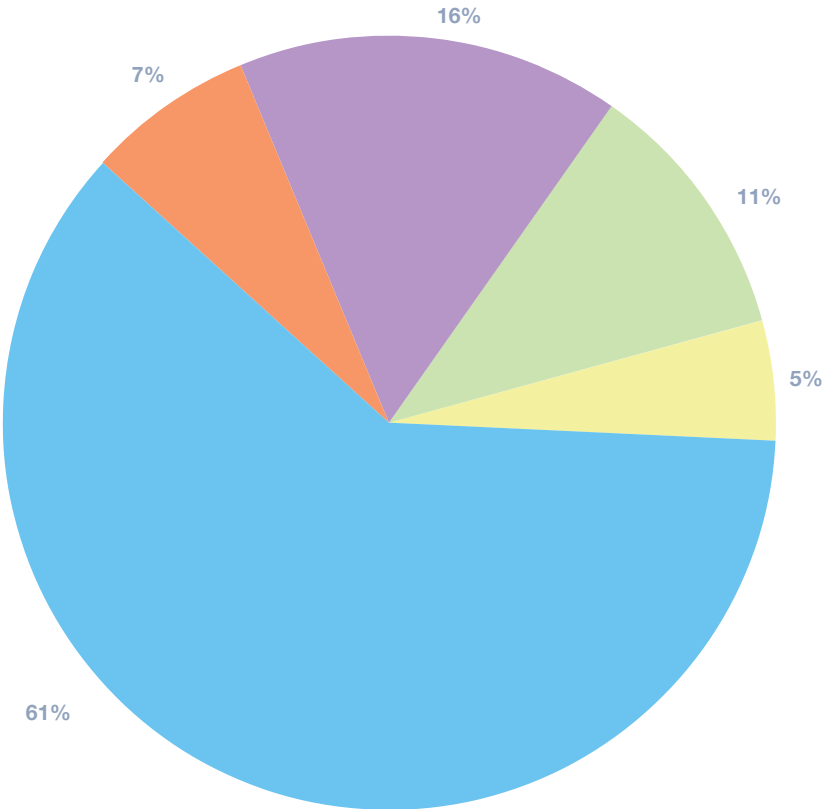




Consumption Land Use Matrix (CLUM) Results of the Philippines

FIGURE 21.
THE PHILIPPINES HOUSEHOLD FOOTPRINT BY
CONSUMPTION LAND USE MATRIX CATEGORIES

- FOOD
- HOUSING
- TRANSPORTATION
- GOODS
- SERVICES

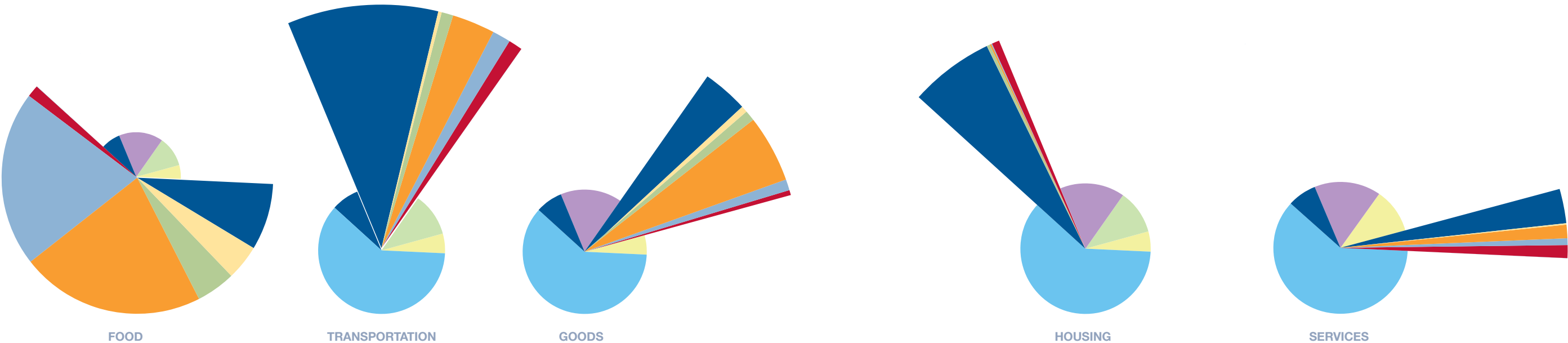


Accounting for 61 percent, food is by far the largest contributor to direct household consumption in the Philippines. This large Footprint for food reflects relatively smaller Ecological Footprint “expenditures” in the other areas. The world average percentage for food in the same Footprint breakdown is 39 percent. Within the food Footprint, fishing grounds and cropland are the dominant land-types used.

The Philippines is largely self-reliant in its demand on fishing grounds and cropland biocapacity, though the trends in net imports of both fishing grounds and cropland Footprints suggest a gradual shift toward greater reliance on the biocapacity of other countries to satisfy domestic demand.

What is the CLUM Analysis?

FIGURE 22.
CLUM BY LANDTYPE BREAKDOWN



As human impacts on the natural world increase, there are increasing calls to understand the driving forces behind these demands and ways to reduce them. The Consumption Land Used Matrix (CLUM) approach can translate land-based Ecological Footprint results into three final demand sectors: direct consumption paid by households (HH), consumption paid by governments (GOV), such as public schools or policing, and gross fixed capital formation (GFCF) — that is, investments in long-lasting goods such as housing and infrastructure. Consumption directly paid by household

component is further broken down into five categories (food, housing, people transport, goods and services).

The graph on the previous page shows a breakdown of just the short-term consumption of households for the Philippines in 2008. This component accounts for 88 percent of the country’s total Ecological Footprint, with government accounting for just three percent, and investment for nine percent.

	CROP LAND	GRAZING LAND	FISHING GROUNDS	FOREST LAND	BUILT-UP LAND	CARBON	
FOOD	46	2	45	2	2	3	IN PERCENTAGES
TRANSPORTATION	23	2	10	5	7	54	
GOODS	50	4	9	8	5	25	
HOUSING	2	0	1	3	8	86	
SERVICES	20	2	10	9	19	40	

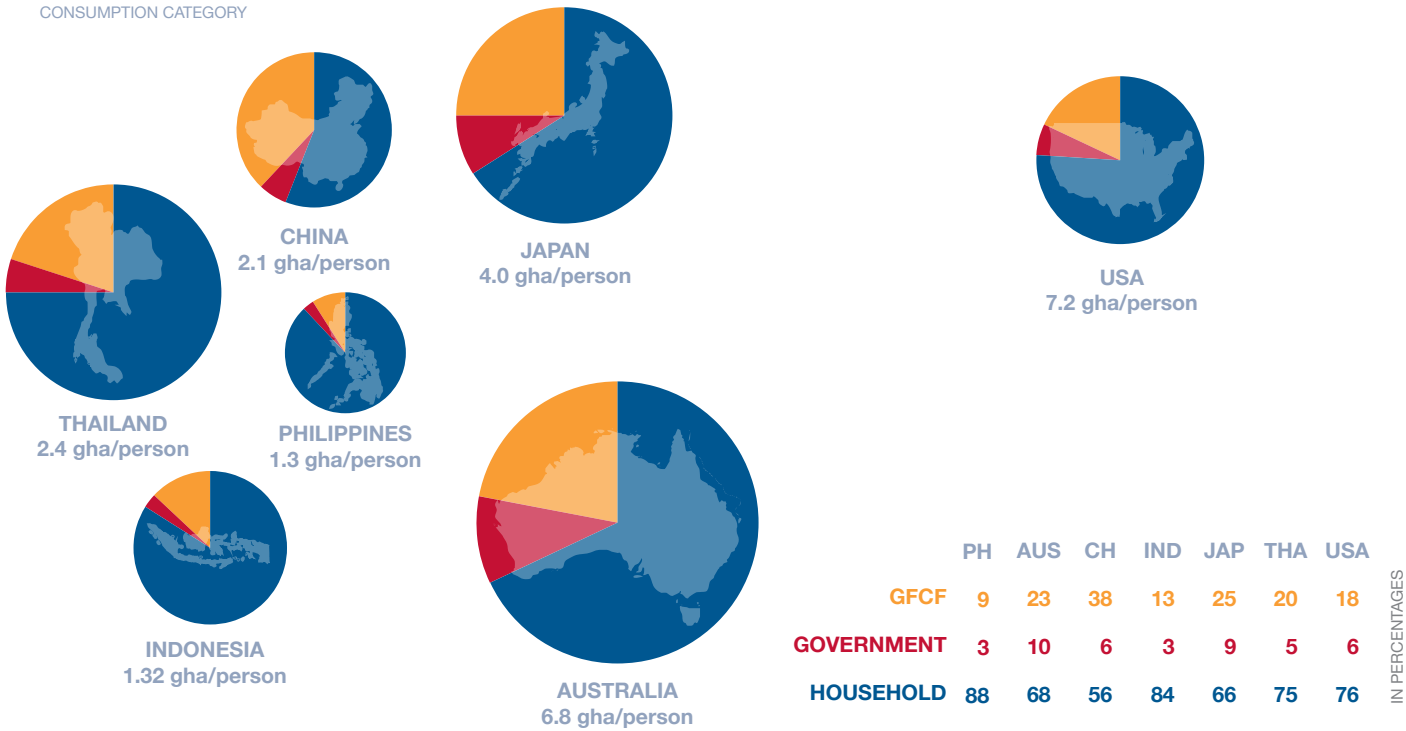
The Consumption Land Use Matrix breakdown of the Ecological Footprint by consumption activities was calculated through Global Footprint Network’s Environmentally Extended Multi-Region Input-Output model. See Appendix A.ii for more information.

NOTE: PERCENTAGES MAY NOT ADD UP TO 100 PERCENT DUE TO ROUNDING.



CLUM and Footprint Comparisons PER PERSON

FIGURE 23.
FOOTPRINT PER CAPITA BY CLIMATE
CONSUMPTION CATEGORY



WHOSE FOOTPRINT IS IT?

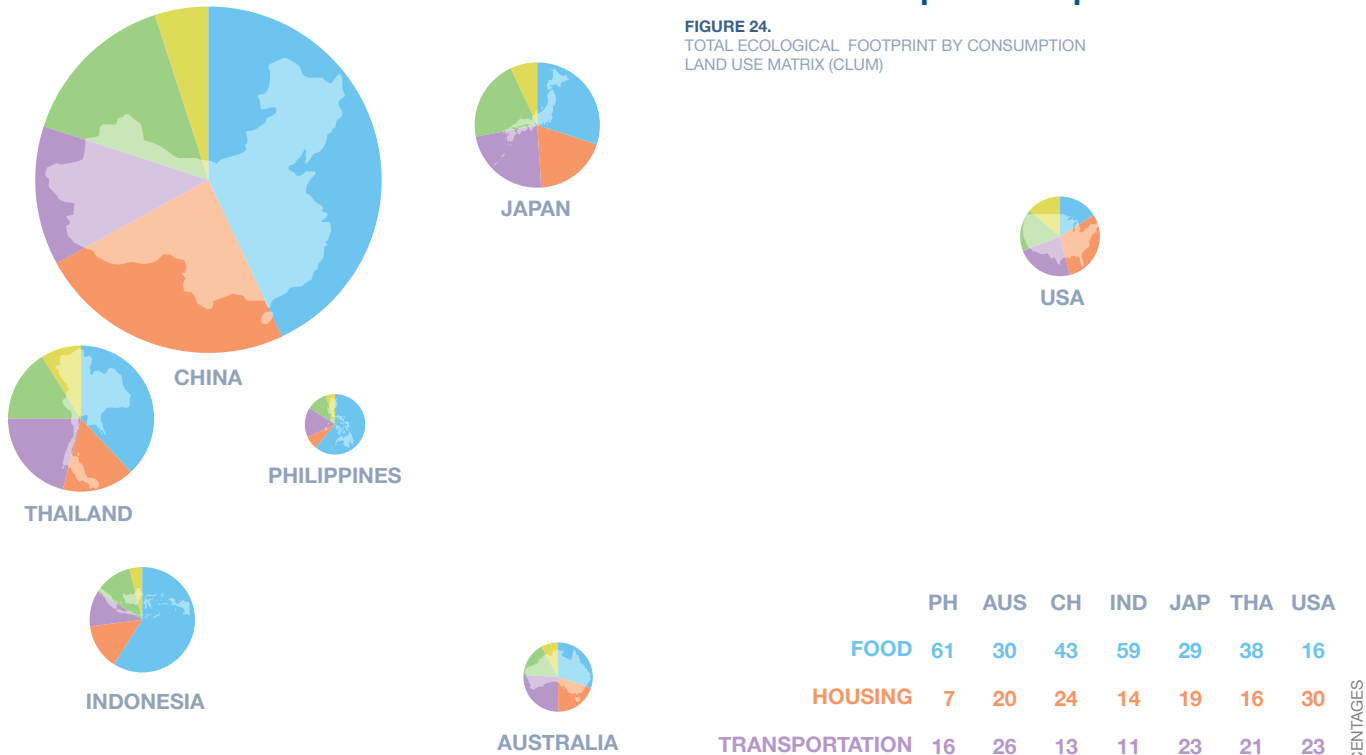
Looking at the Ecological Footprint results by final demand sections—household, government, and investment—gives a broad picture of who in a nation is doing the ecological “spending.” Household consumption in this context is defined as short-lived consumption, paid for by households such as food or clothing. Government consumption is ongoing, short-lived consumption associated with the functions of governments such as paper or energy, which ultimately also benefits households.

Investment includes long-lived items purchased by households, government, and businesses, such as refrigerators and buildings.

When a higher proportion is demanded by households, it suggests that a greater portion of that country’s demand for biocapacity is related to short-lived consumption goods and services, directly by households and individuals.

CLUM and Footprint Comparisons TOTAL

FIGURE 24.
TOTAL ECOLOGICAL FOOTPRINT BY CONSUMPTION
LAND USE MATRIX (CLUM)



COMPARED TO OTHER COUNTRIES

The total area of each circle represents the relative sizes of the average person’s household Footprint in each country.

COUNTRY TO COUNTRY

On this page, the circles’ areas show the relative sizes of the total Footprints of the countries depicted. They look very different than the per capita comparisons. When looked as a whole country, Australia’s Footprint is just 30 percent larger than the Philippines’, while China’s is almost 25 times the size.

COMPARING CONSUMPTION CATEGORIES

Different countries show different proportions of the areas of consumption that utilize the most biocapacity. While food accounts for the vast share of the Footprint of consumption in the Philippines, in the United States food makes up a much smaller piece (16 percent) with the other areas contributing much more to the overall demand.

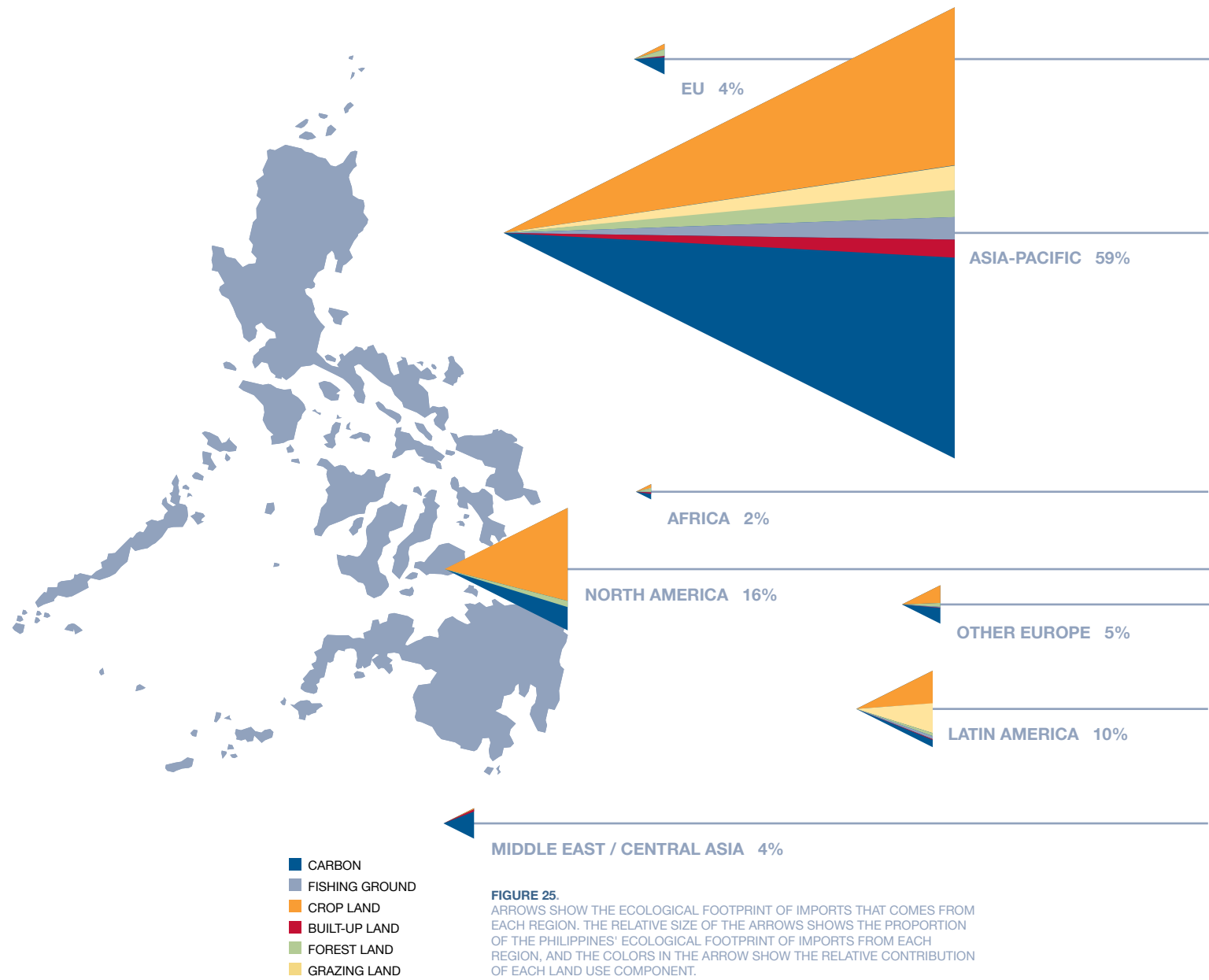
	PH	AUS	CH	IND	JAP	THA	USA
CROP LAND	38	15	32	46	25	31	19
GRAZING LAND	2	21	5	2	4	1	4
FOREST LAND	4	8	2	4	6	4	10
FISHING GROUND	31	3	7	19	11	16	2
BUILT-UP LAND	4	1	4	4	2	3	2
CARBON	21	51	49	25	51	44	64

IN PERCENTAGES

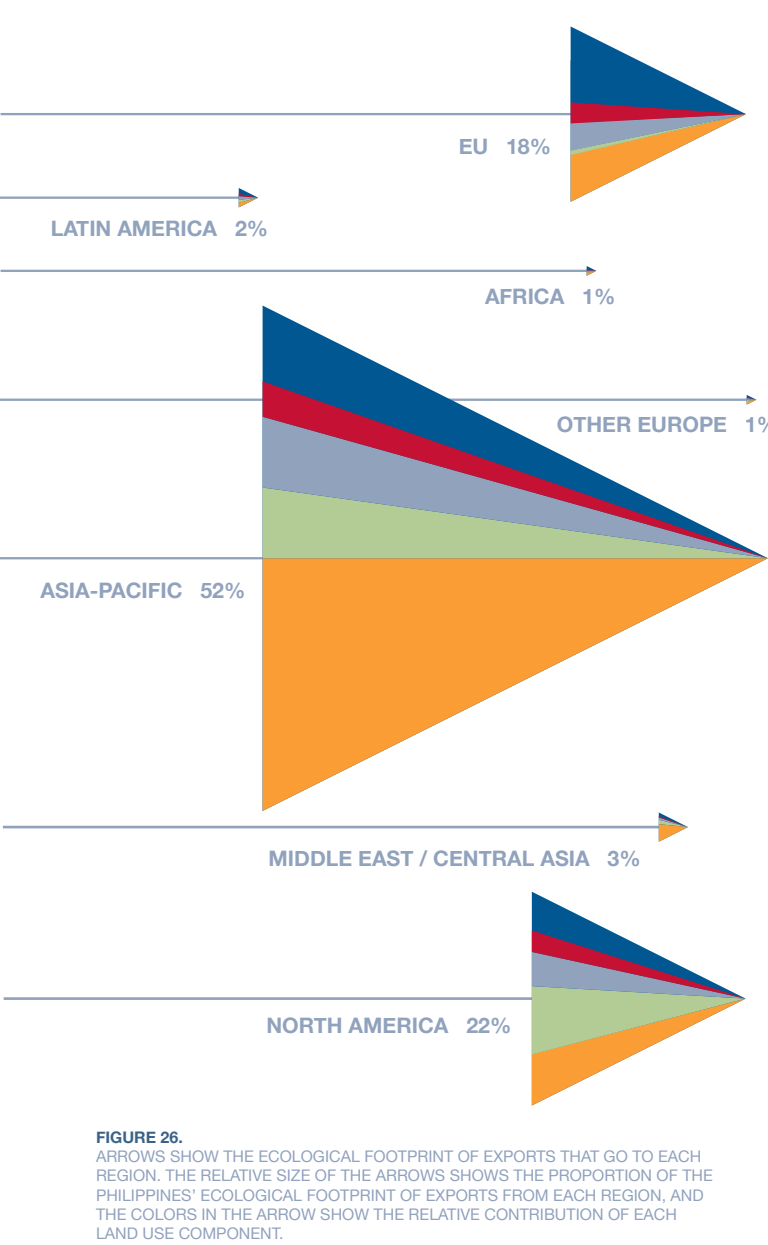
NOTE: PERCENTAGES MAY NOT ADD UP TO 100 PERCENT DUE TO ROUNDING.



Trade Flows Where is Imported Biocapacity Coming From?



Trade Flows Where is Exported Biocapacity Going?



NOTE: PERCENTAGES MAY NOT ADD UP TO 100 PERCENT DUE TO ROUNDING.

The total Ecological Footprint of imports in 2008 was 27 percent of the Footprint, so more than one-fourth of demand is being met by imports from other countries. Cropland was the largest component of the Philippines' import Footprint, with the embodied Footprint of carbon contributing just slightly less.

When a nation imports from other countries, the Ecological Footprint embodied in those imports is added as a part of the importing country's consumption Footprint. Seeing where the Footprint imports are coming from can give a sense of the contributions from those regions, and a sense of regions of dependence, as well as of the resilience of these trade relationships.

Conversely, when a nation exports to other countries, the Ecological Footprint of these exported goods and services goes with it. Following this flow, and especially the non-carbon components, can reveal which countries are using the biocapacity of the Philippines to supply them with goods and services.

In 2008, the Philippines' total Ecological Footprint of exports—not including the carbon component, since this doesn't put direct pressure on domestic biocapacity—was 11 percent of its total domestic biocapacity, meaning that more than a tenth of the biocapacity of the Philippines was being used to provide goods and services for other countries. Looking at all six Ecological Footprint land types embodied in exports, cropland and carbon together comprised almost 91 percent of the Footprint of exports.



Future Scenarios for the Philippines

Ecological Deficits Continuing into the Future

With the world currently demanding 52 percent more biocapacity than is available, and the Philippines demanding more than twice the biocapacity available within its borders, questions about the future loom large.

Under business as usual conditions—that is, if current global production and consumption trends are projected forward—by 2050 humanity will need the biocapacity of nearly three Earths to balance its demand for ecological goods and services. Well before then, local ecosystem collapses resulting from overharvesting and climate changes may further reduce biocapacity, leading to an even more severe overshoot than projected, and/or a failure to support this level of demand.

Future scenarios for the Philippines can be developed by varying projections of population (the estimated number of people that will be consuming), per capita consumption (the quantities of goods and services the average person consumes), and resource intensity (how much energy and material is used to create each good or service; the greater the production efficiency, the lower the resource intensity). Between 1980 and 2008, the Philippine population increased by an average of 2.4 percent per year; per capita consumption increased by 3.7 percent per year; resource intensity decreased almost as much, at 3.4 percent per year. Projecting forward, it is estimated that resource

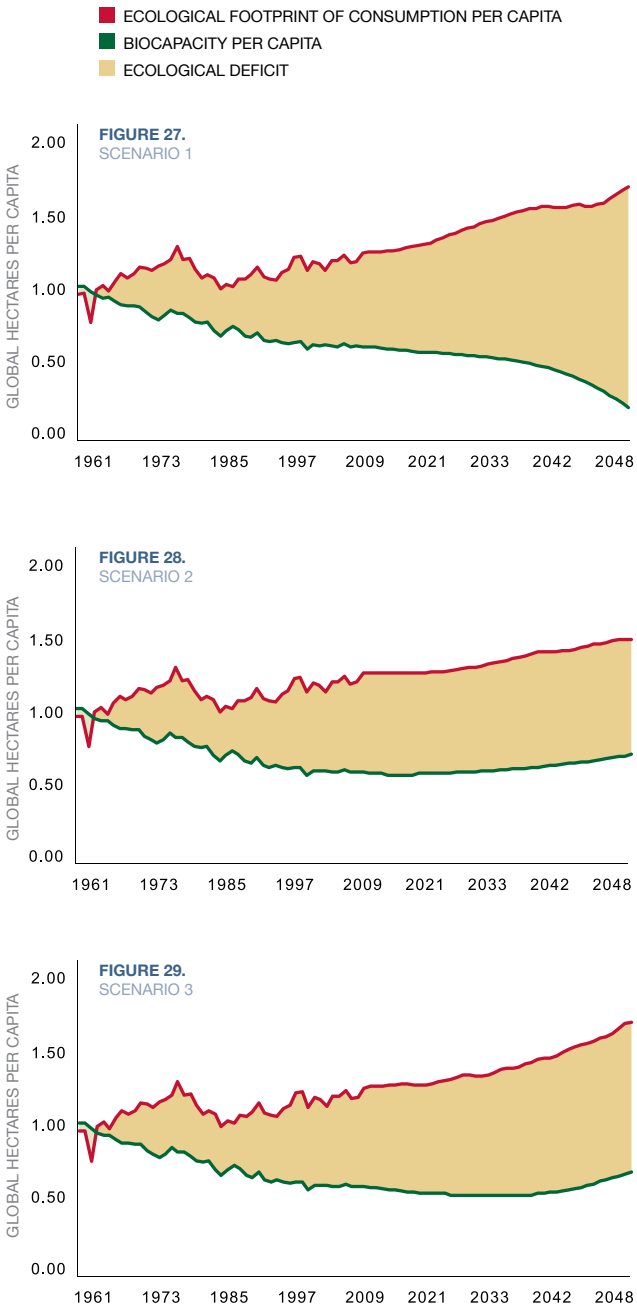
intensity will continue to improve at a rate between 2.8 and 4.0 percent per year, which is a function of economic growth and technological investment (investment in these scenarios is held as a constant percentage of economic output). The United Nations projects the Philippines population to increase at about 1.3 percent per year; however, should additional family planning policies be put in place, it is possible that the Philippines could see this fall to a one percent increase per year by 2025, with continued slowing beyond that. Note that, while population growth does not affect the per capita Ecological Footprint values shown here, it is the cumulative impact of the entire population which places pressure on biocapacity. Finally, two scenarios of economic growth are explored: A rapid growth scenario with five percent growth in the quantity of goods and services consumed between 2008 and 2050; and a slower growth scenario with two percent growth between 2008 and 2020 and four percent between 2020 and 2050.

Despite the slow recovery in overall domestic biocapacity predicted in the second and third scenarios of this initial projection, all three scenarios show an ecological deficit continuing in the Philippines for decades to come. This has implications for one or more of three factors: overharvesting domestic resources; imports; and/or using the global commons as a carbon sink.

FIGURE 27. The business-as-usual case assumes high economic growth, and population to increase in line with UN estimates. In this scenario, the average Philippine Ecological Footprint is projected to grow from 1.3 to 1.7 gha per capita by 2050, far above the 1.3 gha biocapacity per capita estimated to be available globally by that time. Additionally, the extra stress placed on domestic ecosystems is expected to decrease local biocapacity from 0.6 to 0.2 gha per capita – the Philippines will be demanding biocapacity at a rate more than eight times their ability to supply it.

FIGURE 28. With slower economic growth, the average Philippine Ecological Footprint is projected to grow less, to only 1.5 gha per capita. However, this is still above projected globally available biocapacity per capita. Lower economic growth, but similar population growth, is also projected to place lower demands on domestic ecosystems, suggesting that available local biocapacity may recover to 0.7 gha per capita – the Philippines will be demanding biocapacity at a rate about double their ability to supply it.

FIGURE 29. A scenario with high economic growth but reduced population growth suggests the achievement of a per capita Footprint of 1.7 gha per capita but without the additional pressure on domestic ecosystems. Recovery of local biocapacity to 0.7 gha per capita is still achievable – under this scenario the Philippines will be demanding biocapacity at a rate about 2.5 times greater than its ability to supply it.





What Happens Next

Global Footprint Network, in collaboration with the Climate Change Commission of the Republic of the Philippines and the French Agency for Development, published this report in November 2012 with the goal of making available biocapacity assessments to policy makers. Such data and analysis permit analysts to study trends in both the supply of and demand on biocapacity in the Philippines, and in the world as a whole. While the results may be challenging, the trajectories are not irreversible. This report serves as a first step toward addressing these trends, and as the foundation for a multi-phased national collaboration between Global Footprint Network and the Climate Change Commission. In short: This is just the beginning.

Building on the data and analysis in this report, Phase 2 of the Philippines' Ecological Footprint collaboration will examine the resource-vital region of Laguna Lake, in collaboration with the Laguna Lake Development Authority (LLDA) and the Climate Change Commission. The main goals will be to help realize the congressional and municipal vision for sustainable development in Laguna Lake, which includes the economic hub of Metropolitan Manila, by providing a means to benchmark progress, and to provide data needed to inform policy and investments in the region. In addition, because the Ecological Footprint takes a comprehensive approach to resource accounting, it will also complement existing environmental and economic initiatives.

Phase 3 will include building an in-depth understanding of the risks and opportunities for the Philippines' economy. This phase will delve deeper into the analysis of the resource flows within specific sectors to identify the most significant areas of ecological risks and opportunities for the Philippine economy. Global Footprint Network will map the Ecological Footprint flow between industry sectors, and ultimately to consumer final demand. This analysis can help direct more targeted outreach about resource use and waste creation to households and consumers, while also helping the national government understand the ecological resource dependence of industrial sectors. In addition, the Ecological Footprint of production, consumption and trade will be examined, and future projections of biocapacity will be integrated into these calculations to support policy decisions and national action plans around climate change and ecological resource management. Also potential impacts on the Philippines' competitiveness may be explored.

During the course of this collaboration, Global Footprint Network will be providing the technical training needed to build capacity so that the Philippine government can continue to incorporate biocapacity constraints into its decision-making processes long after the collaboration ends.

Appendix A.i

Calculating the Ecological Footprint Consumption, Production and Trade Biocapacity

CALCULATING THE ECOLOGICAL FOOTPRINT

The National Footprint Accounts track countries' use of ecological services and resources as well as the biocapacity available in each country. As with any resource accounts, they are static, quantitative descriptions of outcomes, for any given year in the past for which data exist. The detailed calculation methodology of the most updated Accounts—the National Footprint Accounts 2011 Edition—is described in Borucke et al. (2013). The National Footprint Accounts 2011 Edition calculates the Ecological Footprint and biocapacity for over 50 countries and regions, from 1961 to 2008. A short description of the methodology and the data needs is also provided below.

The National Footprint Accounts 2011 Edition track human demand for resources and ecological services in terms of six major land use types (cropland, grazing land, forest land, carbon, fishing grounds, and built-up land). The Ecological Footprint of each major land use type is calculated by summing the contributions of a variety of specific products. Built-up land reflects the bioproductivity compromised by infrastructure and hydropower. Forest land can either provide forest products, or it can serve

for carbon dioxide uptake. In the later case, it represents the carbon absorptive capacity of a world average hectare of forest needed to absorb anthropogenic CO₂ emissions, after having considered the ocean sequestration capacity (also called the carbon Footprint).

The Ecological Footprint calculates the combined demand for ecological resources and services wherever they are located and presents them as the global average area needed to support a specific human activity. This quantity is expressed in units of global hectares, defined as hectares of bioproductive area with world average bioproductivity. By expressing all results in a common unit, biocapacity and Footprints can be directly compared across land use types and countries.

Demand for resource production and waste assimilation are translated into global hectares by dividing the total amount of a resource consumed by the yield per hectare, or dividing the waste emitted by the absorptive capacity per hectare. Yields are calculated based on various international statistics, primarily those from the United Nations Food and Agriculture Organization (FAO ResourceSTAT statistical databases). Yields are mutually exclusive: If two crops are grown at the

same time on the same hectare, one portion of the hectare is assigned to one crop, and the remainder to the other. This avoids double counting. This follows the same logic as measuring the size of a farm: Each hectare is only counted once, even though it might provide multiple services.

The Ecological Footprint, in its most basic form, is calculated by the following equation:

$$EF = D/Y$$

where D is the annual demand of a product and Y is the annual yield of the same product (Monfreda et al., 2004; Galli et al., 2007). Yield is expressed in global hectares. In practice, global hectares are estimated with the help of two factors: The yield factors (that compare national average yield per hectare to world average yield within the same land category) and the equivalence factors (which capture the relative productivity across the various land and sea area types).

Therefore, the formula of the Ecological Footprint becomes:

$$EF = (P/Y_N) * YF * EQF$$

where P is the amount of a product harvested or waste emitted (equal to D above), YN is the national average yield for P, and YF and EQF are the yield factor and equivalence factor, respectively, for the country and land use type in question. The yield factor is the ratio of national-to-world-average yields. It is calculated as the annual availability of usable products and varies by country and year. Equivalence factors translate the area supplied or demanded of a specific land use type (e.g., world average cropland, grazing land, etc.) into units of world average biologically productive area (global hectares) and vary by land use type and year.

Annual demand for manufactured or derivative products (e.g., flour or wood pulp), is converted into primary product equivalents (e.g., wheat or roundwood) through the use of extraction rates. These quantities of primary product equivalents are then translated into an Ecological Footprint. The Ecological Footprint also embodies the energy required for the manufacturing process.



**CONSUMPTION, PRODUCTION,
AND TRADE**

The National Footprint Accounts calculate the Ecological Footprint of a population from a number of perspectives. Most commonly reported is the Ecological Footprint of consumption of a population, typically just called the Ecological Footprint. The Ecological Footprint of consumption for a given country measures the biocapacity demanded by the final consumption of all the residents of the country. This includes their household consumption as well as their collective consumption, such as schools, roads, fire brigades, etc., which serve the household, but may not be directly paid for by the households.

In contrast, a country’s primary production Ecological Footprint is the sum of the Footprints for all resources harvested and waste generated within the country’s geographical borders. This includes all the area within a country necessary for supporting the actual harvest of primary products (cropland, grazing land, forest land, and fishing grounds), the country’s infrastructure and hydropower (built-up land), and the area needed to absorb fossil fuel carbon dioxide emissions generated within the country (carbon footprint).

The difference between the production Footprint and consumption Footprint is trade, shown by the following equation:

$$EF_C = EF_P + EF_I - EF_E$$

where EFC is the Ecological Footprint of consumption, EFP is the Ecological Footprint of production, and EFI and EFE are the Footprints of imported and exported commodity flows, respectively.

BIOCAPACITY

A national biocapacity calculation starts with the total amount of bioproductive land—or ecological assets—available. “Bioproductive” refers to land and water that supports significant photosynthetic activity and accumulation of biomass, ignoring barren areas of low, dispersed productivity. This is not to say that areas such as the Sahara Desert, Antarctica, or Alpine mountaintops do not support life; their production is simply too widespread to be directly harvestable by humans. Biocapacity is an aggregated measure of the amount of land available, weighted by the productivity of that land. It represents the ability of the biosphere to produce crops, livestock (pasture), timber products

(forest), and fish, as well as to uptake carbon dioxide in forests. It also includes how much of this regenerative capacity is occupied by infrastructure (built-up land). In short, it measures the ability of available terrestrial and aquatic areas to provide ecological resources and services. A country’s biocapacity for any land use type is calculated as:

$$BC = A * YF * EQF$$

where BC is the biocapacity, A is the area available for a given land use type, and YF and EQF are the yield factor and equivalence factor, respectively, for the country land use type in question.

Appendix A.ii

Environmentally Extended Multi-Regional Input-Output Analysis for the Ecological Footprint

The current National Footprint Accounts (NFA) provide disaggregation only according to land use types, limiting their utility to government and private sector decision makers. For analysis on consumption, industry sectors and detailed trade, Environmentally Extended Multi-Regional Input-Output (EE-MRIO) is used, based on data from the Global Trade Analysis Project (GTAP) published by Purdue University, which provides 113 regions to 57 industrial sectors, 3 final demands, and Consumption Land Used Matrix (CLUM) as well as trade.

Monetary input-output tables were first proposed by Wassily Leontief in the early 20th century. The use of input-output analysis to support physical flow accounting gained early acceptance for energy and pollution analysis in the 1970s. Environmentally Extended Input-Output (EEIO) models have been utilized for material and energy flow accounting and land use accounting to forecast trends and measure eco-efficiency. Environmentally extended input-output analysis for the Ecological Footprint requires three key calculations in order to obtain results by industry sectors and final demand: (1) Leontief inverse, (2) physical intensity for Ecological Footprint, and (3) total Footprint intensity.

The Leontief inverse calculation provides the direct and indirect requirements of any industry supplied by other industries to deliver one unit of output for final demand. The physical intensity for the Ecological Footprint is calculated by dividing the Ecological Footprint of each land type reported in the National Footprint Accounts by the total output for final demand, including imports. This represents the direct required Footprint per unit of currency spent. The total Footprint intensity provides the direct and indirect Footprints of industrial sectors to provide one unit of production to final demand—including the entire supply chain. This total Footprint intensity is calculated by multiplying the physical intensity by the Leontief inverse.

Results are then presented according to the final demand categories such as household consumption, government consumption, and gross fixed capital formation. The household consumption results can be further disaggregated according to the Classification of Individual Consumption by Purpose (COICOP). A Consumption Land Use Matrix (CLUM) can be created by combining the Ecological Footprint of household consumption, government consumption, and gross fixed capital with the results from the National Footprint Accounts by land use type.



Humanity is demanding more and more resources and services from nature, more than what nature can replenish. In addition, there are more people on the planet each year sharing nature's provisions. Comparing the total Footprint and biocapacity graph with the per capita results shows that while total biocapacity on the planet is slowly increasing, the average amount of biocapacity available per person is actually shrinking over time.

FIGURE 30. In 1961, humanity's average Ecological Footprint was 2.4 gha per person, around seventy-four percent of the 3.2 gha of biocapacity available to support each person on the planet. Around 1970, the global per capita Footprint and biocapacity had reached par, and by 2008 the average Footprint was 2.7 gha per person, exceeding the 1.8 gha of biocapacity now available per person by more than fifty percent. This forty-four percent decline in per capita biocapacity is due to the fact that more people are now sharing the planet's limited biocapacity.

FIGURE 31. Although globally the average person's Ecological Footprint only increased by fifteen percent from 1961 to 2008, humanity's total Footprint increased by one hundred fifty percent over the period, mirroring the exponential growth in world population. With fossil fuel use rising rapidly, the carbon component of the Footprint was the fastest growing, increasing by almost four hundred percent from 1961 to 2008.

Over the same period, biocapacity grew slightly, largely due to increased agricultural yields.

Some of this increase came with a trade-off; the fossil fuel inputs into farming driving a portion of increased yields also contributed to the rapid growth in humanity's carbon Footprint.

FIGURE 32. Globally, the use of resources and the carbon emissions associated with government functions account for about seven percent of humanity's total Ecological Footprint. Gross fixed capital investment in infrastructure and other long-lived items purchased by households, government and businesses account for another 19 percent. The greatest demand on biocapacity, 74 percent, comes from household expenditure on short-lived goods, services and activities. Almost 40 percent of that household Footprint is from consumption of food.

FIGURES 33-34. Regional differences in Ecological Footprint and biocapacity show great disparities in different parts of the world in terms of the average person's demands on ecological assets as well as the availability of local assets to meet these demands. From 1961 to 2008, the total Ecological Footprint of every region of the world increased in absolute terms, as well as in proportion to regional biocapacity. The drivers of this growth, however, differed considerably from region to region: In some, individual consumption has risen rapidly, while in others, average consumption has remained flat or even declined, and population growth has been the primary driver.

More information on why carbon does not appear as a separate biocapacity component can be found in the Ecological Footprint details section, beginning on page 18.

FIGURE 30.
WORLD PER CAPITA FOOTPRINT OF CONSUMPTION AND BIOCAPACITY

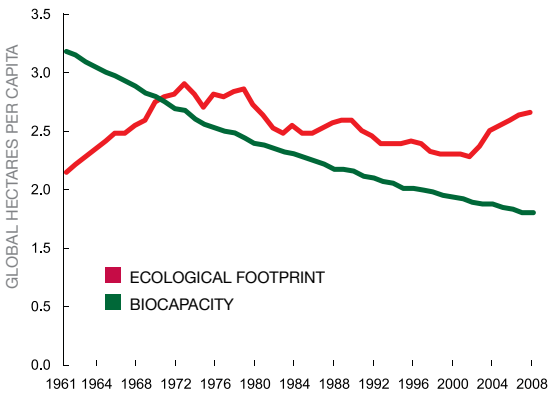


FIGURE 31.
WORLD TOTAL ECOLOGICAL FOOTPRINT OF CONSUMPTION BY LAND TYPE AND TOTAL BIOCAPACITY

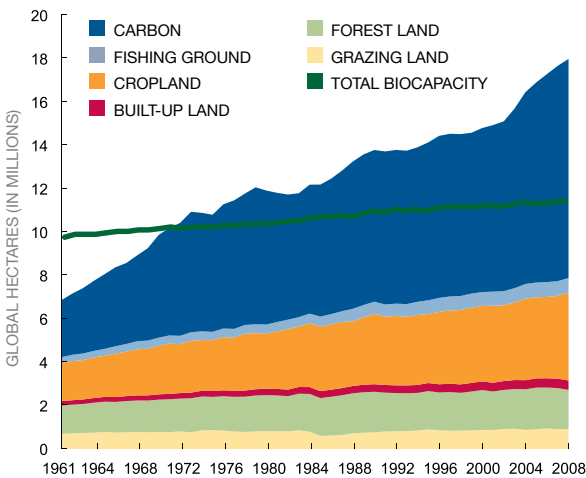


FIGURE 32.
THE WORLD HOUSEHOLD FOOTPRINT BY CONSUMPTION LAND USE MATRIX CATEGORIES

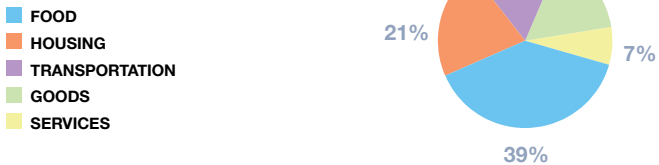


FIGURE 33.
1961 TOTAL ECOLOGICAL FOOTPRINT OF CONSUMPTION AND BIOCAPACITY BY REGION.

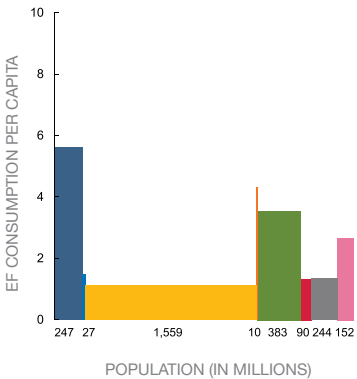
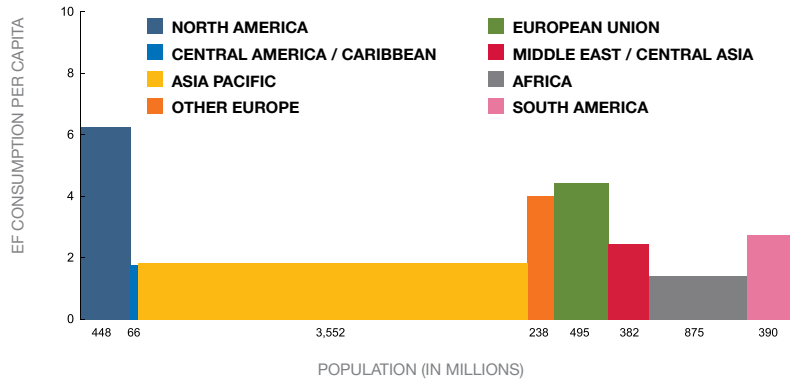


FIGURE 34.
2008 TOTAL ECOLOGICAL FOOTPRINT OF CONSUMPTION AND BIOCAPACITY BY REGION.



Global Footprint Network

In 2003, Global Footprint Network, a 501(c)(3) nonprofit organization, was established to enable a sustainable future where all people have the opportunity to live satisfying lives within the means of one planet. That is why our work aims to accelerate the use of the Ecological Footprint — a resource accounting tool that measures how much nature we have, how much we use, and who uses what.

The Ecological Footprint is a data-driven metric that tells us how close we are to the goal of sustainable living. Footprint accounts work like bank statements, documenting whether we are living within our ecological budget or consuming nature's resources faster than the planet can renew them.

www.footprintnetwork.org

Agence Française de Développement

Agence Française de Développement is a financial institution and the main implementing agency for France's official development assistance to developing countries and overseas territories. It finances projects, programs and studies through grants, loans, guarantee funds and debt reduction-development contracts and provides capacity development support to its partners in developing countries.

www.afd.fr

Climate Change Commission of the Philippines

The Climate Change Commission, which is attached to the Office of the President, is an independent and autonomous agency with the same status as that of a national government. It is the sole policy-making body of the government tasked to coordinate, monitor and evaluate the programs and action plans of the government relating to climate change.

It has formulated the National Framework Strategy on Climate Change (NFSCC), National Climate Change Action Plan (NCCAP) and guidelines for Local Climate Change Action Plan (LCCAP).

www.climate.gov.ph

