Project Portfolio
Attila Tari

The Adequate Living Space concept

Spring
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The Adequate Living Space concept
Master Thesis

Master of Fine Art in Design, Individual Specialization

University of Gothenburg,
HDK School of Design and Crafts

Examinator: Eva Engstrand
Assessing Teacher: Marcus Jahnke
Supervisor: Claes Johansson
Opponent: Ariana Amacker

Spring
2013.
“Only when the last tree has been cut down;
Only when the last river has been poisoned;
Only when the last fish has been caught;
Only then will you find that money cannot be eaten.”

Cree Indian Prophecy
(“Cree Indian Prophecy Quotes.”Quotes.net. STANDS4 LLC, 2013)
Imagine our World after a radical change of a worldwide disaster, when the over consumption and the consumerism is permanently over, no electricity, no service, no supermarket… A world with human beings who are waiting for resumption.
Synthesis

The thesis is taking place beyond our western-thinking based perception. Harsh, radical and from an opposite kind of viewing angle it is cute for the ears, but the studies based on nowadays visible facts, and the conclusions are truly believed by the author.

On the first place the project includes a wide range of theoretical research which observation began with the questioned field of “fundamental human needs”.

On the second place it is also including an imagined future scenario. A vision about how our World will look like in 2050, if we still stick to sustainable development and not to sustainable life.

On the third place, as a conclusion, it contains a proposition about an equivalent human-needs-structure for a more balanced future. A holistic structure which is based on a disappearing culture’s lifelong-learning ideals.

On the fourth but not on the last place, the thesis contains an offer as a tactile outcome of the project. A Skeleton as a framework of a dwelling for adequate and healthy life, called the Sprout. The Sprout shows a minimized home, designed without synthetic components and forced esoterical shaping by using the memory of ancient ruins. Preparation and manufacturing are calibrated through each generation. It is a framework which has to be supplemented by the habitant to accomplish their home, by using available resources from the stated-direct-environment. Main values and beliefs are coded into the structure.

Keywords: Adequate, dwelling, human need, lasting living space, sustainable life.
Purpose, goal and background

The Purpose was to find a source around the ancient living style. The aim was to search for a „space”, where members of our species as a family can live in respect, on an optimal balanced scene.

The adequate living space concept shows a minimized home, which designed with forced esoterically shaping by using traditions parallel with advanced techniques.

Adequate: • Sufficient to satisfy a requirement or meet a need
• Having the requisite qualities or resources to meet a task
• Sufficient for the purpose; “an adequate income”
(The Free Dictionary, FARLEX Inc, 2013)

decent • enough • equal • fair to middling • passable • tolerable

Living: • The condition or action of maintaining life.
• A manner or style of life
• A means of maintaining life; livelihood
(The Free Dictionary, FARLEX Inc, 2013)

aliveness • life • livelihood • substantial • support • sustenance

Space: • An area provided/reserved for a particular purpose
• The familiar three-dimensional region or field of everyday experience
• Space sought for occupation by a nation whose population is expanding
(The Free Dictionary, FARLEX Inc, 2013)

area • district • home • infinite • location • place

The goal is to take a proposal for an entirely new, or just forgotten living philosophy.
Questioned field

*I imagine a world. A world with human beings. Humans whose lives are in balance with other species. They are living together, and not any thinking creatures do any huge impact against other beings which effect could risk the affected creatures race.*

The concept against the wastefulness and the welfare possessed luxurious ideal. The thesis is a living space concept for the future (or for an alternative present), at that time when the over consumption and consumerism are permanently over. Defined as a “PLAN-B”, potentially after a radical change of a worldwide disaster. The concept is for sustainable life, but it isn’t an emergency shelter concept.

Target group of the concept: Mankind

As species on Earth we are living in different places. According to climate our needs are differ, but the basics are the same, independently of environmental conditions.

Theme of the questioning: Homo sapiens sapiens - needs

The way how we are living in the western society, our path is still Evolving?

- I say, some-things wrong around our living
- I assume that the problem is rooted in our life style, deeply in human needs
- I’m questioning the (adequate) living space of humanity

Does the mainstream forcing our race to become Homo sapiens consumericus, would it be a beneficial stage of evolution?

- I guess the happening is more like a devolution
- I say, soon some things becomes a thing of the past, and mankind will be one of them (if we’re not reacting radically)
- Mankind is facing with extinction as the other uncountable species (because of an emerging new race)

Are there exist (or has it ever existed) An equilibrium? The absolute balance.

- There must exist an Equilibrium in our past (a more balanced state than nowadays)
- How else could we still exist?
Time schedule:

The processes were organized by a linear time table for the whole period. The schedule was divided into five phase: Pre-informational-, Informational-, Preparational-, Presentational-, and Exhibitional phase.

Figure Nr.: 1, - Visualization of the Time schedule.
The overall “way of thinking” around the observed field:

Since we are Humans, we are existing in an ambient. We are living in a specified environment; there are surroundings around us and together with all the population of the Flora and Fauna we are completing the Ecosphere of our Planet. Without the radical actions of the past decades the things are staying in a kind of balance, because it was designed by nature over an infinite amount of time. Nowadays since we’re handling everything around us as meaningless resources we’re using everything to satisfy our needs independently of what are renewable or non-renewable sources. We are using Earth’s biocapacity by manufacturing and developing things towards globalization and urbanization of everything that we can perceive, but for what price?

By our evolutional process a part of our species achieved wealth and generated surplus. In the western world the mainstream is forcing humans to become consumers, which results: limitless overconsumption and ends with limitless waste production. The particles
of this consumer society as “homo consumericus” leaves that big size of Ecological foot-
print that Earth can’t support any longer. With the passing time human beings are losing
their global empathy. In another perspective there are still people whose feelings end
up with sympathy, and those who are talking about sustainability. Humans, divided into
Nations, behaving differently because they believe in the different religions and spiritual
faiths. All of our respect & regards depends on our morals and traditions. This is how
we can describe Biodiversity of Mankind, divided into different regions. Ages resulting in
changes on every level, causing alterations in our lifestyle.

I suppose that there are problems which are rooted in our lifestyle, and in the way of how
and what we define as home.

The concept is based on the above mentioned thinking-direction and on the way how to
map out a design issue for potential future problems.

By following this line, the project started with a comprehensive information gathering
phase.

“Homo sapiens sapiens”, named by Carl Lineus in 1758. A species which named them-
selves. And later just put themselves above everything on Earth.

In the following there will be highlighted details from the completed observation, as ex-
amples which are supporting my conclusion.

From an evolutionary and scientific perspective:

“Humans (Homo sapiens) are primates of the family Hominidae, and the only extant
species of the genus Homo. Humans are characterized by having a large brain relative
to body size, with a particularly well developed neocortex, prefrontal cortex and tempo-
ral lobes, making them capable of abstract reasoning, language, introspection, problem
solving and culture through social learning. This mental capability, combined with an
adaptation to bipedal locomotion that frees the hands for manipulating objects, has al-
lowed humans to make far greater use of tools than any other species. Humans are the
only extant species known to build fires and cook their food, as well as the only known
species to clothe themselves and create and use numerous other technologies and arts.
The scientific study of humans is the discipline of anthropology.”
http://en.wikipedia.org/wiki/Human

Nowadays Facts:
http://www.100people.org/statistics_100stats.php?section=statistics
The world population has now reached 7 billion people. This milestone inspired researchers to conduct research to update their statistics, and the changes over the past 5 years are remarkable. In 2006, only 1 person out of 100 would have had a college education-- today that number has jumped to 7 thanks in part to advances in higher education in Asia. The detailed research and source information can be found here and the statistics provided by Donella Meadows in 1990 that originally inspired their project can be viewed here.

If the World were 100 PEOPLE, or simplified as the human population in percentages:

- 50 would be female
- 50 would be male
- 26 would be children
- There would be 74 adults,
  - 8 of whom would be 65 and older

There would be:
- 60 Asians
- 15 Africans
- 14 people from the Americas
- 11 Europeans
- 33 Christians
- 22 Muslims
- 14 Hindus
- 7 Buddhists
- 12 people who practice other religions
- 12 people who would not be aligned with a religion

- 12 would speak Chinese
- 5 would speak Spanish
- 5 would speak English
- 3 would speak Arabic
- 3 would speak Hindi
- 3 would speak Bengali
- 3 would speak Portuguese
- 2 would speak Russian
- 2 would speak Japanese
- 62 would speak other languages
83 would be able to read and write; 17 would not

7 would have a college degree
22 would own or share a computer

77 people would have a place to shelter them
from the wind and the rain, but 23 would not

1 would be dying of starvation
15 would be undernourished
21 would be overweight

87 would have access to safe drinking water
13 people would have no clean, safe water to drink

Sources: 2012 - Fritz Erickson, Provost and Vice President for Academic Affairs, Ferris State University (Formerly Dean of Professional and Graduate Studies, University of Wisconsin - Green Bay) and John A. Vonk, University of Northern Colorado, 2006; Returning Peace Corps Volunteers of Madison Wisconsin, Unheard Voices: Celebrating Cultures from the Developing World, 1992; Donella H. Meadows, The Global Citizen, May 31, 1990.

We are living in different places and believing in different ethical norms. In order to satisfy our needs, our existence is resulting in different effects on Earth, based on social and national separations.

Unfortunately nowadays, especially in modern societies, everything what we do to satisfy our needs is resulting in an ecological footprint which can be signified as a segment of pollution in Earth’s ecosphere.

If we take a look on what our species globally does to satisfy certain kinds of needs then we will understand the worries of this concept. The problems which are rooted into our self-esteem and self actualization based lifestyle.

Nowadays in 2013, with our specific tools and methods we can easily support this assumption, and list a whole bunch of facts, which sound inconvenient for our ears.
Ecological Footprint Graph with Five Major Events (Numbers of Earths / 1950-2010)

While we were only talking during these decades, we are already past the limits of Earth in 1976. It means that the Planet never can get back to the original shape as it was before the actual date. So it can’t be renewed again for hundred percent. On the same graph it is also visible when “sustainable development” becomes the world’s leading solution strategy for solving global problems.

1987 - BRUNDTLAND REPORT Defined - “sustainable development” as the world’s leading solution strategy.

Source: Living Planet Report 1010, by WWF and GFN, by Jack Harich, 28 July 2011
Special report from 2008 about how economy is killing the Earth. The main processes from the past centuries (Amount/ 1750-2000)

**IS ECONOMIC GROWTH SUSTAINABLE?**

The diagram shows the radical development and increase in - and relation to each other's of:

- POPULATION
- GDP (Gross Domestic Product)
- LOSS OF TROPICAL RAINFOREST AND WOODLAND
- SPECIES EXTINCTIONS
- MOTOR VEHICLES
- FISHERIES EXPLOITED
- FOREIGN INVESTMENT

This diagram shows how our Ecological footprints related to Earth’s Biocapacity, through the past fifty years / Global Hectares per Years/:

Earth’s Total Biocapacity of Top 10 Countries per Percent, in 2007.

<table>
<thead>
<tr>
<th>Country</th>
<th>Biocapacity %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>39.4</td>
</tr>
<tr>
<td>Brazil</td>
<td>14.4</td>
</tr>
<tr>
<td>China</td>
<td>11.0</td>
</tr>
<tr>
<td>United States</td>
<td>10.0</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>6.9</td>
</tr>
<tr>
<td>India</td>
<td>5.0</td>
</tr>
<tr>
<td>Canada</td>
<td>4.1</td>
</tr>
<tr>
<td>Australia</td>
<td>2.6</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2.6</td>
</tr>
<tr>
<td>Argentina</td>
<td>2.5</td>
</tr>
<tr>
<td>France</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Percentage of World URBAN and RURAL Population / 1950-2010

The big distance is faded in 60 years, and in 2012 it become equal.


How much Earth would need, if the World population would live like the people in:

Source: Tim De Chant, Data from Global Footprint Network, 2012.

Figure Nr.: 9 - The percentage of the world Urban and Rural Population.

Figure Nr.:10 - Map, If the world population would live like the people in Bangladesh.

Source: Tim De Chant, Data from Global Footprint Network, 2012.
<table>
<thead>
<tr>
<th>Country</th>
<th>100x Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>0.4</td>
</tr>
<tr>
<td>India</td>
<td>0.6</td>
</tr>
<tr>
<td>Uganda</td>
<td>1.0</td>
</tr>
<tr>
<td>China</td>
<td>1.1</td>
</tr>
<tr>
<td>France</td>
<td>2.5</td>
</tr>
<tr>
<td>United States of America</td>
<td>4.1</td>
</tr>
<tr>
<td><strong>United Arab Emirates</strong></td>
<td><strong>5.4</strong></td>
</tr>
</tbody>
</table>

*Source: Tim De Chant, Data from Global Footprint Network, 2012.*

*Figure Nr.: 11 - Map, If the world population would live like the people in the United Arab Emirates.*
Estimated remaining WORLD SUPPLIES of non-renewable resources in 2013.
With “SUSTAINABLE DEVELOPMENT” LEADING STRATEGY

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource</th>
<th>Years Left by 2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>drugs, batteries</td>
<td>ANTIMONY</td>
<td>7</td>
</tr>
<tr>
<td>touchscreens, solar panels</td>
<td>INDIUM</td>
<td>11</td>
</tr>
<tr>
<td>medals, jewellery</td>
<td>SILVER</td>
<td>16</td>
</tr>
<tr>
<td>brass, wires piping</td>
<td>COPPER</td>
<td>31</td>
</tr>
<tr>
<td>aircraft, armour</td>
<td>TITANIUM</td>
<td>43</td>
</tr>
<tr>
<td>mobile phones</td>
<td>TANTALUM</td>
<td>45</td>
</tr>
<tr>
<td>fertilizer, pesticides</td>
<td>PHOSPHORUS</td>
<td>76</td>
</tr>
<tr>
<td>transportation, packaging</td>
<td>ALUMINIUM</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>GAS</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>OIL</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>COAL</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>AGRICULTURAL LAND</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>CORAL REEFS</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>RAINFOREST / INDONESIAN</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>RAINFOREST / BRAZILIAN</td>
<td>195</td>
</tr>
</tbody>
</table>

Third of land plant and animal species extinct by 2050 due to environmental changes.


What will be in the future? No one knows for sure, because a small change could effect a component which could result delay or fastest progresses. But one thing is for sure; if we stay on the same path in 2050 we will blame ourselves that: “How could we let these things happen?”
Future scenario

“On the second place it is also including an imagined future scenario. A vision about how our World will look like in 2050, if we still stick to sustainable development and not to sustainable life.”

How the world will look like?

This is perhaps one of the biggest questions that confront humanity. Almost everyone at some point in life contemplates them.

Hollywood has its own predictions. Futurologists paint fanciful pictures, with flying cars and robots to assist every human need. Doomsayers see the world being destroyed. Even some of the most renowned minds in the scientific community now urge people to abandon Earth before it is destroyed by nuclear war or by natural disaster. Others see global warming as a contributing factor to man’s supposed destruction.

What People Think?

In April 2010, the Pew Research Center and Smithsonian magazine polled a group of Americans for their perspective on what the world will be like in 2050. A majority of people polled believe that advanced scientific development is certain. Eighty-one percent feel computers will probably be able to converse like humans. Concerning cancer, 71 percent think man will find a cure. Sixty-six percent believe artificial limbs will most likely outperform real ones. A majority also believe that space travel will be commonplace for the average person in 40 years.

In addition, most believe that an extinct animal will be brought back to life and mankind will find evidence of life somewhere else in the universe. Forty-eight percent think that a human will be cloned in the decades ahead. Forty percent even believe the technology to read people’s thoughts will exist by 2050!

As to the areas of energy and environment, a large majority believe that our energy will not come from coal, oil and gas in four decades. A similar number 72 percent believe the world will face a major energy crisis. Sixty-six percent feel the earth will be warmer midway through this century.

Regarding war, most of those polled feel that the world will descend into another world war by 2050. A majority also believe America will be attacked with a nuclear weapon.

In summary, people foresee technology advancing, while at the same time they acknowledge that real threats of energy crises and even world wars loom on the horizon. Of those polled, 64 percent are still optimistic about the future, but this number has dropped from 81 percent in a similar poll conducted in 1999. Meanwhile, the number of
people who believe the coming decades will be bleak has doubled. Attitudes about the future of the United States and its economy are also becoming more pessimistic. Finally, 41 percent polled believe Jesus Christ will return within the next 40 years, but even more 46 percent feel this will not occur. Starting with the assumption that Jesus Christ will not return by 2050, the questions must be asked: Where will we be by 2050? What do authorities, planners, scientists, educators and global think-tanks foresee? What do today’s trends reveal for the world tomorrow? While space does not permit a detailed look at every facet of society, let’s paint a picture a figurative snapshot of Earth, dated AD 2050.

Population

To understand where the world is headed, we must examine how many human beings are on Earth today and how many will be in 2050. But to fully appreciate these trends, some basic history is required. First consider that 213 years ago, in 1800, the world population was under 1 billion people. By 1900, the population had grown to 1.65 billion. Fifty years later, the population was over 2.5 billion. We are currently growing at a rate of 1 billion people every 12 years! And by 2050, the United Nations estimates that the number of human beings on Earth will be over 9.1 billion. In just 100 years, the number of people will have more than tripled! In other words, for every human being that existed just after the Second World War, there will be three only 40 years from now!

In 1950, there were on average 30 people per square kilometer. (Realize that much of Earth is uninhabitable, so in actuality this number is far greater.) By 2050, the number of people per square mile will increase to 107. But many areas of the Western world are not projected to grow nearly as fast as others. For example, Africa was 227 million in 1950, yet it is projected to be almost 2 billion by 2050! For every human being in Africa in 1950, there will be nine in 2050! This alone provides a glimpse of the challenges mankind will face in the decades ahead.

Changing Demographics

As immigration continues in an increasingly global-village society, the demographics of nations will continue to change, some dramatically. The Associated Press reported, “Minorities make up nearly half the children born in the U.S., part of a historic trend in which minorities are expected to become the U.S. majority over the next 40 years. “Census projections suggest America may become a minority-majority country by the middle of the century. For America’s children, the future is now,” said Kenneth Johnson, a sociology professor at the University of New Hampshire…”
Similarly, Europe faces significant demographic changes in the next four decades. The Telegraph reported in an article titled “Muslim Europe: the demographic time bomb transforming our continent”: “Britain and the rest of the European Union are ignoring a demographic time bomb: a recent rush into the EU by migrants, including millions of Muslims, will change the continent beyond recognition over the next two decades, and almost no policy-makers are talking about it.

Water Scarcity

Water is one of the most important resources on Earth. Across the globe, nations are preparing for water scarcity. India, one of the most populous countries in the world, is bracing itself for shortages as it expects its demand to double by 2050. IRC International Water and Sanitation Centre reports that almost every Arab country will face water shortages in the coming decades.

Sandia Lab News, a publication connected to the U.S. National Nuclear Security Administration, revealed, “By 2025 more than half the nations in the world will face freshwater stress or shortages and by 2050 as much as 75 percent of the world’s population could face freshwater scarcity.”

The article quoted Mike Hightower and Suzanne Pierce, two Sandia water experts, from a report they published in the journal Nature. “This growing international water crisis is forcing governments to rethink how they value and use and manage water, especially because economic development hinges on water availability,” they stated in the article. “Drinking water supplies, agriculture, energy production and generation, mining, and industry all require large quantities of water. In the future, these sectors will be competing for increasingly limited freshwater resources, making water supply availability a major economic driver in the 21st century.”

The National Geographic April 2010 article “Water Is Life,” stated: “Civilization has been similarly slow to give up on our myth of the Earth’s infinite generosity. Declining to look for evidence to the contrary, we just knew it was there. We pumped aquifers and diverted rivers, trusting the twin lucky stars of unrestrained human expansion and endless supply. Now water tables plummet in countries harboring half the world’s population. Rather grandly, we have overdrawn our accounts.”

The article also states: “With 83 million more people on earth each year, water demand will keep going up unless we change how we use it…Women in developing countries walk an average of 6 km to get water…In 15 years, 1.8 billion people will live in regions of severe water scarcity.”
Feeding 9 Billion People

Food production will be another mammoth challenge in 2050. Studies reveal that food production will need to increase by 70 percent to feed the over 9 billion people on Earth. While many planners are cautiously optimistic that this can be done, one must understand that today people are starving all over the world. More than one-sixth over 1 billion of the world population is hungry, World Food Programme (WFP) Executive Director Josette Sheeran announced in 2009. “Today is world food day,” Ms. Sheeran said, while holding an empty cup, “but for one out of six people on earth they are not even sure that they can fill this cup today. So I am going to rename this as the ‘no food day’ and call upon the world to remember that there are people who have nothing in the cup. One out of six people on earth will go to bed hungry tonight” (euronews).

In 2008, the crisis became apparent after the Food and Agriculture Organization (FAO) and WFP reported 100 million more people became undernourished the highest number in four decades.

According to the UN, Asia and the Pacific Region have the most starving people: 642 million. Sub-Saharan Africa is second with 265 million, followed by Latin America and the Caribbean islands with 53 million, then the Middle East and North Africa with 42 million. The number of starving people in developed countries make up the remaining 15 million.

Children appear to be the hardest hit by the catastrophe. Dr. Otive Igbuzor, head of International Campaigns for ActionAid International, reported that a child dies of malnutrition every six seconds. Dr. Igbuzor calls it a world emergency requiring immediate action from both developing and developed nations.

Ask: how many more will starve in the years beyond 2015?

Some of the other problems predicted for the near future include limited and diminishing arable land, deforestation, urbanization, disappearing family farms, degradation of land and water, irrigation problems, waste, the extinction of certain types of crops, the increased intensity and frequency of severe weather (which causes flooding and seasonal loss of crops), and changes in climate. At the same time, 1.6 acres of rainforest often called the “lungs of the world” as they produce so much oxygen are disappearing through logging every second. Almost half of the Amazon rainforest will be gone by 2050!

Other Problems

What about these fundamental questions: What if another world war breaks out, as many in the survey previously referenced believe? What will happen if a rogue nation uses a nuclear weapon on a populous city? How many millions or tens of millions will be vaporized in an instant? How many lives will be cut short with modern weapons of war?
Intangibles

Now consider the intangibles which cannot be explained through statistics, facts or projections. How much suffering takes place each year? How many uncounted rapes occur daily? How many tears do human beings shed as a result of untold pain and anguish? What will be the cumulative effect of all of this misery by the year 2050?

Think. World events are creating a perfect storm of destruction. Newspaper headlines trumpet financial woes, increasing disease and starvation, worsening weather conditions, political upheaval and nations on the brink of war all worse than ever before. The ultimate question is: will any of this change by 2050? Looking at the path we are following, the answer is NO.

Although every kind of evil affects mankind, the hope offered to humanity is stunning beyond belief. I appreciate to prepare for the worst but hope and believe in the best!
Human needs:

Through mankind and its needs, a hierarchy model of fundamental human needs came up by Abraham Maslow in 1954. He as an important representative of humanistic and transpersonal psychology describes in his book “Motivation and Personality”, how a modern model should be constructed.

The models in 1954 consist of five levels. As the base level the “Physiological Needs” takes place, then the “Safety Needs”, “Love & Belonging”, “Esteem” and on the top the “Self Actualization” as a need. As time goes, in another publication in 1970, he changed small details under the specified levels and extended the previously described “Esteem” to “Self-Esteem” which change is so interesting. In a decade, by actual changing trends a more substantive structure was created. I assume it is partly in context with the well-known “The World is Yours” — slogan, which became as a prestige symbol of the late 20th century.

It is hard or even impossible to describe what is right and what is wrong. Only what we can describe is what makes advantages or disadvantages for a certain target. Did this change in the hierarchy model result in benefits for mankind, or not? I think yes, maybe for some individuals for a few decades. But not for the whole humanity, not even for other fellow species and neither for the Planet.

Figure No.: 14 - Visions of human needs, ‘a’.
In the 70’s John Lennon’s opinion was different, because he assumed that the Human needs can be described only with the need of “Love.”

Manfred Max-Neef, Antonio Elizalde, & Martin Hopenhayn “Human Scale Development: “an Option for the future”

<table>
<thead>
<tr>
<th>NEEDS</th>
<th>BEING (qualities)</th>
<th>HAVING (things)</th>
<th>DOING (actions)</th>
<th>INTERACTING (settings)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREEDOM</td>
<td>autonomy, passion, self-esteem, open mindedness</td>
<td>equal rights</td>
<td>dissent, choose, run risks, develop awareness</td>
<td>anywhere</td>
</tr>
<tr>
<td>IDENTITY</td>
<td>sense of belonging, self-esteem, consistency</td>
<td>language, religions, work, customs, values, norms</td>
<td>get know oneself, grow, commit oneself</td>
<td>places one belongs to everyday settings</td>
</tr>
<tr>
<td>CREATION</td>
<td>imagination, boldness, inventiveness, curiosity</td>
<td>abilities, skills, work, techniques</td>
<td>invent, build, design, work, compose, interpret</td>
<td>spaces for expression, workshops, audiences</td>
</tr>
<tr>
<td>LEISURE</td>
<td>imagination, tranquility, spontaneity</td>
<td>games, parties, peace of mind</td>
<td>day-dream, remember, relax, have fun</td>
<td>landscapes, intimate spaces, places to be alone</td>
</tr>
<tr>
<td>PARTICIPATION</td>
<td>receptiveness, dedication, sense of humour</td>
<td>responsibilities, duties, work, rights</td>
<td>cooperate, dissent, express opinions</td>
<td>associations, parties, churches, neighbourhoods</td>
</tr>
<tr>
<td>UNDERSTANDING</td>
<td>critical capacity, curiosity, intuition</td>
<td>literature, teachers, policies educational</td>
<td>analyse, study, meditate, investigate</td>
<td>schools, families, universities, communities</td>
</tr>
<tr>
<td>AFFECTION</td>
<td>respect, sense of humour, generosity, sensuality</td>
<td>friendship, family, relationships with nature</td>
<td>share, take care of make love, express emotions</td>
<td>privacy, intimate spaces of togetherness</td>
</tr>
<tr>
<td>PROTECTION</td>
<td>care, adaptability, autonomy</td>
<td>social security, health systems, work</td>
<td>co-operate, plan, take care of help</td>
<td>social environment, dwelling</td>
</tr>
<tr>
<td>SUBSISTENCE</td>
<td>physical and mental health</td>
<td>food, shelter, work</td>
<td>feed, clothe, rest, work</td>
<td>living environment, social setting</td>
</tr>
</tbody>
</table>

In 1986 Manfred Max-Neef classified the fundamental human needs from subsistence to freedom, categorized and formed into a 36 cell matrix.

These two main modernism based structures stuck into nowadays societies’ system as well as in human behavior.
The quadrant structures as matrixes are everywhere around the western world. For example the way we learn the Periodic table of Elements.

![Periodic Table of Elements](http://en.wikipedia.org/wiki/File:Periodic_table.svg)

26 February 2007

There exist more creative and continuously illustrated descriptions thanks to enthusiastic researchers, but still the matrix is the accepted version.

![Periodic Spiral of Elements](http://en.wikipedia.org/wiki/File:Periodic_table.svg)

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Figure Nr.: 17 - the well known periodic table of elements.

Figure Nr.: 18 - An unknown periodic spiral of elements.
**Project result and process**

Let’s have a look to the big cities from a satellite view port. How does it look like, while it’s expanding through roads like cobwebs without borders.

*Figure Nr.: 19 - Eurasia, a regular night from satellite view*

The City of GALLESBURG, Knox Country, Illinois, USA

*Figure Nr.: 20 - Gallesburg, a regular day from satellite view.*
I suppose that the layout of a modern city looks like a the shape of a cancer cell.

I assume that the big cities looks like malicious tumors on Earth.
Assumption

WE WERE SO WRONG IN THE PAST 200 YEARS,
THERE IS NO ULTIMATE SOLUTION,
SITUATIONS ARE ALWAYS CHANGING!

THERE ARE EXISTING THINGS WHAT A HUMAN BEING
CAN’T PUT INTO A “BOX”, OR SIGNIFICATE AS A NUMBER!

BIOCAPACITY - ECOLOGICAL FOOTPRINT
what we have left - what we had left

What are the previous civilizations had left?

What does it mean to be PRIMITIVE?

As the final conclusion, I assume that:
As wise as a culture, as less that, what it will leaves after its disappears.
Adequate vision of Human Needs

Compare with other versions, as my vision shows that an adequate system has to be equal in every level.

The proposed three main and significant Branching fields to manifest a Homo sapiens sapiens. The mentioned fundamental needs are differ form a: Homo sapiens consum- ericus’-, or from a Homo sapiens economicus’- needs.

There is no hierarchy, everything staying in balance with the others.

Trinity, three is nothing which is completed within the others.
Do to the observed fields I swear to the Inuit’s Holistic Life long learning model as the optimal setting for living.

Inuit Holistic Lifelong Learning Model depicts the linkage between Inuit lifelong learning and community well-being, and can be used as a framework for measuring success in lifelong learning.

Inuit Holistic Lifelong Learning Model is a result of ongoing discussions among Inuit learning professionals, community practitioners, researchers and analysts. For a complete list of individuals and organizations that have contributed to the development of
this learning model, visit www.ccl-cca.ca. Inuit Holistic Lifelong Learning Model uses a stylistic graphic of an Inuit blanket toss (a game often played at Inuit celebrations) and a circular path (the “Journey of Lifelong Learning”) to portray the Inuk’s learning journey and its connection to community well-being.

Lifelong learning for Inuit is grounded in traditional “Inuit Values and Beliefs,” as articulated in Inuit Qaujimajatuqangit (IQ). To illustrate the strength of IQ, the model depicts 38 family and community members, including ancestors, “holding up” a learning blanket, with each figure representing an IQ value and belief. Inclusion of ancestors represents the sacred Inuit tradition of “naming” a practice which fosters Inuk identity, kinship relations, and the transmission of intergenerational knowledge.

Within the learning blanket are the “Sources and Domains of Knowledge” culture, people, and sila (life force or essential energy) as well as their sub-domains (languages, traditions, family, community, Elders, land, and the environment). Inuk’s lifelong learning journey is ongoing and he/she progresses through each life stage infant and child, youth, young adult, adult, and elder and is presented with a range of learning opportunities.

During each learning journey where he or she can experience learning in both informal settings, such as in the home or on the land, or in formal settings, such as in the classroom or in the community. Inuk is also exposed to both Indigenous and Western knowledge and learning practices, as depicted by the two colors of stitching along the rim of the blanket. Inuk emerges from each learning opportunity with a deeper awareness of Inuit culture, people and sila. In turn, the Inuk contributes his or her newly acquired skills and knowledge to the community, thereby contributing to the determinants of “Community Well-being” (identified as physical well-being, economic well-being, social well-being and environmental well-being), and returns to the learning path to continue the lifelong journey.
Basic statements

As an adequate living space; the home has to be permanent as a base that placed on a location. Which habitation is national and also it is private. It works as a dwelling and allows opportunity for peripatetic, nomadic and for agrarian living. It has to be natural and sacred which contains a message that is conjunctive as a source of eternal life. The home which is appropriate for ethical and continuous life, that comprehensible familiar and offers protection. Framework that is transformable as a tool which is an ergonomically correct construction. It is light and mobile, therefore it has to be stable, adjustable, expandable but also reputable, repeatable, storable, operable and durable as an indispensable element of the safe living.

Figure Nr.: 25 - Visualization of the supposed require fields around the concept.
The eight main features of the “SPROUT“ as the tactile outcome of PLAN „B“

- FRAMEWORK AS A SKELETON

- LOW FOOTPRINTED CONSTRUCTION BY RENEWABLE NATURAL MATERIALS
  (wood, leather)

- FRAMEWORK WHICH HAS TO BE SUPPLEMENTED TO ACCOMPLISH HOME,
  BY USING AVILABLE RESOURCES, IMMEDIATELY FROM
  THE STATED-DIRECT-ENVIRONMENT

- THE SKELETON HAS TO BUILD BY ANYONE, WITHOUT ANY DEVICES, ONLY BY
  USING INHERITED TRADITIONAL TOOLS

- THE EXTENDED SKELETON IS ABLE TO SATISFY THE ACTUAL BASIC NEEDS

- THE SKELETON ALSO FORCING THE USER (AS A REMINDER), TO KEEP IN
  MIND TO SATISFY BOTH THREE FIELDS OF HUMAN NEEDS IN AN EQUAL LEVEL.
  (AS THE GOLDEN MIDDLE WAY)

- KNOWLEDGE, VALUES and BELIEFS are CODED INTO THE STRUCTURE)

- FOUR GENERATIONAL MANUFACTURING, from PLANTING to TREATMENTING...
  and to FINISHING
Figure Nr.: 26 - Sketches, designing the core ‘a’.
Figure Nr.: 27 - Skatches, designing the core ‘b’.
Modelling the Core and Designing the Sprout, skatches 3/10

Figure Nr.: 28 - Skatches, designing the core ‘c’.
Figure Nr.: 29 - Sketches, designing the core ‘d’.

1. Assume the center has to be the same!
2. Has to be in the same place, exactly in the same point.
3. Right proportion?
4. Right way to measure.
Modelling the Core and Designing the Sprout, sketches 5/10

Figure Nr.: 30 - Sketches, designing the shape of the Sprout 'a'.


Modelling the Core and Designing the Sprout, sketches 6/10

Figure Nr.: 31 - Sketches, designing the shape of the Sprout 'b'.
Modelling the Core and Designing the Sprout, skatches 7/10

Figure Nr.: 32 - Sketches, designing the structure of the Sprout 'a'.
Figure Nr.: 33 - Sketches, designing the structure of the Sprout 'b'.

Modelling the Core and Designing the Sprout, sketches 8/10
Modelling the Core and Designing the Sprout sketches 9/10

Figure Nr.: 34 - Sketches, designing the structure of the Sprout 'c'.
Figure Nr.: 35 - Sketches, designing the shape of the Sprout 'c'.
Message: mental source, the Sun

Figure Nr.: 36 - Visualization of the designed structure ‘a’, mental source.
Message: life circles, the Astrology

Figure Nr.: 37 - Visualization of the designed structure 'b', life circles.
Message: requirements, the Inuit’s Values & Belief

Figure Nr.: 38 - Visualization of the designed structure ‘c’, requirements.
Figure Nr.: 39 - Calculation of the overall structure.
Message: the overall reminder

Figure Nr.: 40 - Visualization of the designed structure ‘d’, the overall structure.
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Figure Nr.: 43 - Visualization of the designed structure 'b'.
Figure Nr.: 44 - Photo, making of the Core 'a'.

Figure Nr.: 45 - Photos, making of the Core 'b'.

Figure Nr.: 46 - Photo, making of the Core ‘c’.

Figure Nr.: 47 - Visualization, comparison of the Core and the Sprout.
The Sprout an adequate dwelling concept

*Figure Nr.: 48 - Visualization, design of the Sprout 'a', inner ring.*

*Figure Nr.: 49 - Visualization, design of the Sprout 'b', the completed, closed shape.*
The Sprout an adequate dwelling concept

Figure Nr: 50 - Visualization, design of the Sprout 'c', the completed, opened shape.

Figure Nr: 51 - Visualization, design of the Sprout 'c', the completed, opened shape with rised entrance.
The Sprout an adequate dwelling concept

Figure Nr.: 52 - Visualization, design of the Sprout 'b', approximated dimensions.
The Sprout an adequate dwelling concept

Figure Nr.: 53 - Visualization, designed parts of the Sprout ‘a’

Figure Nr.: 54 - Visualization, designed parts of the Sprout ‘b’
The Sprout an adequate dwelling concept

Figure Nr.: 55 - Visualization, designed parts of the Sprout 'c'

Figure Nr.: 56 - Visualization, designed parts of the Sprout 'd'
The Sprout an adequate dwelling concept

Figure Nr.: 57 - Visualization, designed parts of the Sprout ‘e’

Figure Nr.: 58 - Visualization, designed parts of the Sprout ‘f’
The Sprout an adequate dwelling concept

*Figure Nr.: 59 - Visualization, designed parts of the Sprout ‘g’*

*Figure Nr.: 60 - Visualization, designed parts of the Sprout ‘h’*
The Sprout an adequate dwelling concept

Figure Nr.: 61 - Visualization, designed parts of the Sprout 'i'

Figure Nr.: 62 - Visualization, designed parts of the Sprout 'j'
Reflection a. — design issue

I started to think about this field since the beginning of 2011. That was the year when my first thought came about the questions. I wanted to know the reason: Why in particular the centers of big cities became abandoned by a simple change of a trend or an economical twist? Why wasn’t the system prepared for alternative situations? What if something unaccounted for just happens, like a natural disaster, a flood or an earthquake for example? Why the system builders leave chances globally to let unpleasant things happens? Why they didn’t care about it? Or generally, is it possible to care about it? I noticed that it is really hard to say anything about it, even just to have an opinion. “To fix it or to work on it — seems like a challenge”… I said to myself then I continued to think more about it.

The field of “the Adequate”, what level is more than less, but less than more, what is simply enough. Enough, and satisfy sustainable life. How to achieve this level and how to keep ourselves on the golden middle way? Does “the Adequate” design exist? Is there any need for it? Or since we are humans: Will we ever be satisfied with “enough”.

The key design issue is to offer an optimal holistic home visualization for the future generation.

How should a home look like? What does it really need to contain? Is it only suppose to work on physical level? I mean an object is an object but could generate different feelings through the different senses. On physical, biological and psychological level can support, maintain, or just remind us for necessary or irrelevant values.

As the aim was to figure out a „space”, where members of our species as a family can live in respect, on an optimal balanced scene, I was planning to set the construction on an adequate stage. It means the biggest question was that what is adequate, if it is sufficient to satisfy a requirement need, but on what level. During the information-gathering phase I understood that no one is able to say what is wrong or right, the same with good and bad or with nice and ugly. This categorizing is only about comparison. We are all judging things compared with other things. It has to be evil if we talk about fine, other views everything would be simply okay in the same category. I was searching for the optimal space for a home as a reminder from a holistic perspective and which space also a guideline to the future but equally right at the time (so in the present) it is ready to function as a shelter and to include a reserved place for all the requirement ingredients to satisfy the human needs of the habitants. This stage: to keep the memory of the past, let the life goes at the present and be prepared to the future in all the three level was the main issue of the project. To keeping everything in mind what we can classify as neces-
sary but not as more than enough. This is the core that is generating the questions by itself.
This concept is my proposal from a certain perspective. Since no one knows for sure what life will be in the future - me neither, based on my studies I am also just suggesting. I suggest being flexible and prepared for everything, maintaining all the knowledge what we have left and practice it. Based on this trinity which is already on a trinity, depending of different nations, traditions and beliefs a holistic healthy living space concept generating plenty amount of questions when there are diverse needs to satisfy.

The concept is adequate, or barely enough if we compare with the 20th century’s “modern” society. In other perspective it is equal and wealthy; compare with the ancient times “hunter and gatherer” or “agricultural” society.

Reflection b. — relevance

As mentioned, for the relevance of my project I first have to separate the main branches. It is a living space concept, not the ultimate one, but it is an adequate one. One of the many possibilities. One which breaks with nowadays’ system. It is a concept prepared and preparing for the future, for a new start, for the resumption, after a radical change of a worldwide disaster. The primary end result of the thesis is the structural setting of a long lasting living space. It looks like a draft plan, like a minimized blueprint without concrete measurements, just proportions.

From the perspective of nowadays’ consumers it looks interesting, but compared with the regular homes it is not satisfying. It is not designed to become a mass product, and not even just to become a seasonal product. It can be called a product but it isn’t meant to be just that. The production of the construction wouldn’t be useable within an economical perspective.

Since the concept designed for agricultural, nomadic and hunter and gatherer society it can not be measured or categorized compared with a modern technology based society at the beginning of the 21st century.

Would the concept or the tactile outcome be interesting for the producers, would any company show interest in the object? Based on the studies of the modern world, my answer would be; no. No because it wouldn’t result in estate profit.

From another perspective in another situation; unquestionably the manufacturing of the object would result in benefits, but only after at least two or three generations. Which kind of holistic profit wouldn’t fit into our “live for today” based expectations.

Until one generation grew up under this vision by manufacturing and using the object they can’t see the beneficial meaning of the structure.
Since the Great Acceleration what we date to 1950, our lifestyle completely changed. People moved into bigger and bigger cities, seeking for possibilities to earn more money. I as a designer can accept this point of view; of course we need more and more money for sure if we move to a more “civilized” place. In cities what do we do? We are working to earn money to pay for our ingredients because we want to keep ourselves alive, but thanks for the man made environment and workplaces, in parallel with our extremely working hours we have to do some sports to maintain our health. In villages what do we do? We are working for our ingredients and thanks to the natural environment by producing our own food and setting our homes requirements we don’t have to spend extra time to do sports, because our body’s health maintained during the work. Opposed each habitant’s investments at the urban and the rural environment, we will see that if both two lifestyle is about keeping ourselves alive on a healthy stage, then by living in cities we just wasting energy and resources by making things more complex while the rural life ends with the same result with zero waste (because naturally everything has its place) and less stress.

If it is that simple then why in the past fifty years we who had the chance at the young age are voted to move into cities compare with villages? Why? Because it shows more shine for the eye and gives more joy and results in superficial comfort. For what price? The price of our wealth is coded into graphs by scientific researches.

Based on this line supported by my observations I propose that the life in the cities never will result sustainable life until we amass everything vertically. For example if we bury a human dose of excrement at one place into the ground, it will disappear by few days. But if we do the same at the same place with a thousand of same excrement the Earth cant absolve it fast, it will stay there for a while and it will smell. If we are assembling everything into the same spot, after some time it will smell. It means some inconvenient side effect will rise. The same if we store people vertically: by losing the connection with earth, a problem which looks incomprehensible will come out.

The need for changing lifestyle is on everybody’s lips, who in that side of the planet where this people making others ingredients by the name of surviving, while on the other side the people getting this stuff without any work by the name of enjoying.

The distance between the two extremes is to huge, the stage of living is pretty much far from the adequate both from two side. There are much or less but not adequate. The subsistence are different, joy and comfort on one side facing the need for survival on the other.

The concept is an offering for a balanced future. I’m not saying that this is the ultimate
way how and where should we live, no it is a vision for a possible guideline. All parts of the design are planned with consciousness to give a draft for future generations. It is not designed into consumer society, it is not only for developed or for developing countries. It is designed for everyone. There is no specific target group for my concept. As species on Earth we are living in different places. According to climate our needs are differ, but the basics are the same independently of environmental conditions.

Reflection c. — societal and ethical / technical and ecological / economical

A lasting living space would be necessary for humans, but just that type which requirements won’t risk the Planet’s Ecosystem.

Obviously I'm aware of the modern techniques, new materials and future science, but the way how I imagine the world globally is different from it. Nowadays facts show a harsh picture how the planet will look in few decades. Now at the dawn of the twenty first century most of the contemporary designers, architects and artists imagine the future as a well automated, clean and modern place. A place where there are no problems, no diseases, everyone is healthy and good looking. Sounds nice! But not for everyone, because it will cost lives. Almost all of our fellow species are treated in some way. Of course since we know that humans exist on Earth there were always life forms that suffered from us. Just as Victor Papanek mentioned in his book, at the introduction of: “The Power of Design” “In most industrialized countries many people have come to expect a technological fix for every ecological dysfunction. Certainly my friend and colleagues Buckminster Fuller felt that future inventions would repair all that was wrong on earth, and pinned a good part of his philosophy on this belief. Experience tells me that in design, architecture or planning, new technological fixes usually come accompanied by dozens of unforeseen side effects. Some of these side effects can range from the merely disastrous to the catastrophic, and many of these proposed scenarios willfully ignore human scale.”

My design is not the one, the ultimate artifact which will change the society from what it is now. Or it won’t start to brainwash the people who step into the middle of the structure. No there is no magic in it. The structure and the whole formation of the framework would only help to maintain the knowledge, values and beliefs what we as homo sapiens should keep in mind and practice all the time.

The chosen knowledge what I collected selectively during the process is an average between all of cultural capitals what the different cultures have used to had in their past.
Since on earth we belong to one species, from social aspects there is no reason why my concept wouldn't be acceptable for the different cultures.

Nowadays the accelerated life in the western world is based on sustainable economical development. Which not equals with sustainable life. If we mention sustainability we should say exactly what is in focus to maintain. Is it the life what we have, or is it the way how we maintain it. I suppose today’s sustainability is more about keeping the development on a constant developing stage.

In this case, instead of sustain the life on Earth we just sustain the development by spending the planet’s non-renewable resources for fictive notions. If the earth wouldn’t have limits I would say yes we can make tryouts how to improve our methods, but since I know there are only depleting resources, as a designer I say; stop producing and stop designing new methods.

Lets say enough and only re-use what we have produced in the past 150 years. Continue the life by maintaining it.

If we should describe ourselves; except of us, all of the fellow species on Earth can subsist without uncountable complex tools or electrical devices. Naturally just by the direct stated-environment all kind of creatures can sustain their ingredients without leaving any size of ecological footprints.

The designed object named as “the Sprout”, imagined by renewable resources, and the design optimized to let the parts form by the actual habitant with simple, traditional hand tools. The manufacturing would take time. At least five active years, this period is only a short section from the whole four generational long process.

I assume that nowadays in the western world, one of our biggest problem is that there is no respect shown by younger generation for the elders. This is well-understandable because in the youth mind there is no reason why to respect. The line of respect & honor is already discontinued.

Designing a cultural and social reminder into the object was also the part of the holistic living space concept.

All phases of the manufacturing have a certain meaning: During the preparation, through the treatment and the creation. Since the actual habitant’s grandfather was the one who planted the seeds; the father was who cut down the trees; and the habitant is the one who stores the timber for his child who will start to make the construction right on time.

At the certain age a habitant has to go through every phase. By creating our children’s houses, preparing material for our grandchildren and planting the seeds for our grandchil-
dren's grandchild. Through at least a hundred years long care by forward-thinking; a skill of care and respect has to easily rise in the head of the actual habitant.

The way how the habitants behave has to change into a respectful stage. As the final assumption I believe that an adequate, holistic, lasting-living-space has to contain all the required codes about the values and beliefs just as it is lasted on the structures of the forgotten tribes' homes and artifacts.

Reflection d. — process, methods, learning results

During the process I've used the same method in the different phases. I was thinking all the time. I was holding the whole project with all of the components in my mind. I kept the parts together and I was always questioning them from each other's perspectives.

Built upon the received time schedule I upgraded it with my own tempo, by setting it completely for the available time. During the different phases, some problems just came out that made my project almost impossible to finish. In other case, the reason why the chosen field of research became huge is, that I decided to focus more detailed on lectured facts that will be also useful for all of my further projects. The basic suggestions that I used as the base of my concept became radical from a closer perspective. This observation, together with the unexpected and bothersome damages caused inconvenient delay against my precision.

Due to technological failures I learnt to trust less in modern technology than before. We in the western society who are still part of the system, all artificial humans there is no question about it. Because of loosing a virtual data I became stressed and started to disregard everything around my, especially people who wanted to help and care about be. Is this how it supposess to happen? Just because of a physically not existing information pack? Isn’t it strange? So, this is my answer to the reason that why I was needed to lose the 80% of my written thesis. Only because of my computer's memory capacity? (which is also an untouchable thing).

I was needed to get this question in mind, other views I would have been in time and I may never reach this hidden conclusion, which finally just supporting my assumption. The assumption that we as parts of the modern mechanical system just forming everything around us into a more complicated shape which takes more energy and resources than in an old traditional way. For example I should suppose to have only a tool, ink and a piece of paper to write on, as it was enough for hundreds of years. But no, today we need to have a computer and electricity because we using a different format as parts of the informational society where everything depends on the electricity.
As a wood-based furniture designer, or a craftsman I managed the manufacturing process as I imagined at the beginning, which finally helped to increase my skills in the chosen major.

While I summarizing my work now, I can easily say that in the future, for the same period of time, I will newer set a similar size of project. I learned that I have to keep and organize more extra time in the schedule just in case if something inconvenient situation happens. Next time I have to be prepared for everything, or just more focused, other views I can't come out with the imagined quality in the end of the project. Finally I have to thank all of my teachers, mostly to my supervisor, that gives me useful advices about my topic.
References


http://www.100people.org/statistics_100stats.php?section=statistics

Living Planet Report 1010, by WWF and GFN, by Jack Harich, 28 July 2011


United Nations, http://esa.un.org/unup/p2k0data.asp by Taylorluker, 18 August 2010

Tim De Chant, Data from Global Footprint Network, 2012.
