UNIVERSIDAD DE SONORA

## DIVISIÓN DE INGENIERÍA

## DEPARTAMENTO DE INGENIERIA INDUSTRIAL

# "Sustainable Development on a local scale: The investigation of the Economic component within Sustainable Communities".

### TRABAJO PROFESIONAL

### Que para obtener el Grado de
## ESPECIALIZACION EN DESARROLLO SUSTENTABLE

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# RESUMEN ESPAÑOL

Esta tesina nos brinda un análisis y una evaluación de la determinación del grado de la sustentabilidad económica dentro de una comunidad a escala local.

Los métodos de análisis incluyen la creación de una herramienta metodológica y un análisis de desarrollo sustentable, con respecto a identidades, características, condiciones específicas y el estilo de vida en la actualidad sin el estudio de la comunidad. Todos los datos y la preparación de estos datos pueden ser encontrados en el apéndice.

Las comprobaciones de los datos analizados muestran que el Desarrollo Sustentable y las medidas relacionadas son difíciles de poner en práctica. En particular, la comunidad ha declarado que recursos energéticos renovables y tecnologías así como una red de asistencia es necesaria para la creación de una comunidad sustentable.

Esta tesina encuentra que el grado de sustentabilidad económica es suficiente, lo cual es fabuloso porque es el comienzo de un proyecto. La motivación de los residentes es una base significativa; sin embargo la creación de un mejor ambiente y por lo tanto de un desarrollo sustentable empieza con la persona misma. Se necesita más tiempo para desarrollar una comunidad hacia una Sustentable con un alto grado de sustentabilidad.

Las recomendaciones dadas incluyen:

- La educación para la mejora y el incremento del conocimiento acerca de la materia y sobre sus indicadores;
- La guía externa y asistencia para mejorar e incrementar la motivación así como del desarrollo del proyecto;
- La comunicación externa y contribuciones para la asistencia para proveer estas medidas sustentables.

# ENGLISH ABSTRACT

This tesina provides an analysis and evaluation of the determination of the economic sustainability degree within a community on a local scale.

Methods of analysis include the creation of a methodological tool and analyses of Sustainable Development, in respect to identities, characteristics, specific conditions and the actual lifestyles within the studied community. All data and data preparations can be found in the appendices.

Findings of analyzed data show that Sustainable Development and related measurements is hard to put into practice. In particular, the community state that renewable energy resources & technologies and assistance is needed for the creation of a Sustainable Community.

The tesina finds the economical sustainability degree sufficient, which is great as it is the start of the project. The motivation of the residents is a significant basis; however the creation of a better environment and thus Sustainable Development begins with the person itself. More time is needed to develop the community into a Sustainable one with a higher sustainability degree.

Recommendations discussed include:

- Education for improving and increasing knowledge about the subject matters and measurements;
- External guidance and assistance for improving and increasing motivation and project management;
- External communication and contributions for assistance of providing sustainable measurements.

# TESINA PREFACE

This tesina was prepared to investigate the degree of economic sustainability within a community on a local scale – in order to contribute to the principies of Sustainable Development– in compliance with an interdisciplinary group-project. This interdisciplinary group-project was part of the curriculum of the specialization of 'Desarollo Sustentable'; which in this respect became cooperation between the University of Sonora in Hermosillo (Mexico), and the Delft University of Technology (Netherlands).

The aim of the research is described in the introduction, while the methodology, considering data collection, research process and preparing data analysis are explicated in Chapter 1. Readers who are interested in the theoretical framework of the research (Sustainable Community Building) are referred to Chapter 2. The results of the data collection and research process are discussed in Chapter 3. Before the conclusions and recommendations, an analysis is given in Chapter 4.

I would like to thank Dr. Luis Velazquez Contreras for guidance and feedback, supervising at the spot and at distance. Furthermore, I wish to thank Dr. Leo Baas and Dr.ir Gijsbert Korevaar for their assistance, support and ongoing feedback throughout the research, abroad in Mexico, and in the Netherlands. Their feedback was useful and constructive in the final fashioning and finishing of this tesina. Finally, I also would like to show our gratitude towards Myreya Rodríguez Amavizca, resident and member of the commission of the Casa Grande community, for providing valuable information during meetings.

Leiden, January 2010,

Laura Teunissen

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# INTRODUCTION

The current patterns of economic growth and resource consumption were not could not be maintained by the earth's carrying capacity. In the 1980´s the concept of Sustainable Development emerged as a popular solution to the problems which came along with the increasing resource depletion and economic growth. After its introduction, Sustainable Development urges to be brought closer to the people to create awareness of their current lifestyles and life patterns. To bring the concept as close as to create such awareness, the community level is as closest for the people to work at Sustainability together.

So far there have been few investigations about the subject. Not only the investigated analyses are few, furthermore the analyses are usually focused on modernized countries facing significant impacts of problems as climate change urbanization, economic growth and globalization. Although the world as a whole faces the same problems, the investigated areas are not comparable to the area of Mexico, let alone Hermosillo which is situated in a desert like area.

In this tesina the possibilities of Sustainable Development is investigated on a local scale, at a community level. This is of importance because Sustainable Development begins where people have identified and adopted the thoughts and statements of the creation of a greener existence, and is therefore easier to imply at a local scale. For the implementation of SD goals at a local scale like a neighborhood, the concept of Sustainable Community Building is created which can contribute to the improvement of environment in various important ways:

- Education through local knowledge and communication channels;
- Awareness of the existing local problems;
- Participation within SD through cooperation within environments;
- Creation of new communication channels;
- Social control of consumption patterns and lifestyles;
- Etc.

Sustainable Community Building is a concept where a balance is generated between the three components of Sustainable Development (Social, Ecological, Economical), on a micro scale to create a better and greener environment for all living beings. Through education of all different approaches and methods, awareness can be created on a local level where the changes and intervention contributing to SD are most intensely and immediately seen and felt.

## STRATEGIC STUDY-GOAL

The strategic study-goal is: Determining the degree of economic sustainability within a community on a local scale through the principles of Sustainable Development, respecting Identities, characteristics, specific conditions and the actual lifestyles within the community.

## SPECIFIC STUDY-GOAL

The specific study-goal is: Verifying the sustainability level of the community of 'Casa Grande', through various steps:

(1) Analyzing related literature, for the creation of basic knowledge of the topic;

(2) Adapting a Sustainable Community definition to create one which suites the situation of 'La Casa Grande' residential;

(3) Designing a methodological tool for analysis, through creation of a questionnaire associated to the case-study, defining of sustainable indicators connected to the strategic goal, and conducting the survey related to the found indicators.

(4) Analyzing all data outcomes of the conducted survey and results, for the formation of an overview to state research conclusions.

## RESEARCH SCOPE

The research took place in the city of Hermosillo, Sonora, Mexico, a city located in the municipality of the same name (INEGI, 2003[1]). The community of 'La Casa Grande' residential is located in the south of Hermosillo. The survey is conducted during the first half of 2009, specifically in Casa Grande residential development, located southwest of the city.

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[1] INEGI (2006) Instituto Nacional de Estadística y Geografía Informática: Anuario Estadístico Sonora.

## CONTENT DESCRIPTION

The tesina starts with the methodology chapter. Here the methodological approach, research questions, data collection, research preparation, economy segment research methods, questionnaire, sampling, implementation of research tools and data analysis are described.

The theoretical framework of chapter two is elaborated through definitions and visions of Sustainable Develoment, definitions of communities and Sustainable communities, explication of the economy segment in relation to Sustainable communities, and finally a chapter overview is given.

The research results can be found in chapter three, through the background of Casa Grande, the functioning of the questionnaire, and questionnaire appliance. Furthermore, it illustrates results of employment, family amount, income, professions contributing to sustainability, housekeeping-jobs & household maintenance, Sustainable Development and the Community, consumer patterns, and reduction of consumer patterns.

The research analysis can be found in chapter four, through the sections of the functioning of the questionnaire, questionnaire appliance, employment, family amount, income, professions contributing to sustainability, housekeeping-jobs & household maintenance, Sustainable Development and the Community, consumer patterns, and reduction of consumer patterns.

Conclusions are stated through an elaboration of the tesina content, conclusions of results and analyses, answers of sub-research questions and the conclusion of the main research question.

Recommendations are provided about education, external guidance and assistance, external communication and contribution.


Ali these elements form part of the building of a sustainable community through investigating the opportunities of Sustainable Development on a local level, by analyzing the segment of economy, and to see how people can contribute to Sustainable Development within their own lifestyles and within their own community.

# CHAPTER 1:        METHODOLOGY

In this chapter the case-study appliance is elaborated, which is the preparation of the research investigation. The chapter can be seen as two parts, of which the first part consists of giving direction to the study and investigation, and the second part complies of carrying out the study preparations. The methodological approach; the scope and the research questions; data collection; research preparation; and the research methods for the economy segment, consisting of the segment and indicator selection; all these sections illustrate the system boundaries of the study. The questionnaire; sampling; implementation of research tools; and the data analysis; all these sections describe the operation of the case-study investigation.

## 1.1        METHODOLOGICAL APPROACH

The investigation of the 'Casa Grande' residential consists of an exploratory study. Due to the fact that there is no prior research on the object of study it is required to explore and venture into uncharted territory. Therefore, taking tentative conclusions must be prevented, like choices about which aspects are relevant and which are irrelevant. Taking these measurements into account, the research-project was framed through the vision of Smith (2008), as is explicated in the theoretical framework. The research used Maureen Hart's definition of a sustainable community provided by The Sustainable Report[2], which states that:

> A sustainable community is one in which the economic, social and environmental systems that make up the community provide a healthy, productive, meaningful life for all community residents, present and future. Sustainable communities acknowledge that there are limits to the natural, social and built systems upon which we depend (Hart, 1999).

This definition includes factors of environment, economic and social development in a sustainable community building effort. Considering this definition, the use of this approach allows to examine the practices within the community of Casa Grande residential of Hermosillo. The investigation is done in order to measure the

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[2] Sustainable community research definition, *The Sustainable Report*, Available: http://www.sustreport.org/ [Accessed: 12 December 2009].

sustainability of this area, and consequently identify opportunities in the context of sustainability.

As the community of 'Casa Grande' has to maintain its reputation of modernity and good quality, inhabitants thus the community wanted to be involved with sustainability matters. Inspired with these concepts she turned to the university to set-up a project-study, which could investigate how and where the community can be sustainable.

For maintenance of the good reputation of the 'Casa Grande' community, the community could be involved in Sustainability matters. In cooperation with a study-group of Universidad de Sonora in Hermosillo (UNISON), consisting of 5 members; Adriana Rodríguez Cábo, Nelly Rojo, Rocio Perez Elizondo, Berenice Ochoa Nogales and myself, Laura Teunissen, the project-study has been set up to investigate how and where the community can be sustainable.

## 1.2    RESEARCH QUESTIONS

The research will focus on the community 'La Casa Grande' residential, which is directly defined as the system boundary. The community is located in the South of Hermosillo and will be investigated through the main research question;

> *What is the degree of economic sustainability within a community on a local scale through the principles of Sustainable Development, respecting identities, characteristics, specific conditions and the actual lifestyles within the community?*

To answer the research question the current state and the development of Sustainable Community Building will be examined. Furthermore, the current state and circumstances of the community will be examined by investigating the lifestyles of the community inhabitants.

With all found information the following research questions will be answered:

- Why do people want to be involved in a sustainable community?
- What are the main problems within the community?
- What is the identity of the participants?
- What are significant elements of the lifestyles of the participants?
- Which parts of these lifestyles need to be adapted?
- How to adapt these lifestyles?
- Where to start adapting lifestyles?

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- What can be other necessary tools for the creation of a sustainable community?
- What future technical developments in Sustainable communities are projected?

The study-project of La Casa Grande residential will be investigated through these sub-research questions, to find an answer to the main research question.

## 1.3 DATA COLLECTION

For the creation of adequate fundamental knowledge about the concept, careful literary research is conducted. With this knowledge in mind the questionnaires could be designed as research tools.

To ensure the quality of material selected preferred was: information from refereed journals, books and secondary-refereed journals. Other obtained knowledge took place through discussions between (Mexican) authors, conferences, documents and reports from nongovernmental organizations and agencies. Internet sources and accesses were provided through the databases of the Institutional Library System at the University of Sonora and the (article) databases, catalogues, E-books, E-journals of the University of Technology in Delft, the Netherlands.

The results have been collected through conducted interviews with the inhabitants of the community (Community Casa Grande). These interviews were held at the community itself in order to conduct the interviews under usual conditions. The questions were created through indicators related through literature in respect to sustainability and sustainable development.

## 1.4 RESEARCH PREPARATION

After intensive literature analysis about the Sustainable Community concept, important segments of study were identified (see 'References'). These segments were selected after being considered applicable to the subject matter. Indicators per segment were identified in the same way and serve as a basis for the research investigation. This procedure is described in the paragraphs below.

### 1.4.1     SEGMENT IDENTIFICATION

After reviewing the found literature the concept of Sustainable Community Building needs to be suitable and applicable for the case-study. In the literature a concept was found to be applicable to serve as an example and consisted of the segments illustrated in figure 1. The figure serves as an example of Sustainable segments for community building.



Fig. 1: 'Sustainable Communities Plan' English Government 2003 (Smith 2008, pp. 10).

### 1.4.2     SEGMENT SELECTION

Subsequent to consideration of all elements of the concept of Sustainable Community, the case of 'La Casa Grande' residential will be investigated through 5 of the 8 segments provided by the example case. These segments need to be converted into an applicable form for the case of 'La Casa Grande'. Therefore the segments need to be adapted by the characteristics, identify and current conditions within the community. The adjustments are made through the following procedures:

    (a) Government segment Elimination: The reason for this is that within the country and in the State of Sonora there is no governmental support for the creation of sustainable communities. This is in contrast with the Federal Government planning and execution. More developed countries allocate resources for these communities.

    (b) Unite Equity and Social: The reason for categorize the segment of Equity under the segment of Social is because all involved participants within the research life under the same circumstances and are equal to each other, therefore all involved participants have the same opportunities.

    (c) Division of Service segment: The Service segment is subdivided within the segments of Environment and Housing as it is considered inherent to these parts.

A new concept suitable and applicable to the case of 'La Casa Grande' residential is created with the selected 5 segments illustrated in figure 2 below.

Sustainable Community Building
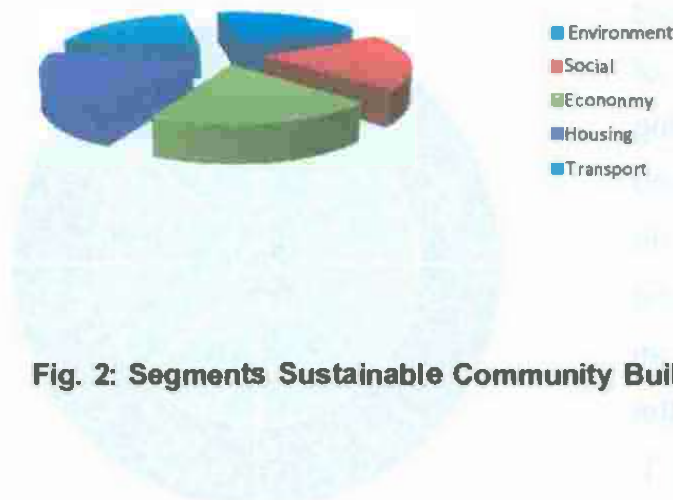


**Fig. 2: Segments Sustainable Community Building 'Casa Grande' case-study**

### 1.4.3 INDICATOR IDENTIFICATION

Within the theoretical framework indicators were found to develop and evaluate sustainable communities. The research is made from databases provided by countries which create and maintain such communities. Indicators chosen are the ones which suit the Casa Grande case-study and the geographical situation of Hermosillo (Sonora, Mexico). The indicator research is followed by an evaluation by a frequency matrix.

## 1.5 ECONOMY SEGMENT RESEARCH METHODS

After a literature analysis about the Sustainable Community concept, the segments applicable to the study were identified and examined. The selections of segments applied to the community consider five of the eight example segments, as is shown in the previous chapter. This selection was made to be suitable to the characteristics, identity and current conditions within the community. The proposed used segments for the investigation of sustainable community building of the Casa Grande residential consist of: transportation, economy, environment, social and housing. In this tesina the aspects of the Economy segment are investigated through related segment indicators.

### 1.5.1 SELECTING THE ECONOMY SEGMENT

The economy segment has been chosen and selected through the importance of this aspect within Sustainable Development and therefore Sustainable Community Building. This is illustrated in the Theoretical Framework of chapter 2, where the Economy is explicated by the UN as an illustration for defining Sustainable Development.

The goal of the economy segment is "To have a fair overview about the sustainable development activities related to production aspects, and a fair and balanced distribution of goods and services in the Casa Grande community"[3.] The goal for the research and the community is: "Determining the degree of economic sustainability within a community on a local scale through the principles of Sustainable Development, respecting identities, characteristics, specific conditions and the actual lifestyles within the community". The reason to choose this goal as basis for the research is that life-styles and consumption patterns will illustrate where opportunities of sustainable development could be realized.

### 1.5.2 SELECTING ECONOMY INDICATORS

Economy Indicators were identified through the literary analysis for developing and evaluating sustainable communities. Through database research provided by governments of countries where such communities are created and maintained, the economy indicators were identified and evaluated through a frequency matrix.

Indicators arose from the production of a matrix, where the indicators were counted by occurrence within the consulted literature (see Appendix I). Indicators were investigated per segment among 20 authors. The indicators with the most occurrences were to be selected to be part of the research. In this tesina the segment Economy is studied. Used indicators for Economy among the investigated literature consisted of:

I.    Re-use, recycle, re-purpose vs. consume and discard (zero waste)   (16).

II.    Percentage of people that have adopted sustainable development goals   (15).

III.    Strengthening local economies   (13).

IV.    Percentage of companies developing new products or services   (12).

V.    Total percentage of Professional, technical & managerial occupations   (12).

VI.    Occupational distribution of women and minorities   (11).

VII.    Income per household   (11).

[3] Investing Glossary, *InvestorWords.com*, Available: http://www.investorwords.com [accessed 7 December 2009]

## 1.6    QUESTIONNAIRE

The investigation of La Casa Grande mainly consists of obtained data through research questionnaires, of which the economy segment consisted of 38 questions in the final and utilized questionnaire. In this section the preparation of these questionnaires is elaborated, followed by how these questionnaires are used among the residents to obtain the data for the investigation.

### 1.6.1    QUESTIONNAIRE PREPARATION

With the selected indicators appropriate questions can be elaborated. These questions facilitate the collection of information through the created questionnaire-sample. The questions are analyzed and corrected for appropriate and suitable formed research instruments. Finally the questionnaire for families of the community participating within the study was designed.

### 1.6.2    QUESTIONNAIRE UTILIZATION

For the creation of a proper questionnaire, literature was searched and investigated. After this literature review, the investigation continued through the construction of research tools. The starting point was a survey designed through relevant indicators for the study: environmental, economic, social, housing and transportation. As was stated in previous sections, indicators arose from a matrix of which indicators with the most occurrences were used as a guide for the preparation of the questionnaire (Appendix II: Economy indicators).

The strategy was to conduct two pilot tests, of which the first test sample was taken by 10 families by interviewing     one member of each family. The second pilot test was taken through a sample of 5 families by usage of the previous method. The aim of these pilots was to make the interviews more understandable, appropriate, and workable to the context of the research and to the participating families of the community within Hermosillo.

After the 2 pilot tryouts, all surveys were applied and answered by the residents and participating families of the community. It is important to note that for purposes of this investigation that the interviewed families consist of people living in the community, potential residents whose homes are under construction, people of the American Consulate who live there temporarily in place, and not land owners, were interviewed.

## 1.7 SAMPLING

The reason for the investigation of opportunities for the creation of 'La Casa Grande' towards a Sustainable community is because of the interest and motivation of the Committee of the colony. Their purpose was purely to have their community to become a Sustainable Community, and therefore to measure their level of sustainability within their community itself, measured through questionnaires. Selection of participating respondents to answer the questionnaire has been performed through a simple random sampling among family residents. These families were selected through the following formula:

$$n = \frac{Z^2 pq\ N}{NE^2 + Z^2 pq}$$

**Formula equations where:**

$n$ : Sample size
$Z$ : Confidence level
$p$ : Positive variation
$q$ : Negative variation
$N$ : Population size

During the questionnaires the person who interviewed names the type of sampling, investigates the data, and states the results afterwards. By means of the study all people living in the community were selected. Therefore, people who were not taken into account consist of people who own land, have houses under construction or live there temporarily, and some members of the American consulate, which was already mentioned above. The inhabitants of the community were interviewed by appointment, in their homes, in a single session of 30 minutes.

The interviews were done by the previous equation of sampling. The exact number of interviewed families was 27, of the 34 families residing in the community. These people were located due to a list provided by the neighborhood committee of the community. Our sample has a 90% confidence level and a sampling error of 10%. In this manner, the formula became:

$n= \dfrac{2^2(0.95)(0.05)(34)}{34(0.04)^2 + 2^2(0.95)(0.05)}$

$n = 27$

**Formula equations:**

$n$ : 27 (Sample size)
$Z$ : 0.9 (Confidence level)
$pq$ : 0.25 (Positive and negative variation combined)
$N$ : 34 (Population size)

Field surveys were taken in the period May-June 2009, while respecting the proposed research protocol, based on relevant guidelines. After a short introduction and identification to perform the research as a student at the University of Sonora, the interview proceeded through an explanation to the committee of community residents about the purpose of the study. After obtaining verbal approval through the committee the research got permission to proceed with the application of questionnaires.

All families were visited twice at least. The first visit had the purpose to make contact with the family and the family members to explain and discuss the project and to request an appointment for the application of the questionnaire. The second visit was to perform the questionnaire, with the purpose to confirm and verify the quality of the collected information, among other issues covered by the surveys. The technique of personal and face-to-face interaction was recommended, because this research includes situations where there is prior information about our object of study and is not extensive.

## 1.8  IMPLEMENTATION OF RESEARCH TOOLS

The survey is used as instrument to collect data in the research field described below. The questionnaire is created for the families of the community, and was administered to the father or mother of the family of each household. The questionnaire consists of 109 questions and is divided into five categories: economy, environment, housing, transport and social (Appendices III and IV).

The purpose of the research was to observe the community as close as possible; therefore work for the research was done at location. During the visits, we could verify the collected information with the above instruments. Through observation and close conversation each of the families who live in this community were specified and characterized. Specific perceptions, such as knowledge of the subject, style and quality of life and the same disposition towards the project, could be identified.

## 1.9  DATA ANALYSIS

The participants were interviewed through surveys based on the questionnaire. These surveys were reviewed in the field in order to verify their accuracy and they were well complemented. The data were processed in the database in Microsoft Office Excel 2007 and analyzed through SPSS.

# CHAPTER 2:     THEORETICAL FRAMEWORK

The 'Sustainable Community' and the 'Sustainable Community Building' is an uncommon and new concept. This can be seen in the small amount of literature and the fact that the authors all have their own definitions and do not refer to other literature or authors (Roseland, 2000; Smith, 2008; Graedel & Allenby, 1995, Bridger & Luloff, 1999). Therefore the article of Bridger & Luloff seems to give the most comprehensive overview, because he summarizes articles and visions of other authors in ali in one article. His article will therefore be used as a basis for this part of the tesina.

To describe its definitions and its characteristics, It is of importance to explain the subject in separate parts. The concept of 'Sustainable Community Building' can be elaborated within three stages. Bridger & Luloff describe these stages within his article, which has been used as an example and guideline for the order of explanation within this part of the tesina. The first stage is to describe the term 'sustainable'. Therefore definitions of 'sustainable development' are introduced. The second stage is to expand the first definition with the second part. The combination offers knowledge about 'sustainable communities'. The final stage is to elaborate the definition 'sustainable community building' as a whole. Through these stages the concept is explained step by step.

This tesina investigates the economy segment of Sustainable Community Building. Thorefore, a definition of economy, oconomy indicators, economy withln a human settlement model and economy in relation to a Sustainable community, are part of this Theoretical Framework which serves as a basis for the further investigation and analysis of the study.

## 2.1  SUSTAINABLE DEVELOPMENT

Thirty years ago environmental problems were considered by-products of economic growth and social progress (Roseland, 2000; Smith, 2008; Graedel & Allenby, 1995). Further applications of growth and progress would solve these problems, because increasing wealth creates the resources and improved technology the means to solve them. Nowadays it is acknowledged and accepted that protecting the environment requires fundamental change in the direction of economic progress and the Institutions of government policy. The answers and solutions are not simply solved by technology.

The concept of sustainable development has been the result of environmental debates about the conflict between environmental protection and economic growth of the 1970s and early 1980s (Roseland, 2000, pp. 76). In 1987 the report 'Our Common Future' of the World Commission on Environment and Development (WCED, also known as the Brundtland Commission) brought the concept of "sustainable development" into the world. Roseland notes that "The term sustainable development dates back at least as far as the World Conservation Strategy (IUCN, 1980), and its conceptual forerunners linking environment and development (e.g. eco-development) have received international attention at least since the United Nations Conference on the Human Environment in 1972" (2000, pp. 76).

### 2.1.1 DEFINING AND VISIONS OF SUSTAINABLE DEVELOPMENT

Definitions of Sustainable Development consist of many sub-definitions and creative authors. All definitions refer basically to the "economic development that meets the needs of all without leaving future generations with fewer natural resources than those we enjoy today".[4]

As with this previous explanation, a definition of 'sustainability' and or 'sustainable development', it is the case that much of the literature consulted refers to the definition provided in 1987 by the Brundtland Commission (the World Commission on Environment and Development), who define sustainability as:

> "*Meeting the needs of the present without compromising the ability of future generations to meet their own needs*". (Graedel & Allenby, 1995; Allenby, 1999; Bridger & Luloff, 1999; Roseland, 2000; Leal Filho, 2002).

However, the definition of sustainable can be subdivided in two views. The first vision of sustainable development can be considered as a constrained economic growth approach. Bridger & Luloff describe that constrained growth involves two separate stages: (1) contractual arrangements based on ecological criteria must be established; (2) the standard utilitarian objective of maximizing economic returns is pursued (Bridger & Luloff, 1999, pp. 378). Standard approaches of economic development are similar to this definition. However, although ecological considerations are added, growth is still the primary objective. Critics of the constrained growth approach argue

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4 Definition Sustainable Development, *People and planet*, Available: www.peopleandplanet.net/section.php [Accessed: 3 March 2009].

that equating sustainable development with sustainable growth is contradictory and misleading, because 'sustaining the growth in material consumption' contradicts the now general recognition that 'ultimate limits' exist and a short-term and localized notion goes against the long-term global perspective of SD (Bridger & Luloff, 1999, pp. 378).

The second vision of sustainable development can be considered as a resource maintenance approach. In this vision "efforts are focused on minimizing our impact on the environment through limiting our use of natural resources while simultaneously meeting the material needs of people" (Bridger & Luloff, 1999, pp. 379).

Bridger and Luloff state that the resource maintenance approach requires a fundamental rethinking of our relationship to the environment, consumption patterns, and standards of living (1999, pp. 379). Here, Bridger refers to Yanarella and Levine (1992, 762) because they argue that development should be understood explicitly in terms of ecological sustainability: "Complex ecosystems (e.g. tropical rainforests) achieve eco-sustainability and balance through shifts of energy system flows, away from production, and towards maintenance of the system itself. By contrast, human settlements typically seek to stall such ecosystems in early stages of ecological succession, where the yield of products is high, but where the stabilizing elements of organic matter and biomass fail to accumulate" (Bridger & Luloff, 1999, pp. 379).

Naess summarizes these approaches and states that the most important changes consist of: (1) an appreciation of the intrinsic value of the natural environment and all life forms; (2) satisfaction of vital needs rather than desires; (3) anti-consumerism and minimization of personal property; and (4) the use of simple and appropriate technology whenever possible (Naess, 1995). The resource maintenance vision is rooted in the criticisms of the constrained growth definition and emphasizes the maintenance of existing and future resources rather than continued growth.

### 2.1.2 APPROACHES FOR SUSTAINABLE DEVELOPMENT

The visions about constrained economic growth and resource maintenance have many approaches which are opposite of one another. However, according to Batie the both visions have besides their opposite opinions, also common subjects on sustainable development. These themes consist of the following characteristics (Batie, 1989, pp. 1085).

- A perception that the biosphere imposes limits on economic growth;
- An expressed lack of faith in science or technology as the primary means by which human betterment can be achieved,

- Extreme aversion to environmental risks,
- Support for redistributive justice and egalitarian ethics and policies,
- Concern over population growth and faith in the wisdom of human capital development, and;
- Survival of species and protection of the environment and minority cultures are goals that are at least as important as economic growth.

This view resembles the constrained growth approach. However, this view about sustainable development is such comprehensive and therefore large enough to include all versions of the various definitions of sustainable development.

Leal Filho has a different vision about sustainable development (Leal Filho, 2002, pp. 15-16). According to him, the sustainable development is a very long progress and that it is still a long way towards achieving the goals set in Agenda 21 (UN 1992). There are several causes to this slow progress. Leal Filho describes several reasons, for example: the broadness of the challenges of sustainability; the posed tasks are wide in scope, complex in their spectrum and expensive in terms of implementation; require a great deal of skills and knowledge; demand inter-sectoral co-operation between actors as government agencies, industry, NGO's and academia. According to Velazquez, Munguia, and Sanchez, there is a special task for students within Sustainability and the role and cooperation of the University for a better performance and functioning of the society (2005). Of course there are more reasons to be added here. For example, the time people need to adapt their customs and habits to a more sustainable way of living; the more knowledge people obtain, the more problems are acknowledged; and, time and the world is continuous, therefore there damages of economic growth, urbanization, globalization and climate change are still present and inevitable. With all these causes and problems, Leal Filho states that there is a therefore a need to see and deal with sustainability as (Leal Filho, 2002, pp. 15-16):

a) A goal which individuals (sustainable living) and nations (sustainable development) should pursue in which both life-styles (for individuals) and policies (for governments) play a key role;

b) A process which involves not only environmental, but also economic, social and political aspects, which combined may lead to improved living standards;

c) A way of thinking which relates to considerations on aspects of equality, ethics and gender, not to mention the issue of development and aid and how they relate to better living conditions;

d) A tool for environmental protection and for the improvement of life quality;

An example of an answer to deal with these four propositions can be found in the technological transformation aspect of sustainability, which was described by the Economic Commission for Europe in 1992 as a five stage process (Graedel & Allenby, 1995, pp.65).

Stage 1)  Ignorance: The environmental problems are unknown.

Stage 2)  Lack of interest: The environmental problems are known, but people do not care about them.

Stage 3)  Reliance on technology: People hope that new technology will solve all environmental problems.

Stage 4)  Toward Sustainability: converting present-day society into the direction of more environmentally adapted to developments.

Stage 5)  Absolute sustainability: The ecological cycle has been brought full circle.

Graedel and Allenby state that no society or community has reached the final stage, and possibly it will never be reached. However, they also state that many groups are progressing through these stages: "Especially as those efforts are encouraged by governmental actions, their progress will continue" (Graedel, 1999: 65). The achieving of Sustainable Development requires a balance between three dimensions:

- **Economical**
(Towards sustainable patterns of production and consumption)

- **Environmental**
(Towards maintenance and the restoration of healthy ecosystems)

- **Social**
(Towards poverty eradication and sustainable livelihoods)
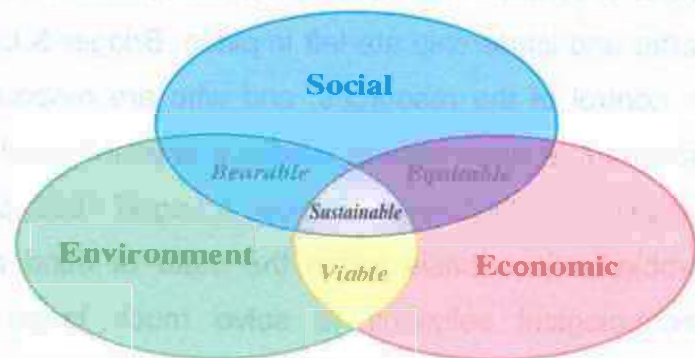


**Fig. 3: UN's Sustainable Development**

Figure 3[5] gives a description of the UN's hopes concerning sustainable development. In this research the economic dimension is referred to as technological, because the economical aspects within this research are part of the social dimension.

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5  UN Sustainability Graph, *Supply Chain Management*, Available: http://at-scm.com [Accessed 12 December 2009].

## 2.2 SUSTAINABLE COMMUNITIES

The concept of Sustainable Development on a more local scale can be found in sustainable communities. The shift from SD to Sustainable Communities needs some attention, because it is of importance to understand the influence of such a local scale. However, this local scale needs to be defined as well. The 'community' can be interpreted in a great variety of manners and requires an explanation. With this knowledge in mind, the definitions of a 'Sustainable Community' can be illustrated.

### 2.2.1 FROM GLOBAL TO LOCAL SUSTAINABLE DEVELOPMENT

The attempts to achieve Sustainable Development on a global scale are associated with many difficulties within politics and culture, which is one of the main arguments to create sustainable communities. The scale of the required change is so immense at such macro levels, that problems of coordination and cooperation across political units are of enormous size as well. This in turn could raise "the need for global ecological planners in international agencies who must work with national political elites and multinational corporate leaders to manage these environmental crises" (Yanarella & Levin 1992, pp. 766).

Such a solution will cause problems, because relations of directing, commandment, order and leadership are left in place. Bridger & Luloff describes that the ones who are in control of the resources, and who are responsible for many of the decisions and actions that have caused insidious environmental damage, are generally charged with cleaning up their mess (Bridger & Logoff 1999, pp. 380). The consequence of these problems is a crisis within the state of mind and thus mentality, which relies on technological solutions to solve much larger structural problems. In this way sustainable development at global scale could strengthen the economic and social conditions which support unsustainable practices.

Sustainable Development on a local scale creates opportunities; therefore there are many reasons to shift Sustainable Development to a local scale like Sustainable Communities. First of all it is hard to understand concepts as 'sustainable society' or a 'sustainable world', because such broad concepts cannot be felt in daily life. On a local scale, changes are felt more immediate, are noticeable and that there tends to be a greater confidence in government action. Bridger & Luloff states that, "The locality, by contrast, is the level of social organization where the consequences of environmental

degradation are most keenly felt and where successful intervention is most noticeable" (Bridger & Luloff, 1999, pp. 380).

The combination of these factors creates opportunities which contribute to the accomplishment of the political process and progress to the actual Sustainable Development. With the concrete examples of the local level, Sustainable Development becomes a touchable aspect of daily life and will acquire a widespread legitimacy and acceptance. Due to the fact that place- based communities are differing from one another, sustainable development at finds the advantage of flexibility. The term 'community', however, is coupled with difficulties of perception. The explanation of the use of this term is described in the following paragraph.

### 2.2.2 DEFINING 'COMMUNITY'

A community can be referred to as a social term with a personal interpretation. According to Smith this term can be associated with a particular place or the term can be applied to a network or group of people with a shared interest (Smith, 2008, pp. 4). Smith also states that it is commonly concerned with a particular place, which refers actually to a particular area. He suggests approaching a community in terms of a neighborhood, a residential or mixed used area around which people can conveniently walk. Its scale is geared to pedestrian access...' (Barton, 2000, pp. 5).

Roseland, however, thinks that a community does not just refer to one describe just one form of neighborhood, town, city or region. "Activities that the environment can sustain and which the citizens want and can afford may be quite different from community to community" (Roseland, 2000, pp. 99). Bridger & Luloff agrees with this point and goes deeper in the subject. He states, together with other authors, that "Communities differ in terms of environmental problems, natural and human resource endowments, levels of economic and social development, and physical (i.e. geological and topographical), and climatic conditions" (Bridger & Luloff, 1999, pp. 380). A description of a community is given by Smith and captured in four aspects (Smith, 2008, pp. 4-5):

- Towns and cities neighborhoods mingle due to many years of development and change;
- Planners often view neighborhoods as a setting for a particular function (base for home life, employment, retail activities);
- People will often associate particular experiences, hopes and values to an area. This sense of localness and distinctiveness provides us with a sense of place.

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- A neighborhood might well provide hook for feelings of community and the setting for the sorts of relationships and networks that we call community.

Because of such a great variety and heterogeneity, the focus on only global or national Sustainable Development would be problematic and uncontrollable; therefore a 'one-size-fits' all approach is not logical or reasonable. According to Bridger & Luloff "A community-level approach allows for the design of policies and practices that are sensitive to the opportunities and constraints inherent to particular places" (Bridger & Luloff, 1999, pp. 380).

The definition of a 'community' appears to be hard to capture in one definition, therefore there has to be made a distinction in the definitions described above and the definition used within this research. Within this investigation the term 'community' is referred to a place where people feel connected with a shared interest with respect to social and cultural related characteristics.

With the knowledge of the definition of a 'community', the description of a 'Sustainable Community' can be elaborated.

## 2.3 'SUSTAINABLE COMMUNITY' DEFINITION

The sustainable community is an uncommon and new concept, as is stated above. There is not a lot of scientifically literature about the concept and there are many different perspectives about the concept. Therefore it is of importance to identify the subject matter and to give an understandable definition. In this section some of many definitions are used as an example for the creation of an own perspective, which can be suitable for the community investigated within this project. The selected definitions are those who approach, to my opinion, the concept of sustainable community in the best manner.

The first example comes from the article of Bridger & Luloff (1999). According to him in defining a Sustainable Community, it is of importance to "Strike a balance between environmental concerns and development objectives while simultaneously enhancing local social relationships. Sustainable communities meet the economic needs of their residents, enhance and protect the environment, and promote more humane local societies" (Bridger & Luloff, 1999, pp. 182). This definition is of importance because it embraces all three factors of Social, Environmental, and Technological concerns, and looks at the prospects of these concerns.

A second definition comes from the article of Roseland (2009), who goes a step further than Bridger & Luloff and takes a broader perspective to define SC. Roseland starts with de same description as Bridger & Luloff, namely "Rather than being a fixed thing, a sustainable community is continually adjusting to meet the social and economic needs of its residents while preserving the environment's ability to support it" (Roseland 2009, pp. 99). Then, Roseland takes a deeper look and uses the definition of Minnesota citizens (Minnesota SEDEPTF, 1995), in his article of Sustainable Communities:

> "A sustainable community is a community that uses its resources to meet current needs while ensuring that adequate resources are available tor future generations. A sustainable community seeks a better quality of life for ali its residents while maintaining nature's ability to function over time by minimizing waste, preventing pollution, promoting efficiency and developing local resources to revitalize the local economy. Decision-making in a sustainable community stems from a rich civic life and shared information among community members. A sustainable community resembles a living system in which human, natural and economic elements are interdependent and draw strength from each other"(Roseland, 2000, pp. 99).

In short Roseland states four aspects: (1) Thoughtful resource usage, (2) seeking a better quality of life for residents and environment, (3), equity among all community members, (4) resembling a living system with interdependent elements.

A third definition is stated by Girardet (1999). Although he defines a 'sustainable city', the same definition elements can be used for the creation of a perspective of 'Sustainable Communities'. According to Girardet: "A 'sustainable city' is a city that works so that all its citizens are able to meet their own needs without endangering the well-being of the natural world or the living conditions of other people, now or in the future" (Girardet, 1999, pp. 419). Smith (2008) uses the definition and takes out the importance of people and their long term needs. He describes the importance of (Smith, 2008, pp. 4-5):

- Good quality of air and water, health tood and good housing;
- Good quality ot education, a vibrant culture, good health care, satisfying employment or occupations and a sharing of wealth;
- Good quality ot safety, in public places, equal opportunities, treedom ot expression and catering tor the needs ot the young, the old and the disabled.

These elements of Smith have some overlap with the aspects of Bridger & Luloff and Roseland. The first element refers to the quality of environment, the second to equity, the third to governance.

To conclude which of the three examples is the most suitable definition for our case of study, the 'La Casa Grande' community, it is useful to summarize the examples. Bridger & Luloff emphasizes environmental elements; social elements are given a second place. Roseland stresses the need to preserve the environment by adjusting social and economical needs. Girardet on the other hand, highlights achievement of social needs through sufficient use of economical elements. Therefore the environmental elements are strongly presented by Bridger & Luloff and Roseland. Social elements are of second importance because it is present in all three definitions, although with less attention. To create a suitable definition, it is of importance to go step by step. Sustainable community comes from 'Sustainable Development' which contains the definition: "Meeting the needs of the present without compromising the ability of future generations to meet their own needs", as was stated earlier. The definition of 'Community' is described as "...a place where people feel connected with a shared interest with respect to social and cultural related characteristics". Therefore a 'Sustainable Community' consists of two parts and can be defined as:

> A community which uses its resources to meet current needs without
> compromising the ability of resource usages of future generations to
> meet their own needs. Such a community has shared interest to
> improve their environment and to create a better quality of live by
> limiting waste, preventing pollution, maximizing conservation and
> promoting efficiency, developing local resources to enhance the local
> economy, and therefore sustaining human and environmental health
> care.

This definition is created by a mixture of the given definition. The first part is an adapted version of the Sustainable Development definition, the second part is with assistance of the definition of the government of South Florida[6]. This definition of a Sustainable Community will be the guideline for the rest of this tesina.

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6   Sustainable   Community   definition,   *Government   South   Florida*,   Available:
    http://dlis.dos.state.fl.us/fgils/agencies/sust/tocs.html [Accessed 12 December 2009], Governor's
    Commission for a Sustainable South Florida, initial report.

## 2.4 SUSTAINABLE COMMUNITY ECONOMY SEGMENT

In this tesina the Economy segment is examined, therefore it is of importance to illustrate some background information. Therefore, this section describes an Economy definition, how economy can be implemented in Sustainable communities and which indicators contribute to investigating this segment. This is in relation to the goal of the Economy segment, which compiles of:

> To have a fair overview about the sustainable development activities
> related to production aspects, and a fair and balanced distribution of
> goods and services in the Casa Grande community.[7]

The following sections describe first a definition, followed by three perspectives towards economy and sustainability. Spangenberg & Bonniot describe sustainable economy more traditionally, Newman sees economy as a sustainable metabolism which contains several human activities, and Carrillo sees economy as a capital system which transforms into a knowledge system. All three are of importance within this section, because they involve important sustainability elements for the Economy segment.

### 2.4.1 ECONOMY DEFINITION

For the defining of 'Economy', the Free Dictionary has been used[8]. Economy can be defined as a careful, thrifty management of resources, such as money, materials, or labor; in which it is learned to practice economy in making out the household budget. Furthermore, economy can be defined as the system or range of economic activity in a country, region, or community; in which effects of changes were felt at every level of the economy. The community of Casa Grande residential can be examined through their lifestyles in finance management, in how they manage their 'resource' thus materials and energy use, and labor related management; all being part of the household budget.

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[7] Investing Glossary, *InvestorWords.com*, Available: http://www.investorwords.com [accessed 7 December 2009].

[8] Definition of Economy, *The free dictionary*, Available : http://www.thefreedictionary.com/economy [accessed 7 December 2009].

## 2.4.2 Sustainable Economy indicators

In market economies, economic sustainability is usually defined as firms' ability to persist durably on the market under competition constraints (Spangenberg & Bonniot, 1998, pp. 18). The core group of indicators for assessing this narrow definition of economic sustainability is constituted of:

- Liquidity/ solvency rations (working capital, level of indebtedness, etc.)
- Profitability ratios (RoI, capital and labor productivity, Price Earning Ratio, etc), and
- Growth ratios (relative market share, returns, profits, etc.).

However this perception of economic sustainability is one-sided: Western economies firms have developed along particular paths with an emphasis on industrial growth, efficiency (defined in narrow monetary terms) and performance. Result of this emphasis is an "economic blindness", because 'Western-economy' ideas or perceptions are not always applicable to non-Western economies. Therefore indicators should be adapted to the geographical area, social construction, and economical situation of the investigated project.

## 2.4.3 Economy within a human settlement model

Newman created the model the 'Extended Metabolism Model of the City', where metabolism can be defined as a biological systems way of looking at the resource inputs and waste outputs of settlements (Newman, 1999, pp. 220). This approach can be used in policy development for city planning.

Fig. 4 (Newman, 1999, pp. 220) illustrates how this metabolism concept has been extended to include the dynamics of settlements and livability in these settlements.

According to Newman can the extended metabolism model be applied at a range of levels and to a range of different human activities (Newman, 1999, pp. 222):



RESOURCE INPUTS
Land
Water
Food
Energy
Building material
Other resources

DYNAMICS OF SETTLEMENTS
Transportation priorities
Economic priorities
Cultural priorities

LIVABILITY
Health
Employment
Income
Education
Housing
Leisure activities
Accessibility
Urban design quality
Community

WASTE OUTPUTS
Solid waste
Liquid waste
Toxics
Sewage
Air pollutants
Greenhouse gases
Wasteheat
Noise

Fig. 4: Extended metabolism model of human settlements (Newman, 1999, pp. 220).

- **Industrial areas** can examine their inputs of resources and outputs of waste while measuring their usual economic parameters and other matters like worker health and safety.
- **Households or neighborhoods** can make an assessment of their metabolic flows and livability and together make attempts to do better with both, of which examples of these approaches usually are being labeled `urban ecology' (Newman & Kenworthy, 1999).
- **Urban demonstration projects** can be assessed for their sustainability using the extended metabolism model.
- **Individual businesses** can apply the extended metabolism model and create a sustainability plan.
- **City comparisons**. By comparing indicators for resource use, wastes and livability in different cities, it is possible to locate those cities (or parts or cities) that have something to contribute to policy debates on sustainability.

Newman states that cities can operate this model on many such levels, but most of all they need to be able to measure how they are doing overall as a city in reducing their metabolic flows whilst improving their human livability. Furthermore, most cities will be able to point to a few innovations they are making in sustainability. However, until they can bring a full assessment of these matters together they will not be concentrating on the fundamentals of urban sustainability.

The statements of Newman are of importance for the investigation of Casa Grande residential, due to the comparable process of development within a community as in a city. The community therefore can make an assessment of their metabolic flows and livability and together make attempts to do better with both, as is stated by Newman in the above examples.

### 2.4.4 ECONOMY IN RELATION TO A SUSTAINABLE COMMUNITY

Carrillo claims the importance of cities as capital systems, where the understanding of human organizations —whether a tribe, a country, or a contemporary company- primarily as productive entities is fundamental to Knowledge-based Development, KBD (Carrillo, 2004, pp. 24).

> Production here represents the generation of any form of collective value: a function in which there is a positive difference between total input value and total output value. Value represents all objects of preference —either tangible or intangible- for a given community, such as material, artistic or relational. Hence, production as the basis of

*social organization refers to activities which increase social value*
(Carrillo, 2004, pp. 24).

According to Carrillo there is a transition within the social organization from a Material production era towards a Knowledge-production Era, which can be found in the article of Newman as well, where it can be understood that people need to improve their human livability which is usually pared to communication among several levels of human activities.

## 2.5 CHAPTER OVERVIEW

This chapter illustrated the theoretical framework of SD, relating to the case-study of the Casa Grande and the Economy segment itself. Sustainable Development can be defined as: "Meeting the needs of the present without compromising the ability of future generations to meet their own needs". Sustainable communities can be explicated as Sustainability from Global to Local Sustainable Development, of which a 'Community' can be defined as a place where people feel connected with a shared interest with respect to social and cultural related characteristics.

Furthermore, this tesina investigates the economy segment of Sustainable Community Building. The goal of the Economy segment is to have a fair overview about the sustainable development activities related to production aspects, and a fair and balanced distribution of goods and services in the Casa Grande community. Therefore the community of Casa Grande can be investigated by Sustainable Economy indicators, provided by Spangenberg & Bonniot; a biological systems way of looking at the resource inputs and

Fig. 5: Ecological Footprint example.

waste outputs of settlements, provided by Newman; and as a knowledge-based Development, explicated by Carrillo. The economy part of the questionnaire is mostly created through an elaboration of these three visions. The sustainability elements within the questionnaire are related to lessons learned from ecological footprint accounting[9].

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[9] Ecological footprint, *Redefining Progress*, available: http://www.myfootprint.org/en/visitor_information/ [accesssed: 12 January 2009].

# CHAPTER 3:    RESEARCH RESULTS

In this chapter the results of economy segment of the Casa Grande case-study are described. The economy segment has as goal to have a fair overview about the sustainable development activities related to production aspects, and a fair and balanced distribution of goods and services in the Casa Grande community. With this goal in mind, the results of the following categories are investigated: questionnaire appliance, employment, family amount, income, housekeeping-jobs and household maintenance, sustainable development and the community consumer patterns, reduction of consumer patterns. First, the community is introduced to clarify the background and its social context. Secondly, the functioning of the questionnaire in regard to the results is described. Subsequently, the results are elaborated according to the categories stated above.

## 3.1  SUSTAINABLE COMMUNITY BUILDING: CASA GRANDE

The concept of Casa Grande Residential became innovative through design, equipment and quality of its final condition shape. At the same time as the concept was born, it created a commitment (1) to respond to the demands of a growing city, and (2) a commitment for families in particular looking to live where modernity and a good quality of life can be combined.

The First Stage of the innovative and modern Casa Grande Residential became reality at Thursday May 28 (El Imparcial 1992). Important participants of this particular project of 1992 were the PLANORO[10] Group Director, the Governor of the State of that year (Mr. Manlio Fabio Beltrones), customers, authorities, Banco del Atlantico and staff working within the PLANORO Group. PLANORO Construction is a company which is part of the MEZORO Group. It operates in areas of development, construction and real estate field

According to El periódico Sonorense (1991) the concept of urban residential Casa Grande is recognized as the best of Hermosillo, as 'Richness and wellness with class and style'. The entire development comprises of six stages, and was sold out one after,

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[10] PLANORO Group, *Grupo Mezoro*, available: http://mezoro.com/construccion.htm [Accessed: 12 january 2009].

the other before even completing their development. The excellent location of the neighborhood, the innovative character of its design, the quality of its urbanization and road upgrading work constructed in the sector; it ali contributes to ensure the highest added value for their terrain.

Myreya Rodríguez Amavizca is a resident of the community 'Casa Grande' and together with a small group of other residents she can be seen as the initiator of the project-study. Because of the reputation of the community, Miss Rodriguez wanted to be involved with sustainability matters. Inspired with these concepts she turned to the university to set-up a project-study, which could investigate how and where the community can be sustainable.

## 3.2 QUESTIONNAIRE RESULTS FUNCTIONING

The questionnaire is formed with a select amount of participants within the Casa Grande community. Although the response is high (84% of a total of 32 families) a sample of 27 families is small. The economy part of the questionnaire consisted of 38 questions, which can be found in Appendix V (English) and Appendix VI (Spanish).
The amount of time spent on the investigation consisted of two factors: (1) the questionnaire; duration of one month, from the May until June 2009; (2) the results with SPSS usage, duration of one month of June 2009.

The percentages need to be taken into account. The investigation is done with a select amount of participants, because the respondents only consist of 27 families. Therefore the percentages only give an overview of the total of the related respondents.

## 3.3 QUESTIONNAIRE APPLIANCE

The questionnaires were held by family as a total. Of the families who took the questionnaire, about 11% collected by males and 89% female. The majority of the females were born in 1956-1965, namely 44,44%. Three males were part of the investigation, born in the years 1965 or were born later than 1955.

Figure 6 illustrates that the education level of the majority of the participating families is a Bachelors degree (59%). 21% has a High-school level of education. Only 4%, one person has a Master level of education.

**Fig. 6: Family education**



- Highschool
- Bachelor
- Specialization
- Master
- Other

8%   4%   8%

11%

59%
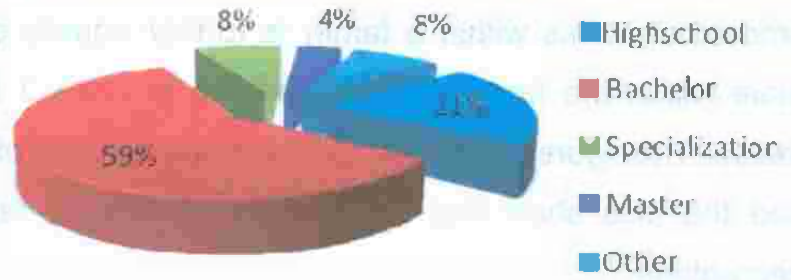
## 3.4 EMPLOYMENT

The study included employment, as an effect of education. The employment gives an indication of the work or occupation in which the residents are engaged, and the number and percentage of the residents gainfully employed.

The results show that all men are employee. Of the females, 11 are employed, 11 do the household of their family, and two of the respondents were students. To the question of what sort of labor they have, all men answered that they have their own business. Of the 24 participating females, about half of them (50%) have Domestic labor, about ¼ of these females (25%) have their own business, and paid and voluntary labor have an equal amount of 12,5%.

## 3.5 FAMILY AMOUNT

The division of males and females is investigated. First, the amount of females is investigated (see figure 7). The majority of the participants contain 4 females within their family (41%). The respondents who answered to have 3 females within their family, consists of 33%, and 26% contain 1 or 2 females. Of 41% of the participants families have 4 females within their family.

**Fig. 7: Females within family**   **Fig. 8: Males within family**



3;11%   4;15%
11;41%
9;33%

- 1
- 2
- 3
- 4



4; 15%   1;3%   4;15%
4;15%
14;52%

- 1
- 2
- 3
- 4
- NA
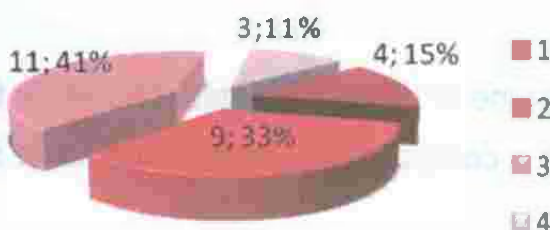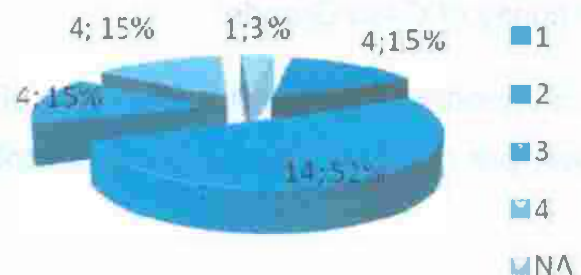
Secondly, the amount of males within families is investigated (see figure 8). Most of the participants have the amount of 2 males within their family (52%). The answers to the amount of males within a family is further equally divided; 15% answered to have 1 male within the family, 15% answered to have 3 males, 15% answered to have 4 males. The figures are illustrated with the amount of females or males within a family, and the pies show first the amount of families answered, followed by the answer percentage.

The investigation looks into the construction of the family, and therefore the community inhabitants. Table 1 shows the amount of family members with age diversities, to illustrate the structure of a family and the inhabitants within 'La Casa Grande'.

| Amount | Under 3 | 3 – 11 | 12 – 17 | 18 – 59 | 60 – older |
|--------|---------|--------|---------|---------|------------|
| 1 | 1 | 6 | 8 | 2 | 1 |
| 2 | - | 3 | 8 | 6 | 1 |
| 3 | - | - | 1 | 6 | - |
| 4 | - | - | - | 8 | - |
| 5 | - | - | - | 4 | - |

Table 1: Age of family member

The table shows that the majority of the families of the respondents consist of people with the age between 18 and 59. An example could be a 2 parent household, with children who are studying, or are working.

## 3.6 INCOME

Income is a significant indicator of the community, because it indicates the amount of money earned through employment and investments. Therefore, income is an essential element of the in- and out-flow of products within a community, because it indicates the purchasing-, buying-, and spending- power of the residents within the community of Casa Grande.

It is of importance to illustrate the value of the income of these residents. Therefore the income per capita of Hermosillo is described for a comparison with the income of the

40

residents of Casa Grande residential. According to some facts of 2005[11] the per capita income for the municipality of Hermosillo was $15,310 pesos and the Human Development Index was 0.8912. HDI: The Human Development Index is an index used to rank countries by level of 'human development', which usually also implies whether a country is developed, developing, or under developed

The monthly income categories were set after the pilot-questionnaire, and are stated in Mexican pesos. Here, an example is given to illustrate the value the peso by converting it into USD$. An amount of $10,000 pesos is equal to $658.70 dollars (USD)[12].

In the study, the amount of people who contribute to household income is divided in one or two persons. The results of table 2 show that there are 17 families who answered to have 1 person and 10 families with 2 people who contribute to the household income. The monthly income per males, females and adolescents is taken into account to see what a family can spend and therefore to see what they (can) consume.

| Monthly income | Males | Females | Adolescents | Family total |
|---|---|---|---|---|
| under 20.000 | 1 | 7 | - | 2 |
| 21.000 – 30.000 | 6 | 3 | - | 2 |
| 31.000 – 40.000 | 5 | - | - | 2 |
| 41.000 – 50.000 | 1 | - | - | 3 |
| 51.000 – 60.000 | 3 | - | - | 7 |
| 61.000 – 70.000 | 3 | - | - | 1 |
| 71.000 – 80.000 | 5 | 1 | - | 5 |
| 81.000 – more | - | 1 | - | 4 |
| N.A | 3 | 15 | 27 | 1 |

Table 2: Income per month

Table 2 shows that 24 males of 27 families earn the monthly income. The most earned amount of income of males is between 21.000 and 30.000 pesos per month, with an amount of 6 families. There are 5 families who answered to have an income earned by

[11] Capita income, *Absolute astronomy*.
    Available : http://www.absoluteastronomy.com/topics/Hermosillo [Accessed: 21 December 2009].
[12] Currency converter, available: www.travelex.com. [Accessed: 21 December 2009].

males of 31.000 – 40.000 pesos per month, and 5 families have an income earned by males of 71.000 – 80.000 pesos per month.

The table shows that 12 females of 27 families earn the monthly income. The most earned amount of income of females is under 21.000 pesos per month, with an amount of 7 families. There are 3 families who answered to have an income earned by females of 21.000 – 30.000 pesos per month. Two families have answered to have a monthly income of 71.000 – 81.000 or more pesos per month.

## 3.7 PROFESSIONS CONTRIBUTING TO SUSTAINABILITY

The investigation is whether the colony of 'La Casa Grande', could be a Sustainable Community. Therefore it is of importance to investigate whether the inhabitants have professions which could contribute to Sustainability and the Development of their Sustainable Community.

There are three directions are chosen which could be part of this development, consisting of: technical, for the knowledge of renewable energy and science implementation; management, for coordinating sustainable programs within the community; and educational, to create awareness and consciousness of Sustainability.

Figure 9 shows that the majority of the respondents have a profession which is related to management (37%, 10 families). Less than half of the respondents (45%, 12 families) have professions which can assist to create awareness and consciousness of Sustainability and its Development.

**Fig. 9: Profession**
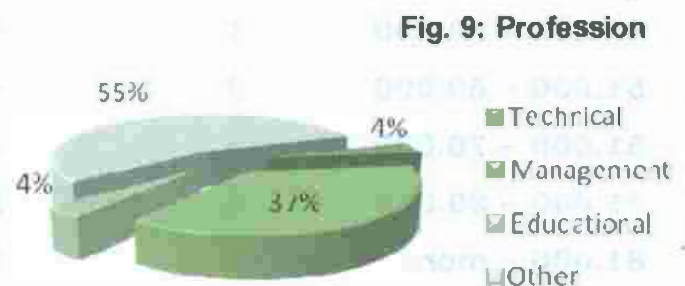


## 3.8 HOUSEKEEPING-JOBS & HOUSEHOLD MAINTENANCE

A sustainable community includes its own economy and industry, therefore the investigation includes this aspect within its study. The jobs investigated are jobs for household maintenance. These housekeeping jobs consist of cooking, cleaning, gardening and other jobs (see table 3, horizontally). The respondents answered

whether they had these jobs or not, and the quantity of these jobs per week or month (see table 3, vertically).

The majority of the families have employees to assist with cleaning the house, with an amount between 3-4 (7 families, 25,9%) and 5-6 (10 families, 37%) times a week. Gardening is important as well. About 14 families (51,9%) have employees to assist with gardening, which is divided between 3-4 times a week (7 families, 25,9%) and once per 2 weeks (6 families, 22,2%).

|  | Cooking | Cleaning | Gardening | Other |
|---|---|---|---|---|
| Yes | 2 | 24 | 14 | 2 |
| No | 25 | 3 | 13 | 25 |
| 3 – 4 times per week | 1 | 7 | 7 | 1 |
| 5 – 6 times per week | 1 | 10 | 1 | - |
| 7 times a week | - | 5 | 1 | 1 |
| Once per 2 weeks | - | 2 | 6 | - |
| 2 times per month | - | - | - | 1 |
| N.A | 25 | 3 | 12 | 24 |

Table 3: Household maintenance and -jobs

The table shows that the majority of the families has assistance with cleaning, and has their help every day or every 2 days.

## 3.9 SUSTAINABLE DEVELOPMENT AND THE COMMUNITY

This section describes the attitude of the participating families towards the Sustainable Development concept, in relation to: knowledge about the SD concept, knowledge about the SC concept; profession or employment which contributes to SD; profession which influences the choice to participate in SD matters; and amount of families willing to participate to create a SC. The results can be seen in table 4.

About 18 of the participating families (66,7%) have knowledge about the Sustainable Development concept, which is important of the process towards the creation of a Sustainable Community. The knowledge about the concept of Sustainable community is equally divided, with 13 families (48,1%) who have knowledge about the subject, and 13 families (48,1%) lack of knowledge.

The respondents answered to contribute with their profession, school, employment, and other manners to contribute to Sustainable Development with 15 families (55,6%). This is more than half of the participants. The other half of the respondents answered 'No', 'Not sure' or they skipped the question (N.A). The reason for this can be related to the amount knowledge about the concept and how to bring this knowledge into practice. The majority with 17 families (63%) of the respondents, answered that their profession, school, employment have influenced their choice and decision to create a Sustainable Community. About 6 families (22,2%) answered that their profession, school, employment did not have influenced their choice to create a Sustainable Community.

Almost all respondents are willing to participate in creating a Sustainable Community, with an amount of 26 families (96,3%). Only one respondent does not want to participate to create a sustainable community.

|  | Yes (%) | | No (%) | | Not sure (%) | | N.A (%) | |
|---|---|---|---|---|---|---|---|---|
| SD concept knowledge | 18 | (66,7) | 8 | (29,6) | - | | 1 | (3,7) |
| SC concept knowledge | 13 | (48,1) | 13 | (48,1) | - | | 1 | (3,7) |
| Employment SD contribution | 15 | (55,6) | 4 | (14,8) | 4 | (14,8) | 4 | (14,8) |
| Profession choice influence | 17 | (63) | 6 | (22,2) | 3 | (3,7) | 3 | (11,1) |
| Family participating in SC | 26 | (96,3) | 1 | (3,7) | - | | - | |

Table 4: Sustainable Development and the community

## 3.10 CONSUMER PATTERNS

This section describes the consumer patterns of the respondents. Investigated elements are products with a sustainable character, usage of renewable energy resources, reason why there is not usage of renewable energy resources,

**Fig. 10: Sustainable Products**

- Yes
- No
- Sometime
- NotSure

30%
7%
30%

and incorporation of Sustainable Development within the family consumer-pattern.
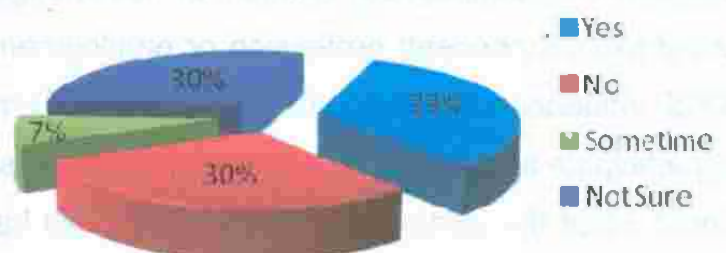
Results in figure 10, show that buying products with a sustainable character, for example organic products or recycled paper, is equally divided between 'Yes', 'No', 'Sometimes'. Therefore it is hard to conclude which element is determined.

The usage of renewable energy resources is low. The question contained the answers: 'No', 'hopefully in the future', 'Windmills', 'Solar Cells', 'Gas instead of gasoline', and 'other'. About 74,1% does not use renewable energy resources, and 18,5% hopes to use these resources in the future. The respondents answered for 7,4% that they have other manners of Renewable Energy usage.

The reasons for not using the renewable energy resources (yet), are divided in several reasons: No knowledge about the subject, not knowing where it is available in shops, it is expensive, it is not used in México, it is not at the Mexican market, and other options. This is illustrated in figure 11.

**Fig. 11: Reason no RE use**



- No knowledge about the subject
- Not knowing where available in shops
- It is expensive
- We don't use it in Mexico
- It is not available at the Mexican market
- Other

The majority of the respondents replied that they do not use Renewable Energy options, because there is no knowledge about the subject (30%) and that it is expensive (30%).

The respondents incorporated SD within its consumer patterns for 63%, and about 37% did not incorporated SD (see table 5). The SD consumer patterns can be incorporated through various ways, consisting of buying fewer products, buying less plastic products, using less water, using less electricity, using less gas, and other options.

| Consumer patterns | Yes (%) | | No (%) | | N.A (%) | |
|---|---|---|---|---|---|---|
| Buy less products | 4 | (14,8) | 22 | (81,5) | 1 | (3,7) |
| Buy less plastic products | 6 | (22,2) | 20 | (74,1) | 1 | (3,7) |
| Use less water | 14 | (51,9) | 12 | (44,4) | 1 | (3,7) |
| Use less electricity | 16 | (59,3) | 10 | (37) | 1 | (3,7) |
| Use less gas | 5 | (18,5) | 21 | (77,8) | 1 | (3,7) |
| Other manners | 1 | (3,7) | 25 | (92,6) | 1 | (3,7) |

Table 5: Consumer patterns

Results of table 5 show that in relation to the time before this questionnaire, most of the respondents are using less electricity within their consumption patterns (59%). However, the graphic also shows that most respondents are not incorporating SD consumer patterns. The majority of the respondents answered that they are not buying less products (81,5%), which is important for the research because it is one of the elements which has to be adapted to create sustainability.

## 3.11 REDUCTION OF CONSUMER PATTERNS

This section describes the reduction of the amount of consuming of the respondents. Investigated elements contain Waste separation, water and Electricity usage, product usage and reuse, recycling and contribution.

Waste separation is investigated in wastes of organics, glass, inorganic, cans, plastics, and paper (see table 6). In general the respondents do not separate waste, with more than half of the respondents. The waste which is separated is mainly paper (33,3%), plastic (29,6%), and cans (25,9%). The waste which is hardly separated consists of glass (7,2%), inorganic waste (11,1%), and organic waste (18,5%).

| Waste separation | Yes | % | No | % |
|---|---|---|---|---|
| In family | 12 | 44,4 | 15 | 55,6 |
| Organic | 5 | 18,5 | 22 | 81,5 |
| Glass | 2 | 7,4 | 25 | 92,6 |
| Inorganic | 3 | 11,1 | 24 | 88,9 |
| Cans | 7 | 25,9 | 20 | 74,1 |
| Plastic | 8 | 29,6 | 19 | 70,4 |
| Paper | 9 | 33,3 | 18 | 66,7 |

Table 6: Waste separation

Results of table 7 show that the reduction of water and electricity usage is more or less equally divided, with 85,2% of the respondents who reduce their electricity use. About 88,9% of the respondents are more conscious of their water use and saving.

| Water and Electricity | Yes | % | No | % |
|---|---|---|---|---|
| Reduce electricity use | 23 | 85,2 | 4 | 14,8 |
| Water saving | 24 | 88,9 | 2 | 7,4 |

Table 7: Water and electricity

Results of product use and reuse is illustrated in table 8, and investigated in product-reuse, plastic, wood, glass, personal items, and other. The table also illustrates recycling and reuse: recycling can be seen as the the act of processing used or abandoned materials for use in creating new products[13]; reuse can be seen as the act to use again, especially after salvaging or special treatment or processing[14]. Most of the respondents (81,5%) reuse their products, of which glass is mostly reused (55,5%). This is a striking difference with the recycled number of glass, so in this matter the use of glass can therefore be considered sustainable. Plastic is less reused than glass (40,7%), which is also a significant number because plastic is the most used product in consumer goods.

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[13] Defining recycling, WorldReference.com, Available: http://www.wordreference.com/recycling [Accessed: 15 January, 2009].
[14] Defining reuse, The Free Dictionary, Available: http://www.thefreedictionary.com/reuse [Accessed: 15 January, 2009].

| Use and Reuse | Yes | % | No | % |
|---|---|---|---|---|
| Product reuse | 22 | 81,5 | 5 | 18,5 |
| Plastic | 11 | 40,7 | 16 | 59,3 |
| Wood | 1 | 3,7 | 26 | 96,3 |
| Glass | 15 | 55,6 | 12 | 44,4 |
| Personal items | 9 | 33,3 | 18 | 66,7 |
| Other | 4 | 14,8 | 23 | 85,2 |

Table 8: Use and reuse

Results of table 9 show that the respondents are not recycling often, about 40,7% replied that they are not recycling products. This could be changed in the future. About 81,5% of the respondents stated that they are willing to contribute financially to make their community sustainable.

| Decreasing and reducing | Yes | % | No | % |
|---|---|---|---|---|
| Product recycling | 11 | 40,7 | 16 | 59,3 |
| SC Contribution | 22 | 81,5 | 5 | 18,5 |

Table 9: Decreasing and reducing products

The numbers of these tables (table 6, 7, 8, and 9) are of significant importance, because they show that there has a lot to be done to make their community sustainable and that they are willing to change their habits and consuming patterns.

This chapter illustrated the results of the data. The next chapter will give the explanation and implications of these results through an analysis of the research of the case-study of the Casa Grande community.

# CHAPTER 4:    RESEARCH ANALYSIS

In this chapter the analysis of economy segment of the questionnaire is explicated. Here, all important findings of the results, the previous chapter, are described and elaborated. The analysis takes the goal of the economy segment in account as well, as it analyses the inflow and outflow of products and services within the community. Therefore, as is stated in chapter 3 in the economy definition, the community of Casa Grande residential can be examined through their lifestyles in finance management, in how they manage their 'resource' thus materials and energy use, and labor related management; all being part of the household budget[15].

## 4.1  QUESTIONNAIRE ANALYSIS FUNCTIONING

The questionnaire gave many results, which are of importance for the community itself. Therefore, although the sample of 27 families is small, the response of the community with 84% is high: this is of importance because the findings contain value for these families living within the community. The goal of this analysis is to identify opportunities to create a Sustainable Community, within the 'Casa Grande' residential community in Hermosillo, Sonora.

The analysis done within this chapter refers to the results of the previous chapter. Therefore, section-headings of the previous chapter are used in this analysis as well.

## 4.2  RESULTS OF QUESTIONNAIRE APPLIANCE

When the questionnaires were held, there were more females who did the questionnaire in name of the families, and the amount of males was lower. A reason for this could be: because of the time of the day that the questionnaires were held, the males were at work outside the house. This could imply that: the females work at home; the females stayed at home to do the household; the females have part-time jobs; the females are more interested in Sustainable Development than males. Reasons that only a few males did the questionnaire could be: the males are less interested; males have longer working days than females; the few males who did the

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[15] Definition of Economy, *The free dictionary*, Available: http://www.thefreedictionary.com/economy [accessed 7 December 2009].

questionnaire have more time than the other males; the males are pushed to do the questionnaire by their wives.

The level of education is high. The majority of the participating families have a Bachelor diploma, and additionally the family members have a Specialization or even a Masters degree. It can be concluded that the knowledge-level of these participating families is high, and therefore the families can obtain more awareness regarding the possibilities of Sustainable Development.

## 4.3 EMPLOYMENT

Employment can be seen as an effect of education. According to the results, all men are employee; females are almost equally divided in employment or household. This could imply: 11 families have a two-income household; the employment relates to their educational background, and provides sufficient income; females are doing more domestic labor then men; females work at home because they have their own business. All men answered to have their own business, which implies that they are not voluntary or paid within their labor and thus can set their own tariff.

## 4.4 FAMILY AMOUNT

The amount of females within families generally consists of 3 or 4. The amount of males within families generally consists of 2. This could imply: the amount of females within the community is higher; the amount of males are more spread among the participating families; the amount of family members is high; females are in the majority within this community.

The results show the age of family members in separated categories: under 3 years; 3-11 years; 12-17 years; 18-59 years; 60 years-older. These categories are referred to the amount of family members carrying that age which relates to the age-category. The majority of family members are in the age-category of 18-59 years. The smallest amounts are in the category of under 3 years or 60 years-older. This could imply: the majority of the participating families are adults; there are few children in the community; the majority is not at home because of responsibilities at school or at work.

## 4.5 INCOME

Income is related to purchasing power, through which in a further state the consuming and lifestyles can be measured. In the previous chapter is stated that the capita income for the municipality of Hermosillo was $15,310 pesos in the year 2006 (which is USD$1018,15). The results show that the majority of the families have a one-person-income (63%), and fewer families have a two-persons-income (26%). This could imply: income of the solo-earner is sufficient for the whole family; income of dual-earners is sufficient for the household; there are people working although it is unnecessary, because they are bored when they are not working or busy; the income of dual-earners is necessary to comply with the spending behavior of the family.

Results of the monthly income showed that the majority of the males have an income between 21,000-40,000 pesos per month, the majority of females have an income of below 20,000 pesos per month, adolescents did not answer at all, and the majority of the families have a total income between 51,000-60,000 pesos per month.

There can be five reasons why 15 females which did not answer: there are no men to earn the family income; there are no men in the family; females did not know their income (precisely); females do not work; females rather not answer this question, because the question was too personal and therefore uncomfortable. The adolescents did not answer at all, which could imply: they do not have work; they don't consider their jobs as 'work'; they were uncomfortable to answer the question because it could imply that they are not studying or not studying enough. A significant quantity was the monthly income of the family in total, which was between 51,000-60,000 pesos per month. This could imply: there are answers missing of females; the families who have a dual-earning income add up to this final family total.

## 4.6 PROFESSIONS CONTRIBUTING TO SUSTAINABILITY

An adequate amount of the participating families have a profession which can assist to create awareness and consciousness of Sustainability and its Development (45%, 12 families). This is a little less than half of the total, but still a vast amount. Other jobs could vary significantly from each other, therefore it can be considered that these families who have professions which contribute to sustainability are with a sufficient amount to stimulate other participating families to create a sustainable community.

The study showed some significant numbers within the results related to housekeeping-jobs and household maintenance. The families do not provide many cooking jobs (only 2 families; 7,4%); but they do provide many cleaning jobs (24 families; 96,3%). The amount of providing gardening jobs is kind of equally divided (14 families 'yes', 13 families 'no').

Ten families have cleaning assistance for 5-6 times a week (37%), which is almost every day. It is, however, not exactly clear how much hours the assistance must clean per day. There could be five reasons for this much cleaning assistance: the house is too big for the families to clean themselves; it is common to have cleaning assistance; cleaning is a disliked maintenance which is therefore done by someone else; there is no time for the family members to clean the house; it is not of their status to clean the house all by themselves.

Gardening shows a significant number of assistance which is about 3-4 times a week for 7 families. This is significant, because it is hard for a garden to grow in a deserted area. There can be three reasons for gardening assistance for 3-4 times a week: the garden must be maintained because of the status of the family towards neighbors; the garden is hard to maintain by the family itself; working in the garden is not a job done by one of the family members.

The majority of the families have assistance for about 3-4 times a week in general (14 families; 51,9%). There could be three reasons for this amount of assistance per week: family members are working during the week and do not have time to maintain their household sufficiently; the accompany of the assistance is welcome, because there are not many people at the house during the day (and it was concluded that half of the females do not have jobs/ have jobs at home/work part-time, and are more at home than their partners); the house is too big to maintain for the family members themselves; it is common to have household assistance, therefore these families have assistance as well.

## 4.8 SUSTAINABLE DEVELOPMENT AND THE COMMUNITY

The study showed some significant numbers within the results of Sustainable Development and the community. Notable is that all participating families answered positively to the questions about: knowledge about the SD concept, knowledge about

the SC concept; contributing profession or employment to SD; profession which influences the choice to participate in SD matters; and amount of families willing to participate to create a SC.

However, the knowledge about the concept of Sustainable community is equally divided. This outcome is a little manipulated, because there was an introduction of the research before the questionnaires were conducted. Still, half of the participants have knowledge of the subject which can lead to more awareness among the inhabitants of the community.

## 4.9   CONSUMER PATTERNS

This section describes the consumer patterns of the respondents. It is subdivided in Sustainable products; usage of renewable energy resources; reasons why renewable energy resources are not used; and Sustainable Development incorporation within the family consumer-pattern.

The results stated that the amount of families that bought, not bought or sometimes bought Sustainable products, are equally divided. There could be four reasons for this equally division: the families do not know what a sustainable product is; families think that the products that they buy have a sustainable appearance and think 'yes' I bought a sustainable product; the families are not aware that they buy sustainable products; the families want to believe that they buy sustainable products.

The usage of renewable energy resources is low, as is described in the results. About 74,1% (20 families) does not use renewable energy resources and only a few (5 families; 18,5%) hope that they can use renewable energy resources in the future. Reasons for this low usage could be that: there is not enough knowledge about this concept; there is not enough money to adapt these renewable energy resources within their family and homes; the families do not know where to obtain such knowledge; the families do not know where to. purchase such renewable energy resources. Reasons why renewable energy resources are not used is mainly because there is no knowledge about this subject and that it is expensive. The results show that there are many reasons for not using renewable energy, because all participants answered this question.

Sustainable Development incorporation within the family consumer-pattern considered several aspects: buy fewer products and less plastic products; and use less water,

electricity and gas. The results showed some interesting data, which showed that the majority are NOT buying fewer products and less plastic products; or using less gas. Reasons for not changing this consumer behavior is that: it is difficult to adapt the consumer behavior of these families to buy more sustainable products; the families find it difficult to change their custom consumer attitude, thus behavior; it is easier to remain the same consuming attitude, than to change; the families are not aware that consuming can be made sustainable as well. However, 16 families (59,3%) are using less electricity and less water. A reason for this specific number is that this study helped to change the attitude of the inhabitants of the community.

## 4.10 REDUCTION OF CONSUMER PATTERNS

This section describes the reduction of the amount of consuming of the respondents. Investigated elements contain Waste separation, water and Electricity usage, product usage and reuse, recycling and contribution.

The results of Waste separation show some interesting numbers, because to the question whether the family separated organic-, glass-, inorganic-, cans-, plastic- or paper-waste: the majority of all families answered that they did not separate these wastes. Even if families separated waste, it was more paper and plastic than organic-, glass- or inorganic- waste. Reasons for this low amount of separated waste are: families do not separate waste because they are not used to; there are no waste separation facilities; this separated waste is collected by one and the same garbage company, therefore separated waste will become one afterwards.

The majority of the families reduce Water and Electricity usage, according the results. Reasons for this result could imply: the families want to contribute to the sustainable development concept; water and electricity use is found to be easy to adapt in custom consumption within the participating families; the families found it a good reason for consumption reduction because it cuts down the water and electricity bills.

The majority of the families state that they use and reuse products (22 families, 81,5%). Reasons for this answer could imply: families reuse products like furniture, offered by other family members or friends; the families have a different idea of what reuse implies; families reuse products because they want to contribute to the sustainable development concept. However, this number remains interesting, because the majority of the families state that they reuse plastic, wood and other personal items.

Wood is the product which is reused the most; glass is the product of which the majority of the families do not reuse.

Results show that a small majority of the families (16, 59%) are recycling their products. This is an interesting number, because recycling is an important indicator for Sustainable Development matters. However, the majority of the families are willing to contribute financially to Sustainable Community Building.

This analysis described some significant findings, which could lead to important conclusions. The most important conclusions are stated in the following chapter.

# CONCLUSIONS

In the introduction it was described that in this tesina the possibilities of Sustainable Development is investigated on a local scale, at a community level. It was stated that this community would be investigated through: analyzing related literature, for the creation of basic knowledge of the topic; adapting a Sustainable Community definition to create one which suites the situation of 'La Casa Grande' residential; designing a methodological tool for analysis, through creation of a questionnaire associated to the case-study, defining of sustainable indicators connected to the strategic goal, and conducting the survey related to the found indicators; analyzing all data outcomes of the conducted survey and results, for the formation of an overview to state research conclusions. The order of the chapters consists of a construction where the subject goes more into detail ager another. From the methodology, through defining of sustainable development, towards the results and results analysis to at the final come to a conclusion and recommendations of the study towards the community residents to transform their neighborhood into a Sustainable Community. This order of chapters is designed to achieve an answer to the problem statement and research question *"What is the degree of economic sustainability within a community on a local scale through the principies of Sustainable Development, respecting identities, characteristics, specific conditions and the actual lifestyles within the community?"*.

First, the methodology was described, which consisted of various steps through which the sustainability level of the community of 'La Casa Grande' is verified and investigated. The first step has been analyzing associated literature; the second step has been the creation of a Sustainable Community definition which suites the situation of 'La Casa Grande' residential; the third step was identifying related categories; the fourth step was characterizing the indicators related per category; the fifth step was accumulating questions per indicator; the sixth step was to form questionnaires with the found questions, and the final and seventh step was analyzing all found data of the questionnaires.

Secondly, the theoretical framework of chapter 2 provided several important definitions, which served as a basis for this tesina. First of all the definition of 'Sustainable Development', provided by the Brundtland commission in 1987. According to them Sustainable Development consists of: Meeting the needs of the present without

compromising the ability of future generations to meet their own needs. A second definition was given for the meaning of 'Community', which is referred to a place where people feel connected with a shared interest with respect to social and cultural related characteristics. Finally, the 'Sustainable Community' can be defined. A community which uses its resources to meet current needs without compromising the ability of resource usages of future generations to meet their own needs. Such a community has shared interest to improve their environment and to create a better quality of live by limiting waste, preventing pollution, maximizing conservation and promoting efficiency, developing local resources to enhance the local economy, and therefore sustaining human and environmental health care. The economy segment went studying the community through the goal *"To have a fair overview about the sustainable development activities related to production aspects, and a fair and balanced distribution of goods and services in the Casa Grande community"*. The chapter provided this definition, and the previous ones, which served as a basis for the research study.

Thirdly, the results of the Case-study in relation to the Economic segment have been described. It became clear that the Casa Grande residential stands for commitment, to respond to the demands of a growing city, and a commitment for families in particular looking to live where modernity and a good quality of life can be combined. This Community-background gave significant direction and importance to the study. Furthermore, the results of the following categories were investigated: questionnaire appliance, employment, family amount, income, housekeeping-jobs and household maintenance, sustainable development and the community consumer patterns, reduction of consumer patterns. First, the functioning of the questionnaire in regard to the results is described. Subsequently, the results are elaborated according to the categories stated above. The results showed that the community has the intention to become sustainable. The intention to start a sustainable community is of importance because it motivates more to actually achieve sustainable development on local scale and therefore the accomplishment would be taken more intensive and be taken more seriously by the residents of La Casa Grande.

Fourthly, an analysis of the research-results is provided in the fourth chapter. In this section some main assumptions of the analysis are stated. The level of education is high, all males are employee and many females have jobs. The amount of family members is high within the participating families, and the amount of females within a family is higher than the amount of males. Income is earned through males and also by some females. There are sufficient professions which contribute to sustainability. Many

families provide housekeeping-jobs and household maintenance jobs. Equally divided knowledge about the concept of Sustainable Development and the community. Consumer patterns results show that Sustainable products are not bought often, there is a low usage of renewable energy resources among the participating families, there are many reasons for not using renewable energy, and that Sustainable Development incorporation is not been put into practice. Reduction of consumer patterns differed per family: the majority of all families answered that they did not separate waste. Also, the majority of the families reduce Water and Electricity usage, and use and reuse products. Only a small majority of the families are recycling their products.

This conclusion provides the main evaluation of the research results and its analysis. Below are conclusions given per investigated element, referring to: Employment, family amount, income, professions which contribute to sustainability, housekeeping-jobs and household maintenance, Sustainable Development and the community, consumer patterns, and reduction of consumer patterns.

Employment has illustrated that all men are employed and that lesser females have jobs. Therefore, it can be concluded that the inhabitants do not need to worry about their income, because there are sufficient jobs to provide the income. Furthermore, some females do not have a job, although there are not many children of small age. It can be concluded that it is not necessary for these females to have work.

The family amount has illustrated that families consist of many family members. It can be concluded that the participating families are wealthy to nourish its family members. Furthermore, the majority of the participating families are adults, and there are few children in the community. It could be concluded that the family is wealthy enough to pay for the adults to go to school and/ or to go to the university.

The income of the participating families is high. All males work and have a job, and some females work as well. Therefore, the total family income is high, between 51,000 and 60,000 pesos per month, which adds up to their purchasing power, through which in a further stadium the consuming and lifestyles can be measured. It could be concluded the inhabitants the community have a higher income than that of their fellow townspeople. The residents generally earn an amount of money per month, which is higher than the capita income of Hermosillo consisting of $15,310 pesos annually.

The professions which contribute to sustainability is less than 50%. However, it can be concluded that the community contains a large amount of Sustainability and awareness

creating professions, which could make the transition of the community towards a Sustainable Community much easier and less complicated.

Housekeeping-jobs and household maintenance-jobs are provided by many families. Especially cleaning, which is by many families needed almost every day. The overall conclusion could be that these community members have a lot of extra help and assistance for their household maintenance. However, a missing question could be 'who is in charge of the selected household maintenance and household-jobs?', because this could show who needs assistance in the household the most, and why assistance is needed.

Sustainable Development and the community analysis showed that the knowledge about the concept is equally divided. However, many people have a profession which influences the choice to participate in SD matters, and many families are willing to participate to transform their community in a Sustainable one. It could be concluded that the vast majority has knowledge about Sustainable Development matters, and is willing to transform their community into a Sustainable Community. However, more knowledge about the specific subject of SC is needed and of importance, about how this community can actually transforms itself.

Consumer patterns analysis showed that Sustainable products are not bought often, therefore it could be concluded that the overall attitude about sustainable products of the families is that they are not sure what sustainable products are, and if they buy these products. Again, knowledge is necessary to create awareness of this subject. The usage of renewable energy resources is low, therefore it can be concluded that these families want to act within Sustainable development matters. However, they do not have the means to achieve it, considering these renewable energy solutions. The results show that there are many reasons for not using renewable energy, because every single family found a reason and answered this question (none didn't). Sustainable Development incorporation is not been put into practice, because the majority are NOT buying fewer products and less plastic products; or using less gas. It can be concluded that although all families are willing to participate to create a Sustainable community, and want play a part in sustainable development matters, the families are not taking action. Perhaps when these families obtained more knowledge about the subject, they know how to act so they can put their knowledge into practice.

The majority of all families answered that they did not separate waste. Also, the majority of the families reduce Water and Electricity usage, and use and reuse products. Only a small majority of the families are recycling their products. It can be

concluded that within the city of Hermosillo there are no or rare facilities that collect waste separately. Furthermore, the separated waste, where does it go? It is not certain whether this separated waste adds up to local businesses and companies for their material supply. Results show that a small majority of the families are recycling their products. This is an interesting number, because recycling is an important indicator for Sustainable Development matters. However, the majority of the participating families are willing to contribute financially to Sustainable Community Building.

The research was further investigated through sub-research questions. Through all obtained knowledge of the previous chapters, these sub-research questions can be answered.

- *Why do people want to be involved in a sustainable community?*

The people want to be a sustainable community to maintain an of urban residential which is recognized as the best of Hermosillo. Casa Grande has the status to represent 'richness and wellness with class and style'.

- *What are the main problems within the community?*

Main problems consist of lack of knowledge relating to Sustainable Development, difficulties to change lifestyles and consumption, rare waste separation, and lack of Sustainable Development facilities (as separated waste collection, knowledge provision, sustainable development regulations, etc); lack of sustainable technologies.

- *What is the identity of the participants?*

The identity of the participants can be considered as educated and wealthy families, who are very motivated to maintain the status of their community and themselves and are motivated to transform their community into a Sustainable Community through usage of the Sustainable Development concept.

- *What are significant elements of the lifestyles of the participants?*

Significant elements of the lifestyles consist of significant electricity use (e.g. air-conditioning), significant water use (e.g. cleaning, washing), household maintenance (e.g. toxic materials for cleaning, painting), buying more consumption goods than necessary and without reusing materials, no waste separation.

- *Which parts of these lifestyles need to be adapted?*

Custom lifestyles need to be adapted, like the electricity and water usages. For the participating families it seems that it looks more appealing to buy renewable energy measurements (e.g. photovoltaic cells, solar collectors, etc). However, adapting their custom lifestyles and reducing their custom consumptions would make a significant difference for the creation of a Sustainable Community.

- *How to adapt these lifestyles?*

Lifestyles can be adapted by reducing electricity consumption, reducing water usages, reducing product retailing, separate waste and find companies who can use this separated waste: these adaptations can decline their ecological footprint and can therefore contribute to Sustainable Development.

- *Where to start adapting lifestyles?*

Lifestyles can be adapted by self-awareness: How much electricity is used, where this usage can be cut down (e.g. turn off electrical equipment and lights when leaving the room). When is water used, how to reduce this usage (e.g. shorter showers, reuse of water for garden, less dishwashing water). There can be many ways, but it starts with the person itself and how this person measures its own lifestyle & consumption pattern.

- *What can be other necessary tools for the creation of a sustainable community?*

Necessary tools can consist of high-tech solutions like PV-cells (photovoltaic), Solar collectors, rainwater harvesting systems, etc. However, these are secondary solutions which are to be taken when primary solutions are succeeded: reduction of consumer patterns and lifestyles. A necessary assistance tool could consist of waste separation bins with different colors for the different wastes. Other assistance tools are electricity- and water-measurement tools (which measure the amount of electricity- and water-usage). This are small adaptations but can contribute a great deal for the creation of a Sustainable Community.

- *What future technical developments in Sustainable communities are projected?*

Future technical developments that can be projected are such technologies which use the advantages of the geographical area. Hermosillo, thus Casa Grande, is located in a deserted area. The advantage of this is the sun; therefore solar technologies are more than suitable. Furthermore, because there is a lack of water, optimization of this fact is necessary. When there is the rainy-season this should be optimized and used for future needs. A solution can be rainwater-harvesting with an insulated storage-tank undergrounds.

The research was set-up to find an answer to the research question, which served as the basis of the investigation of the Casa Grande case-study. The research question was: *"What is the degree of economic sustainability within a community on a local scale through the principles of Sustainable Development, respecting identities, characteristics, specific conditions and the actual lifestyles within the community?"*.

The degree of economic sustainability on a local scale, in this case Casa Grande, can be considered as 6 on a scale from 1 (bad) –to– 10 (perfect).

There are many reasons for this. The Casa Grande community has many abilities: it wants to maintain its status, it wants to become sustainable, it wants measurements to become sustainable, etc. However, they do not take time into account.

Results and analysis show that the families are willing to become sustainable, but they are not putting their ability into practice. Families state that they need renewable energy resources and assistance. However, a better environment start with the person him or her-self.

The qualification of '6' is because the participating residents are motivated, but seem to be a bit lazy as well. It seems that the community wants to become sustainable as soon as possible, although 'the change of mind' needs a lot of time. Furthermore, sustainability cannot be bought. The assisting tools, they can be bought.

Taken this small weakness aside, it is more than admirable that such a community: with a considerable lack of knowledge; an absolute lack of facilities; a significant lack of help, assistance, and management to put their abilities into practice; and all else what is not mentioned here; still is motivated to become of importance within Sustainability Development matters.

# RECOMMENDATIONS

The conclusion showed that the main problems consist of lack of knowledge relating to Sustainable Development, difficulties to change lifestyles and consumption, rare waste separation, and lack of Sustainable Development facilities (as separated waste collection, knowledge provision, sustainable development regulations, etc); lack of involvement of other and external parties (groups, participants, companies), and therefore sustainable measurements. The reasons for these problems are that the most difficult is to start to change lifestyles, when there is no knowledge about how to put Sustainability into practice. Therefore the recommendations given in these sections are related to the problems of lack of education, lack of guidance, and lack of involvement of external parties and other groups.

Most important is knowledge about Sustainable Development for the creation of a Sustainable Community. Therefore education about Sustainability Development and how to put this concept into practice is a recommendation for this community. With more knowledge about the subject Sustainable measurements can be undertaken through which the community can more easily be transformed into a Sustainable one.

The community wants to start to become a sustainable community, but do not know how and where to begin. Therefore external guidance and assistance is recommended for motivation (when the motivation of the community is fading) and project management. When the community has their own leader(s), other community members could find this position/status difference difficult, which could end-up in less tolerance towards community members. The guidance and assistance from outside the community can therefore be seen as twofold.

The community could be of need for sustainable measurements, which could be financial unattractive by being expensive. Enterprises in the United States or Europe are willing to support and invest in countries, cities, communities, and companies who are interested in Sustainable development. Furthermore, companies in other continents are more than pleased to test their technological solutions and equipment, of which much diversity of such technologies are demonstrated at the global market today and

faces a lot of competition. Therefore external communication with contributing groups and parties is recommended.

The community is more capable of becoming sustainable than they might think they are. The most important thing is to involve others, like: external assistance, agencies, external guidance, enterprises who might be interested in the abilities of the community, companies who could be linked and thus involved with the community (as the example of waste separation, to be separated for the company which can use these separated materials), etcetera.

The motivation is the most positive basis. With this motivation as background, sustainability will be achieved in this community.

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# Appendix I: Indicator Matrix

| ECONOMY INDICATORS | | Indicator 1 | Indicator 3 | Indicator 3 | Indicator 4 |
|---|---|---|---|---|---|
| Authors | Articles | Percentage of people that have adopted sustainable development goals | Percentage of companies developing new products or services | Number of building permits issued | Occupational distribution of women and minorities |
| Name 1 | www.sustainablemeasures.com | 1 | 1 | 1 | 1 |
| Name 2 | Catalog of Administrative Data Sources for neighbourhood indicators, Claudia Coulton | 0 | 0 | 0 | 0 |
| Name 3 | Peter Clavelle | 1 | 1 | 0 | 1 |
| Name 4 | Green Communities Home | 1 | 1 | 1 | 0 |
| Name 5 | epa.gov /greenkit/ sustain.htm | 1 | 1 | 1 | 1 |
| Name 6 | Institute for Sustainable Communities (ISC) | 1 | 0 | 0 | 1 |
| Name 7 | Ontario Round Table on Environment and Economy | 1 | 1 | 1 | 1 |
| Name 8 | Carillo, F.J. (2004) "Capital cities: a taxonomy of capital accounts for knowledge cities", Journal of Knowledge Management 8 (5): 28-46. | 1 | 1 | 0 | 1 |
| Name 9 | The Egan Review: Skills for Sustainable Communities. Sir John Egan | 0 | 0 | 0 | 0 |
| Name 10 | Building Sustainable Communities. The Century Commission for a Sustainable Florida. Anne Merrill | 0 | 0 | 0 | 0 |
| Name 11 | Dunn, B.G, A. Steinemann (1998) „Industrial ecology for sustainable communities", Journal of Environmental Planning and Management 41 (6):661-672. | 1 | 1 | 0 | 0 |
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| Name 14 | Roseland, M (2000) Sustainable community development: integrating environmental, economic, and social objectives", Progress in Planning 54: 73–132. | 1 | 1 | 0 | 1 |
| Name 15 | Smith, M.K. (2008) "Sustainable communities and neighbourhoods. Theory, policy and practice", The encyclopaedia of informal education: 1-17. | 1 | 1 | 0 | 1 |
| Name 16 | Bridger, J.C., A.E. Luloff (1999) "Toward an interactional approach to sustainable community development", Journal of Rural Studies 15: 377-387 | 1 | 1 | 0 | 1 |
| Name 17 | Indigo development: http://www.indigodev.com/Sustain.html april 2006 | 1 | 0 | 0 | 1 |
| Name 18 | Measuring Neighbourhood Sustainability in New Zealand Conference Paper, UPE7 World Class Cities, January 2007 | 0 | 0 | 0 | 0 |
| Name 19 | Maureen Hart www.What Is Sustainability.htm (2008) | 1 | 0 | 0 | 0 |
| | TOTAL | 15 | 12 | 6 | 11 |

**ECONOMY INDICATORS**

| Articles / Authors | Indicator 5 — Percentage of residents who want to work full time who actually work full time | Indicator 6 — Total percentage of Professional, technical and managerial occupations | Indicator 7 — Self sustaining (self-producing energy) | Indicator 8 — Strengthening local economies | Indicator 9 — Income per household | Indicator 10 — pay maintenances | Indicator 11 — Economically prosperous | Indicator 12 — Re-use, recycle, re-purpose vs. consume and discard (zero waste) |
|---|---|---|---|---|---|---|---|---|
| Name 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| Name 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Name 3 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| Name 4 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| Name5 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| Name 6 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| Name7 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Name 8 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| Name 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Name10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Name11 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| Name 12 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 |
| Name 13 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| Name 14 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Name 15 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| Name 16 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| Name 17 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| Name18 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| Name19 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| TOTAL | 4 | 12 | 9 | 13 | 11 | 8 | 9 | 16 |

## Economy Indicators

The construction of this section consists of the following: Indicators found by group work; collected indicators per grouping, and finally the created questions contributing per indicator. Used acronyms within this section: pp- per person; hh- household; phh- per household; SD-Sustainable Development; SC- Sustainable Community; SCB- Sustainable Community Building.

### A)      Indicators found:

o   Re-use, recycle, re-purpose vs. consume and discard (zero waste)   (16)

o   Percentage of people that have adopted sustainable development goals   (15)

o   Strengthening local economies   (13)

o   Percentage of companies developing new products or services   (12)

o   Total percentage of Professional, technical & managerial occupations   (12)

o   Occupational distribution of women and minorities   (11)

o   Income per household   (11)
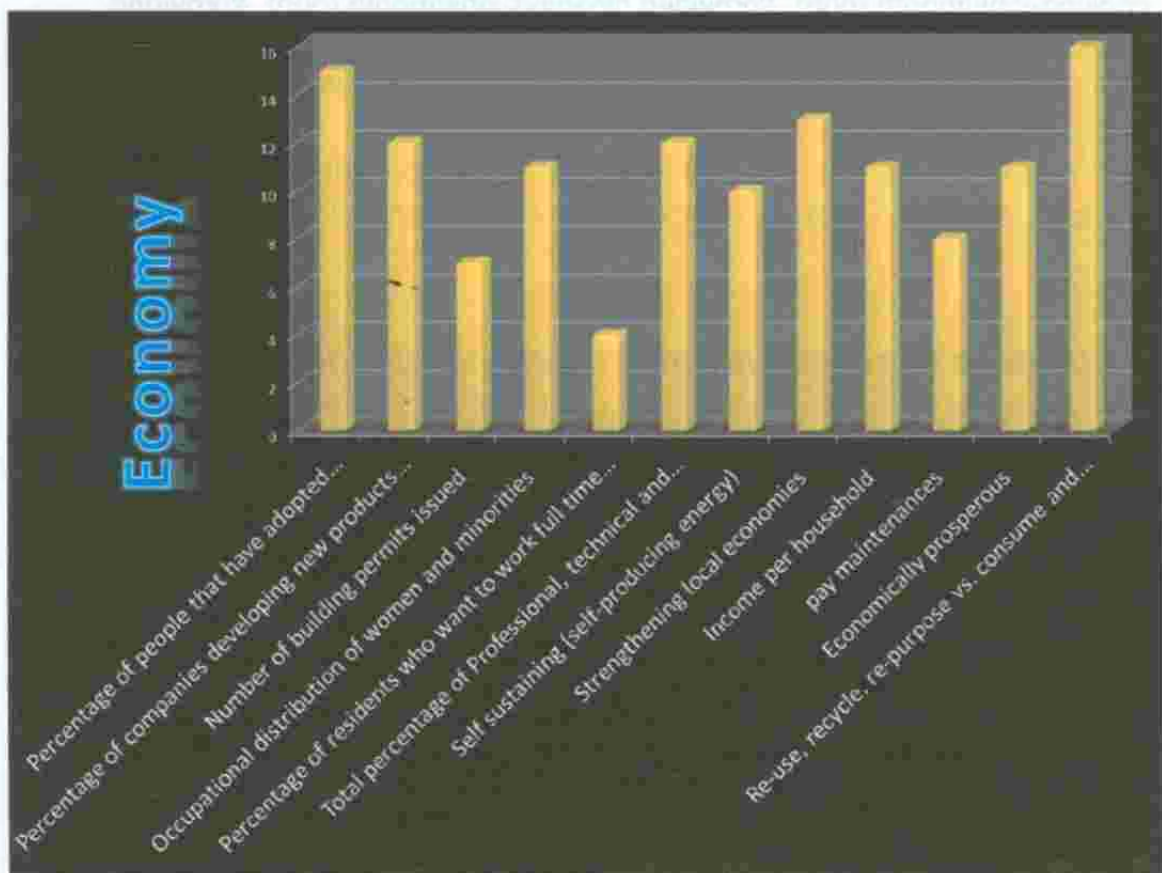


*Fig. X: Economy Indicators Graph, created 30 March 2009.*

**B)**     **Indicators per grouping**

*I.*   *Re-use, recycle, re-purpose vs. consume and discard (zero waste) (16)*

    a) RE-USE:#reused items/hh
    b) RE-CYCLE: # Recycled items/hh
    c) CONSUMPTION: # food-products/ month (phh), #gas-use/month (phh), #electricity-use/month (phh), #water-use/month (phh).
    d) WASTE: #garbagebags/week (phh), #kg/garbagebag (phh).

*II.*   *Percentage of people that have adopted sustainable development goals (15)*

    a) INVESTMENT: #sustainable furniture/hh, #money/project-part (phh)
    b) CUSTOMCHANGES: #adapted customs/hh, #adapted consumption/hh, #custom-changes/week

*III.*   *Strengthening local economies (13)*

    a) AVAILABLE HOUSEKEEPINGJOBS: #housekeeping-jobs/phh, #cooking-jobs/month (phh), #cleaning-jobs/month (phh), #gardening-jobs/month (phh),
    b) PROVIDED HOUSEKEEPINGJOBS: #provided housekeeping-jobs/phh, #provided cooking-jobs/month (phh), #provided cleaning-jobs/month (phh), #provided gardening-jobs/month (phh).
    c) AVAILABLE ADOLESCENTJOBS: #babysitting-jobs/phh, #hh-jobs/phh, #cooking-jobs/phh, #cleaning-jobs/phh.
    d) PROVIDED ADOLESCENTJOBS: #babysitting-jobs provided/phh, #provided hh-jobs/phh, #provided cooking-jobs/phh, #provided cleaning-jobs/phh.

*IV.*   *Percentage of companies developing new products or services (12)*

    a) COMPANIES: #companies/ SCB goal, #companies willing to learn more about SD/ SCB goal, #possible adaptations/company.
    b) SERVICES: #adopted SCB services/ company, #adopted SCB products/ company

*V.*   *Total percentage of Professional, technical and managerial occupations (12)*

    a) PROFESSION: #professions/phh, #technical professions/phh, #managerial professions/phh.
    b) PROFESSIONINFLUENCE: #professions which influence choice for SC/phh, #contributing professions towards SD-SCB/phh, #professions which aid to create SCB/phh.

*VI.   Occupational distribution of women and minorities   (11)*

   a) EDUCATION:#high-school graduations/phh, #Bachelor degrees/phh, #master degrees/phh, #titles/phh.
   b) JOBS-LABOUR: #paid labour/phh, #voluntary labour/phh, #fulltime jobs/phh, #part-time jobs/phh.

*VII.   Income per household   (11)*

   a) HOUSEHOLD: #men/phh, #women/phh, #adolescents/phh.
   b) MONTHLY INCOME: #income men pp/month (phh), #income women pp/month (phh), #income adolescents pp/month (phh)
   c) INCOME MEN: #paid labour/phh, #voluntary labour/phh, #jobless/phh.
   d) INCOME WOMEN:  #paid labour/phh, #voluntary labour/phh, #jobless/phh.
   e) INCOME ADOLESCENTS:  #paid labour/phh, #voluntary labour/phh, #jobless/phh.
   f) DOUBLE INCOME: #husband-wife incomes/phh, #2 incomes other/phh, #3 incomes/phh, #4 or more incomes/phh.

## C)      Contributing Questions per Indicator

### I.   Reuse, recycle, re-purpose vs. consume & discard (zero waste) (16)

1) Re-use of products? (Use materials *again*; eg. Furniture which is secondhand, fixing broken products, eg. Electronics, clothes, shoes)
    a. What products do you reuse?
    b. How are these products reused?
    c. How long are these products used?
2) Re-use of materials? (Use materials *again*; eg. Fruit compost for garden, plastic/ wood to construct within house)
    a. What kind of materials are reused?
    b. How are these materials reused?
    c. How long do these materials last?
3) Re-cycling of products and materials? (eg. Use parts of products to create other products, eg. Ruined wooden table, used for closet shelves)
    a. What products are recycled?
    b. How are these products recycled?
    c. What materials are recycled?
    d. How are these products recycled?

### II.   Percentage of people that have adopted sustainable development goals   (15)

1) Investing in Sustainable Development?
    a. Did you bought products with a sustainable characterization?
    b. Do you make use of renewable energy resources?
    c. Do you incorporate SD in your consumer-pattern?
    d. Did you bought sustainable equipment to generate from sustainable energy resources?
    e. Do you invest in Sustainable Community Development?

2) Change of habits?
   a. Did you change your consumer habits?
   b. How do you incorporate SD in your consumer-pattern?
   c. Did you change your waste habits? (separate/less waste/reuse)
   d. Did you change your habits to decrease the electricity use?
   e. Did you change your habits to decrease the electricity bill?

## III. Strengthening local economies (13)

1) Are there housekeeping-jobs available for household maintenance?
   (cooking, cleaning, gardening)
   a. Are there cooking jobs for household maintenance?
   b. Are there cleaning jobs for household maintenance?
   c. Are there gardening jobs for household maintenance?

2) Are there jobs offered for adolescents?
   a. Are there babysitting jobs offered for adolescents?
   b. Are there housekeeping jobs offered for adolescents?
   c. Are there cleaning jobs offered for adolescents?

## IV. Percentage of companies developing new products or services (12)

1) Which companies follow your SCB goal?
   a. Which electricity company follows your SCB goal?
   b. Which gas company follows your SCB goal?
   c. Which water company follows your SCB goal?

2) Do these companies develop new products and services?
   a. How does the electricity company develop new products to follow your SCB goal?
   b. How does the electricity company develop new services to follow your SCB goal?
   c. How does the gas company develop new products to follow your SCB goal?
   d. How does the gas company develop new services to follow your SCB goal?
   e. How does the water company develop new products to follow your SCB goal?
   f. How does the water company develop new services to follow your SCB goal?

## V. Total percentage of Professional, technical and managerial occupations (12)

1) Do you have a Profession?
   a. Does your profession concerns technical occupations?
   b. What kind of technical occupations take place in your profession?
   c. Does your profession concerns managerial occupations?
   d. What kind of managerial occupations take place in your profession?

2) Does your profession has anything to do with Sustainability and SD?
   a. Does your profession influences your choice to create a SC?

b. Does your profession contributes to SCD?

c. Do you want to contribute to SCD through your profession?

## VI. Occupational distribution of the residents (11)

1) What is the average educational degree?
   a. Did you graduated High school?
   b. Which degree?
   c. Did you have a Bachelors degree?
   d. What is your Bachelors specialty?
   e. Did you have a Masters degree?
   f. What is your Masters specialty?
   g. Do you have other titles?
   h. What are the specialties of these titles?

2) Do you have a job?
   a. Does your job consists of paid labour?
   b. Does your job consists of voluntary labour?
   c. Do you work full-time?
   d. Do you work part-time?

## VII. Income per household (11)

1) What is your monthly income?
   a. What is the income of the working men per household, per person, per month?
   b. What is the income of the working women per household, per person, per month?
   c. What is the income of the working children per household, person, per month?

2) How many men are in the household?
   a. Which of the men has a job in paid labour?
   b. Which of the men has a job in voluntary labour?
   c. Which of the men do not have a job?

3) How many women are in the household?
   a. Which of the women has a job in paid labour?
   b. Which of the women has a job in voluntary labour?
   c. Which of the women do not have a job?

4) How many children are in the household?
   a. Which of the children has a job in paid labour?
   b. Which of the children has a job in voluntary labour?
   c. Which of the children do not have a job?

5) Amount of double-income households?
   a. Does the household consist of more than one person to earn the household income?
   b. Does the household consist of more than two people to earn the household income?

# Appendix III: Questionnaire English

## ECONOMICAL

1) Birthyear:
   19____

2) Gender/Sex
   ____ Male   ____ Female

3) Level of education within family
   ____ Degree of Secundary Education (College)
   ____ Highschool degree
   ____ Bachelor degree
   ____ Specialization
   ____ Master Degree
   ____ Other, which?

4) What is your employment?
   ____ Employee   ____ Student   ____ Household

5) Sort of labour:
   ____ Paid labour   ____ Voluntary (non-paid) labour   ____ Domestic

6) Amount of family members (Including you)
   ____ Females   ____ Males

7) Which are of age (year):
   ____ Under 3   ____ 3-11   ____ 12-17   ____ 18-59   ____ 60 or older

8) Amount of people who contribute to household income?
   ____ People

9) Total amount of income of **Males** per month of family:
   $ ____

10) Total amount of income of **Females** per month of family:
    $ ____

11) Total amount of income of **Adolescents** per month of family:
    $ ____

12) Labour time:
    ____ Full-time   ____ Part-time
    ____ Amount of work-hours per week

13) Total amount of income of the employed family members
    $ ____

14) Sort of profession:
    ____ Technical   ____ Management   ____ Educational
    ____ Other

15) How to explain your work; What do you do?
    ____

16) Does your family offers housekeeping-jobs for household maintenance?
    Please note the age, in case of positive answer.
    ____ No,
    ____ Cooking   ____ Age   ____ Cleaning   ____ Age
    ____ Gardening   ____ Age   ____ Other

17) How often does a person assists in your housekeeping per week?
    ____ Cooking   ____ Cleaning
    ____ Gardening   ____ Other

18) Does your family know about the Sustainable Development concept?
    ____ Yes   ____ No

19) Does your family knows about the Sustainable Community concept?
    ____ Yes   ____ No

20) Does your profession, school, employment **contribute** to Sustainable
    Development?
    ____ Yes   ____ No   ____ Not sure
    Why?
    ____

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21) Did your profession, school, employment had **influenced** your choice/ decision to create a Sustainable Community?

_____ Yes _____ No _____ Not sure

Why? _____

22) Is your family willing to participate in creating a Sustainable Community?

_____ Yes _____ No _____ Not sure

Why= _____

23) What is your family GOAL to achieve with this project? _____

24) Do you buy products with a sustainable character? (e.g. organic products, recycled paper, etc).

_____ Yes _____ No _____ Not sure

Which? _____

25) Does your family make use of renewable energy resources?

_____ No _____ hopefully in the future _____ Windmills

_____ Solar Cells _____ Gas instead of gasoline _____ Other

26) When you are not using renewable energy resources (yet), what could be the reason for this?

_____ No knowledge about the subject
_____ Do not know where available in shops
_____ It is expensive
_____ We don't use it in México
_____ It is not at the Mexican market
_____ Other, _____

27) Did your family incorporated Sustainable Development within its consumer-pattern?

_____ Yes _____ No

28) How did your family incorporated SD within its consumer patterns?

_____ Buy less products        _____ Buy less plastic products
_____ Use less water           _____ Use less electricity
_____ Use less gas             _____ Other, namely

29) Does your family separates waste?

_____ Yes _____ No

30) How does your family separates waste?

_____ Organic      _____ Glass
_____ Inorganic    _____ Cans
_____ Plastic      _____ Paper

31) Did your family changed its habits to decrease its electricity use?

_____ Yes _____ No _____ Not sure

How? _____

32) Please write the number of the CFE meter down _____

33) What does your family do to safe water? _____

34) Does your family reuse products/ materials? (E.g. Using a coffee jar to safe screws)

_____ Yes _____ No

35) Which products/ materials?

_____ Plastic   _____ Wood
_____ Glass     _____ Personal items (clothes, shoes)
_____ Other

36) Does your family recycle products/ materials?

_____ Yes _____ No

37) Which products are recycled and how?

(Eg. Using parts of a product to create other products, like: Wood of a broken table, used for the shelves of a closet)

_____

38) Is your family willing to contribute financially to make your community Sustainable?

_____ Yes _____ No _____ Because _____

## TRANSPORT

39) Amount of cars at home?

_____ Cars

40) Did you or another family member experienced an accident, related to the transport within your community?

_____ Yes _____ No

41) When the previous answer is affirmed, please indicate which transportation usage.

_____ Car _____ Motor _____ Public transport _____ Bicycle
_____ Walking/pedestrian

42) What type of car(s) your family uses?

_____

43) Which brand name and models is/are the(se) car(s)?

1. _____
2. _____
3. _____
4. _____

44) What amount of cylinders is/ are your car(s)?

1. Inline 4
2. V6
3. V8
4. V10, V12, V16

45) The sound of the claxon of motors, cars, buses in the neighbourhood is:

_____ Very often _____ Normal _____ Rare _____ Absent

46) What is the usual form of transport within your family?

_____ Car _____ Motor _____ Public transport _____ Bicycle
_____ Walking

47) What type of gas your family uses?

_____ Magna _____ Premium

48) Weekly amount of money spent on gas in average?

$ _____

49) For what type of destinations is your way of transport used?

_____ Work _____ School _____ Family/ friends visit
_____ Recreationally _____ Shopping/ food supply

50) What is the approximate distance travelled to reach their destinations?

Work _____ km. Family/Friends visit _____ km.
School _____ km. Shopping/ food supply _____ km.
Recreationally _____ km.

51) What amount of time do you spend to go to your destinations?

Work _____ min. Family/Friends visit _____ min.
School _____ min. Shopping/ food supply _____ min.
Recreationally _____ min.

52) What, according to your experience, does having a car represents?

_____ Necessity _____ Normal _____ Luxury

53) Do you have easily access to public transport? Yes/no, in:

_____ District _____ Work _____ School _____ University

54) Do you feel safe and secure walking/ cycling within your district?

_____ Si _____ No

55) How often do you use seatbelts?

_____ Always _____ Frequently _____ Occasionally _____ Never

56) In your opinion bicyclists are:

_____ Sportsmen _____ Environmentalists _____ Low income

57) Do you or someone in your family are usually walking?

_____ Yes _____ No _____ Who

58) What amount of time per week? _____ min.

59) How long does this take? _____ min.

60) What is the amount of distance? _____ km.

61) Do you or someone in your family use(s) the bicycle?

_____ Yes _____ No _____ Who

62) What amount of time per week?

63) How long does this take? _____ min.

64) What is the amount of distance? _____ km.

65) Do you consider the climate as a factor to determine wheter you travel by foot or by bicycle?
___ Yes ___ No  Why? _____

## HOUSING

66) When is your house built? _____

67) Are you the owner or the renter of the house?
___ Owner ___ Renter ___ Other _____

68) Is the house under construction?
___ Yes ___ No

69) The material of which the house is built, consists of:
___ Recycled ___ New ___ Rests and leftovers of the house built before

70) The house contains:
___ Isolation ___ Heating ___ Cooling

71) Did the orientation and direction of the sun was taken in consideration when the plans for the house were made?
___ Yes ___ No ___ Not sure

72) Of what material is your house constructed?
___ Blocks ___ Bricks ___ Panel W- ___ Other

73) How many people live in your house? _____

74) Do you consider the space of you house appropriate?
___ Yes ___ No

75) Do you have plans to expand your house and property?
___ Yes ___ No

76) Which part?
___ Living room ___ Dining room ___ Other, Which? _____

77) Of what amount of m2 consists your property and terrain?
_____ m2

78) Of what amount of m2 consists your building site?
_____ m2

79) Of what amount of m2 consists your garden?
_____ m2

80) Your house contains for children/students:
___ Playroom ___ Study Room ___ Safety plug-in/ switches
___ Hazardous materials out of reach of children

81) Your house got extra expedients:
___ handrails on stairs ___ Slopes ___ Lifts.

82) Does your family has furniture made from natural materials?
___ Yes ___ No

83) When reused, did another person gave you these materials already used?
___ Yes ___ No

84) Has your family donated furniture for reuse?
___ Yes ___ No

85) Does your house needs to be reparations now and then?
___ Yes ___ No

86) What needs to be repaired? _____

87) How often do you need to realize maintenance of:

Sealing, make waterproof _____
Painting _____
Appliances _____
Other _____

88) Do you keep your garden in good condition?
_____ Yes _____ No

89) How much time is needed for each?

Improve, fertilize/ compost _____
Pruning/topping _____
Seeding _____
Repair/ renewing _____

## ENVIRONMENT

90) Does your house has drinking water?
_____ Yes _____ No

91) Does your house has drainage sanitaria?
_____ Yes _____ No

92) Does your garden has grass in the backyard?
_____ Yes _____ No

93) What type of vegetation is there in the garden? _____

94) Do you have native vegetation within your backyard?
_____ Yes _____ No

95) Which sorts?
_____ Sahuaro _____ Palo verde _____ Mezquite _____ Other

96) How frequent does your family need to water the garden?
_____ Daily _____ Every third _____ Once a week

97) At what time the garden is usually watered?
_____ Before 6 PM
_____ After 6 PM
_____ Early in the mornings

98) What is the average time you need to water the garden? _____

99) Which method do you use to water the garden? _____

100) How much M3 water is consumed per month? (receipt) _____

101) In the following characteristics, please select those which are used for water saving within the house.

_____ Low-flow toilets;
_____ Showers with low-flow
_____ System for gray water recycling
_____ System for capturing rainwater
_____ System to reuse soapy water

102) Do you produce your own organic waste?
_____ Yes _____ No

103) How many garbage bins does your home fills every week?
Amount
_____ 0 - 1 _____ 1 - 2 _____ 2 - 4 _____ 5 or more

104) What amount of electricity your family uses per month (Kwh)?
$ _____ Summer $ _____ Winter

105) What amount of gas is used within your family per month?
$ _____

106) ¿Do you turn the light off when you leave the room?
_____ Yes _____ No

107) What type of gas does your family uses within the household?
_____ Gas LP  _____ Natural

108) What type of products does your family uses to clean the house?
_____

109) In what manner do you take care for the environment when using these products?
_____ Using a small amount  _____ Not mixed
_____ Dilution with water
_____ Other, namely _____

110) How often do you chose cleaning product that are biodegradable and nontoxic?
_____ Almost never  _____ Sometimes  _____ Most of the time  _____ Always

111) How often do you buy new things to replace the ones already in possession?
_____ Not often replaced: I tend to use things until they really need to be replaced.
_____ Replacement depends: Some articles can be used for years, other articles are replaced before it is necessary.
_____ Often replaced: Often belongings are replaced, even when they are in good condition.

112) Do you use the dryer to dry your clothes?
_____ Yes  _____ No

113) Can your neighbourhood be considered as a quiet and calm place?
_____ Yes  _____ No

114) What type of noises in your neighbourhood do you consider annoying?
_____
_____

115) Where do you bring your empty and discharged batteries?
_____
_____

116) Which of these daily activities take place in your house?
_____ Careful with water use
_____ Use natural light
_____ Turn off all switches when leaving your room/ house
_____ Turn off all electronically gear/ machinery when not in use

## SOCIAL

117) Do you practice any physical activity?
Yes _____  No _____  Which _____

118) What amount of hours per week?
_____ Less than 2  _____ Between 2 and 3  _____ Between 4 and 5  _____ 6 or more

119) Do you and your family have a private health insurance?
Yes _____  No _____

120) Do you support the social security services of the federal government and/or state?
Yes _____  No _____  Why? _____

121) Does anyone in your family smokes?
Yes _____  No _____

122) When above question is answered positively, how many cigarettes are smoked per day? _____

123) Does anyone in your family used (some kind of) drugs?
Yes _____  No _____

124) Does one of your neighbours use drugs?
Yes _____  No _____

125) Does anyone in your family drinks alcohol?
Yes _____  No _____

126) Amount of glasses you drink per week:
Wine _____  Beer _____  Whisky _____  Other _____

127) Does your family organises recreational activities?

Yes_____ No_____

128) When above question is answered positively, how many hours per week?

_____ Less than 1 hr.              _____ Between 1 and 3 hrs.
_____ Between 4 and 6 hrs.         _____ More than 6 hrs.

129) Time spend by the family?

_____ Less than 1 hr.              _____ Between 1 and 3 hrs.
_____ Between 4 and 6 hrs.         _____ More than 6 hrs.

130) Do the adolescents organize festivities/ parties in the common areas? (Park, streets, etc)

Yes.____         No.____    At what frequency?_____

131) When the above question is answered positively, do you consider these activities bothersome?

Yes_____ No_____ Because:_____ _____

132) Do you consider your neighbourhood as safe?

Yes_____ No_____ Because _____

133) Have you experienced a burglary in your home?

Yes_____ No_____

134) Have you experienced a burglary in your neighbourhood?

Yes_____ No_____

135) Do you know a neighbour who suffered from a burglary in his/her home?

Yes_____ No_____

# Appendix IV: Cuestionario Español

## ECONOMICO

1) Año de nacimiento:
   19_____

2) Género/Sexo
   _____ Masculino _____ Femenino

3) Grado de educación de la familia
   _____ Certificado de Preparatoria   _____ Certificado de Licenciatura
   _____ Certificado de Secundaria     _____ Especialidad
   _____ Maestría                      _____ Otro, ¿cuál?

4) A qué se dedican?
   _____ Trabaja _____ Estudia _____ Hogar

5) Tipo de empleos:
   _____ Asalariado _____ Trabajo voluntario _____ Negocio propio

6) Del número total de los miembros de la familia, (incluyéndolo a usted)
   ¿cuántos son?
   Hombres_____ Mujeres_____

7) De los cuales:
   _____ menos de 3 _____ 3-11 _____ 12 a 17 _____ 18 a 59 _____ 60 o más

8) ¿Por cuántas personas es obtenido el ingreso en su hogar?
   _____ Personas

9) Monto total de ingresos por mes de los **hombres** de la familia:
   $_____

10) Monto total de ingresos por mes de las **mujeres** de la familia:
    $_____

11) Monto total de ingresos por mes de los **adolescentes** de la familia:
    $_____

12) Jornada Laboral:
    _____ Tiempo completo _____ Medio tiempo
    Monto de horas trabajadas por semana

13) Ingreso total mensual de las personas que laboran
    $_____

14) Tipo de profesiónes:
    _____ Técnico _____ Dirección _____ Educacional _____ Otro

15) ¿Cómo explica su trabajo?
    _____
    _____

16) ¿Cuenta en su hogar con personal para el servicio doméstico?
    _____ No,
    _____ Cocinero _____ Edad _____ Limpieza _____ Edad
    _____ Jardinero _____ Edad _____ Otro _____ Edad

17) ¿Con qué frecuencia asisten a laborar?
    _____ Cocinero _____ Edad _____ Limpieza _____ Edad
    _____ Jardinero _____ Edad _____ Otro _____ Edad

18) ¿Qué edades tienen las personas que trabajan en el servicio domestico?
    _____ Si _____ No

19) ¿Conoce su familia el concepto de Desarrollo sustentable?
    _____ Si _____ No

20) ¿Conoce su familia el concepto de Comunidad Sustentable?
    _____ Si _____ No

21) ¿Sus profesiónes, escuelas y/o empleos contribuye al Desarrollo Sustentable?
    _____ Si _____ No _____ No se
    ¿Porqué?
    _____

22) ¿Sus profesiónes, escuelas y/o empleos los han influenciado en su decisión de crear una Comunidad Sustentable?

___ Si ___ No ___ No se

¿Porqué? _____

_____

23) ¿Está su familia dispuesta a participar para crear una Comunidad Sustentable?

___ Si ___ No ___ No se

¿Porqué? _____

_____

24) ¿Cuál es el objetivo de su familia para este proyecto?

_____

_____

25) ¿Compran ustedes productos de carácter sustentable (productos orgánicos, papel reciclado, etc.)?

___ Si ___ No ___ No se

¿Cuáles? _____

_____

26) ¿Ustedes hacen uso de fuentes de energía renovable?

___ No ___ Espero en el futuro

___ Molinos de viento ___ Celdas solares

___ Gas en lugar de gasolina ___ Otro _____

27) Si ustedes no utilizan todavía fuentes de energía renovable, ¿cuál es la razón?

___ No tenía conocimiento sobre el tema

___ No se en que tiendas están disponibles

___ Es caro

___ No lo usamos en México

___ No están en el mercado mexicano

___ Otro, _____

28) ¿Su familia incorpora el Desarrollo Sustentable en sus patrones de consumo?

___ Si ___ No, ¿Cómo?

___ Compro menos productos

___ Compro menos productos de plástico

___ Uso menos agua

___ Uso menos electricidad

___ Uso menos gas

___ Otro, menciónelo _____

29) ¿Su familia separa la basura?

___ Si ___ No, ¿Cómo?

___ Orgánica ___ Vidrio

___ Inorgánica ___ Latas

___ Plástico ___ Papel

30) ¿Su familia ha cambiado sus hábitos para disminuir el uso de electricidad?

___ Si ___ No ___ No se,

¿Cómo? _____

31) Podría anotar el número de medidor de CFE.

_____

32) ¿Qué esta haciendo su familia para ahorrar agua?

_____

_____

33) ¿Su familia reutiliza productos/materiales?

___ Si ___ No,

¿Cuáles?

___ Plástico ___ Madera

___ Vidrio ___ Artículos personales (ropa, zapatos)

___ Otro

34) ¿Su familia recicla productos/materiales?

___ Si ___ No

¿Qué productos son reciclados y cómo?

(Ej. Usar partes de un producto para crear otros productos, ej. La madera de una mesa arruinada, usada para los estantes de un closet)

_____

_____

35) ¿Estarían dispuestos a participar económicamente para hacer de su colonia una comunidad sustentable?

___ Si ___ No ___ Porque _____

## TRANSPORTE

36) ¿Cuántos carros hay en casa?
_____ carros

37) ¿Ha estado expuesto usted o alguien en su familia a algún accidente relacionado con cualquier forma de transporte en la comunidad?
_____ Si _____ No

38) En caso de contestar afirmativamente la anterior, indique en que medio de transporte.
_____ Automóvil _____ Motocicleta _____ Transporte urbano
_____ Bicicleta _____ Caminata

39) ¿Qué tipo de carro(s) utilizan en su familia?
_____

40) ¿Cuáles son las marcas y modelos?
1. _____
2. _____
3. _____
4. _____

41) ¿De cuántos cilindros son?
1. _____
2. _____
3. _____
4. _____

42) El sonido del claxon de motocicletas, autos o camiones en el fraccionamiento es:
_____ Muy frecuente _____ Normal _____ Poco frecuente _____ Ausente

43) ¿Cuál es la forma habitual de transporte en su familia?
_____ Automóvil _____ Motocicleta _____ Transporte Urbano
_____ Bicicleta _____ Caminata

44) ¿Qué tipo de gasolina utilizan?
_____ Magna _____ Premium

45) ¿Cuánto gastan en gasolina semanalmente en promedio?
$ _____

46) ¿Qué tipo de transporte utilizan para llegar a sus diferentes destinos?
_____ Trabajo _____ Escuela _____ Visitar Familia _____ Recreación
_____ Abastecimiento de Alimentos

47) ¿Cuál es la distancia aproximada que recorren para llegar a sus diferentes destinos?
_____ Trabajo _____ km. _____ Escuela _____ km. _____ Visitar Familia _____ km.
_____ Recreación _____ km. _____ Abastecimiento de Alimentos _____ km.

48) ¿Cuánto tardan en llegar a sus diferentes destinos?
_____ Trabajo _____ min. _____ Escuela _____ min. _____ Visitar Familia _____ min.
_____ Recreación _____ min. _____ Abastecimiento de Alimentos _____ min.

49) ¿Para usted qué representa tener un automóvil?
_____ Necesidad _____ Medio _____ Lujo

50) ¿Tienen acceso a transporte público? En:
_____ Colonia _____ Trabajo _____ Escuela

51) ¿Se siente protegido para caminar o andar en bicicleta en su colonia?
_____ Si _____ No

52) ¿Con qué frecuencia utilizan cinturón de seguridad?
_____ Siempre _____ Frecuentemente _____ Ocasionalmente _____ Nunca

53) En su opinión los ciclistas son:
_____ Deportistas _____ Ambientalistas _____ De bajos recursos

54) ¿Ud . o alguien de su familia practica la caminata?
_____ Si _____ No _____ Quien

55) ¿Cuántas veces por semana ?
_____

56) ¿Cuánto tiempo lo hace? _____ min.

57) ¿Qué distancia recorre? _____ km.

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58) ¿Ud . o alguien de su familia utiliza la bicicleta?
Si _____ No _____ Quien _____

59) ¿Cuántas veces por semana ? _____

60) ¿Cuánto tiempo lo hace? _____ min.

61) ¿Qué distancia recorre? _____ km.

62) ¿Considera al clima un factor determinante para la caminata o el uso de la bicicleta?
_____ Si _____ No
¿Por qué? _____

## VIVIENDA

63) ¿Cual es la antigüedad de su vivienda? _____

64) ¿Usted es   Propietaro _____   Arrendatario _____

65) ¿Su vivienda está en construcción? _____ Si _____ No

66) El material con el que construyó su casa es:
_____ Reciclado _____ Nuevo _____ Del que sobró la última vez

67) Su casa cuenta con:
_____ Aislamiento _____ Calefacción _____ Refrigeración

68) ¿Se consideró la orientación y dirección solar al momento de hacer los planos de la casa?
_____ Si _____ No _____ No se

69) ¿De qué material está construida?
_____ Block _____ Ladrillo _____ Panel W _____ Otros

70) ¿Cuántas personas viven en la casa? _____

71)

72) ¿Considera adecuado el espacio de su casa?
_____ Si _____ No

73) ¿Tiene planeado ampliar su vivienda?
_____ Si _____ No,
¿Qué parte?
_____ Sala _____ Comedor _____

74) ¿Cuántos m2 mide su terreno? _____ m2

75) ¿Cuántos m2 tiene su terreno de construcción? _____ m2

76) ¿Cuántos m2 mide su jardín? _____ m2

77) Su casa cuenta con :
_____ Área de juegos _____ Tapones en los interruptores( enchufes)
_____ Sala de estudio _____ Material peligroso lejos  del alcance de los niños

78) Su vivienda tiene::
_____ Barandal en las escaleras _____ Desniveles _____ Elevador.

79) ¿Tiene muebles hechos con material natural?
_____ Si _____ No

80) ¿Han sido reutilizados, alguien se los regalo ya usados?
_____ Si _____ No

81) ¿Ha regalado muebles para su reuso?
_____ Si _____ No

82) ¿Su casa necesita reparaciones?
_____ Si _____ No
¿En donde? _____

83) 43)  ¿Cada cuánto tiempo realiza mantenimiento de:
Impermeabilizar _____ Pintura _____
Aparatos _____ Otros _____

95) ¿Qué método utilizan para regar el jardín?
_____

96) ¿Cuánto consume de agua al mes (m3)?(Recibo)
_____

97) ¿Elaboran composta con sus residuos orgánicos?
_____ Si _____ No

98) ¿Cuánto consumen de luz al mes (Kwh)?
_____

99) ¿Cuánto gastan de gas al mes en promedio?
$ _____

100) ¿Qué tipo de gas utilizan en su domicilio?
_____ Gas LP _____ Natural

101) ¿Qué tipos de productos químicos utilizan para la limpieza del hogar?
_____

102) ¿Qué tipos de cuidados realizan al utilizar estos productos?
_____ Uso en poca cantidad _____ No mezclarlos
_____ Otros_____

103) ¿Qué tan seguido compran cosas nuevas para reemplazar las que ya tienen?
_____ Tiendo a utilizar las cosas hasta que realmente hay necesidad de sustituirlos.
_____ Algunos artículos los uso durante años, otros artículos los reemplazo antes de que sea necesario.
_____ Frecuentemente reemplazo las pertenencias, incluso si están en buen estado.

104) ¿Utilizan secadora de ropa?
_____ Si _____ No

105) ¿Considera usted que el fraccionamiento es un lugar silencioso (tranquilo)?
_____ Si _____ No

84) ¿Mantiene en buen estado su jardín?
_____ Si _____ No

85) ¿Cada cuánto tiempo lo?
_____ Abona _____ Poda _____ Siembra
_____ Renueva

**MEDIO AMBIENTE**

86) ¿Cuenta su domicilio con agua potable?
_____ Si _____ No

87) ¿Cuenta su domicilio con drenaje sanitario?
_____ Si _____ No

88) ¿Tiene zacate en su jardín?
_____ Si _____ No

89) ¿Qué otro tipo de vegetación tiene en el jardín?
_____

90) ¿Tiene plantas nativas (de la región) en el jardín?
_____ Si _____ No

91) ¿Cuáles?
_____ Sahuaro _____ Palo verde _____ Mezquite
_____ Otro

92) ¿Con qué frecuencia riega el jardín?
_____ Diario _____ Cada tercer día _____ Una vez a la semana

93) ¿A qué hora acostumbran regar el jardín?
_____ Antes de las 6 de la tarde _____ Después de las 6 de la tarde

94) ¿Cuánto tiempo tarda en promedio regando el jardín?
_____

106) ¿Qué tipo de ruidos fuertes considera usted son molestos en el fraccionamiento?
_____
_____
_____

107) ¿En dónde depositan las pilas cuando las desecha?
_____
_____

108) ¿Apagan ustedes la luz cuando salen de algún cuarto?
____ Si ____ No

109) ¿Cual de estas actividades realizan en su casa diariamente:
____ Utiliza la luz natural ____ Apaga todos los interruptores al salir de casa
____ Cuida el agua ____ Apaga todos los aparatos eléctricos cuando no los usa

## SOCIAL

110) ¿Practica Ud. alguna actividad física?
____ Si ____ No
Cual _____

111) ¿Cuantas horas a la semana?
____ Menos de 2 ____ Entre 2 y 3 ____ Entre 4 y 5 ____ 6 o mas

112) ¿Cuenta Ud. Con algún tipo de seguro médico privado?
____ Si ____ No Porque _____

113) ¿Asiste Ud. A los servicios de seguridad social de gobierno federal y/o estatal?
____ Si ____ No Porque _____

114) ¿Alguien en su familia fuma?
____ Si ____ No

115) En caso de haber respondido positivamente la pregunta anterior,
¿Cuántos cigarros fuma al día? _____

116) ¿Alguien de su familia utiliza algún tipo de droga?
____ Si ____ No

117) ¿Tiene algún vecino que utilice drogas?
____ Si ____ No

118) ¿Alguien de su familia toma alcohol?
____ Si ____ No

119) ¿Cuántos vasos toma a la semana de…?
____ Vino ____ Cerveza ____ Whisky ____ Otro

120) ¿Tiene algún vecino que tome alcohol?
____ Si ____ No

121) ¿Realizan en su familia actividades recreativas?
____ Si ____ No

122) ¿Cuántas horas por semana?
____ Menos de 1 hr. ____ De 1 a 3 hrs. ____ De 4 a 6 hrs. ____ Más de 6

123) ¿Dedican tiempo a la familia?
____ Si ____ No

124) ¿Cuántas horas a la semana?
____ Menos de 1 hr. ____ De 1 a 3 hrs. ____ De 4 a 6 hrs. ____ Más de 6

125) ¿Se hacen fiestas de jóvenes dentro de su colonia en las áreas comunes?(Ej.
Parques, en las calles.)
____ Si ____ No Con que frecuencia _____

126) En caso de que su respuesta anterior sea afirmativa,¿considera que son molestas?
____ Si ____ No Porque _____

127) ¿Considera Ud. Que su fraccionamiento es seguro?
____ Si ____ No Porque _____

128) ¿Ha sufrido usted algún robo en su vivienda o dentro del fraccionamiento?
____ Si ____ No

129) ¿Conoce a algún vecino que haya padecido algún robo en su vivienda?
____ Si ____ No

# Appendix V: SPSS Analysis

## Birthyear

| Valid | Frequency | Percent |
|---|---|---|
| 1976-1985 | 2 | 7,4 |
| 1966-1975 | 7 | 33,3 |
| 1956-1965 | 14 | 85,2 |
| 1955 - older | 4 | 100,0 |
| Total | 27 | |

Most of the respondents are in the Age Group of 1956 – 1965, with a percentage of 85%.

## Gender

| Valid | Frequency | Percent |
|---|---|---|
| Male | 3 | 11,1 |
| Female | 24 | 88.9 |
| Total | 27 | 100,0 |

The respondents were mostly female, namely with 88,9%

## Level of education within Family

| Valid | Frequency | Percent |
|---|---|---|
| Highschool | 5 | 18,5 |
| Bachelor | 17 | 63,0 |
| Specialization | 2 | 7,4 |
| Master | 1 | 3,7 |
| Other | 2 | 7,4 |
| Total | 27 | 100,0 |

The majority of the respondents have their Bachelors diploma, with 63%.

## Kind of employment

| Valid | Frequency | Percent |
|---|---|---|
| Employee | 14 | 51,9 |
| Household | 11 | 40,7 |
| Student | 2 | 7,4 |
| Total | 27 | 100,0 |

About 51,9% of the respondents are employee.

## Labour

| Valid | Frequency | Percent |
|---|---|---|
| Paid labour | 3 | 11,1 |
| Voluntary labour | 3 | 11,1 |
| Domestic labour | 12 | 44,4 |
| Own Business | 9 | 33,3 |
| Total | 27 | 100,0 |

Domestic labour has the most frequency among the respondents, with 44,4%.

## Amount of males within Family

| Valid | Frequency | Percent |
|---|---|---|
| 1 | 4 | 14,8 |
| 2 | 14 | 51,9 |
| 3 | 4 | 14,8 |
| 4 | 4 | 14,8 |
| N.A | 1 | 3,7 |
| Total | 27 | 100,0 |

Most of the respondents have 2 males within the family, namely 51,9%.

## Amount of females within Family

The amount of females within a family is in general 3, with an amount of 40,7%.

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 1 | 4 | 14,8 |
| | 2 | 9 | 33,3 |
| | 3 | 11 | 40,7 |
| | 4 | 3 | 11,1 |
| | Total | 27 | 100,0 |

## Age 0-2

Only one respondent has a person with the age of 0 – 2 years old (3,7%).

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 1 | 1 | 3,7 |
| | N.A | 26 | 96,3 |
| | Total | 27 | 100,0 |

## Age 3-11

There are 6 respondents with one person between the age of 3 – 11 years old, namely 22,2%.

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 1 | 6 | 22,2 |
| | 2 | 3 | 11,1 |
| | N.A | 18 | 66,7 |
| | Total | 27 | 100,0 |

## Age 12-17

About 29,6 has one person between the age of 12 – 17 within their family, which is the same amount as the amount of families who have 2 persons about this age within their family.

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 1 | 8 | 29,6 |
| | 2 | 8 | 29,6 |
| | 3 | 1 | 3,7 |
| | N.A | 10 | 37,0 |
| | Total | 27 | 100,0 |

## Age 18-59

Most of the respondents have 4 people of the age between 18 – 59 years old within their family.

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 1 | 2 | 7,4 |
| | 2 | 6 | 22,2 |
| | 3 | 6 | 22,2 |
| | 4 | 8 | 29,6 |
| | 5 | 4 | 14,8 |
| | N.A | 1 | 3,7 |
| | Total | 27 | 100,0 |

## Age 60-older

Only 2 respondents (7,4%) have people with the age of 60 –older within their family, with a total of 3.

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 1 | 1 | 3,7 |
| | 2 | 1 | 3,7 |
| | N.A | 25 | 92,6 |
| | Total | 27 | 100,0 |

## Total income Adolescents

There are no adolescents with an income.

| | | Frequency | Percent |
|---|---|---|---|
| Valid | N.A | 27 | 100,0 |

## LabourQuantity

About 59,3% of the respondents have a full-time job.

| | | Freqency | Percent |
|---|---|---|---|
| Valid | Full-time | 16 | 59,3 |
| | Part-time | 6 | 22,2 |
| | Domestic | 5 | 18,5 |
| | Total | 27 | 100,0 |

## Total family income

The total income of a family is in general 51.000 – 60.000 pesos per month (25,9%).

| | | Frequency | Percent |
|---|---|---|---|
| Valid | under 20.000 | 2 | 7,4 |
| | 21.000 - 30.000 | 2 | 7,4 |
| | 31.000 - 40.000 | 2 | 7,4 |
| | 41.000 - 50.000 | 3 | 11,1 |
| | 51.000 - 60.000 | 7 | 25,9 |
| | 61.000 - 70.000 | 1 | 3,7 |
| | 71.000 - 80.000 | 5 | 18,5 |
| | 81.000 - or more | 4 | 14,8 |
| | N.A | 1 | 3,7 |
| | Total | 27 | 100,0 |

## Members Amount contributing income

The majority of the respondents have one person who contributes to the household income, with 63%.

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 1 | 17 | 63,0 |
| | 2 | 10 | 37,0 |
| | Total | 27 | 100,0 |

## Total income Males

Most of the males (22,2%) have a total income between 21.000 -30.000 pesos per month.

| | | Frequency | Percent |
|---|---|---|---|
| Valid | under 20.000 | 1 | 3,7 |
| | 21.000 - 30.000 | 6 | 22,2 |
| | 31.000 - 40.000 | 5 | 18,5 |
| | 41.000 - 50.000 | 1 | 3,7 |
| | 51.000 - 60.000 | 3 | 11,1 |
| | 61.000 - 70.000 | 3 | 11,1 |
| | 71.000 - 80.000 | 5 | 18,5 |
| | N.A | 3 | 11,1 |
| | Total | 27 | 100,0 |

## Total income Females

Most of the females (25,9%) have a total income under 20.000 pesos per month.

| | | Frequency | Percent |
|---|---|---|---|
| Valid | under 20.000 | 7 | 25,9 |
| | 21.000 - 30.000 | 3 | 11,1 |
| | 71.000 - 80.000 | 1 | 3,7 |
| | 81.000 - or more | 1 | 3,7 |
| | N.A | 15 | 55,6 |
| | Total | 27 | 100,0 |

**Profession**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Technical | 1 | 3,7 |
| | Management | 10 | 37,0 |
| | Educational | 1 | 3,7 |
| | Other | 15 | 55,6 |
| | Total | 27 | 100,0 |

The majority of the respondents have other jobs than technical, management, or educational professions.

**CookingJobs**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 2 | 7,4 |
| | No | 25 | 92,6 |
| | Total | 27 | 100,0 |

Only 7,4% of the respondents provide cookingjobs.

**CleaningJobs**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 24 | 88,9 |
| | No | 3 | 11,1 |
| | Total | 27 | 100,0 |

About 88,9% of the respondents provide Cleaning-jobs.

**GardeningJobs**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 14 | 51,9 |
| | No | 13 | 48,1 |
| | Total | 27 | 100,0 |

About 51,9% of the respondents provide gardening-jobs.

**OtherJobs**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 2 | 7,4 |
| | No | 25 | 92,6 |
| | Total | 27 | 100,0 |

Only 7,4% of the respondents provide other jobs than cooking-, cleaning-, gardening- jobs.

**CookingFreq**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 3 - 4 times per week | 1 | 3,7 |
| | 5 - 6 times per week | 1 | 3,7 |
| | N.A | 25 | 92,6 |
| | Total | 27 | 100,0 |

About 3,7% of the respondents have cooking assistance for 3-4 times a week. This is the same amount for cooking assistance for 5-6 times a week (3,7%).

**CleaningFreq**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 3 - 4 times per week | 7 | 25,9 |
| | 5 - 6 times per week | 10 | 37,0 |
| | 7 times per week | 5 | 18,5 |
| | Once per two weeks | 2 | 7,4 |
| | N.A | 3 | 11,1 |
| | Total | 27 | 100,0 |

Most of the respondents have 5-6 times a week assistance with cleaning (37%).

The frequency of knowledge about the Sustainable Community concept is equally divided: 48,1% yes, 48,1% no.

About 55,6% of the respondents stated that their profession contributes to SD.

About 63% of the respondents stated that their profession have influenced their choice to create a Sustainable Community.

**SCKnowledge**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 13 | 48,1 |
| | No | 13 | 48,1 |
| | N.A | 1 | 3,7 |
| | Total | 27 | 100,0 |

**ProfessionContribution**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 15 | 55,6 |
| | No | 4 | 14,8 |
| | Not sure | 4 | 14,8 |
| | N.A | 4 | 14,8 |
| | Total | 27 | 100,0 |

**ProfessionInfluence**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 17 | 63,0 |
| | No | 6 | 22,2 |
| | Not sure | 1 | 3,7 |
| | N.A | 3 | 11,1 |
| | Total | 27 | 100,0 |

About 25,9% of the respondents have 1-2 times a week assistance with gardening.

Most of the respondents did not answer this question (88,9%).

About 66,7% of the respondents have knowledge about the Sustainable Development concept.

**GardeningFreq**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 1 - 2 times per week | 7 | 25,9 |
| | 5 - 6 times per week | 1 | 3,7 |
| | 7 times per week | 1 | 3,7 |
| | Once per two weeks | 6 | 22,2 |
| | N.A | 12 | 44,4 |
| | Total | 27 | 100,0 |

**OtherFreq**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | 1 - 2 times per week | 1 | 3,7 |
| | 7 times per week | 1 | 3,7 |
| | 7 times per week | 1 | 3,7 |
| | N.A | 24 | 88,9 |
| | Total | 27 | 100,0 |

**SDKnowledge**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 18 | 66,7 |
| | No | 8 | 29,6 |
| | N.A | 1 | 3,7 |
| | Total | 27 | 100,0 |

**ReasonNoUse**

The two main reasons for the respondents not to use renewable energy are 'no knowledge about the subject' (29,6%), and 'it is expensive' (29,6%).

|  |  | Frequency | Percent |
|---|---|---|---|
| Valid | No knowledge about the subject | 8 | 29,6 |
|  | Do not know where available in shops | 3 | 11,1 |
|  | It is expensive | 8 | 29,6 |
|  | We don't use it in México | 2 | 7,4 |
|  | It is not available at the Mexican market | 3 | 11,1 |
|  | Other | 3 | 11,1 |
|  | Total | 27 | 100,0 |

**SDincorporation**

About 63% of the respondents incorporated Sustainable Development within their consumer patterns.

|  |  | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 17 | 63,0 |
|  | No | 10 | 37,0 |
|  | Total | 27 | 100,0 |

**SD incorporation buy less products**

Respondents do not buy less products (81,5%).

|  |  | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 4 | 14,8 |
|  | No | 22 | 81,5 |
|  | N.A | 1 | 3,7 |
|  | Total | 27 | 100,0 |

**FamilyParticipation**

The majority of the respondents (96,3%) stated that they are willing to participate in a Sustainable Community.

|  |  | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 26 | 96,3 |
|  | No | 1 | 3,7 |
|  | Total | 27 | 100,0 |

**SustainableProducts**

Most of the respondents stated that they buy products with a sustainable character (33,3%).

|  |  | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 9 | 33,3 |
|  | No | 8 | 29,6 |
|  | Sometimes | 2 | 7,4 |
|  | Not sure | 8 | 29,6 |
|  | Total | 27 | 100,0 |

**REnergyUse**

The majority of the respondents (74,1%) stated that do not use renewable energy resources.

|  |  | Frequency | Percent |
|---|---|---|---|
| Valid | No | 20 | 74,1 |
|  | Hopefully in the future | 5 | 18,5 |
|  | Other | 2 | 7,4 |
|  | Total | 27 | 100,0 |

## SD incorporation buy less plastic products

Respondents do not buy less plastic products (74,1%).

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 6 | 22,2 |
| | No | 20 | 74,1 |
| | N.A | 1 | 3,7 |
| | Total | 27 | 100,0 |

## SD incorporation use less water

Respondents use less water (51,9%).

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 14 | 51,9 |
| | No | 12 | 44,4 |
| | N.A | 1 | 3,7 |
| | Total | 27 | 100,0 |

## SD incorporation use less electricity

Respondents use less electricity (59,3%).

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 16 | 59,3 |
| | No | 10 | 37,0 |
| | N.A | 1 | 3,7 |
| | Total | 27 | 100,0 |

## SD incorporation use less gas

Respondents do not use less gas (77,8%).

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 5 | 18,5 |
| | No | 21 | 77,8 |
| | N.A | 1 | 3,7 |
| | Total | 27 | 100,0 |

## SD incorporation other incorporated patterns

Respondents have not mentioned other incorporated patterns (92,6%).

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 1 | 3,7 |
| | No | 25 | 92,6 |
| | N.A | 1 | 3,7 |
| | Total | 27 | 100,0 |

## FamWasteSep

About 44,4% of the respondents saves waste.

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 12 | 44,4 |
| | No | 15 | 55,6 |
| | Total | 27 | 100,0 |

## SeparateOrganic

Respondents do not separate organic waste often (81,5%).

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 5 | 18,5 |
| | No | 22 | 81,5 |
| | Total | 27 | 100,0 |

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## SeparateGlass

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 2 | 7,4 |
| | No | 25 | 92,6 |
| | Total | 27 | 100,0 |

Only 7,4% of the respondents separates glass.

## SeparateInorganic

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 3 | 11,1 |
| | No | 24 | 88,9 |
| | Total | 27 | 100,0 |

Most of the respondents/do not separate inorganic waste.

## SeparateCans

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 7 | 25,9 |
| | No | 20 | 74,1 |
| | Total | 27 | 100,0 |

About 74,5% of the respondents does not separate cans.

## SeparatePlastic

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 8 | 29,6 |
| | No | 19 | 70,4 |
| | Total | 27 | 100,0 |

About 70,4% of the respondents does not separate plastic.

## SeparatePaper

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 9 | 33,3 |
| | No | 18 | 66,7 |
| | Total | 27 | 100,0 |

About 66,7% of the respondents does not separate paper.

## DecreaseElectUse

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 23 | 85,2 |
| | No | 4 | 14,8 |
| | Total | 27 | 100,0 |

About 85,2% of the respondents decreases electricity use.

## WaterSaving

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 24 | 88,9 |
| | No | 2 | 7,4 |
| | Not sure | 1 | 3,7 |
| | Total | 27 | 100,0 |

About 88,9% of the respondents saves water.

## ProductReuse

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 22 | 81,5 |
| | No | 5 | 18,5 |
| | Total | 27 | 100,0 |

About 81,5% of the respondents reuse products.

## ReusingOther

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 4 | 14,8 |
| | No | 23 | 85,2 |
| | Total | 27 | 100,0 |

About 85,2% of the respondents does not have other options for reusing products.

## ProductRecycling

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 11 | 40,7 |
| | No | 16 | 59,3 |
| | Total | 27 | 100,0 |

About 59,3% of the respondents does not recycle products.

## SCContribution

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 22 | 81,5 |
| | No | 5 | 18,5 |
| | Total | 27 | 100,0 |

About 81,5% of the respondents are willing to contribute financially to make their Community Sustainable.

## ReusingPlastic

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 11 | 40,7 |
| | No | 16 | 59,3 |
| | Total | 27 | 100,0 |

About 59,3% of the respondents does not reuse plastic.

## ReusingWood

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 1 | 3,7 |
| | No | 26 | 96,3 |
| | Total | 27 | 100,0 |

About 96,3% of the respondents does not reuse wood.

## ReusingGlass

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 15 | 55,6 |
| | No | 12 | 44,4 |
| | Total | 27 | 100,0 |

About 55,6% of the respondents reuse glass.

## ReusingPersonalItems

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Yes | 9 | 33,3 |
| | No | 18 | 66,7 |
| | Total | 27 | 100,0 |

About 66,7% of the respondents does not reuse personal items.