

ASIAN Community Knowledge Networks for the Economy, Society, Culture and Environmental Stability



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Society, Culture and Environmental Stability

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Session 8

Techno – Scientific Progress, Climate Change and the Energy Transition for Development



Carbon Footprint Analysis and the Development of Low Carbon Society Model of Community: A Case Study of Pasicharoen Districts, Bangkok

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Abstract

The objectives of this research were to study the quantity and source of carbon footprints in Phasi Charoen District and to develop of low-carbon society model for Phasi Charoen District. The area of research is Phasi Charoen district. The data collection was conducted by query by questionnaire for assessing quantity of carbon footprints in community. Brainstorming Meeting for to develop of low-carbon society model. The results are shown that the quantity and source of the carbon footprints from using electric appliances, traveling, and consumption. The three communities were different that Klong-ladpachee community was carbon footprints from the electricity use in homes activity average of 0.95 tonnes of carbon dioxide equivalent per year, Punbumpen community was carbon footprints from travels and recreation average of 0.90 tonnes of carbon dioxide equivalent per year and Klong Ta Ban community was carbon footprints from consumption average of 1.10 tonnes of carbon dioxide equivalent per year. The low-carbon society model develop of community result that Klong-ladpachee community has event provides knowledge about the differences and use of energy saving by LED lamps and combined with the knowledge Under Events "Change the LED lamp Change to the world" and answer questions after the transfer of knowledge to the community. Punbumpen community has event with the activity of the community's activities Workshop is bringing the waste to be processed including the houses in the community participating by planting vegetables to eat fertilizers from organic waste composting in the community. Klong Ta Ban community has event cloth bags for shopping and knowledge about green product. The activities of low-carbon society model get the community aware of the importance of behavior change to reduce carbon dioxide emissions.

Keywords: Carbon Footprint, Carbon Footprint Analysis, Low Carbon Society

Introduction

Nowadays, global warming has become a worldwide problem, taking its cause from the increasing emission of greenhouse gases. According to "Trend in Global CO₂ Emissions: 2012 Report" [1] by European Commission's Joint Research Centre (JRC) and PBL Netherlands Environmental Assessment Agency (PBL), the world's level of CO₂ emissions has a 3% rise per year. The accumulated CO₂ emissions from human activities causes 420,000 million tons of CO₂ from 2000 to 2011. Such activities include household consumption, use of energy, communication, transportation; also, the manufacturing process of industrial sector and agricultural activities. Such are the causes of the weather that has changed, natural disasters that have become harsher; e.g., floods, earthquakes, storms, heatwaves, and plagues with increasing carriers.

In 2011, Thailand emitted 272,521 tons of CO₂, 1% of overall gas emissions and ranked 22nd of the world, as there was no enforcement to contain the greenhouse gas emissions. Thus, it is categorized as a non-Annex I country: having no obligation for such containment. Compared to industrialized and other developing countries, Thailand has so far emitted a relatively little portion of greenhouse gases, with 0.6% of global emissions. Additionally, the average greenhouse gas emissions per capita in Thailand are lower than those of the whole world. With this regard, Thai government has signed the sanction in the UN Convention on weather change [2].

Bangkok is considered an economic center of Thailand which provides convenience in public utilities that respond to people's need. Nowadays, there are environmental problems

in various aspects, leading environment improvement into consideration. The main aim is toward the changing of weather, the cause of which originates from cities emitting greenhouse gases through various activities: waste disposal, communication, and use of energy. The concern should eventually reach Low Carbon Society, which are those with mutual agreement or concordant lifestyles between people who intend to reduce greenhouse gas emissions, especially CO₂ emitted in daily life. The examples of such emission reduction are the use of renewable and fossil energy, energy saving, waste reduction, efficient use of resources, and recycling. Many countries have set goals to change city lifestyles, be it daily activities, environmental management, and policies aimed for the improvement of the Low Carbon Society [3].

Therefore, this study aims to Carbon Footprint analysis and the Development of Low Carbon Society Model of Community, Phasi Charoen District, Bangkok, as a case; in order to study the quantity and sources of the community's carbon footprints, and to Development of Low Carbon Society Model in the district.

Objective of the Research

1. To study the quantity and sources of the community's carbon footprints in Phasi Charoen District.

2. To study development of low Carbon Society Model for community in Phasi Charoen District.

Research Methodology

1. The area for the study was Phasi Charoen District, Bangkok. The method of selection was specific, considering from the community leaders' determination to work and participate in the project. The selected communities were Klong-ladpachee, Punbampen, and Klong Ta Ban.

2. Population and samples include:

2.1 Questionnaire group: covers residents in the community. The selection of samples was determined with population percentage, which is between 15-30% (Somchai Worakijkasemsakul, 2010). The samples include 59 households from Klong-ladpachee, 80 households from Punbampen, and 78 households from Klong Ta Ban. Convenience random sampling was implemented afterwards.

2.2 Conference group: covers community leaders, committees, and representatives; 8 from Klong-ladpachee, 13 from Punbampen, and 10 Klong Ta Ban.

3. Research tools

The Research tools used in the data collection process was questionnaires, whose contents cover general information of the communities, knowledge about carbon footprints, and the information of carbon footprints production from using electric appliances, traveling, and consumption.

4. Data collection

In order to receive sufficient information for this study, the collection of data was divided into two parts, as followed:

4.1 Collect the data using questionnaires for general information about the three communities, and the production of carbon footprints per capita and per household; in order that the analysis on the sources and quantity of carbon footprints in each community can be made.

4.2 Hold a conference to exchange opinions about activities in Low Carbon Society, in order to find a way to reduce greenhouse gas emissions. People who attended the conference include the researchers; the leaders, committees, and representatives of all the three communities. There were presentations about sources and quantity of carbon footprints in each community, and also ideas of proper activities to better Low Carbon Society.

5. Data analysis includes:

5.1 Descriptive analysis, to make known the general information about Klong-ladpachee, Punbampen, and Klong-tapan community; and about the sources of greenhouse gases, also carbon footprints produced by people in the communities. The data were shown in percentage and mean.

5.2 Quantitative analysis, implementing the footprint gauging tool from Thailand Greenhouse Gas Management Organization (Public organization) to make known the quantity of carbon footprints produced in daily activities – indoors, travels, and consumption. The data were shown in kilograms of carbon dioxide equivalent (CDE).

Research result

The sources and **quantity** of carbon footprint in the communities

Basic information

Klong-ladpachee Community: located in Petchkasem Rd, 48, 4th -7th junction, Bangduan Sub-district, Phasi Charoen District, Bangkok. The study reveals that the majority of the population are women (61.02%). 79.66% are around 31-40 years old with lower levels of education than high school. The most preferred occupations in the community are grocers (27.12%). As for the knowledge on carbon footprint, only 3.39% of the people recognize the term, with newspaper and internet as their sources of information.

Punbampen Community: located in Village no.4, Klong-khwang Sub-district, Phasi Charoen District, Bangkok. The majority of the people are women (61.25%). Most of the people are at the age of more than 60 years (68.75%) with lower levels of education than high school. Major professions, like business owners and housewives, in the community (37.50%) are uncategorized by the researchers. A very small number of population (1.25%) knows of the term carbon footprint, taking information from newspaper and internet.

Klong Ta Ban Community: located in Village no.11, Bangwa Sub-district, Phasi Charoen District, Bangkok. 60.26% of the populations are women. 73.08% of the community are people between 51-60 years old with lower levels of education than high school. 41.03% have an occupations uncategorized by the researchers, such as business owners and housewives. 3.85% of the community know what carbon footprint is, taking information from newspaper and internet.

Sources and quantity of carbon footprints in the communities

According to the sources and quantity of carbon footprints analysis; electricity use in households; traveling; recreation; and consumption, the results reveal that:

Klong-ladpachee community: the average per capita production of carbon footprints from the use of electricity in a year is 0.95 tons of carbon dioxide equivalent, 0.55 tons from travels and recreation, and 0.59 tons from consumption. The study found that Klong-ladpachee community production of carbon footprint mostly use electricity. Because of the most people in community has work at home or freelance at home cause use of electricity in houses all day.

Punbampen Community: the average per capita production of carbon footprints from the use of electricity in a year is 0.81 tons of carbon dioxide equivalent, 0.90 tons from travels and recreation, and 0.54 tons from consumption. The study found that Punbampen community production of carbon footprint mostly from travels and recreation. Because of most of them are working in private companies and state enterprises therefore people in the community go out to work outside the community and traveling to work is quite far from the community. Or have to continue to public buses go to work.

Klong Ta Ban Community: the average per capita production of carbon footprints from the use of electricity in a year is 0.76 tons of carbon dioxide equivalent, 0.33 tons from travels and recreation, and 1.10 tons from consumption. The study found that Klong Ta Ban

community production of carbon footprint mostly from consumption. Because of the community is in a deep alley. Most people are employed outside the home. When come back home therefore purchase a lot of stock food and delicatessen within a week

Appropriate developments for Low Carbon Society

After conducting the research for appropriate development for Low Carbon Society, holding activities that allow people to exchange thoughts and opinions, and work together for activities that satisfy their need and the community's context; it is found that:

Klong-ladpachee community has its way of development by the community leader and committees presenting the activity that provides knowledge on the use of energy and how to save it. The activity also covers giving knowledge on LED bulbs and the project to change one bulb in each house into an LED one. The intended outcome is for the people to properly apply the knowledge in both household and community level. In addition, the activity provides knowledge about the benefits of LED bulbs and the differences between them and fluorescent bulbs, under the project name "Change for the Nation, LED for the World", which help provoke changes in people's attitude towards the use of LED light.

Punbampen community has its leader and committees exchanging thoughts about how the low-carbon community is meant to be under the current environment and the need of its people. The decision made is to hold a workshop, promoting people to process their residual materials and use such materials as fertilizers to grow vegetables for household consumption, in order that people will see the significance of processing residues and reducing greenhouse gas emission in daily routines. In terms of application, people in the community can use the knowledge as a guide in changing their lifestyles; starting from themselves, then spread to the wider circle. The activities for the Low Carbon Society progress slowly but steady; inviting, suggesting; and informing about waste processing and planting in Punbampen. The activities include the promotion of backyard vegetable gardening, vertical farming, and fence-planting; making and applying compost and Effective Microorganisms; waste segregation; and plastic recycling.

Klong Ta Ban community, the research team, the community leader and committees conclude the way of improving the community as running activities like promoting the use of tote bags to replace plastic ones, and informing about environmentally friendly products. Practicality is a main factor, as the aim is for the people to notice the significance of changing their consumption habits. The campaign also includes reducing the use of energy and pollution production, which are the indirect causes of greenhouse gases.

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