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Europäischer Hochschulverlag GmbH & Co. KG

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October 2010

Abstract

The underlying purpose of this paper is to analyse determining factors of responsible environmental behaviour, which serves as a formative evaluation prior to implementation of a pilot project with the aim of assisting the sustainable development of Hyderabad. This comprises the objectives of discussing the project strategy and aims, as well as analysing the target audience's individual behaviour and conditioning factors deriving from the external situation that require consideration in the design of the project's implementation strategy. A further implication is to clarify how present theories help to understand factors inhibiting or enabling responsible environmental behaviour and to provide knowledge on communication campaigns and strategy design.

The key findings indicate that theory on individual behaviour change from psychology and social studies is vast, however strategy designers of environmental campaigns do not make sufficient use of it and often

develop programmes based on simplistic knowledge-attitude-practice models. On the other hand, literature on external factors determining environmental behaviour is not as advanced, besides the fact that a change of situational terms and conditions is postulated to yield great results. In general, individual and contextual factors need to be addressed to bring about the desired behaviour change, which has been considered in the strategy design of the 'Solar powered Schools for Hyderabad' project.

Key words: sustainable development, climate change, communication, environment, responsible environmental behaviour, education, communication campaigns, behaviour change, solar power, Megacity, Hyderabad, India

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[Introduction](#)

Climate change today is a reality caused by people, affecting people and an issue that can only be solved by people. Partly, it is the result of an approach to economic growth and development that has proven to be unsustainable.

A country that has marked accelerated economic growth in the past decade is India (2007-2009 CAGR 7.5%) – the largest democracy in the world with a population of 1.15 billion (World Bank, 2009a). India's integration into the global economy has brought economic and social benefits; however, the development has also given rise to problems. One of the major challenges is the continuing spread of urban development. In 2009, 29.8% of the total Indian population were urban citizens. The metropolitan areas of India today are bursting at the seams, stressing infrastructure, resources such as housing, education and transport, as well as the ecological system, due to expanding energy and resource consumption and constantly increasing greenhouse gas emissions.

This is an indication that a long-term growth is only sustainable if city attributes, such as pollution, congestion and safety are improved alongside urban economic development (Gill and Kharas, 2007 cited in Chetan, 2009). Unambiguously, the rapid growth of metropolitan areas necessitates environmental planning, which includes strategies to reduce CO_2 emissions.

Hyderabad, the state capital of Andhra Pradesh, is an emerging megacity in Southern India, which is estimated to have a population of 10.5 million by 2015.

In order to allow for a sustainable development of Hyderabad, the Federal Ministry of Education and Research (BMBF) Germany, in cooperation with the Indian government, has initiated the 8-year development project "Hyderabad as a Megacity of Tomorrow", with the aim of designing a "Perspective Action Plan" that will establish Hyderabad as a "Low Emission City in Asia" in 30 years time (BMBF, 2010). To achieve this vision researchers are developing adaptation strategies and pilot projects. "Solar powered Schools for Hyderabad" is one of the pilot projects the nexus Institute is dedicated to. The project aims at achieving outcomes across a number of sectors: social, ecological, educational, physical, economic, and political, as well as outcomes at the cognitive individual behaviour, community and systems level. At the school level the objectives are to increase energy supply, and thus improve learning conditions, while at the same time fostering awareness on alternative energies and low emission lifestyles. This particular objective as part of the project builds the focal points of this discussion.

Over the last decades research by psychologists and sociologists has concentrated on exploring the factors which influence environmentally friendly action in order to improve environmental education and communication programs. Earlier research on environmental behaviour has focused on the hypothesis that knowledge, attitudes and behaviour are linked in a linear model, and, even though today it is known that this proposition is incomplete, many development programs still design their strategies based on this concept. Yet, environmental communication involves much more than simply conveying information to a neutral audience. A wide array of internal (knowledge, attitudes, beliefs, norms, etc.) and external factors (institutional, economic, social, cultural, etc) determining behaviour, need to be taken into consideration when promoting environmental behaviour change (Steg & Vleg, 2008).

The process of designing respective campaigns includes thorough formative evaluation, which provides information on the current situation, the target audience, including an analysis of their present behaviour and their beliefs about the proposed behaviour, as well as an investigation of communication mechanisms that people use to adopt responsible environmental behaviour.

Therefore, the research question of "Which factors facilitate or prohibit responsible environmental behaviour with regard to the 'Solar powered Schools for Hyderabad' project?" constitutes the cornerstone for this study.

Moreover, the findings that will shape the discussion of the research question will be derived at by addressing the following objectives:

1. Determination of theoretical background from literature on characteristics and strategy of the 'Solar powered Schools for Hyderabad' project

2. Identification of efforts undertaken by local actors to promote pro-environmental behaviour in children

3. Analysis of the level of knowledge, awareness and behaviour of children from secondary schools on environmental issues and low-emission lifestyles prior to project implementation

To start with, it is important to know to which extent theories from the spheres of social science, psychology and communications specifically addressing environmental awareness and behaviour, provide insights into topic related issues, such as: What is the definition of environmental friendly behaviour? Which factors determine behaviour change? How can these factors be measured? And what implications are proposed by literature for the strategy

development of communication campaigns? This will be assessed in Chapter 1.

Thereupon, the 'Solar powered Schools for Hyderabad' project will be discussed in detail from an analytical and strategic perspective in Chapter 2. A description of the project background and situational factors that led to the formation of the project is followed by the presentation of aims, objectives, target group and the overall theory of change underlying the pilot project.

Chapter 3 attempts to identify actors and their communication strategies on promoting responsible environmental behaviour in children from secondary schools in Hyderabad. First insights into the Indian secondary school system will be provided in order to analyse institutional factors that have an effect on children's behaviour. Moreover, the role of non-governmental organisations that have introduced many initiatives and policies to advocate environmental education will be assessed. This chapter therefore aims at learning from communication mechanisms that are currently employed, as well as identifying opportunities of coalition for the pilot project.

In Chapter 4 the question will be what internal factors determine environmental behaviour. Results from a quantitative study aim at characterising the target audience in terms of their knowledge, beliefs about environmental issues as well as their present behaviour. To fulfil this objective a conceptual model including particular variables for measurement was designed based on knowledge generated from the literature review.

Finally, the gathered findings relating to the three objectives are compiled and discussed in regard to insights from theory in order to find an answer to the research question.

Consequently, the implications of this study are twofold. The study aims to derive a guideline or key factors that ideally will be considered in the design of the 'Solar powered

Schools for Hyderabad' project for promotion of environmental awareness and low-emission lifestyles, by the nexus Institute. Moreover, the implication is to apply current knowledge from literature, academics and secondary data to a specific case and examine to what extent the aim of the study can be reached or which limitations exist by doing so.

Methodology

Social research aims at exploring reality and understanding human behaviour and actions. Moreover, it offers the basis to suggest possible solutions to social problems. A variety of methodologies and methods are employed in social research, since it is diverse and pluralistic (Sarantakos, 2005). Babbie (2007, p. 297) likewise states: 'Evaluation research refers to a research purpose rather than a specific method'. It is defined as the process of determining how social interventions can produce envisaged result or whether specific activities have led to the desired outcome (Babbie, 2007). This can be done with various research methods. Academics distinguish between two main areas of research, namely quantitative or qualitative.

Quantitative research is chosen when the need to systemise easily quantifiable data exists. Quantitative research is perceived in an instrumental way, where, based on clear and objective facts, numerical data is collected and mathematical and statistical tools are used to evaluate the findings (White, 2002). The mathematical and objective nature of quantitative research can accord for greater accuracy of results and simplifies comparability with other studies. It aims at discovering, explaining and documenting general causal laws, by studying and learning about social events. This technique is limited in that research is often conducted in an unnatural environment in order to gain a certain level of control over the subject, leading in some cases to superficial datasets. It strictly relies on methods, predefined research concepts and their results. Consequently, findings might not match real world results nor reflect how people really feel about the exercise (Learn Higher and MMU, 2008b).

The second type of research method, the *qualitative study* is a descriptive, non-numerical way to collect and interpret information. This method is preferred when investigating a phenomenon of which there is little knowledge (White, 2002). It contains elements from various schools of thought and the findings can provide a rich, detailed picture about, for example, attitudes, feelings and behaviour of people. The research takes place in actual and everyday settings and the researcher is often part of the research. The latter gives ground to the main criticism raised by opponents who neglect this method due to its subjective nature (Babbie, 2007). Moreover it is said to be limited in efficiency, due to the lack of studying relationships between variables accurately, so as to derive at knowledge about social trends or to establish social policies.

The research design underpinning this paper incorporates a combination of qualitative and quantitative approaches to data collection. According to the objectives of the study the relevant research methods are explained.

Primary research questions:

- What theoretical background does literature provide in relation to characteristics and strategy of the 'Solar powered Schools for Hyderabad' project?

- What efforts are undertaken by local actors to promote pro-environmental behaviour in children?

- What is the level of knowledge, awareness and behaviour of children from secondary schools on environmental issues and low-emission lifestyles prior to project implementation?

As such the first question serves to obtain background information and a general understanding of the project.

Findings from questions two and three aim at identifying which factors promote or inhibit responsible environmental behaviour. Ideally the results will be incorporated in the design of the implementation strategy of the project.

First, literature primarily in the fields of social psychology, responsible environmental behaviour, communications and social development was reviewed, with the aim to place the 'Solar powered Schools' project into a theoretical framework and to learn what research results from other studies suggest in terms of factors determining responsible environmental behaviour.

1. Solar powered Schools for Hyderabad

In respect to the objective of presenting the strategy and characteristics of the 'Solar powered Schools for Hyderabad' project, qualitative research was conducted. Key informant interviews with the project leaders and analysis of secondary data provided by the project team generated the case related findings on project aims and objectives, target group, project partners and background information on schools, education and energy issues.

2. Promotion of pro environmental behaviour in Hyderabad

Next, in order to investigate the efforts undertaken by local actors to address environmental issues in Hyderabad, desk research accounted for insights on the Indian school system and the state of environmental education, as well as the identification of main organisations and their strategic approaches in promoting responsible environmental behaviour.

Moreover, primary data was gathered by conducting semi-structured expert interviews with three interview partners. First, the interview with De Paul Kannamthanam, one of the founders of Yardstick, a private organisation promoting