

# **3D CORPORATE TOURISM: APPLICATION-ORIENTED PROBLEM SOLVING IN TROPICAL RAINFORESTS**

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## **ABSTRACT**

3D Corporate Tourism is a niche tourism concept that serves international as well as local scientists, engineers, designers, nature guides and artists, and their families. Corporate tourists and their local bioscouts practice biomimetics, i.e. knowledge transfer from nature to technology and arts, in rainforests, coastal and marine environments. 3D Corporate Tourism combines corporate, ethical and ecotourism and complements South East Asian niche tourism products. Benefits for stakeholders such as local community, local authority, the central government and private enterprises comprise sustainable usage of the environment, increased income and employment while encouraging conservation and sustainable tourism development.

Key Words: innovation, science, engineering, design, niche tourism.

## INTRODUCTION

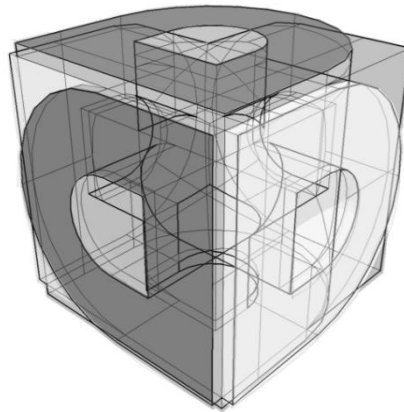
In Malaysia, tourism is the second largest foreign exchange earner. In addition, it is a multi-sectored industry that consists of transportation, accommodation, restaurants, recreation, entertainment, retailers, handicraft and tour agencies. In 2007, the tourism industry provided employment for almost one million people in Malaysia. Tourism also provides a platform for realising socio-economic and distributive benefit policies. Community-based tourism principles are applied in the implementation of homestay and eco-tourism programmes. Community-based tourism strengthens the ability of rural communities to manage tourism resources, earn their own income while ensuring local participation [Peng O. H., 2009].

Niche Tourism refers to special interest tourism [Macleod D., 2003] and is a way forward to sustainability [Novelli M. & Benson A. M., 2005]. Niche Tourism is divided into the following broad segments: photographic tourism, religious tourism, cultural and heritage tourism, tradition and culture-based tourism, adventure tourism, wild-life tourism, special interest tourism. It has just recently been employed as a concept, see [Novelli M., 2005] for an integrated picture of macro and micro niche tourism as a whole. Malaysia is increasingly focusing on niche tourism markets [Malaysia to focus on niche tourism markets, 2008; Get into niche tourism, 2010].

Policies aiming at innovation in tourism should not uniformly focus on the industry itself, but take into account the driving forces of other business sectors and the public sector [Hjalager A.-M., 2002]. This manuscript introduces a niche tourism concept where science, engineering and design are the driving forces for innovation in tourism: 3D Corporate Tourism (for logo, see Figure 1), a solution-based approach to innovation in science, engineering and design [Gebeshuber I. C. and Majlis B. Y., 2010; Menon P. S. et al., 2010], is proposed to the tourism community. The three main pillars of this integrated concept are termed discover, *determine* and **design** (Figure 2). In 3D Corporate Tourism, biologists, scientists, engineers and designers jointly work in an environment with high inspirational potential and construct initial prototypes and designs directly on site. This joint niche tourism approach yields new links, networks and collaborations between communities of thinkers and local populations (including indigenous peoples and their tacit knowledge) in different countries in order to stimulate and enhance creative and application-oriented problem solving for society. Indigenous peoples have begun to take more active roles in the tourism economy. Indigenous tourism is likely to remain a niche form of tourism, mostly small in scale, dependent on mainstream tourism elements for access to and from markets, but of increasing importance to many indigenous communities as a supplementary form of income and, perhaps, and as one form of economic and cultural empowerment (Hinch T. and Butler R., 2009).

Figure 1

Logo of 3D Corporate Tourism



The 3D Corporate Tourism concept has been inspired by the ‘Biomimicry and Design Workshops’ (offered for one week per year, location: rainforest in Peru or in Costa Rica) by the US based Biomimicry Guild. Companies such as Boeing, Colgate–Palmolive, General Electric, Levi’s, NASA, Nike and Procter and Gamble have already used their services.

The proposed 3D tourism concept complements South East Asian niche tourism products such as homestay, education tourism, the Malaysian My Second Home programme and health tourism. 3D tourism combines corporate, ethical [Weeden C., 2004] and ecotourism and shall produce increased income and employment also for the local communities while encouraging conservation and sustainable tourism development.

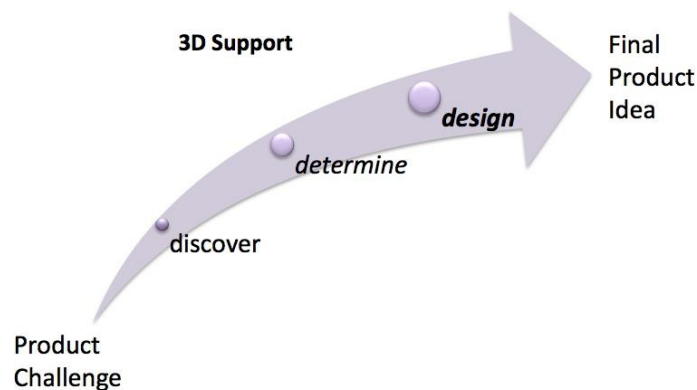
## MATERIALS AND METHODS

With 3D Corporate Tourism, the successful concept of the ‘Biomimicry and Design Workshops’ offered by the US based Biomimicry Guild is developed further into a complete niche tourism concept. At the ‘Biomimicry and Design Workshops’, researchers and corporate members spend about one week in the rainforest, and perform the biomimicry innovation method with the help of specifically trained biologists (called ‘biologists at the design table’). Databases and scientific articles are available on local hard-drives, and access to the internet is provided on occasional visits to local internet cafés.

The 3D in 3D Corporate Tourism stands for the three pillars of this concept: discover, determine and design (Figure 2). In the discover phase, problems (in science, in technology, in design) are formulated and respective solutions in nature are sought with the help of nature scouts (Figure 3). Nature scouts are locals and/or people from indigenous communities, who know their surroundings and understand the complex biosystems of their environment. The next phase is the *determine* phase. Here, details are analyzed and first designs of solutions are drafted. Process experts analyse such solutions regarding energy balance, costs and benefits. The best method for choosing fit solutions and for the design is selected via a push-pull analysis. This push-pull analysis investigates the needs of the corporate specialists in relation to the available potential in nature (at reasonable cost). Pull: There is pull from the corporate specialists, defining their requirements. Push: The available solutions in nature for the creation of the man-made solution will be assessed. In the **design** phase, nature's solutions are adapted to human technology, nature serves as design study.

Figure 2

Concept of 3D Corporate Tourism



3D Corporate Tourism aims at mapping new frontiers in emerging and developing engineering and design areas. It provides a novel way to foster and promote innovative thinking in the sciences, and considers the need for synergy and collaboration between biology, engineering and materials science rather than segmentation and isolation: Corporate specialists (i.e., specially trained biologists, scientists, engineers as well as designers) travel to adequate places (environments with high inspirational potential) in Malaysia or Thailand and apply an innovation method that promotes knowledge transfer from nature to technology development and design. They use the 'Biomimicry Innovation Method' (© Biomimicry Guild, Helena, MT, USA 2008) innovation method. The corporate specialists are supported by locals (bioscouts, see Figure 3) and discover, *determine* and **design** complex materials and design solutions inspired by nature. Directly at the site of this research, first prototypes and designs are constructed, and first detailed investigations take place. Access to the internet and to databases is continually provided, and machinery to investigate structures and materials on-site is provided. In contrast to the 'Biomimicry and Design Workshops' the research stations where the corporate specialists are staying are equipped with all amenities that

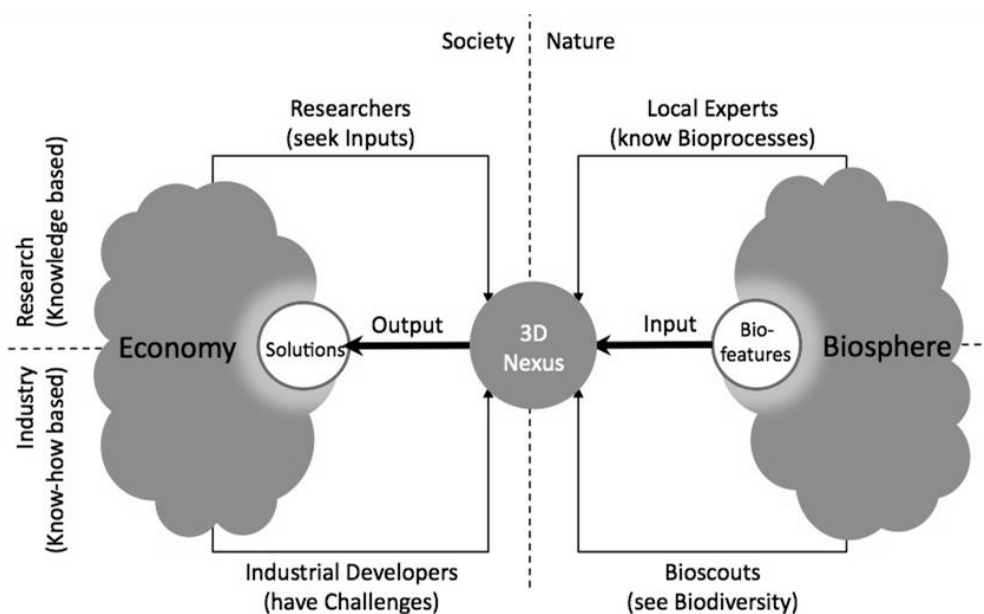
executives might need, and with specific libraries and CAD and further prototyping machines. To facilitate networking, discussion and creativity, locals and corporate specialists stay together for the whole duration of the stay. After the first initial prototypes are constructed, a family holiday for the corporate specialists takes place, freeing the mind and allowing for new ideas and concepts to settle. After the family holiday, the corporate specialist and their local partners meet again, to finalize the designs and draft future joint projects and collaborations.

Nature can serve as teacher for technology and design development, since nature's materials and structures are complex, multi-functional, hierarchical and responsive, and in most cases far better than man made materials. Biomimicry and biomimetics deal with knowledge transfer from nature to technology and design. Increasingly, collaborations across fields (such as among biology, engineering, design, art and the knowledge of local and indigenous communities) prove successful [Gebeshuber I. C. and Drack M., 2008; Gebeshuber I. C. et al., 2010; Bawitsch J. and Stemeseder T., 2010] and are highly useful for innovation [Gebeshuber I. C., Gruber P. and Drack M., 2009; Gebeshuber I.C. et al., 2009; Gebeshuber I. C., Majlis B. Y. and Stachelberger H., 2009].

The outcome of 3D Corporate Tourism are – besides the research results, developments and designs – new links, networks and collaborations between communities of thinkers in different countries in order to stimulate and enhance creative and application-oriented problem solving for society (Figure 3).

Figure 3

Interactions of the society, local experts, industrial developers and bioscouts

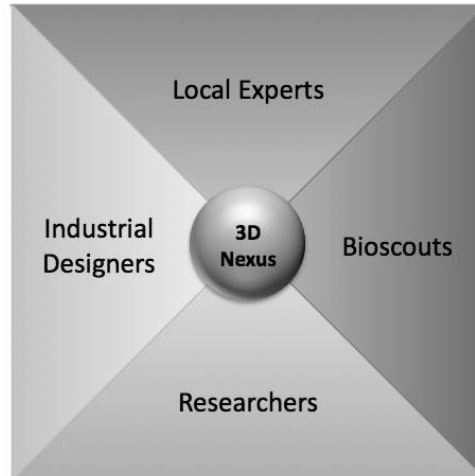


## RESULTS

The high species variety in the rainforest, with nature's 'best practices' everywhere aids to relate structure with function in natural materials, structures and processes and helps to increase awareness about the natural resources surrounding us. With the 3D Corporate Tourism concept the potential of the virgin rainforests is used in a sustainable way, without exploiting the natural resources or removing anything else from the jungle apart from ideas. In this way, the value of the virgin forests is increasing in the minds of policy makers and threshold countries have the opportunity to contribute highly valued inputs to the international research and development elite, as well as train their local experts in very important future technologies. The possibility to perform first investigations directly on-site, and subsequent deeper and more detailed investigations at the home institution fosters collaborations and results in synergistic effects across borders.

Figure 4

The central role of the 3D Nexus



The 3D Nexus is the general connection between local experts, bioscouts, researchers and industrial designers (Figure 4). The 3D Nexus stands for a highly profitable centre of competence that serves as basis for a completely new type of tourism. In 3D Tourism, corporate and scientific tourism merge with ecotourism. The tourists themselves are high end tourists such as executives and professors for industrial design, ecology, business and the pharma industry.

Thailand as well as Malaysia provide perfect environments for 3D tourism: they offer marine as well as terrestrial life with high biodiversity, marine research stations as well as jungle lodges. In various marine stations, habitats of interest such as the high sea areas, reefs and mangrove forests as well as coastal areas with industry are at the disposal of the corporate tourists, and the terrestrial stations offer virgin forests, secondary forests and plantations at sea level, elevated level and extreme altitudes, ensuring the essential diversity of possible solutions in a variety of climatic zones.

Advantages of this concept are an increased appreciation of nature, combined with comprehensive collection and sustainment of the knowledge of indigenous peoples. Furthermore, the input from nature for technology inherently includes best practices and allows for the evaluation of existing solutions in nature according to the secondary impact (technology assessment): also in nature some solutions yield unfavourable consequences. An example for this is the introduction of tilapiine fish species to lake Victoria in Africa in the middle of the last century, which led to a decline, and in some cases an almost total disappearance, of many of the native fish species of lake Victoria [Ogutu-Ohwayo R., 1990].

## DISCUSSION AND OUTLOOK

3D Corporate Tourism is a high quality niche tourism area that sustainably applies and expands the Biomimicry Innovation Method. Preliminary data on how biomimicry can contribute to niche tourism were acquired on a scientific expedition to Bukit Fraser in February 2010. The corporate executives were two tissue engineers from Austria (Jennifer Bawitsch and Teresa Stemeseder), performing industry training at the Institute of Microengineering and Nanotechnology at the National University of Malaysia (Universiti Kebangsaan Malaysia), and one of the authors, ICG, who is Physics Professor at UKM and the Vienna University of Technology in Austria, Europe. Prof. Jumaat Adam and his team from the UKM biology department and various locals such as our guide Mr. Shukri from the Malaysian Forestry department and local rangers served as bioscouts. Joint publications and reports as well as various ideas for future collaborations and research projects were generated during the stay at the research station in Bukit Fraser (director: Prof. Jumaat Adam). The executives also spent their subsequent holidays in Malaysia, with several additional friends and colleagues from Austria, who were attracted by their reports and success stories [Bawitsch J. & Stemeseder T., 2010].

Thereby, a first proof of principle on how the Biomimicry Innovation Method links to niche tourism and corporate applications of biomimicry design workshops was established.



This initial application of the concept of 3D Corporate Tourism showed how technology, especially in terms of design and innovation, is helpful for tourism-based schemes.

Below, we summarize the benefits amongst the stakeholders: Local community: supplementary form of income from corporate tourists and their local bioscouts, who come from local universities and/or companies. Additional funds can be acquired for enhancement for community structures such as streets and joint facilities. Local authority: Increased awareness of needs of corporate tourists, contacts to internationals with high esteem for the respective country, its culture and its nature, increased awareness of the value of their own environment (the jungle gains value, although nothing is taken from it but ideas). The central government: ideas for new community projects that increase the attractiveness of rural areas with lush natural environment for corporate tourists. Private enterprises: provision of needed facilities and instruments such as internet access, CAD machines, microscopes, design materials and information material.

Summing up, 3D Corporate Tourism is a promising concept that should be developed further and be implemented in official niche tourism programmes and projects in South East Asia.

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