

# DESIGN INNOVATION TOWARDS AGRICULTURAL EXCELLENCE

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## ABSTRACT

There is no denial to the importance of design in agriculture and making land more productive. One wonders what will happen if designing for agriculture stops and agriculture fail to exist? Would man then survive the world through new era of synthetics? We consume designs every single day of our lives. In the agricultural sector, designers undeniably play major roles in the production of new and innovative design insights to uplift the dignity of the agricultural sector. Agricultural excellence could be achieved, through technological advancement and innovation in design. Operation becomes faster and safer, and doesn't need much labour, and quality of production can improve tremendously. However as exposed by Centre of Ergonomics for Developing Countries, in the industrially developing countries (IDC), in many cases, it is sad to say that, the exposure to risk factors in agricultural activities is alarming. Among the most hazardous factors are, working with farm machinery, use of chemicals, manual lifting, carrying and handling, bending and stooping, repetitive activities and also high level of noise and vibration, which create high risk of musculoskeletal injuries which exceed all other types of problems. Technology in agriculture through design is said to be appropriate, when it harmonises with its environment, maximizes its benefit and minimizes its harmful effect, and requires an intelligent balance, namely a balance of labour-intensive, and capital-intensive technologies. Locally nurtured designs could be successfully generated through academic collaboration with selected foreign design institution to further enhance a smart assimilation of local input with foreign technology.

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*Keywords:*

## 1 INTRODUCTION

The word agriculture, in simple term as phrased in the Britannica, is globally accepted as the science or art of cultivating the soil, the growing and harvesting of crops, and not forgetting the raising of livestock as well. This art of making land more productive is practiced throughout the world. In some areas the methods are not far removed from the conditions of several thousands of years ago, and understandably, in other locations especially those of the advanced nations, through the aid of science and technology and mechanization, the status of agriculture has uplifted to a highly commercial type of endeavour. We are also informed that, due to the geographical locations and nature of the universe, agriculture still drafts into its service more of the world's aggregate manpower than all other occupations and services combined. Agricultural sciences deal with farm production, including soil cultivation, water control, crop growing and

harvesting, animal husbandry, the processing of plant and animal products, engineering, economics and other related disciplines. The agricultural industry includes farming, which concerns with production. The service industry, concerned with making or supplying machinery, buildings, fertilizers and pesticides and finally the purchasers of farm products, such as the processors, distributors, and marketing boards. All these activities needed designs to make it work and operational, and there are already in existence thousands of idealistic and innovative designs, or products satisfying such occupational needs. It is actually the biggest product design industry ever, and obviously, through the services of industrial designers worldwide.

## **2 AGRICULTURE TODAY**

Today, agriculture have certainly gone a long way in life and through generations, even though knowingly, in some less developed nations, the farmers are still largely self-sufficient, producing just enough food-stuffs for the cultivators, with perhaps a small surplus for the local market. Such status still holds for many years in the developing world from Asia to Africa. Malaysia knowingly has surpassed that status of agony, and people are beginning to see the light and benefit of agriculture, in contributing to the nation's economy and quality of life. The new era of biotechnology, through strong government support for example, is currently becoming the in thing now in our local industry. Malaysia expects, according to the Malaysian Prime Minister, at least 100 biotechnology companies of global standards by the year 2020. The tremendous response of the general public towards the country's continuous agricultural expositions, is a definite testimony to the positive direction of agriculture in Malaysia darting towards an almost ultimate success and should be applauded and appreciated.

## **3 INDUSTRIAL DESIGN**

Industrial design originated with the reaction against aesthetic problems, created by the 19<sup>th</sup> century industry, and was first introduced to the world as early as 1907 by a group of German architects, designers, manufacturers and merchants. Today, industrial design has grown much in scope, and has generally been accepted in many parts of the world. Essentially, an industrial designer is a specialist in the field of creating products that appeal to the purchaser. But the job also requires a good working knowledge of engineering, familiarity with modern materials, and a firm understanding of production techniques. Their work is also directed toward increasing the value of products, to both the producer and the user. In general terms, designs are seen everywhere, and we experience and consume designs every single day of our lives. Some designs are good and some can be rather bad. A spade which was well designed for a specific function can also be a weapon for murder. Thus it takes a good heart to make a good design best. Even though the term good and bad design is widely used, the writer believes and concludes that there is no such thing as good or bad design, but instead termed them as appropriate or inappropriate design. A design which is appropriate for the Americans or a chosen geographical location might not be suitable for Malaysians, due to the differences mentioned and also due to the nature of the varied anatomical standards and weather conditions. But most certainly, designers and consumers are in agreement that, appropriate design improves and elevates quality of human life.

In the agricultural sector, designers undeniably, through their capabilities, play major roles in the production of new and innovative design insights, to uplift the dignity of the agricultural sector. Agricultural excellence could be achieved, through technological

advancement and innovation in design. Operation becomes faster and safer, and doesn't need much labour, and quality of production can improve tremendously due to the power of design. Understandably, in advanced nations, billions were spent almost yearly on research and development, in trying to generate creative and innovative ways of making agricultural activities prosper like never before, never even imagined and experienced by the previous civilization. Design certainly has major roles to play and contribute.

We all know that, more and more new designs for agriculture are seen in the market, ranging from simple hand tools for manual operation, and also not forgetting the larger than life million dollar harvesters which are all designed and engineered through years of ardent research and development, in the spirit of making and transforming agricultural activities friendlier, safer and more productive than the previous ones. However as exposed by Centre of Ergonomics for Developing Countries, in the industrially developing countries (IDC), in many cases, it is sad to note that, the exposure to risk factors in agricultural activities is alarming. Agricultural industry as quoted by Professor Emeritus Shahnavaaz, has both high rate and high number of occupational injuries and death when compared with other industries. Among the most hazardous factors are, working with farm machinery, use of chemicals, manual lifting, carrying and handling, bending and stooping, repetitive activities and also high level of noise and vibration, which create high risk of musculoskeletal injuries which exceed all other types of problems.

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reference

One major factor contributing to such occupational hazards is probably the less sensitive and concern in the application of ergonomics in the designing of the tools or products, and machines for agriculture. Ergonomics, as we all know, which can simply means, the factors of human engineering, or man machine relationship, is certainly a vital criterion, in the designing of product based items. Through the writer's humble observation, unless designs for agriculture are home nurtured and developed and tested locally, based on the true needs of the local farmers and their habitat, the farmers might face difficulty in using those imported ones, unless certain adaptation are smartly done to the products, ranging from even the simple hand tools, to the mighty heavy durable ones. This also justifies that, whilst technology transfer of design for agriculture, is important from advanced nations to developing countries, it must be done in a manner that it satisfies the need of the recipient countries, or else we might just be trapped, in this product or technology colonization, which in the long run might affect and erode certain traditions and social belongings and the nature of our local environment and resources etc.

Technology in agriculture is said to be appropriate, when it harmonises with its environment (Stapanek 1978), maximizes its benefit [6] and minimizes its harmful effect [5], and requires an intelligent balance [7], namely a balance of labour-intensive, and capital-intensive technologies. Design must connect to the consumers at its maximum. It must attain the psychological connection and touches the consumer's heart. There must be certain assimilation of technology and aspects of humanity during the process of designing, the nature of which is so diverse and inter and multidisciplinary. To upgrade and achieve that status of agricultural excellence, one has to most certainly embark investing into research and development, and crave for that innovativeness in their activities.

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The developing nations must try to appreciate the services and capabilities, of their own local designers, and only then they might just be able to design their own tools, products and machines etc that satisfy the true needs of the their local farmers. It is truly undeniable that technology transfer is important, but it must be done not in the expense

of the developing nations being colonized by the imported technology. Technology transfer must uncover and stimulate local design capability and capacity.

One must learn to breed their own technology and design in agriculture, and follow suit of the success of the advanced nations in creating innovative products with respected brand names. It took the Japanese more than 25 years to finally transform their initial ‘copycat modes’ to currently producing their own designs and getting recognized by the world over. Developing nations with universities or colleges conducting industrial or product design courses must now look seriously into making ergonomics, as a compulsory subject and also giving design projects to students, based on the country’s true agricultural needs. Collaboration with agricultural industries is important to ensure the fluid imparting of knowledge. Agro based research must also be encouraged. Designs for the packaging of foodstuff, must also improve to international standards in order to dart into global market forces. Such awareness is already seen amongst the respective manufacturers and that certainly is a positive signal of success in design awareness.

As in the case of Malaysia, the establishment of the Malaysia Design Council in 1996, under the Ministry of Science, Technology and Environment, is a clear evidence of the government’s support and endorsement of design, as a major factor, contributing to economic growth and satisfying the targeted vision 2020 in making Malaysia an industrialized nation. The writer suggests that the Malaysia Design Council initiates a design competition for young and inspiring designers, based on the country’s agricultural needs.

To achieve an agricultural excellence through design, technology and innovation is by no means easy. It requires a total commitment, and a constant and consistent drive and motivation, to succeed and achieve the ultimate, and most importantly being able to work together, which seeming is probably the most difficult part, due to the multifaceted and varied disciplines involved. Designing is certainly just a fraction of the activities, contributing to the whole success.

#### **4 DESIGN COLLABORATION**

Design education through smart collaboration can certainly play major roles in producing well trained designers for agriculture. One such collaboration concept which should be implemented formally as an on-going scheme is to have the Malaysian design students working closely with students from selected reputable design colleges from advanced nations in order to exchange ideas and enrich their knowledge on design. And since adaptation of agricultural products seemed important to make it appropriate for the local use, it is suggested that a common design project based on agriculture be delivered to both groups of students. Such collaborative effort must be monitored in such a way that both groups with possible differences in methods and approaches could advance the project through their own parameters. It is suggested that students from England for example could just concentrate on designing the product in accordance with their technological advancement and agricultural needs in England while the Malaysian students will do it based on the Malaysian environmental needs and cultural belongings etc. An exhibition or exposition of the project will then be held and analysis on the designs done to justify the proposed design solution, in the hope that students could learn from each other’s design methods and approaches in accordance with the agricultural needs of the respective countries. The second phase of the project will be for students from England designing for the Malaysian, based on the availability of Malaysian technology and the Malaysian design students designing for the Malaysian

needs based on the British technology. Analysis is then undertaken to reason out the similarities and possible differences of the output and points taken for references.. The final phase of the collaboration will be for the British students designing for the Malaysian, based on the British and Malaysian technology and the Malaysian students assisted in the possible adaptation and providing necessary inputs needed to satisfy the market and agricultural needs of the Malaysian. The results and findings of the various phases will then be analyzed in order to gather vital factors which could be used as the basis of improving the Malaysian design capabilities and thus understanding the possible adaptation needed in making the imported products appropriate to the Malaysian agricultural needs. If succeeded such a collaboration exercise will enlighten more avenues of improvements in the designing of syllabus and curriculum in order to make it more global but still retaining certain element of locality. Agriculture is just an area; collaboration can also advance to other multifaceted disciplines in design as well.

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