

## ABSTRACT

Biotechnology became a buzzword in Malaysia with the launch of the National Biotechnology Policy in April 2005. Since then, a number of government initiatives saw heavy investment in this sector, both in terms of funding and infrastructure. Various policies were developed to serve as catalysts to propel this industry to greater heights and make Malaysia a global biotechnology player. Nevertheless, public understanding of biotechnology has not been a priority at the national level to support the enthusiasm in making biotechnology an engine for economic growth. Human capital development, public acceptance of new technology, public's ability to make informed-decisions and ability to participate in government policies and decisions are factors that determine the success of biotechnology sector, and this can only be achieved if there is a coordinated effort in enhancing public understanding of biotechnology at the national level. A number of players from the universities, research institutes, ministries and government agencies are involved in communicating biotechnology to the public and various stakeholders but there is no integration, synergy and coherence among them. Moreover, these outreach programmes are carried out without proper understanding of public interests, perceptions and attitudes. Thus, this research attempted to map all the biotechnology communicators in Malaysia to form a better understanding of their strategies, target audiences, objectives, challenges, and proposed solutions. This was then compared against data on public interests, attitudes and perceptions which was obtained by conducting public surveys. In-depth interviews were also conducted with biotechnology communicators in the USA, UK, Singapore, the Philippines and Australia, to benchmark Malaysian biotechnology communication efforts and to adapt successful communication strategies for Malaysia. The research showed understanding of the public among communicators is lacking and communication strategies are carried out in an ad-hoc manner as institutional direction is lacking. However, although the main objectives of scientists are skewed towards branding the institutes and their research activities and commercialisation, a wide range of outreach programmes takes places, reaching out to various sectors of the publics. The missing links are the understanding of the public, national policy on biotechnology communication, synergy and integration among the communicators, trained communicators, and media support. A framework for national biotechnology communication strategy is proposed by incorporating current communication practices, addressing current challenges and shortcomings, public attitudes and interests, and international experiences. The proposed framework is expected to create a robust and effective biotechnology communication strategy for Malaysia.

## ABSTRAK

Dengan terlancarnya Dasar Bioteknologi Negara pada bulan April 2005, bioteknologi menjadi satu *'buzzword'* di Malaysia. Semenjak itu, beberapa usaha kerajaan menyaksikan pelaburan yang besar dalam sektor ini, baik dalam bentuk peruntukan kewangan mahupun pembinaan prasarana. Pelbagai dasar telah dibentuk bagi menjadi pemangkin untuk melonjakkan industri ini ke tahap yang lebih tinggi dan menjadikan Malaysia sebagai pemain bioteknologi di peringkat global. Namun demikian, kefahaman awam mengenai bioteknologi tidak menjadi keutamaan di peringkat kebangsaan bagi menyokong keghairahan dalam menjadikan bioteknologi sebagai jentera pembangunan ekonomi. Pembangunan modal insan, penerimaan awam terhadap teknologi baharu, kemampuan awam untuk membuat keputusan bermaklumat dan kemampuan untuk terlibat dalam dasar dan keputusan kerajaan adalah faktor-faktor yang menentukan kejayaan sektor bioteknologi, dan ini hanya boleh dicapai jika wujud usaha tersusun dalam meningkatkan kefahaman awam mengenai bioteknologi di peringkat kebangsaan. Beberapa pemain utama dari universiti, institusi penyelidikan, kementerian dan agensi kerajaan terlibat dalam mengkomunikasikan bioteknologi kepada masyarakat awam dan pihak-pihak berkepentingan tetapi tidak ada kesepaduan, kerjasama dan kesepakatan sesama mereka. Tambahan pula, program penyampaian yang dijalankan adalah tanpa kefahaman sebenar mengenai minat, persepsi dan sikap orang awam. Atas sebab ini, maka penyelidikan ini cuba memetakan semua komunikator bioteknologi di Malaysia bagi membentuk kefahaman yang lebih baik terhadap strategi, kumpulan sasar, matlamat, cabaran, dan cadangan penyelesaian. Ini kemudiannya dibandingkan dengan data mengenai minat, sikap dan persepsi awam yang diperolehi daripada tinjauan lapangan ke atas orang awam. Temu bual secara mendalam di jalankan dengan komunikator bioteknologi di Amerika Syarikat, United Kingdom, Singapura, Filipina dan Australia, bagi menanda aras usaha-usaha komunikasi bioteknologi di Malaysia di samping menyesuaikan strategi komunikasi yang berjaya untuk Malaysia. Penyelidikan ini menunjukkan kefahaman mengenai orang awam di kalangan komunikator masih rendah dan strategi komunikasi yang dijalankan bersifat *ad hoc* kerana wujud kekurangan dalam hala tuju institusi. Bagaimanapun, didapati objektif utama saintis walaupun terarah kepada penjenamaan institut, aktiviti penyelidikan dan komersialisasi, terdapat pelbagai bentuk program penyampaian yang dijalankan yang sampai kepada pelbagai lapisan masyarakat awam. Hubungan yang hilang ialah kefahaman awam, dasar kebangsaan mengenai komunikasi bioteknologi, kerjasama dan kesepaduan sesama komunikator, komunikator terlatih, dan sokongan media. Satu rangka kerja komunikasi bioteknologi kebangsaan dicadangkan dengan melibatkan amalan-amalan komunikasi semasa, menangani cabaran-cabaran dan kekurangan-kekurangan semasa, sikap dan minat awam, dan pengalaman antarabangsa. Cadangan rangka kerja ini diharap dapat membentuk strategi komunikasi bioteknologi yang teguh dan berkesan untuk Malaysia.

*THIS THESIS IS DEDICATED TO  
MY BELOVED LATE FATHER  
MR. ARUJANAN PJK PERIASAMY*

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## LIST OF ABBREVIATIONS

ABC	Australia Broadcasting Corporation
ACPEG	Australian Centre for Functional Plant Genomics
AFIC	Asian Food Information Centre
AFP	Agence France-Presse
AIMST	Asian Institute for Medical, Science and Technology University
ANOVA	Analysis of Variance
ASM	Academy of Sciences Malaysia
BERNAMA	Berita Nasional Malaysia (The National News Agency)
BIO	Bio Industry Organization
BiotechCorp	Malaysian Biotechnology Corporation
BIOTEK	National Biotechnology Division, Ministry of Science, Technology and Innovation
CBCM	Catholic Bishops Conference of Malaysia
CCM	Council of Churches Malaysia
CFM	Christian member organisations are Christian Federation of Malaysia
CoPUS	Committee on Public Understanding of Science
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DNA	Deoxyribo Nucleic Acid
EU	European Union
FASTS	Federation of Scientific and Technical Societies
FETTU	From Earth to the Universe
FRIM	Forest Research Institute Malaysia
FTAM	Federation of Taoist Associations of Malaysia
GDP	Gross Domestic Product
GM	Genetic Modification
GMAC	Genetic Modification Advisory Committee
GMO	Genetically Modified Organism
IFIC	International Food Information Centre
IHIA	International Halal Integrity Alliance
IKIM	Institute for Islamic Understanding Malaysia
ILIM	Malaysian Institute for Islamic Training
ISAAA	International Service for the Acquisition of Agri-Biotech Applications
JAKIM	Department of Islamic Development Malaysia
LAT-WP	Los Angeles Times – Washington Post
LMO	Living Modified Organism
MABIC	Malaysian Biotechnology Information Centre
MASTIC	Malaysian Science and Technology Information Centre
MARDI	Malaysian Agricultural Research & Development Institute
MBA	Malaysian Buddhist Association
MCCBCHST	Malaysian Consultative Council of Buddhism, Christianity, Hinduism, Sikhism and Taoism
BMSM	Buddhist Missionary Society Malaysia
KDM	Khalsa Diwan Malaysia
MGC	Malaysian Gurdwaras Council
MHS	Malaysian Hindu Sangam
MPOB	Malaysian Palm Oil Board

MOSTI	Ministry of Science, Technology and Innovation
MRB	Malaysian Rubber Board
NECF	National Evangelical Christian Fellowship
NGO	Non Governmental Organisation
NIH	National Institutes of Health
NSF	National Science Foundation
NRE	Ministry of Natural Resources and Environment
NRO	Non Research Organisation
NSC	National Science Centre
PAO	Public Affairs Officer
PUSH	Public Understanding of Science and Humanities
RTM	Radio Television Malaysia
SAWS	Sasana Abhiwurdhi Wardhana Society
SEARCA BIC	SEAMEO Regional Centre for Graduate Study and Research in Agricultural Biotechnology Information Centre
SMP	Science Meets Parliament
SNSM	Sikh Naujawan Sabha Malaysia
UK	United Kingdom
UKM	Universiti Kebangsaan Malaysia
UM	University of Malaya
UPM	Universiti Putra Malaysia
USA	United States of America
USM	Universiti Sains Malaysia

## **LIST OF APPENDIX**

Appendix I: Interview Questions for Biotechnology Communicators

Appendix II: Survey Questions for Malaysian Publics

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Appendix IV: Verification from respondents (Signatures)

Appendix V: First page of email from respondents

## **OUTLINE OF THESIS**

Chapter 1 is the Introduction that gives an overview of the impact of biotechnology and the controversies surrounding it. An overview of the relationship between the scientific fraternity and the communication with the public is discussed, where the need for public understanding of biotechnology is also explored. This Chapter also provides the research scope, objectives and the hypothesis of this research. The key terms used in this thesis are defined here and an overview of the methodology is also provided. Finally, the limitations encountered in conducting this research are discussed.

The Chapter on Literature Review explores previous research carried out in this area. The references are mainly from outside Malaysia, however, there were a number of areas which were novel and lacked references. The different science communication models in practice now are presented. Past research on public attitude towards biotechnology, the different biotechnology communicators and their strategies and media coverage on biotechnology is presented. The other areas that are relevant to the current research are the scientists' perception of public understanding of biotechnology, the different culture between scientists and journalists that causes conflict between them, and the common challenges in communicating biotechnology. A number of non-traditional approaches that have been used in communicating biotechnology are also presented as a comparison to the biotechnology carnival (MyBio Carnival) that was studied in this research. The impact of training scientists and journalists in communicating biotechnology and working effectively with each other is discussed. Reference to science communication strategies in a number of countries is also made. Finally, the areas with limited literature review were mentioned.



The Chapter on Methodology outlines the all the methods used in this research based on the objectives set forth. Thus, the Chapter provides an insight into how the objectives of the research were achieved. References to these methods are also cited.

The Chapter 4 to 6 are the “Results and Discussion” that presents all the findings. This is divided into: the various communicators (the objectives, target audiences, strategies, challenges, and suggestions), international comparisons where biotechnology communication strategies in the USA, UK, Australia, Singapore and the Philippines are discussed, the publics (their interests, level of understanding, sources of information, trusted sources, and motivation to understand biotechnology), and the impact of the non-traditional approach (public feedback on MyBio Carnival on its effectiveness as an approach in communication biotechnology) are presented. All the findings led to the development of a biotechnology communication framework and strategy for Malaysia.

The final Chapter concludes all the findings and presents the proposed biotechnology communication framework for Malaysia, strategies, and some recommendations. It also suggests a few areas which could be explored in future research.