

Economic Value of Public Infrastructure in Jamaica: The Case of Emancipation Park

Principal Researcher:
Dr. Abdullahi O. Abdulkadri
Department of Economics

This research project attempts to put an economic value on the benefits derived by patrons of the Emancipation Park using the contingent valuation methodology. The research resulted from an observation of the variety of activities that take place at the park, and the recognition that there are costs associated with the facilitation of these activities, for which patrons are not directly responsible.

A survey of park users conducted in the summer of 2005 yielded 199 useable responses, which revealed that 28% of respondents visit the park on a daily basis, while 53% visit at least 2-3 times per week. It was revealed that more than half of the respondents (55%) prefer to visit the park in the evening, while about a quarter (26%) prefers the early morning hours. Additionally, a large proportion of the respondents (64%) live away from the New Kingston area, mainly in other locations in Kingston and St. Andrew, and in St. Catherine. However, visitors come from as far as the parishes of St. Thomas, St. Elizabeth, Clarendon and St. Mary. There was also interesting findings regarding the age and gender distribution of patrons.

Overall, 95% of respondents consider the park to be of some benefit to them personally. Among the respondents, 54% identified using the park for relaxation or "hanging out" as their most important benefit, while 39% indicated jogging or walking. Other highlighted benefits include the aesthetic value of the park and its use as a venue for various kinds of activities. When the park's benefits were analyzed in terms of age, it was revealed that respondents 30 years old or younger considered the use of the park for relaxation or "hanging out" purposes as the most important benefit, while respondents 50 years of age or older predominantly value the use of the park for jogging or walking as the most important benefit. There was no significant gender differences in the ranking of benefits derived from the park.

Park patrons vary in their estimation of the benefits derived from the Emancipation Park. In all, about 45% of respondents are not willing to pay for the use of the park. Of those willing to pay for the use of the park, about 22% are willing to pay a fee of \$500 for a monthly pass while about 32% are willing to pay \$50 for a daily pass to the park. The maximum anyone is willing to pay for the use of the park ranges from a daily fee of \$150 to a monthly fee of \$2000. Those who are unwilling to pay overwhelmingly indicated that the government should provide the park for free.

There were challenges experienced by the researcher in explaining the logic of the contingent valuation methods, which may have influenced the elicitation of the true value of the park to patrons. However, this research study has found evidence that the Emancipation Park is of significant benefit to its patrons, and to some users, these benefits are invaluable. The study also points to the fact that the park may be used as a rallying point for promoting physi-

Economic Value of Public Infrastructure in Jamaica: The Case of Emancipation Park

cal fitness, especially among the elderly, and for youth socialization, which may have positive impacts on the incidence of crime.

Findings from this study will be presented at the Southwestern Economics Association annual conference in Albuquerque, New Mexico, in March 2007, prior to submission for publication in journals. •

Mona Online Research Database

Project Coordinators:

Mrs. Norma Amenu-Kpodo,
Library

Mrs. Leona Bobb-Semple,
Library

Ms. Janet McCallum,
Human Resources
Management Division

Ms. Joan Leitch
Mona Information Technology
Services

Ms. Doreen Mallett,
Mona Information Technology
Services

The Mona Online Research Database captures the research information and output of the University for regional and international visibility. The database provides access to a variety of research-related information, grouped in three major categories, namely:

1. Bibliographic information
 - Published works
 - Unpublished works
 - Multi media
 - Patents
2. Research Information
 - Research interest
 - Research in progress
 - Research grants
 - Collaborative projects
3. Expert Information
 - Bio-data
 - Courses taught
 - Language expertise
 - Graduate advising
 - Public service

The key feature of the database is the over 6000 bibliographic entries of published and unpublished research of the University of the West Indies for the period, 1993-2006. The Library aims at providing two annual updates. In these updates, published and verified unpublished works will be added as provided by faculty or if gleaned from other sources. The Library will also seek to acquire a copy of the research output for its University Collection or establish URL links where possible. The Human Resources Management Division will update faculty profiles with new bio-data, research and expert data while the Office of Sponsored Research will provide information on sponsorship. The enterprise systems that are being used for the development of the database are: PROCITE, PEOPLESOFT and BANNER FINANCIAL SYSTEM.

Faculty members were asked to submit their research profiles to the Library in June 2005 and in May 2006. Efforts to elicit information from faculty are ongoing. Future plans include the opportunity for faculty to update their profiles directly on the PEOPLESOFT System.



Coordinators in discussion about MORD
<http://mord.mona.uwi.edu>

Mona Online Research Database

The project was recommended for funding by the Strategic Transformation Team, and the first phase was launched on Research Day, January 2006 by the then Principal of the UWI, Mona Campus, Professor the Hon. Kenneth O. Hall. The following three publications were compiled and published:



- Research for Development: a Bibliography of Staff Publications, 1993-1998. Vol. 1. Edited by Judith Rao, Verna George, Jacqueline Roberts and Leona Bobb-Semple. Technical editor, Janet McCallum. Kingston: UWI Library, 1998.
- Research for Development: a Bibliography of Staff Publications, 1998-2002. Vol. 2. Edited by Leona Bobb-Semple, Tereza Richards, Gracelyn Cassell. Technical editor, Janet McCallum. Kingston: UWI Library, 2003.
- Research for Development: a Bibliography of Staff Publications, 2002-2005. Vol. 3. Edited by Frances Salmon, Myrna Douglas, Faith McKoy-Johnson, Karlene Robinson, Rosemarie Runcie, Tameca Thelwell. Technical editor, Janet McCallum. Kingston: UWI Library, 2006. •



Principal Researcher:
Dr. Susan Anderson
Department of Educational Studies

Behavioural Problems including Violence and Aggression in the Schools: A Model for School Improvement

This research examines behavioural problems in schools and the intervention programmes being implemented to deter them. Special emphasis is placed on one particular programme which attempts to curb the violence and aggression, as well as, analyse the socio-psychological implications of the disturbing trend at the school. The intervention and research in the chosen area uses a recently established High School in the corporate area which draws its students from communities surrounding the University of the West Indies which are considered among the most violent and "home" to major "warring" gangs. The school selected has been plagued by major behavioural problems over the recent past

The findings to date have shown that many of the students who exhibit violence and aggression are misunderstood/misdiagnosed (which is highlighted in the body of literature on this issue but which educators at times refuse to accept). However, it was also found that some of the factors that contribute to violence in schools include, residential location, political/garrison related issues, gang issues not necessarily connected to politics, and drug issues (mainly marijuana). The study also indicated that many of the contributing



Researcher, a member of the school administration and a parent engaging students in a discussion-treatment on specific behavioural problem.

factors, such as male absenteeism in families, members of family lost to gun violence or incarcerated, parents lost to HIV/AIDS, and not living with the preferred parent or step-family, are all related to the home and community. Given this background, it is not surprising that there is a lack of motivation towards academic and other forms of achievement. However, teachers do not readily offer the type of support that is needed by students living in such dire circumstances. It was found that students had self-esteem needs,

as well as, humanistic needs, such as the need to belong and to be loved. However, this same environment contributed to the teachers' intolerance and lack of empathy.

The findings have been documented in two articles which are "in press", namely:

- The Discipline Dilemma; and,
- Improving Classroom Management and Discipline through the use of Non-Verbal Language Techniques.

Behavioural Problems including Violence and Aggression in the Schools: A Model for School Improvement

Work is also underway on operationalising the Psycho-educational Approach (Phase Two). Some of the intervention strategies that were tried include building self-esteem and Pro social Discipline with a focus on "Victim-centred Discipline". This involved giving student tips, steps, hints, and 'how to dos' for growing up, getting along, learning and having fun. They were also taught that emotions guide the decisions we make and that positive healthy emotions serve to help us make better decisions. It became necessary to build their self-esteem as the initial observation and interviews showed that the students were found to be affected by self esteem issues. It was hoped, therefore, that by raising the level of self esteem, the students would become less dependent on external verification and display an awakening of their creativity.

The use of the Pro-social Discipline approach allowed for attention to be focused on the harm caused to the victim rather than the negative consequences in store for the perpetrator. Efforts are made to understand the reasons behind the intentions of the harm-doer, as well as, the consequences for the student that has been harmed. This approach requires that the perpetrators be informed about the harm they have caused and are encouraged to empathise with the victim. They also learn how to respond in a helpful, rather than harmful manner. Therefore, standards of appropriate conduct can be jointly constructed by the disciplinarian and the audience. Subsequently, they can learn, directly and vicariously by imitating models, how to aid the victim through helpful acts of reparation.

Another intervention strategy employed has been the widespread use of partnership and collaboration. To this end, several collaborative efforts have been initiated, such as partnering with the guidance counselling fraternity, and with the Department of Psychology in the Faculty of Social Sciences. In the case of the latter, help in the form of one-to-one counselling treatment for a group of affected students is provided by a Clinical Psychologist, as well as, trainees in psychology. Collaboration has also taken place with literacy studies specialists, as well as, others educators where deemed necessary. •



Principal Researcher:
Dr. Lawrence Bamikole
Department of Language, Linguistics
and Philosophy

Violence and Democratic Politics

The purpose of this ongoing research is to identify new ways of looking at violence in democratic states. The researcher seeks to examine the various dimensions of violence, their causes and the various justifications which agents and institutions have given for acts of violence, even in democratic states whose aims are to secure peace, stability and harmony.

The findings of this research project will be published in a book which will provide an analysis of the concepts of violence and democracy and their interconnectedness. The book delves into the various dimensions of violence and the various ways of understanding democracy. It is argued that contrary to the prevailing view that democracy is incompatible with violence, democracy and violence are not entirely opposed. In fact, there is an inner logic in democracy which accommodates violence, and furthermore violence is sometimes used in the service of democracy.

The findings of this study should add new insight into understanding the relationship between democracy and violence. The main contributions will be in explaining and justifying the linkage between violence and democratic politics - a linkage which has not been sufficiently explored given the usually held belief that violence and democratic politics are incompatible.

The resulting publication should also be regarded as good teaching material for lecturers in the Humanities, Law and Social Sciences, and will equally be a seminal source of insight into democracy and violence, for students in these disciplines. •



Principal Researcher:
Dr. Lou Anne Adrianna Barclay
Department of Management Studies

Resource-based Development Revisited: The Case of the Bauxite and Alumina Industry in CARICOM Countries

The main objective of this research is to analyse the role played in the economic development of less-developed countries by large foreign firms [Multinational Enterprises (MNEs)] that operate in the resource sector. The research focuses on four resource-rich countries of the Caribbean Community (CARICOM). It examines the bauxite/alumina industry of Jamaica, Guyana and Suriname, and the nascent aluminium industry in Trinidad and Tobago.

The selected CARICOM countries serve as an excellent laboratory for the study of the role of the resource-seeking MNEs in economic development. With the exception of Trinidad and Tobago, bauxite and alumina smelting traditionally have been strategic sectors in these economies.

The research is in its early stages. Work has so far been done in two of the focus countries, Jamaica and Guyana, but is yet to commence in Trinidad and Tobago and Suriname.

The researcher intends to publish a minimum of three academic papers and a book, using the findings of this research project. Four policy papers, targeted to policymakers in the countries studied, will also be prepared. It is hoped that these policy papers will provide policymakers with analyses that could be used to inform decision-making. •



Principal Researcher:
Dr. John Ayotunde (Tunde)
Isola Bewaji
 Department of Language, Linguistics
 and Philosophy

Contemporary Themes in African Philosophy: A Critical Perspective

The research is aimed at providing original resource material on Africana Philosophy. The findings will be presented in the form of a text book that addresses the numerous issues of history, relevance and availability of a structured discussion in the area of Africana Philosophy. By addressing the ambivalence of scholars about the existence and content of Africana Philosophy, through doing Africana Philosophy rather than engaging in a meta-philosophical discussion, this original effort will be ground-breaking. It will show that Africana Philosophy not only exists but is capable of being taught and can be done in very creative, engaging and rigorous ways. This research addresses what should be considered to be our obligation to both present and future generations, that of preserving our intellectual heritage and also showing how this heritage has been and continues to be a source of intellectual engagement and development.

A number of questions are critically explored in this research. These include:

- Is it possible for societies of sophisticated cultures to not have to deal with fundamental issues related to good, right, wrong, bad, moral, immoral, praise, blame, punishment and reward?
- Is it possible for civilizations to germinate and grow, and no longer need to determine the issues related to what to understand by truth, falsity, evidence, justification, opinion, and guesswork?
- Is it possible for discussions on the topics of truth, falsity, evidence, justification, opinion and guesses to be clarified in such societies without considerations of contradiction, validation, soundness, implication, and consequence to arise?
- Is it possible for such societies to exist without members ever wondering about where they came from, what was the nature of being and existence, terminal or the final end of things, and what there was after this end?
- Is it possible to have civilizations in which there are no questions about which relations among members of the society are just, fair and humane, either arising out of the frictions that ensue in the process of living or as a consequences of having to resolve contestations over resources?
- Is it possible to have civilizations where there are no questions relating to how to use technology (whatever these are) to serve human interest and to protect human goals (whatever these are) as members of the society, although this might contrast with the goals of others who may wish to propose contending ideas about ownership of the resources that are to be shared or fought over?

Based on data available from the research conducted to-date, the answer to these questions is no. It is expected that this research will provide the first deliberate material that critically and analytically examines the Philosophies of Africa, African-America, and the Caribbean, in a creative, rigorous and objective way, thereby providing resource material for teaching, research and discussion in the under-researched and under-respected but critically important area of Africana Philosophy.

Contemporary Themes in African Philosophy: A Critical Perspective

To date, various papers have been produced, disseminated and published in book chapters, journals, conference presentations and seminars, including:

- Bewaji, J. A. I. 2005: "Philosophical Exploration of Leadership in Caribbean and Diaspora Polities", by Journal on African Philosophy. An Electronic Journal of International Society for African Philosophy and Studies. At site: <http://www.africanphilosophy.com/issue2/bewaji.html>.
- Bewaji, J. A. I. 2005: "The nature and evolution of civil society - A Leadership Perspective". Paper presented at the 2nd Faculty of Humanities Conference, Obafemi Awolowo University, Ile-Ife, Nigeria, March 7-10.
- Bewaji, J. A. I. 2005: "Culture, Poverty and Civil Society - A critical analysis of aspects of African leadership". Paper Presented at 11th ISAPS Annual Conference, Bigard Memorial Seminary, Enugu, Nigeria, March 10-12.
- Bewaji, J. A. I. 2005: "Civil Society, Leadership and Poverty - an exploration of logical and practical connections". Paper presented and the Mona Association of Post-graduate Students 2nd Annual Conference, University of the West Indies, Mona Campus, Jamaica, February 17-18.
- Bewaji, J. A. I. 2004 "The geographies of reason - remapping the existential model across cultural boundaries". 1st Caribbean Philosophical Association Conference, Barbados. June.
- Bewaji, J. A. I. 2003. "If my people must go, they will have to find their way by themselves - Critical comments on Wim Van Binsbergen's *Ubuntu and the Globalisation of Southern African Thought and Society*" in South African Journal of Philosophy. Volume 22, No 4, pp. 378-287.
- Bewaji, J. A. I. 2003. "Beyond ethno-philosophical myopia - Critical comments on Mogobe B. Ramose's African Philosophy Through Ubuntu" in South African Journal of Philosophy. Volume 22, No 4, pp. 388-401.
- Bewaji, J. A. I. 2002. "Philosophical Exploration of Leadership in Caribbean and Diaspora Polities", Hunter College, CUNY, June 4, 2002. Public Lecture delivered as **Caribbean Exchange Scholar**.
- Bewaji, J. A. I. 2001. "Shepherding and Leadership - Perspectives in Afro-Caribbean Polities", University of the West Indies Conference of Rethinking Culture, Cave Hill, Barbados, June.
- Bewaji, J. A. I. 1989. "Traditional Religions, Constituted Authority, Law and Order: The Yoruba Perspective", in Momoh, C.S. et al (eds.) Nigerian Studies in Religious Tolerance, Lagos, CBAAC/NARETO, Vol. III. pp. 311-331. •

Reproductive diversity and Strategies for Breeding in Jamaican Pimento (*Pimenta dioica* L.)

Principal Researcher:
Mr. Frederick Boyd
Department of Life Sciences

Pimenta dioica is indigenous to the Caribbean islands and the tropical Central American region. The trees are widely distributed in Mexico, Guatemala, Honduras, Belize, Cuba, Hispaniola and Grenada, but most significantly in Jamaica. It can be found all over the island but is particularly concentrated in the rugged upland limestone areas of Westmoreland, St. Elizabeth, Trelawny, St. Ann, St. Mary and St. Catherine. The crop has been traditionally propagated by avian dispersal in a sporadic manner island-wide but over the last fifty years there has been increasing consideration given to organized orchard activity.

Historically, Jamaica has been the major producer of the best quality Pimento and has enjoyed a traditional monopoly. However in recent years there has been a decline due to decreasing production coupled with more aggressive marketing of the Central American product. This trend obtains at a time when the world market for Pimento continues to expand. Against this background, Jamaica stands to lose much valuable foreign currency earnings when the local economy can least absorb such losses.

Pimento is one of the export spice crops for which the Jamaican Government has earmarked an investment of over J\$230 million in its bid to develop certain key areas of the agricultural sector. In keeping with this stated intention to increase the gains from the Pimento industry, this study finds its relevance and application in the improvement of the quantity and security of supply, while assuring its quality. This goal is to be achieved through the production of Pimento trees of known gender through DNA fingerprinting and subsequent tissue culture techniques. This project seeks to determine the genetic basis for the incipient dioecism thought to be operative in Pimento, thereby generating information for persons interested in precise orchard planning and crop development.

The findings of this project will facilitate the following deliverables:

- The selection and sequential propagation of plants of predetermined gender.
- Live collection of male-enhanced and female-enhanced plants for conservation and breeding purposes.
- Mass production of these plants through tissue culture, since bud-grafting and approach-grafting are currently the only available vegetative propagation methods. Both of these methods necessitate waiting for the plant to attain a certain level of maturity. They are also labour-intensive and incompatibility reactions are often encountered. Pimento is quite refractive to many methods of vegetative propagation.
- The ability to engineer Pimento orchards in which there is optimal opportunity for efficient cross-pollination between these plants.
- The generation of current, much-needed scientific data on the reproductive biology of the crop. •

Molecular and Immunological Analyses of Pathogenic *Leptospira* in Jamaica

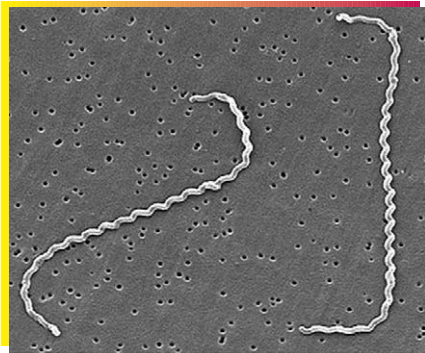


Principal Researcher:
Dr. Paul D. Brown
Department of Basic Medical
Sciences

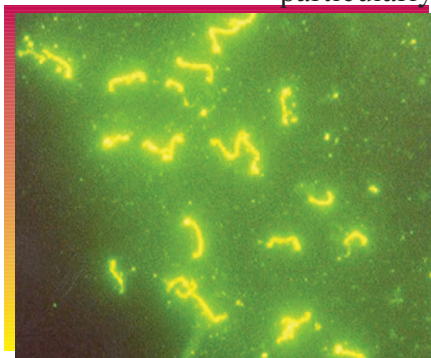
Leptospirosis is an important global human and veterinary health problem caused by pathogenic *Leptospira* bacteria. Humans become infected through exposure primarily to the urine of chronically-infected wild and domestic animals (especially rodents, cattle, pigs and dogs) that serve as reservoir hosts. The purpose of this project is to determine the regulatory role of two genes, *recA* and *relA*, on the disease-causing potential of pathogenic leptospires. These two genes are important for bacterial survival during periods of stress or harsh conditions.

The specific aims of the study are:

- to identify those regulatory mechanisms, controlled by the genes, that are switched on when the bacteria interacts with a host, and to develop a biological test that might be useful for diagnosis of leptospirosis;
- to assess the influence of environmental factors on those regulatory mechanisms; and,
- to observe the attachment of leptospires to mammalian cells and determine whether the bacteria have a preference for some type(s) of cells.



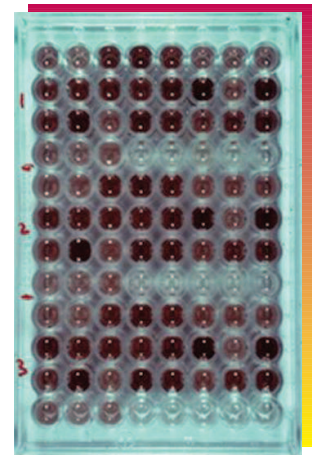
Electron micrograph of leptospires (note spiral shape)



Fluorescing leptospires

Given the importance that several pathogenic bacteria place on these two genes, *recA* and *relA*, to regulate their ability to cause disease and/or to survive stress, the researcher is interested in evaluating these associations in leptospires. Special focus will be placed on the area of influence of environmental factors on the function of these genes, and on the ability of the bacteria to bind to mammalian cells. The hypothesis is that these genes play a particularly important role in the ability of leptospires to cause disease.

The results of this project could lead to the development of protective and diagnostic strategies for leptospirosis in Jamaica. The project should further national interest in an important re-emerging disease, and a significant cause of mortality and morbidity in the Caribbean. •



Biological test which can be used for diagnosis of leptospirosis •



Principal Researcher:
Dr. David Dodman
Department of Geography and
Geology

Managing Caribbean Cities: Analysing the Past, Facilitating the Future

The Latin America and Caribbean region is the most urbanised area in the developing world with 75% of the region's population living in cities. This relatively high concentration of people in urban areas has political-economic, socio-cultural, and ecological ramifications, but also provides significant opportunities for individuals and societies to achieve human and national development. However, the demographic process of urbanisation in the Caribbean has not been accompanied by an expansion in the capacity of urban governance structures. In this context, therefore, it is imperative to analyse the ways in which Caribbean cities have been managed in the past and to understand how they are managed in the present, in order to facilitate improved structures and processes of urban management in the future.

The research identifies the characteristic structures of urban management associated with three distinct periods of time: the colonial period of urban management, in which urban management was directed by structures imposed from overseas; the post-independence period in which municipal government was weakened at the expense of a focus on newly independent nationhood; and a neo-liberal period in which many of the key initiatives are driven by international institutions including the World Bank and the United Nations. The research, however, focuses mainly on the final stage identified.



The Kingston waterfront redevelopment took place in the late 1960s and resulted in a complete transformation of the city's harbour.

Fieldwork for the project has thus far been conducted in Kingston (Jamaica), Port of Spain (Trinidad), Castries (St Lucia) and St John's (Antigua). Governments throughout the region have adopted a variety of strategies for regeneration, including the creation of urban development corporations (such as the St John's Development Company in Antigua, the Urban Development Corporation of Trinidad and Tobago (UDeCoTT), and the Urban Development Corporation in Jamaica). Figures 1 and 2 show the waterfront

redevelopment projects in Kingston and Port of Spain, both of which have been managed through urban development corporations which have been granted special powers for development which supersede traditional structures of urban management. Private sector organisations, such as the Downtown Owners and Managers Association (DOMA) in Port of Spain and the Downtown Kingston

Management Area have also acquired the responsibility for certain urban management functions that were previously the domain of local authorities. These changing structures of urban management have social and political implications for the ways in which cities in the region are organised and the ways in which they respond to the needs of citizens.

Managing Caribbean Cities: Analysing the Past, Facilitating the Future



The Port of Spain Waterfront Redevelopment project is ongoing and utilises a similar model of management to that adopted in Kingston 30 years ago.

In addition to filling an important gap in the literature on urbanisation in the Caribbean, the research findings could also be of interest and relevance to practitioners. Town planners and city managers in the public sector will also benefit from the provision of reference material on the management of urban areas in the region, and the study's outputs will provide civil society interests with a more thorough understanding of the context within which they operate. In addition, the analysis of past structures of urban management and proposals for future improvements will be of relevance to regional governments and international organisations as a means of improving their planned or proposed interventions within Caribbean cities. •



Principal Researcher:

Dr. Augustine Ezenne

Department of Educational Studies

Collaborators:

**Dr. Anthony I Miles
and Dr. Philo Hutchinson**

College of Education, Georgia State
University, Atlanta, Georgia

Dr. Clinton Hutton

Department of Government, UWI,
Mona

Understanding Academic Achievement among College and University Students of African Descent in the Caribbean

Consistently low academic achievement in Caribbean examinations over the last decade in subject areas such as English Language, Mathematics and the Sciences, by high school students (Ezenne, 2005), has made it difficult for them to matriculate into higher education programmes. Among the factors that may have contributed to the poor performance are socioeconomic issues, such as the rising cost of tuition, economic difficulties, lack of institutional support and cultural identity issues. Similarly, within the United States of America, a well documented achievement gap has persisted among African Americans for several decades (Bennett et al, 2004).

This research project is a cross-national and cross-cultural study designed to investigate the factors contributing to the academic achievement of students of African descent in the Caribbean and in the State of Georgia, USA. The research examines the relationships between institutional factors and psychological and social variables among students of African descent, incorporating both quantitative and qualitative methodologies. The project is a collaborative effort between researchers from the University of the West Indies, Mona Campus, and Georgia State University in Atlanta, Georgia.

The project is in its initial stages, and will utilise, as research instruments, a questionnaire and interviews. The questionnaire is a twenty-paged instrument covering a wide range of factors affecting academic achievement of students and has been administered to 250 students at the University of the West Indies, Mona Campus and 250 students at Georgia State University in Atlanta. Analysis of the pilot data is presently in progress, and will be completed by December 2006. •



Principal Researcher:
Dr. Abiodun Oluwole Folawewo
Department of Economics

The Informal Labour Market in Developing Countries

The broad objective of the study is to add to the existing stock of knowledge on informal sector research, by dially, the study seeks to:

- provide a basis for understanding and conducting research in the informal sector in developing economies;
- provsseminating the findings of the study on several controversial issues. Specificide a comparison between informal labour markets in Jamaica and Nigeria;
- provide basic characterization of informal labour market, with a view of providing the framework for understanding the process of labour demand and wage determination in the sector; and
- serve as a handy tool for formulation of policies that have to do with the informal labour market.

The study content will cover a whole range of issues centred around theoretical, methodological, empirical, and policy. Essentially, the study will be divided into four major parts. Part one provides background information and contains general introduction and conceptual definition of informal sector. In part tow, an overview of informal sector is provided by examining the structure and characteristics of informal sector in Nigeria and Jamaica. Theoretical issues are dealt with in part three, with an examination of theories of informal labour market labour demand and supply, as well as how to model informal sector. Part four deals with empirical analysis and covers labour demand and wage determination in urban informal sector of South-Western Nigeria. Finally, part five focuses on policy issues such as how to boost employment generation within the informal sector and how to forester a closer linkage between formal and informal sectors.

Outline of the content is as follow:

- | | |
|-----------|--|
| Part I: | Background
Chapter One - Introduction
Chapter Two - Concept of Informal Sector |
| Part II: | Overview of Informal Sector
Chapter Three - Structure and Characteristics of Informal Sector in Nigeria
Chapter Four - Structure and characteristics of Informal Sector in Jamaica |
| Part III: | Theoretical Issues
Chapter Five - Theory of Informal Sector Labour Demand and Supply
Chapter Six - Modelling Informal Sector |
| Part IV: | Empirical Analysis
Chapter Seven - Labour Demand in Urban Informal Sector of South-Western Nigeria
Chapter Eight - Wage Determination in Nigeria's Urban Informal Enterprises |

The Informal Labour Market in Developing Countries

Part V:	Policy Issues
	Chapter Nine - Boosting Employment Generation of Informal Sector
	Chapter Ten - Fostering a closer linkage between Formal and Informal Sector
Appendix	
Index	

The project will lead to a production of a book expected to be of immense benefits to development practitioners both in the public and private sectors, as well as the academic community. Particularly, the book is expected to serve as a useful study guide to both teachers and students in the field of development and labour economics. •

The Investigation of Marine Organisms in Jamaican Waters for Bioactive Metabolites

Principal Researcher:
Dr. Winklet Gallimore
 Department of Chemistry

The marine environment covers 70% of the earth's crust and is inhabited by a wide variety of flora and fauna, many of which are yet to be discovered and investigated. This research focuses on the discovery of new therapeutic and industrial applications for known marine natural products in addition to the identification of novel biologically active compounds. An obstacle to drug development using marine algal species and marine invertebrates is the insufficient quantities of the compounds which can be obtained for conducting comprehensive pharmacological investigations. This challenge will be addressed in the project by undertaking experimental work which could lead to the development of protocols for the aquaculture of sponges and algal species.

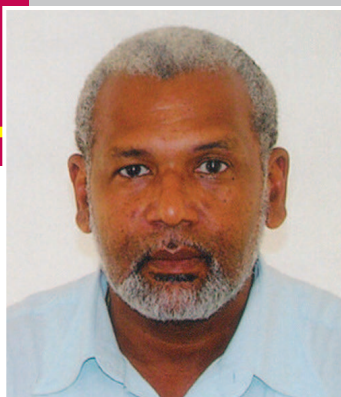
Research work is presently underway on various marine organisms identified in several locations around the island, and includes:

- Work on a soft coral (a gorgonian) which is generally avoided by SCUBA divers due to skin irritation that occurs on direct contact with this organism. The extract from this coral has been found to contain terpenoids;
- Work on a sponge species collected off the coast of Port Royal (Lime Cay and Drunken Man's Cay) at depths of between 6 and 14 metres. Extracts from this organism have been found to possess insecticidal and piscicidal activity.
- Sponge samples collected from Montego Bay have been assessed, and compounds isolated.
- Bioactive extracts of a Port Royal mangrove ascidian from the Ecteinascidia lagoon have been identified, and are being purified to determine the active constituents of the organism.
- Extracts from the green alga, *Udotea* sp., which was recollected from the North Coast, are also under investigation to determine the constituents of the alga.

These investigations are expected to result in the identification of bioactive compounds with potential commercial applications. •



Conducting research work in the vicinity of the Pelican Bar, off the coast of St. Elizabeth



Principal Researcher:
Dr. Keith D. Golden

Department of Basic Medical
Sciences

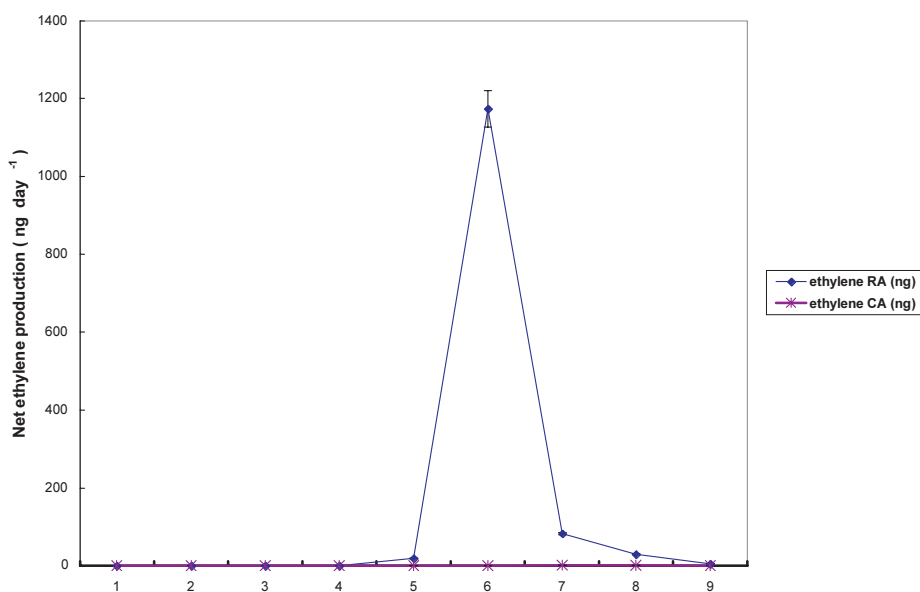
Research Fellow:
Mrs. Blessing Agoreyo

Controlling Fruit Ripening Using Post-Harvest Technology

The aim of this research project was the development of a process to extend the shelf life of the plantain (*Musa paradisiacal L.*) and papaya (*Carica papaya cv sunrise solo*) fruits using post harvest technology. In addition, the activity of ACC oxidase (production of ethylene), polygalacturonase, and glycosidases in plantain (*Musa paradisiacal L.*) were also determined.

Post-harvest technology was performed on the plantain and papaya at controlled atmosphere and regular atmosphere. Based on the analysis conducted, the production of ethylene under controlled atmospheric conditions (using the diffusion channel system) was not detected when compared to fruit kept at regular atmosphere. Therefore, use of post-harvest technology had the effect of enhancing the shelf-life of the plantain and papaya fruits when stored at controlled atmosphere.

The activity of the following enzymes, Acc oxidase, β -D-galactosidase, β -D-glucosidase, N-acetyl- β -D-glucosaminidase and polygalacturonase, was determined at the unripe, ripe and over-ripe stages of ripening. The activity of all the enzymes increased from the unripe stage up to the ripe stage and declined at the over-ripe stage.

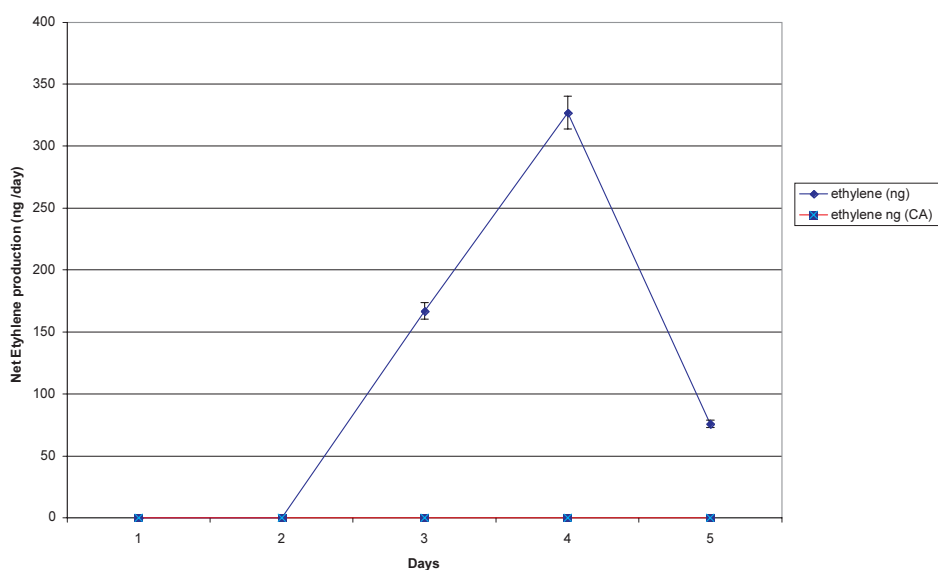


Endogenous ethylene production in intact plantain at regular atmosphere (RA) and controlled atmosphere (CA) using the diffusion channel system. At controlled atmosphere there is little or no ethylene production for the entire 9 day period.

Controlling Fruit Ripening Using Post-Harvest Technology

The information resulting from this study will be of significant importance to the agricultural sector in Jamaica, since the poor shelf-life of many tropical fruit has resulted in the loss of much needed foreign exchange. The capacity to extend the shelf of tropical fruits will improve the agricultural sector's ability to deliver fresher fruits to overseas markets and by extension, improve the country's foreign exchange earning potential.

Ethylene production in papaya RA & CA (diffusion channel)



Endogenous ethylene production in intact papaya at regular atmosphere (RA) and controlled atmosphere (CA) using the diffusion channel system. At controlled atmosphere there is little or no ethylene production for the entire 5 day period.



Principal Researcher:
Dr. Anthony Greenaway
Department of Chemistry

Research Fellow:
Ms. Rosemarie Wilson

Remote Sensing of Water Quality in Jamaican Coastal Waters

The quality of Jamaica's coastal waters is a significant factor impacting the success of the tourism and fishing industries and the economy in general. It is an established fact that rivers and other inland fresh water sources serve as carriers of a number of contaminants to the coastal waters into which they flow. However, regular water quality monitoring of Jamaica's coastal waters is limited by the scarcity of technical and laboratory resources, and consequently there are little suitable spatial and temporal data for scientific and management purposes.

This project investigates the possibility of using daily, freely-available, remotely measured spectral characteristics of the Black River and Rio Cobre estuaries and bays to provide reliable coastal water quality information which can be related to the sources and concentrations of optically active dissolved and particulate substances. As light enters water, dissolved substances, generally called coloured dissolved organic matter or humic substances, absorb photons from the light beam. Concurrently, biological and non-biological particulates in the water absorb and scatter photons from the beam, further reducing the intensity of the within-water light field. The resulting radiation leaving the water body can be measured using suitable radiometric sensors placed directly within and above the water body (in situ measurements) and also on remote platforms such as satellites (remote sensing measurements). By relating the in situ radiometric data to water quality and then deriving relationships between the in situ and remotely collected radiometric data it may be possible to show that the remotely collected data can be used to quantify the quality of our coastal waters.



Remote spectral data for this project are being obtained from the Moderate Resolution Imaging Spectroradiometer (MODIS) sensors flown on board two of The United States of America's National Aeronautical and Space Agency's (NASA) satellites which together do twice-daily crossings of the Equator. The MODIS sensors spectral bands, which report signatures from the water bodies viewed on spatial resolutions of 250, 500 and 1000 metres, can provide interpretive data in terms of water quality parameters. These data will be ground-truthed with in situ spectral data collected concurrently with a hand-held, field-based spectroradiometer. A crucial element of the work involves laboratory-based measurements of phytoplankton pigments, coloured dissolved organic matter, suspended sediments, nutrients (C, N, P, Si) and biochemical oxygen demand. These parameters are important indicators of the chemical and ecological status of a water body. However, to monitor them using classical field sampling and laboratory based methods is labour-intensive and require significant laboratory resources, and so they are often not quantified.

Remote Sensing of Water Quality in Jamaican Coastal Waters



This work may show how the national water quality monitoring programme can obtain freely available remotely sensed water-leaving radiation and use them to provide a historic and ongoing geographically located database on important coastal water quality parameters. Such information can then be used to make land-management decisions which could reduce contaminants reaching the coastal zone. •



Principal Researcher:
Dr. Otelemate G. Harry
Department of Language, Linguistics
and Philosophy

A Neurolinguistic Study of Children in Bilingual Education in Jamaica

The research aims to determine brain localizations for bilingual functions and its impact on performance in non-language related areas in the neural developmental of bilingual Jamaican children.

The results from this research project should provide a major platform for the effective study of neurolinguistic abilities of children in similar language situations to that of Jamaica. In turn, this platform will provide a typological model of types of bilingualism peculiar to the region and other similar non-Caribbean contexts. The potential benefits/uses of the findings of this study include:

- The development and standardisation of a neurolinguistic test to identify the localization of language functions within the brain for Jamaican Creole and English;
- The collection and analysis of baseline data on primary students entering bilingual learning/teaching contexts at various points;
- The collection and analysis of end of year data on the impact of bilingual education on nerolinguistic pathways and social interaction in the developing child;
- Application of the findings in the educational system to help teachers employ methods that will greatly enhance student language skills in and out of the classroom; and,
- Application of the findings in the area of speech therapy for both adults and children. •

Burnout and General Well-Being among Nurses in Four Medical Facilities in Jamaica: Investigating the Contributions of Occupational Stress, Personality Factors and Coping Strategies



Principal Researchers:
Dr. Rose Johnson
Department of Sociology,
Psychology and Social Work



Dr. Tracy McFarlane
Department of Sociology,
Psychology and Social Work

This study examines the degree of burnout among a sample of Jamaican nurse practitioners, and the contributions that occupational stress, personality factors and coping strategies have been making to the manifestation of this phenomenon.

The study is being conducted in two phases. Phase one involved a baseline survey of the degree of burnout among thirty final-year nursing students and forty-three nurse practitioners at the University Hospital. Phase two, currently ongoing, is a multi-site study of correlates of burnout, including, personality factors, coping, psychological well being, and general health. It will involve a larger sample of three hundred nurses from four medical facilities. The nurse practitioners in phase one completed five inventories - Maslach Burnout Inventory, Occupational Stress Inventory-Revised; NEO Personality Inventory Revised; General Health Inventory; and the General Well-Being Inventory. Descriptive statistics, Pearson Correlation Coefficient and Multiple Regression Analyses were used to address the research questions.

The baseline results indicated that while final year nursing students and nurse practitioners do not fit the full criteria for the syndrome of burnout, neither do their scores indicate low or no burnout. Among the students, more than 50% were already feeling emotionally overextended and exhausted from their work and were not experiencing a sense of successful achievement. Nevertheless, they still cared about their patients. A similar pattern was observed for nurse practitioners. The more stress nurses experienced from their work roles, the more emotionally exhausted they were. Similarly, the more personal strain they experienced, the more emotionally exhausted they were. Increased personal strain also led to increased depersonalization. On the other hand, the better nurses were at coping, the less depersonalized they were. Personality and work factors of neuroticism, conscientiousness, coping, extraversion and vocational strain also predicted burnout.

The findings suggest that both psychological and work factors impact on the manifestation of burnout. In light of the current upheaval in the nursing profession, training programmes and hospitals need to better understand these factors so that they can be addressed more effectively. •



Principal Researcher:
Dr. Eulalia Kahwa

The UWI School of Nursing

Collaborators:

Dr. Norman Waldron

The UWI School of Nursing

Dr. Hermi Hewitt

The UWI School of Nursing

Mrs. Yvonne Wint

The UWI School of Nursing

Professor Laurel Talabere

Capital University,
School of Nursing

Professor Nancy Edwards

University of Ottawa,
School of Nursing

Dr. Jennifer Knight-Madden

Tropical Metabolism Research
Institute

Dr. Ray Bailey

Department of Obstetrics and
Gynaecology & Child Health

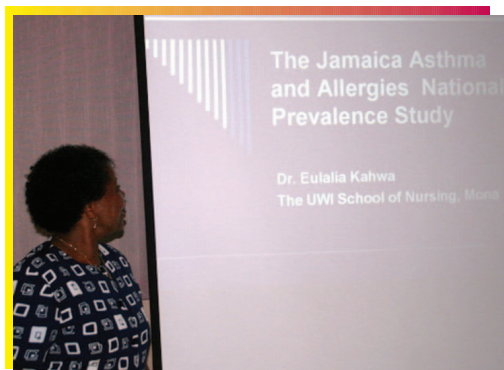
The Jamaica Asthma and Allergies National Prevalence Study

Asthma is a major public health problem that affects both adults and children. Studies done in some Caribbean countries suggest that many children in these countries suffer from this condition, but few studies have been done to determine its prevalence in adults. Statistics from the Ministry of Health, Jamaica, show a high number of visits by persons with asthma to Accident and Emergency Departments for treatment, and an increasing number of hospital admissions due to the disease. However, current research data regarding the number of adults and children affected by asthma in Jamaica, the risk factors that contribute to the development of asthma, environmental irritants and asthma triggers are lacking. The most recent widespread study on the occurrence of asthma in Jamaica was done more than 20 years ago by Lawrence & Segree (1981) which indicated that 21% of Jamaican high school children had asthma. Information on the occurrence and impact of asthma on the Jamaican population is important for health care planning and the allocation of resources for effective prevention, treatment and management of the condition. Since current research data on asthma are lacking, health planners have had to rely on asthma statistics from Accident and Emergency (A&E) Departments which are often inaccurate.

The key objectives of this study are:

- to determine the proportion of the Jamaican population affected by asthma and allergies,
- to gather data on risk factors and triggers for asthma and allergies, and,
- to assess the current level of knowledge about asthma within the Jamaican population.

Findings from this study should benefit the Ministry of Health, Jamaica and regional health authorities by providing information that will facilitate effective programme planning to meet the health care and health promotion needs of individuals and families affected by asthma, inform policy



The Jamaica Asthma and Allergies National Prevalence Study



decisions on asthma and contribute to the development of a comprehensive approach to asthma management including asthma education for Jamaica.

The Statistical Institute of Jamaica (STATIN) has been contracted to conduct an island-wide survey under the direction of The UWI School of Nursing, Mona. A nationally representative sample of 2000 adults and 2000 children will be interviewed using modified versions of the International Study of Asthma and Allergies in Childhood (ISAAC) Questionnaire (1991) for children, and the European Community Respiratory Health Survey for adults (1994). Both questionnaires were developed and

standardized to facilitate comparison of data on the occurrence of asthma and allergic diseases internationally. A pilot study will be conducted with 50 children and 50 adults who meet the study criteria to determine the suitability of the questionnaires for use in the Jamaican setting. •



Principal Researcher:
Dr. Garth Lipps
 Department of Sociology,
 Psychology and Social Work



Collaborator:
Dr. Gillian Lowe
 Department of Community Health
 and Psychiatry

Depression among High School Students in the Caribbean

Depression is the one of the most common mental health problems in teenagers. Past research (Lewinsohn, Rohde, Seeley, Klein, & Gotlib, 2000) suggests that depression in teenagers is linked to many serious social problems including substance abuse, unplanned pregnancy, poor grades and failure in school, as well as suicide.

Recent research by Lowe and Lipps (2006) found that the patterns of depression found in North America teenagers do not necessarily hold true for their Jamaican counterparts. In their research, Lowe and Lipps found that while students attending an elite secondary school in Jamaica displayed characteristics similar to those reported in North American schools, the prevalence of depression was higher for teenagers attending an inner-city school, and there were no significant gender differences in the levels of depression.

This research project, which is just commencing, follows up Lowe and Lipps' work by looking at how social conditions and parenting practices are related to teenagers' feelings of depression. Samples for the study were drawn from teenagers in the fourth form of selected schools in St. Vincent and the Grenadines, St. Kitts and Nevis, The Bahamas, and Jamaica.

It is hoped that the study will contribute to Caribbean social policy by providing well needed information on how the social conditions and community contexts of each island contribute to depression in teenagers. •

Human Papilloma Virus (HPV) Infection in Jamaican Women

Principal Researcher:

Professor

Norma McFarlane Anderson

Department of Basic Medical
Sciences

Research Assistant:

Ms. Angela Watt

Collaborators

Professor Horace Fletcher

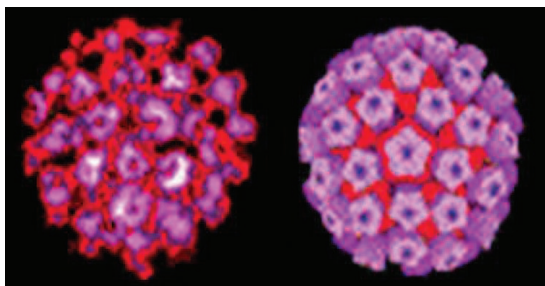
Department of Obstetrics,
Gynaecology and Child Health

Professor Monica Smikle

Department of Microbiology

The rate of cervical cancer remains high in Jamaica despite the increased availability of Papanicolaou (Pap) smear screening. There is now general consensus that, along with lifestyle and possibly host genetic factors, HPV is the causative agent for cervical cancer [now classified as a sexually transmitted infection (STI)]. Of the more than 100 Human Papilloma Virus (HPV) genotypes that have been identified, 30-40 infect the genital tract. These are further classified as 'high' and 'low' risk strains based on whether infection is associated with the development of cancer or benign changes in the cervix and genital warts. Since a prophylactic vaccine which targets four of the most prevalent types in Europe and North America - 16, 18, 6 and 11 - was being developed, (now available as Gardasil), the researcher thought it would be important to investigate the HPV types that infected Jamaican women, as this could impact the effectiveness of the vaccine in the population. The researcher also sought to compare the use of urine against cervical cells for HPV deoxyribonucleic acid (DNA) screening, since urine collection is non-invasive and might be more acceptable to participants.

The hypothesis that the prevalence of infection by 'high risk' HPV types in Jamaican women is high and associated with the presence of other STI, was tested. Approval for the study was obtained from the Ethical Review Board, UWI/UHWI, and 409 women were recruited at their first antenatal visit at the UHWI, and another 97 women were recruited at a family practice in Savannah-la-mar. All the women completed a lifestyle/sexual practices questionnaire. Urine was collected from the pregnant women, and urine and cervical cells were taken from the non-pregnant women. HPV DNA was detected using the Polymerase Chain Reaction (PCR) and Reverse Line Blot hybridization. Data were analyzed using SPSS version 12 and STATA.



Human Papilloma Virus (HPV)

The results showed that urine was not a good medium for screening. HPV DNA was detected in 86% of the cervical cell samples while the detection rate in the corresponding urine samples was 20%. The rate in the urine from pregnant women was 36%. There was no apparent association between HPV and other STI such as Chlamydia, Gonorrhoea, Syphilis, Herpes Simplex 2 and HIV-AIDS but younger women were at greater risk of infection.

The most common high risk types found in both groups of 'healthy' women of predominantly African descent were 35, 51, and 52 (In sub-Saharan Africa, the most common HPV types are reported to be 35, 45, 52, 56 and 58). In an earlier study, HPV types 16 and 45 were reported to predominate in colposcopy patients. Types 16 and 18 were present at 9% and 3% in urine from pregnant women while in non-pregnant women, type 18 was present at 1%. In cervical cells the rates were 3% and 18% respectively. 35% and 44% of non-pregnant and pregnant women respec-

Human Papilloma Virus (HPV) Infection in Jamaican Women

tively had multiple infections. HPV types 51, 52 are among the types that cooperate with HPV 16 to produce dysplasia or cancer and HPV types 35, 52 exert oncogenic effects more rapidly and extensively in cervical epithelia infected with other HPV types.

Since urine was a poor medium for HPV detection, we continued cervical cell sample collection from non-pregnant women and also collected 138 cervical cell samples from pregnant women. HPV DNA detection has been completed and statistical analysis is ongoing.

These findings are of importance since the use of the HPV vaccine in Jamaica is being contemplated. •



Principal Researcher:
Dr. Wayne McLaughlin
 Department of Basic Medical
 Sciences
 - Caribbean Genetics (CARIGEN)

Chief Forensic DNA Analyst:
Mr. Compton Beecher

Establishment of an Independent Forensic DNA Typing Laboratory

Within the last ten years, the successful use of new technologies such as Deoxyribonucleic Acid (DNA) testing has made this form of evidence a predominant forensic tool in the criminal justice system. The technological progress that has occurred now makes it possible to obtain conclusive results in cases where previous testing was inconclusive. Forensic DNA evidence has helped to solve more cases than had been previously possible, and is aiding in both the conviction of the guilty and the exoneration of the innocent.

Independent facilities and expertise in forensic DNA testing and analysis are severely lacking in the Caribbean, and as a result, defendants cannot readily access these resources. Furthermore, the Courts are not familiar with the technology and the data analysis. Against this background, the Department of Basic Medical Sciences sought to help address this short coming through the establishment of an independent forensic DNA testing laboratory, in January 2005. The Laboratory was intended primarily to provide Human DNA Identification (HID) analysis in forensic and paternity applications for both civil and criminal cases, case reviews and expert witness testimony. It has the distinction of being the first facility in the entire Caribbean region that provides private DNA analysis for academics and the public.



In July 2005, an Applied Biosystems Inc. 3130 state-of-the-art industry standard DNA analyzer was commissioned. The device provides reference-standard quality data and sophisticated hands free automation capabilities. A Forensic DNA Analyst with over ten years experience was also hired. In November 2005, Caribbean Genetics (CARIGEN) was established as a unit in the Department to provide forensic DNA analysis and consultancy services to the legal profession involved in both civil and criminal cases. To ensure that CARIGEN provides the highest quality forensic DNA services, in a timely manner, the ISO/IEC 17025:2005 accreditation standard was adopted to establish a laboratory quality management system. Also, the Starfruit IdentiTrack® laboratory information management system (LIMS) was adopted in respect of the management of samples, and forensic DNA training of the technical staff. In January 2006 a website www.caribbean-genetics.com was launched and active network/contracts and partnerships were established with forensic and medical diagnostic laboratories throughout the region.

Since January 2006, CARIGEN has been able to secure DNA testing service contracts with eleven medical diagnostics laboratories in Jamaica, St. Lucia, Trinidad and Tobago, Antigua, Barbados and Belize, and some 128 paternity cases

Establishment of an Independent Forensic DNA Typing Laboratory

have been analysed. CARIGEN has also successfully handled ten forensic DNA cases, including requests from defence attorneys for independent post-conviction DNA testing, as well as, support to the Government Forensic Science Laboratory in Jamaica. Following the introduction of the Y-chromosome DNA (STR) testing service, CARIGEN was able to provide DNA evidence in the landmark case of Regina vs. Stafford Webb, in May 2006. The accused was exonerated after spending four years in prison following his earlier conviction on a charge of rape.

In terms of futures plans, CARIGEN hopes to offer Genomic DNA sequencing services as of January 2007. This should substantially improve the research capabilities of the region in the areas of genomics and biotechnology. •



Principal Researcher:
Dr. Lawrence A. Nicholson
 Mona School of Business

Yield Management and Jamaica's Hotel Industry

The Jamaican economy depends to a great extent on the viability of tourism. It is estimated that in 2005, travel & tourism (direct and indirect impact) accounted for 36.2% of GDP and 394,189 jobs, which represents 31.9% of total employment in the island (World Travel and Tourism Council, 2004). Data for 2004 showed that 1 in 4 jobs depended in some way on tourism (Ibid). The hotel industry is an important component of Jamaica's tourism. It is important, therefore, that every measure is taken to ensure that this significant sub-sector is operated as efficiently and effectively as resources will allow. Yield management is a technique that has proven to be effective in maximising revenue for many hotels across the world. The main unanswered question is, to what extent has yield management been adopted by the hotels in Jamaica?

Yield management is the practice of maximizing profits from the sale of perishable assets such as hotel rooms by controlling price and inventory and improving service. It is the application of information systems and pricing strategy to allocate the right capacity to the right customer at the right place at the right time. The principles of yield management have been used in various industries such as the airline, hotel and restaurant industries, to maximize revenue.

Being convinced of the benefits of yield management, the researcher seeks to explore the extent to which such practice has been adopted in Jamaican hotels and the benefits, if any, which have been accrued from its adoption. In addition, the research will seek to explore the nexus between yield management and the operational aspect of supply chain management.

The study has employed a combination of methods in data collection. A survey instrument (questionnaire) has been administered among a target group of hotels across Jamaica. The questionnaire solicited the views of a number of employees and guests in these hotels. Analysis of the data will follow and the results compared to other survey findings and literature on yield management practices in other parts of the world.

The findings of this research will help in the formulation of a strategic framework as it relates to the adoption and application of yield management in Jamaica's hotel industry. The findings should also provide material for developing a case study on yield management in Jamaica's hotels as a teaching tool in relevant courses. It should also facilitate the creation of a forum for the continued engagement of the hotel sub-sector and academia, which in turn should lead to the development and delivery of more courses/modules that meet the changing needs of this important sub-sector. •



Principal Researcher:
Dr. Roy Porter
 Department of Chemistry

Investigation of Chemical Composition and Biological Activity of the Essential Oils from Jamaican Plants Belonging to the Hyptis Genus

The Hyptis genus is a member of the Labiatae family, which comprise over 400 species found mainly in the tropical Americas. The plants in the Hyptis genus are widely used in traditional medicine for the treatment of various illnesses ranging from fungal diseases to gastrointestinal ailments. The leaves of many species are also used as potent insect repellants by native populations in many parts of the world. Many of these plants are highly aromatic and little or no prior systematic phytochemical studies have been done on the Jamaican varieties.

This research project seeks to investigate the essential oils from local plants belonging to the Hyptis genus, and involves a comprehensive study of all species of the plant found in the Island. Eight species of Hyptis have so far been identified in Jamaica and two of these (*H. verticillata* and *H. capitata*) have been successfully studied in this project. The essential oils were extracted from these plants and analyzed for their chemical composition and for insecticidal, acaricidal, antimicrobial and antioxidant activity.

One of the Hyptis species analyzed is *Hyptis verticillata*. The essential oil from this species was resolved into 37 components and 88% of this number was positively identified. The major components were cadina-4,10(15)-dien-3-one (1) (15.1%) and aromadendr-1(10)-en-9-one (squamulosone) (2) (30.7%). The oil was found to be an effective insecticidal agent against *Cylas formicarius elegantulus* (sweet potato weevil) with a 48 hr Ld50 value of 0.4 μl/g insect compared with Ld50 of 0.13 μl/g insect for dimethoate (control) at a concentration of 2 μL/g insect at 48 h. The oil disrupted the oviposition and hatching of *Boophilus microplus* (cattle tick) eggs. The IOd50 was 1.5 μL/g tick while that for the commercial pesticide dimethoate was IOd50 of 1.7 μL/g tick.

The essential oil of *Hyptis verticillata*, due to the plant's widespread occurrence, could provide an alternative as a natural product-based pesticide in the control of *Boophilus microplus* and *Cylas formicarius elegantulus*. It could also find application in the post-harvest treatment of sweet potato tubers being placed into storage to prevent reinfestation by nearby fields.

At the end of this project, we hope to discover new sources of natural products that can also find application in the Nutraceutical industry. •



Principal Researcher:
Dr. Dalip Ragoobirsingh
Department of Basic Medical
Sciences

Acute Impairment of Insulin Signalling by Dexamethasone in Primary Rat Skeletal Myocytes

The study examined the cellular content of the insulin receptor substrate (IRS)-1 phosphorylated tyrosine (pY) and serine (pS) residues in IRS-1 and the glucose transporters GLUT-1 and GLUT 4 in primary cultured rat skeletal myocytes, treated with the glucocorticoid, dexamethasone.

The results of the study showed that Dexamethasone significantly decreased basal and insulin stimulated IRS-1 content by 75-85% ($p < 0.006$). A similar level of decrement was observed for pY-IRS-1 content. Conversely, the expected increase in pS-IRS-1 content was not realized. Further, dexamethasone reduced the cellular content of GLUT-1 and GLUT-4 when insulin and glucose were absent ($p < 0.05$), but did not significantly affect the expression of GLUT-1 or GLUT-4 in the presence of insulin ($p > 0.05$).

It was concluded that dexamethasone treatment impairs insulin signalling by a mechanism independent of pS-IRS-1 mediated ubiquitination and IRS-1 depletion, or impairment of GLUT 1 or GLUT-4 expression. Instead, dexamethasone-induced insulin resistance may be mediated via reduced cellular content of IRS-1 accompanied by a parallel reduction in pY-IRS-1. •

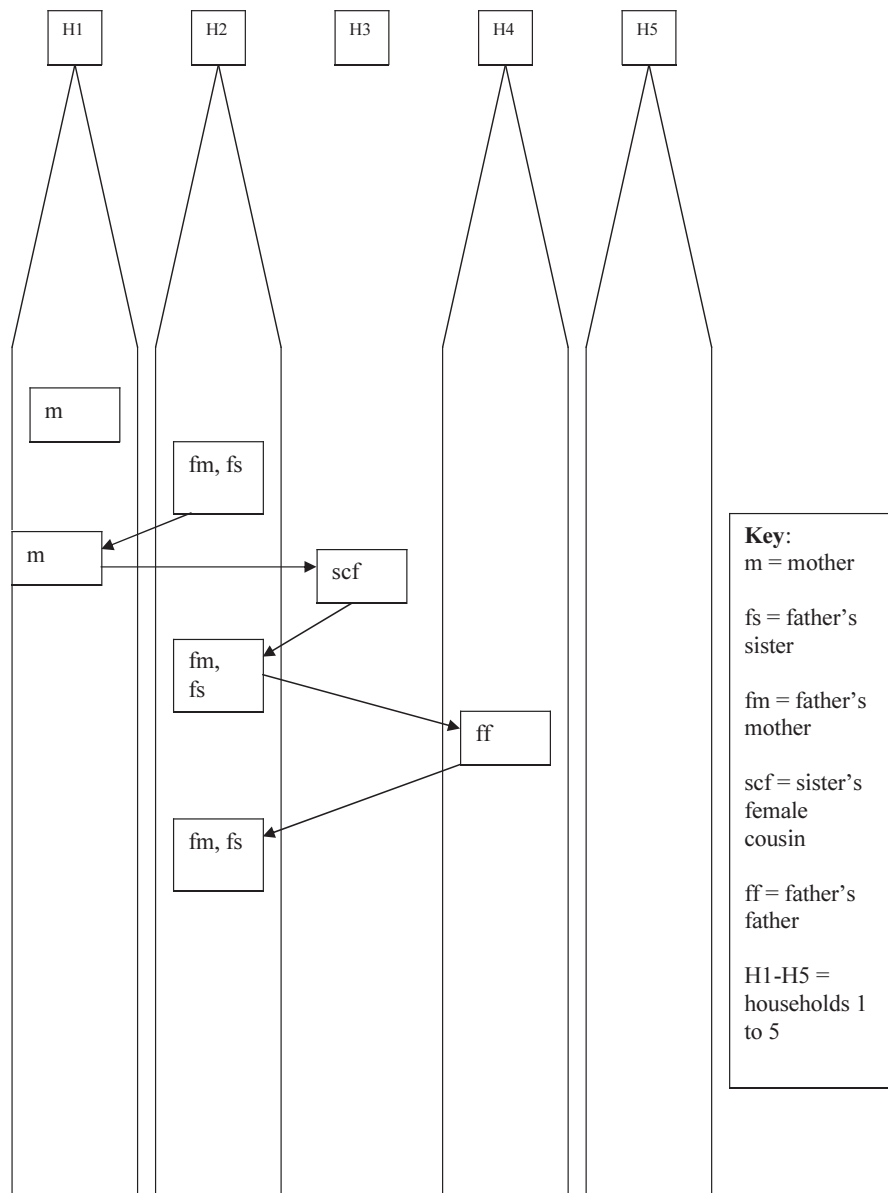
Descriptions of Child Shifting in Jamaican children



Principal Researcher:
Ms. Marina Ramkissoon
 Department of Sociology,
 Psychology and Social Work

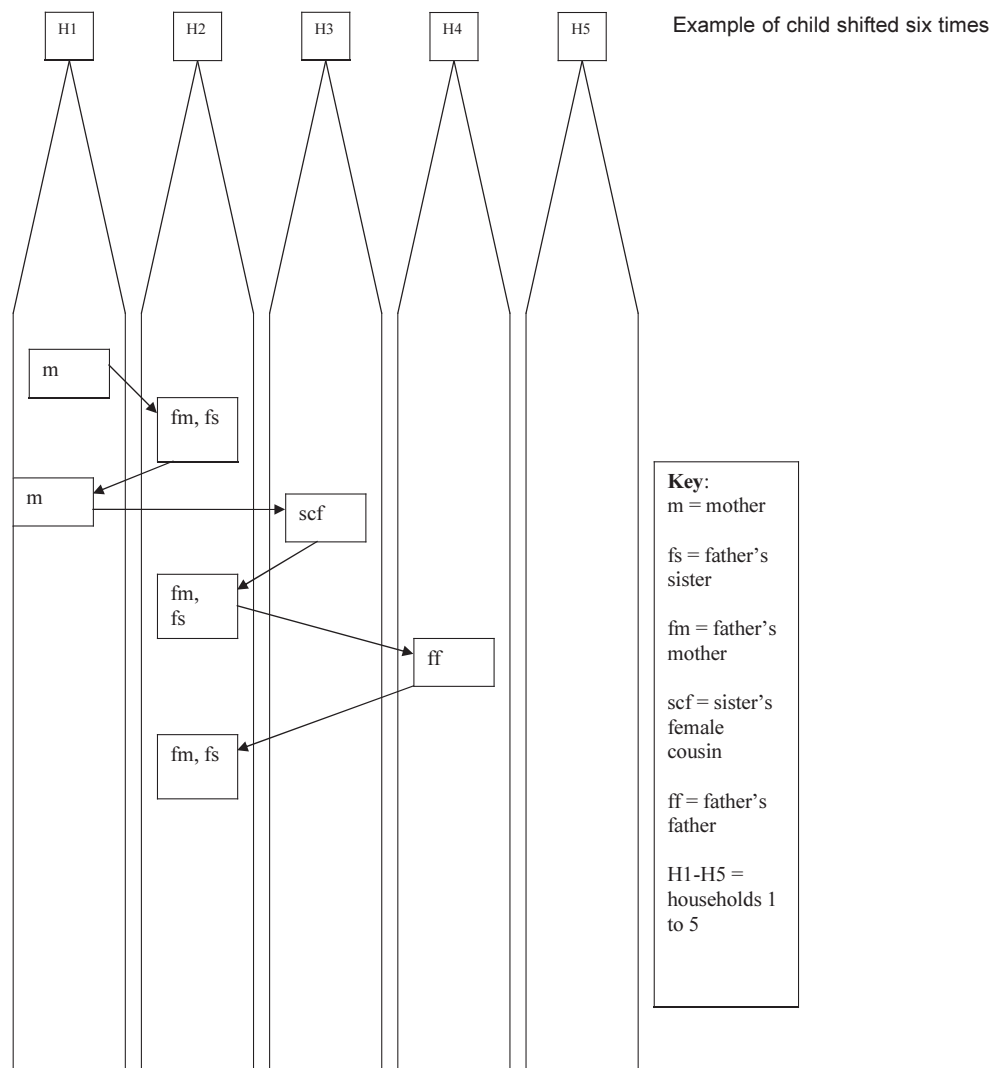
Shifting is broadly defined as any physical movement of a child away from that person he/she perceives to be his/her primary caregiver. This study examines shifting patterns in a sample of 156 children, drawn from a high school in Kingston, Jamaica. It is the first in a series of planned reports, the second of which is intended to outline the effects of shifting on children's wellbeing and academic performance. Data for the study were collected through structured interviews with caregivers, on shifting histories.

Example of child shifted six times

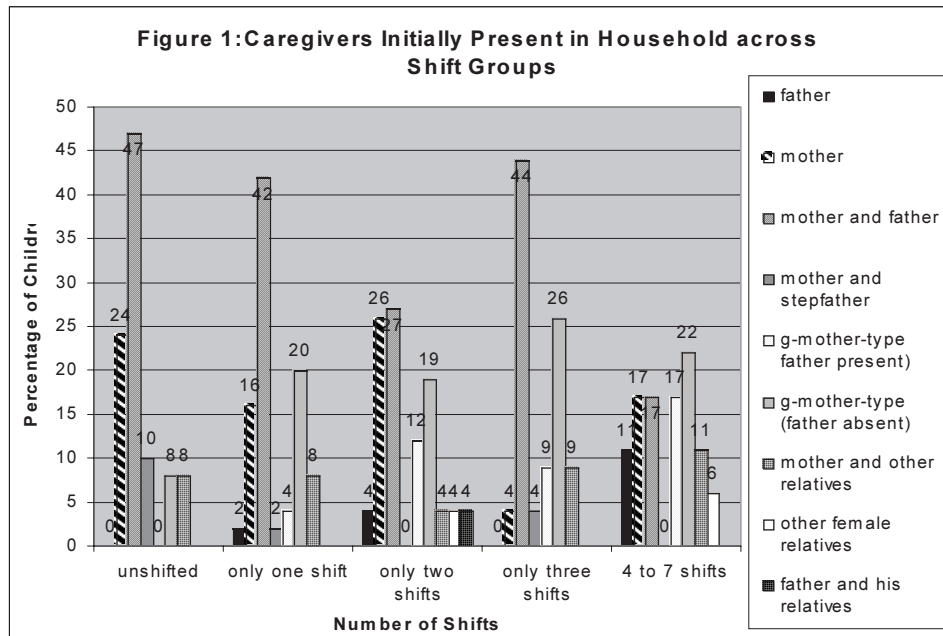


Descriptions of Child Shifting in Jamaican children

The findings of the survey confirmed the continued existence of shifting patterns that were identified in earlier studies. It also found that migration and death of parent(s) were among the major motives for shifting. Mothers were still perceived as the main caregivers. The survey results show a few patterns, but more variability among groups. Even if a child lived with both parents initially, he/she was still at a high risk of losing one parent, or being shifted up to three times. A child was also at risk of being shifted once from his/her father, if the mother and father had relationship problems. A child was at risk of being shifted at least once if he/she initially lived in a grandmother-type family setting where the father was absent. Children who were shifted between four and seven times were least likely to have lived initially with both parents. Younger children were at a higher risk of being shifted three or more times. If a child was shifted from his/her mother, he/she had a greater chance of returning to her at a later stage, when compared to being shifted from a father.



Descriptions of child shifting in Jamaican children



Based on the survey results, it could be useful if more detailed data is collected on child shifting within families in Jamaica. •

Assessment of Genetic Diversity of *Citrus Tristeza Virus* and Citrus Viroids from Jamaica; Towards Efficient Diagnosis and Management of Citrus Pathogens

Principal Researchers:

Dr. Paula Tennant

The Biotechnology Centre

Dr. Wayne McLaughlin

Department of Basic Medical
Sciences

Citrus tristeza disease is the most economically important viral disease of citrus. This disease is caused by the Citrus tristeza virus (CTV), which comprises many strains. Some strains of CTV are essentially symptomless in most citrus varieties while other strains induce decline, stem pitting, low yields, poor fruit quality and eventually, death of the plant. Several viroids have also been identified in citrus. Two important citrus diseases caused by citrus viroids are the Citrus Exocortis disease and the Citrus Cachexia disease. Citrus Exocortis disease causes stunting or dwarfing, bark scaling and bark splitting, while symptoms of Cachexia disease include pitting and gum impregnation of the phloem.

The Jamaican Citrus Industry is presently managing the spread of citrus diseases by replanting with certified seedlings and introducing new rootstocks that are resistant to CTV. To support this effort, research is being undertaken to determine the distribution and diversity of citrus viruses and viroids infecting citrus trees in Jamaica. Using molecular and biological tools such as reverse transcriptase polymerase reaction, cloning, genomic sequencing and bio-indexing CTV and viroids, isolates will be genetically and biologically characterized to identify mild and severe strains.

Preliminary research has shown that CTV and viroids are highly diverse and widely distributed in Jamaica. The data indicate that the incidence of CTV has increased in all parishes except St. Ann. In addition, the incidence of severe CTV isolates increased in six parishes. Genetic analysis of five CTV isolates using amino acid and nucleotide sequences showed that these isolates are genetically diverse. The data also show that a mild CTV isolate from St. Catherine was closely related to the Florida mild strain T30, while a mild strain from Clarendon is distantly related to all other CTV isolates. A stem pitting isolate from St. Catherine was also found to be closely related to a Florida severe CTV strain.

The coat protein gene of the most prevalent severe CTV strain will be used to initiate genetic engineering of citrus plants, whereas mild strains that could be used in cross protection strategies will be identified. •