

THE UNIVERSITY OF MAURITIUS

Maurice Ile Durable Project

Analysis and Synthesis Report

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Dr K. Elahee
MID Project Coordinator at UoM

Executive Summary

- This report analyses the findings of research conducted at the UoM under Phase I of the MID research project. Its objectives have been the following:
 - Framing a definition of the MID concept
 - Identification of the appropriate methods and technologies
 - Identification of the major stakeholders for MID
 - Establishing criteria and indicators for monitoring
- Detailed reference reports (RR) address the different Themes or Volets that have been studied under Phase I. These are :
 - Concept Definition,
 - Institutional Framework,
 - Participative Democracy,
 - Sustainable Energy,
 - Ecotourism,
 - Transport and Land Use,
 - Health and Environment,
 - Sustainable Agriculture,
 - Culture,
 - Standards, Indicators and Dashboard.
- Transport and Land Use, Health and Environment, Culture as well as Sustainable Agriculture are Themes that have been added at a later stage of Phase I, but have now been completed to the extent that first findings can be reported. Two further Themes (Water and Waste Water, Waste Management) have been added but their findings will be available only under Phase II. It is to be noted that Phase II refers to ongoing research on MID at the UoM under the Centre for Studies on Sustainable Development.
- The outcome of Phase I is certainly not to provide an action plan towards MID, but to provide the methodology that will lead towards and support such an action plan.
- Such an action plan has to be elaborated on the basis of participative democracy. Not only will such a condition ensure that a shared vision is achieved but it will ease the implementation of the action plan. Stakeholders, including citizens, will feel a sense of ownership and responsibility towards the MID project and will understand more clearly the role that they have to play in it.
- If MID is belief in a vision and people are required to work towards making it a reality, symbols are very important. This allows people, irrespective of their background or level of understanding, to reach beyond the complexity of theoretical issues and to engage in concrete actions towards turning a vision into reality.
- Foremost among the symbols are role-models who serve as champions for the MID cause. These are people who lead by example, inspire others and bring changes. The Prime Minister and Pr de Rosnay have been identified as such champions of MID
- At a first level of understanding accessible to all, we propose that MID stands for '**Myself for Mauritius**', '**Immediate Action**' and '**Deciding for the long-term**' (in French, *Moi-meme pour*

Maurice, Immédiatement Agir, Decision durable'. Such a definition covers the holistic nature of the MID Concept whilst being easy to understand by all. Moreover, it focuses on the need of local and daily action starting with the individual himself or herself. It englobes the essence of our nation-building spirit, for the sake of Mauritius with a long-term consideration...

- At a second level of understanding, MID itself can be reckoned as a **criteria for judging our actions**. We should ask ourselves before every deed, every initiative and every project whether it is compatible with MID. Hence, the idea of MID-compliance, that is, sustainability, should be at the core of our decision-making process.
- At a third level of understanding, MID should be defined explicitly in terms of:
 - a) A Shared Vision based on participative democracy.
 - b) A Set of Priority Orientations, Projects, Targets and Expected Outcomes within a Time-frame, ie a coherent and consensual **action plan**.
 - c) Reference to agreed-upon standards and indicators within a dashboard signalling the level of progress towards turning the MID vision into reality.
- As a result of a national consultation involving all stakeholders, two pillars of MID should emerge:
 - I. A *loi-cadre* defining the orientations of MID, its programmes, its mechanisms, conditions, targets, timeframe and monitoring.
 - II. A **MID-compliant business framework** reducing our current economic, social and environmental vulnerability and creating added-value out of our local and regional renewable resources, including marine assets.
- It goes without saying that there will be no MID without education, training, research, communication and sensitization. These should be cut-across issues within the MID action plan. **Teaching and learning** of '*savoir*' (knowledge), '*savoir-faire*' (know-how) and '*savoir-être*' (art of living) should be done holistically, globally, systemically. The pursuit of new knowledge, including knowing self and others, has to be promoted. Others include our environment just as we are part of others' environment. MID is about discovering ourselves, together.
- Participative Democracy (PD) is about empowering people. It is the process through which the vision of MID and its action plan should be defined.
- Participative Democracy is not only aimed at involving stakeholders in decision-making but also in engaging the latter in concrete tasks within the defined action plan. PD goes beyond collaborative democracy wherein people are merely consulted and informed, rarely made actors of the transformation required. PD ultimately leads to stakeholders assuming relevant levels of responsibility and partaking in the action plan.
- It is known that institutional framework, in particular regulatory aspects of it, can lead to tremendous bureaucratic practice. MID is not compatible with red-tape. This concern must be an integral part of any reform towards implementing the MID vision.

- The role of private sector and NGOs should not be merely conjectural. The former must move beyond the voluntary spirit of Corporate Social Responsibility (CSR) to a real commitment towards MID. The latter should shift from benevolent part-time community service to full-fledged involvement to defend causes, not lobbies.
- Several findings focus on the long term energy future. However, an analysis is also undertaken to provide a transition strategy towards a sustainable energy future. Decisions have to be taken urgently and it is believed that it is still possible to insert current projects within the MID framework. Actions are recommended over the next four years in order to move towards a more sustainable energy future.
- A comprehensive set of recommendations is made on Ecotourism. This was a highly multidisciplinary effort related to tourism and its relation with marine biodiversity, culture and energy.
- No less than 20 concrete strategies or alternatives are discussed on Transport and Land Use. Reinventing the wheel cannot be a possible option: the latter proposals are, therefore, not totally new. In fact, there is no dearth of proposals coming from experts, concerned citizens or stakeholders. The same question that comes up many-a-time is ‘why is there so little action?’. Particularly in view of the transport congestion problems experienced almost every day in and around the capital. Government has reacted by proposing in the 2009 Budget a series of investment projects in infrastructure.
- The UoM work by relating transport to land use has the merit of opening up a holistic approach as pruned by MID. Further studies are required to assess the mutual interactions between energy, environment, engineering, economics, land use and social impact.
- It is essential to assess the MID-compliance of all new infrastructure projects. The need of a national consultation to define the MID vision and its action plan, including details of infrastructure investment, is more urgent than ever.
- Human health sustainability should also be a key issue. Health, in fact, should also be interpreted to include not just physical health, but also the mental and psychological states of being. The interrelationship between health and environment is also fully recognized, but there is a need to come up with a concrete action plan in this respect. The spread of NCD or HIV/AIDS can seriously affect the MID project.
- On another note, health research on plants or on ocean resources can provide a new cutting edge to the MID project.
- The Sustainable Agriculture Theme/ Volet started up functioning quite late but has provided results to be included in Phase I. It is noted that the Government, in response to the threat of food crisis last year, has initiated a Blueprint for a Sustainable Diversified Agri-food Strategy extending to 2015. This is indeed a positive step that can be integrated in the MID action plan. Food security also should be a key objective of MID.
- It may be added that sustainable agriculture can also help fight consumerism, create jobs, improve the health of people and reduce negative economic and environmental impacts related to import of food.

- Organic standards should also be promoted whilst at the same time familiarizing breeders, farmers and planters with the benefits of sustainable agriculture.
- Water/Waste Water and Waste Management are new Themes/Volets that have been added. Findings and reports will follow in the course of Phase II research. However, these topics should be holistically integrated in the course of any national consultation on MID vision and action plan.
- The Re-engineering of the Cane Industry Theme/Volet is largely based on the Multi-Annual Adaptation Strategy of the Cane Industry (MAAS 2006-2015) adopted by the Government. UoM reports 8 key recommendations towards re-engineering of the cane sector and proposes the introduction of sustainable indicators for the industry.
- The implementation of the MAAS has been marked with a degree of success with respect to a number of issues like decentralisation, voluntary retirement schemes or still the opening of refineries. However, the strategy is not on schedule as far as the setting up of flexi-factories is concerned. The energy aspect of MAAS with emphasis on bagasse and ethanol is indeed lagging behind.
- It is highly time to ensure that the agreement reached between the Prime Minister and the Mauritius Sugar Producers Association in 2007 is transformed into action. This will indeed open the way for new win-win situations for all stakeholders.
- Cultural Heritage Preservation is an essential part of MID. It relates to fundamental questions concerning the Mauritian identity, values underpinning the MID concept, the role of religion, traditions and customs in the local context as well as the ethical basis of MID.
- Cultural ecosystems are just as vital as natural ecosystems. Not just for the sake of having new economic opportunities, but because these have to be transmitted to future generations.
- On a different note, heritage buildings and architecture can inspire green economy promoters because in many instances they are bio-climatic references in terms of construction and use.
- Last but not least, this Volet/Theme can also explore the emergence of a shared Mauritian culture, intrinsically linked to the shared MID vision. However, although participative democracy (PD), for example through a national consultation, may help in the definition of this shared Mauritian culture, the process is a long one. Akin to nation-building...
- As a result of a national consultation, a set of parameters should be agreed upon to constitute together the parameters to make up the MID dashboard. The following list is suggested but it is certainly not exhaustive. The focus is on favouring sector-wise or topic-wise parameters that are based on indicators that can be fairly easily compiled AND that are understandable, pertinent and reliable. Departing from established UN indicators should not be an inhibition if justice is to be done to the specific context of MID.

PARAMETER 1: EDUCATION
 PARAMETER 2: HEALTH
 PARAMETER 3: FAMILY-LIFE
 PARAMETER 4: CULTURE
 PARAMETER 5: BUSINESS

PARAMETER 6: ENERGY
PARAMETER 7: WATER
PARAMETER 8: AGRICULTURE
PARAMETER 9: PARTICIPATIVE DEMOCRACY
PARAMETER 10: INSTITUTIONS
PARAMETER 11: TRANSPORT
PARAMETER 12: TOURISM
PARAMETER 13: LAND
PARAMETER 14: FOOD
PARAMETER 15: BIODIVERSITY

- The Parameters above reflect the social and environmental domains where the centre of gravity of MID lies. The political and economic dimensions are only processes towards the MID vision, not its goals.
- From the list of 134 or more indicators identified, many are not available because of lack of data. The Central Statistical Office should play a pivotal role in the national consultation forum proposed in order to obtain from stakeholders in a consensual manner the list of indicators that they propose to be considered. Many indicators are already available but some will have to be invented. In particular, indicators relating to family-life, culture or health should aim, if it is agreed, to include elements related to happiness, prosperity and well-being. A difficult and challenging task, but a worthwhile one indeed.
- It goes without saying that monitoring and feedback mechanisms are essential. In the context of the national forum, the monitoring and feedback mechanisms should be finalised by participative democracy. In the end, it should be remembered also that MID is not about long, heavy and expensive bureaucratic practice.
- To conclude it may be worth summarizing the key milestones ahead as given below. When do we start? 'Now' is the answer in view of meeting key targets e.g for 65% renewable energy for electricity by 2028, in less than two decades when we will celebrate 60 years of independence.
 - a) Calling of a national consultation forum on MID
 - b) Finalising the shared vision, mission, priorities and action plan
 - c) Setting up of the relevant institutional framework within a *loi-cadre*.
 - d) Continuous monitoring, feedback and communication on the MID progress.
- Without being comprehensive, the findings of Phase I point to the sequence of events below in view of ensuring that a systemic or holistic approach is respected. It is to be noted that as far as the MID Scenario for energy is concerned, we are already running late and the sooner that we rectify our orientation, the better will it be.
 - I. Responding to immediate areas of concern e.g with respect to energy, transport, new buildings and cane industry in order to ensure that MID-compliance is not overlooked.
 - II. Responding to the needs of the population, particularly vulnerable groups as a condition to participative democracy.

- III. Sustaining MID in its initial stage through education, training, sensitization and communication campaigns.
- IV. Combating consumerism and debt through the promotion of a sustainable living.
- V. Introduction of standards, indicators and dashboard for MID as part of the MID action plan.

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1. Introduction

‘...do not eat up your resources among yourselves unjustly...’

The Koran 4:29

1.1 From vision to reality

MID is today more than just a vision. But it is yet to become a reality. That reality will not be attained by restoring Mauritius into its natural state. Paradise is not really paradise without its people. For centuries, people of an incredible diversity have been building, consciously or not, a new nation. With people of different origins have come cultures with their similarities and differences. Along with the transformation of the natural landscapes of Mauritius, time has witnessed the evolution of the original cultures. Never have we seen such rapid changes as over the last decades since Independence, particularly since the end of the last century.

What is MID? It is today a real catchphrase that everyone seems to understand without being able to explain its meaning thoroughly. More easily, most people can provide immediate examples of what is not MID.

There may indeed be several visions of MID and a common vision may be difficult to be forged. However, there can be a shared vision around the concept. Sharing is about taking and giving. From the past to the future. From others to ourselves. From ourselves to others.

Who are we? Who are the others? The answers to these questions will help us define MID. And adopting a holistic and global approach requires us to reconsider the intrinsic relationship between ourselves or others, and the environment. Such a systemic methodology is highly complex. No system is in isolation and the surroundings are made up, themselves, of interconnecting sub-systems.

The task is a difficult one. But we have no other choice. A simplistic approach will not make matters simple. Conventional or classical theories have to be revisited. The current world economic crisis, the threat of global climate change and social problems in many parts of the world, if not in the daily life of so many people, all point to the need for innovative thinking out of the box. With due consideration to the specificity of Mauritius.

Defining Paradise might not have been easier than defining MID, but whatever be the definition, at the end, what is most important is that people share the belief. And above all, work for it...

1.2 A methodology towards an action plan

This report analyses critically in a holistic manner the synthesis of findings of Phase I of the MID Research.

The general objectives of Phase I are as following:

- Framing a definition of the MID concept
- Identification of the appropriate methods and technologies
- Identification of the major stakeholders for MID
- Establishing criteria and indicators for monitoring

Detailed reference reports (RR) address the different Themes or Volets that have been studied under Phase I (Concept Definition, Institutional Framework, Participative Democracy, Sustainable Energy, Ecotourism, Transport and Land Use, Health and Environment, Sustainable Agriculture, Culture, Standards, Indicators and Dashboard).

Transport and Land Use, Health and Environment, Culture as well as Sustainable Agriculture are Themes that have been added at a later stage of Phase I, but have now been completed to the extent that first findings can be reported. Two further Themes (Water and Waste Water, Waste Management) have been added but their findings will be available only under Phase II. It is to be noted that Phase II refers to ongoing research on MID at the UoM under the Centre for Studies on Sustainable Development. It should also be pointed out that Phase II is also ongoing at UTC in collaboration with UoM.

It is to be remarked that the Concept Definition and Standards, Indicators and Dashboard Volets are dealt with mainly in this analysis-synthesis report given their cut-across dimension.

The outcome of Phase I is certainly not to provide an action plan towards MID, but to provide the methodology that will lead towards and support such an action plan. Such an action plan cannot be the theoretical creation of an elite at the UoM, or elsewhere, but has to be elaborated on the basis of participative democracy. Not only will such a condition ensure that a shared vision is achieved but it will ease the implementation of the action plan. Stakeholders, including citizens, will feel a sense of ownership and responsibility towards the MID project and will understand more clearly the role that they have to play in it.

1.3 Champions of MID

If MID is belief in a vision and people are required to work towards making it a reality, symbols are very important. This allows people, irrespective of their background or level of understanding, to reach beyond the complexity of theoretical issues and to engage in concrete actions towards turning a vision into reality.

Foremost among the symbols are role-models who serve as champions for the MID cause. These are people who lead by example, inspire others and bring changes.

Politicians come and go, but a very few stand out and alter the course of history by changing for good the life of people who put their trust in them. People believe in MID when they have confidence in the leadership of its stalwarts. If the MID project has come into the limelight, tribute should be paid to the Prime Minister, Dr the Hon. N. Ramgoolam. As matters stand, there is an unanimous consensus across

the political spectrum that MID is in the higher interest of the nation.

From Singapore to Canada through the seat of UNESCO in Paris, the Prime Minister has rarely left aside an opportunity to highlight that MID can be an example for the world. More than any strategy that one can apply, the success of MID rests on the commitment of the Prime Minister. 'Putting MID first' or '*MID d'abord*' is no more a mere slogan if it is uttered from the mouth of such a personality.

In the scientific community, in academia, in the private sector and in civil society, both locally and worldwide, we have in Pr Joel de Rosnay another such champion of MID. In his vision, many are able to see the MID future today. He has been and should continue to be an inspiration for so many young and not-so-young minds.

The third champion of MID, unfortunately, is as dead as anything could be. In the dodo, indeed, we have a wonderful and famous symbol of how fragile sustainability could be. A lesson that no one should forget, particularly the people of Mauritius.

There may be other symbols like Mark Twain's Paradise (why not?), well-known landmarks of Mauritius like the Ferney Forest, Blue Bay Marine Park, the Pamplémousses Garden, Le Morne, Apraavasi Ghat, the Motherland, Tifrière's Papidou, the Pink Pigeon, the Trochetia or still the brand to be soon given to Mauritius. These symbols have a powerful impact on the minds of people, often far more effective in turning MID in reality and engaging people in concrete actions than high-cost complex strategies.

1.4 Limitations of Phase I work

The aim of Phase I has already been stipulated above. Each Theme or Volet has specific objectives as given in the reference reports (RR). A comprehensive overview of what has already been achieved and of what lies in the current context has been the starting point of most of the studies. Drivers of each Theme/Volet have been urged to show critically how we may move away from the not-invented-yet syndrome whilst adopting a holistic or systemic approach in their assessment. They have been encouraged to deepen the multidisciplinary dimension of the issues they are addressing. Several sessions, including the participation of external stakeholders, have been organized to thrash out common problems.

Ease of implementation and cost-benefit analysis are two crucial issues that, however, cannot be fully addressed within Phase I with equal relevance for all the Themes/Volets. For instance, some renewable energy technologies have yet to reach commercialization and it would be premature to venture into detailed economic analysis. This does not prevent us from highlighting in other Themes/Volets that the current market mechanisms and institutional framework are detrimental to renewable energy promotion. Phase II is expected to focus on targeted problems identified as priority concerns in the light of Phase I and on the specifics agreed upon by stakeholders for the ultimate action plan. As such it should be remembered that Phase I provides a methodology, not the specifics for an action plan.

Not re-inventing the wheel is often a wise advice. Our research has found that there is no dearth of studies, surveys and reports on all the issues addressed. What has been lacking is implementation and following up.

Initiated as a cooperation with UTC on an Atelier-Projet on MID, the MID work is reaching its completion phase as far as Phase I is concerned. However, since January 2009, UTC has submitted a report providing an external fresh perspective on MID, particularly from a systemic/holistic angle. We consider it is also pertinent to assess the MID concept from the point of view of non-Mauritians. In this case we have had the privilege of the collaboration of a team of young researchers from Compiègne, particularly versed in systems engineering. The findings of the UTC team will also be further analysed in this report wherever appropriate.

A visit of a high-level UTC delegation in the context of a Grenelle/Colloque was scheduled to take place. Unfortunately, in spite of our persistent trials, this has not been possible to date. In consequence, the project has had to be re-scheduled slightly. Such an event, or even an International Workshop on MID, would have allowed stronger interaction on the relevance of various findings.

In collaboration with the MID Fund, in absence of UTC, we ran a Seminar during the MID Week as the second best option in lieu of the Grenelle/Colloque. We consider that the latter event is still essential. It would, however, be best organized under the aegis of the Government after discussion and deliberation on the Phase I reports as well as of other reports. Amongst other documents awaiting submission soon that may be relevant in the wider context of MID are the National Energy Policy of the Government, the Blueprint of the Energy Sector of the National Economic and Social Council and the feedback reports on the Additional Stimulus Package.

UTC and other local and international stakeholders, including Pr de Rosnay and UNDP and Agence Francaise de Developpement should be present when the Grenelle/Colloque will be organised.

Other key events in the context of MID project at UoM have been exchanges between UoM and UTC, a national workshop under the aegis of the Ministry of Environment and NDU as well as the setting up of a MID website.

2. Concept Definition

2.1 What's in a name?

The definition we intend to encompass is that of MID. Is it the definition of its vision, its mission, its priorities or that of its outcomes? Can there be a single definition in each case? Who are we to define MID for others?

We believe that MID should be defined through a participative democratic process involving all shareholders. It is in this sense that a Workshop was run in November 2008 under the aegis of the Ministry of Environment and NDU involving around 80 stakeholders from all sectors. It was found that there are several visions of MID, not a common vision. However, these visions may converge towards a shared vision. And the definition of the concept of MID is reflected largely in the shared vision.

Brainstorming and other similar exercises on concept definition were held at the University as well as elsewhere. Debates on radio and television were also organized. Since it is also pertinent to know how people outside Mauritius perceive MID, the UTC also conducted a workshop in that sense in Compiègne (*Maurice Ile Durable Atelier Projet*, UTC, 2008, p24).

Numerous publications have appeared in the newspapers on MID, often contributions from citizens. However, scattered articles rarely provide an impact and significant discussion. It is for this reason that a website was set up in late 2008 and launched by the Prime Minister in March 2009. The www.maurice-ile-durable.com website has been initiated as a '*forum citoyen*', a platform to allow anyone, including people outside Mauritius, to participate in the discussion around MID. The website has been a useful tool in defining the MID concept.

1.2 Historically

Although the phrase '*ile durable*', and, most particularly '*Maurice Ile Durable*' originates from Pr de Rosnay in October 2007, the concept that it refers to is not totally new.

Not more than 40 years ago, most of our electricity was generated from renewable sources. Lagoons swarmed with fish. People would normally travel by foot for trips over distances less than one or two kilometres. Above all, the lifestyle that was practiced was based on judicious use of resources.

'*Pas jeter*', '*Ramsasser*', '*Garder*', '*Reservi*', ie, 'Do not throw', 'Keep it', 'Conserve' and 'Use again' were household instructions that governed their everyday life. The different communities used to live together very much in harmony and solidarity.

More recently, in the nineties, the Government produced a document called VISION 2020 on the National Long Term Policy of the country (*Vision 2020*, Ministry of Economic Development and Regional Cooperation, 1997). To a large extent, it englobed the main tenets of sustainable development. In 2005 with the UN Conference on small-island developing states (SIDS) held in Mauritius, the concept of sustainability came into the limelight in the particular context of small island economies (Ref. RR12).

A most significant contribution to the concept definition of MID was the *Manifeste pour une*

ile durable published in all major daily papers in November and December 2007 (Ref. RR2).

Written in consultation with Pr de Rosnay by citizens who would later become his collaborators, the Manifeste triggered a real interest in embarking on a holistic programme towards achieving specific objectives and greater sustainability. Even if the focus was mainly on energy, the Manifeste referred to the intricate interaction between the economic, social and environmental dimensions of issues being addressed. The Manifeste had the merit of setting targets within a timeframe, for example to attain 60% renewable energy in electricity production by the 60th Anniversary of the Independence or in two decades. It also showed how sectors like energy, cane industry, land use, transport, environment and economy could be related in a holistic or systemic manner.

Right from the beginning, the word ‘development’ was left aside in most discussions. The emphasis was very much on ‘*durable*’ or ‘sustainability’. Given the criticism that has been made on the issue of Sustainable Development, particularly on the predominance of economic considerations when it comes to ‘development’ or ‘growth’, rejecting the reference to ‘development’ made the concept of MID more acceptable to many.

In another publication that appeared shortly afterwards (Ref. RR2), it was observed that mention of ‘Maurice Ile Durable’ instead of ‘Ile Maurice Durable’ gives pre-eminence to ‘Maurice’, that is to the people, the cultures, the traditions, the values without excluding the fauna, the flora, and also Rodrigues and the outer-islands. In addition, Mauritius is not just an island but a marine Exclusive Economic Zone that extends towards Seychelles and Madagascar. MID should include the sea indeed.

In March 2008, Pr Joel de Rosnay is made Special Adviser to the Prime Minister. A key reference to MID should indeed be the ‘*Presentation et historique du projet*’ article written by the former (Ref. RR6). In it, he refers to the measures adopted in the Budget in June 2008 setting the way for the progress of MID. He re-iterates the proposal for a World Ecological Forum in Mauritius in 2011. Cultural heritage, including pluralism, is there acknowledged as an asset of MID. In October 2008, at the UNESCO, the Prime Minister will further emphasise in his presentation of MID to the world that ‘if Mauritius succeeds, the world can succeed’.

1.3 Summary of findings

- The workshop conducted in November 2008 towards reaching a shared vision of MID achieved mixed results. About 80 participants were divided into FOUR groups to focus on what should be the vision of MID from the perspective of Economic Development, Social Development, Physical and Natural Resources including Technology, and Institutional and Regulatory Framework. It was found that the composition of the group can have major influence on the results. For instance, the high participation of public servants in the last group on Institutional and Regulatory Framework led as output a vision very-much tainted with the latter’s perspective of the matter. Civil society’s point of view was not much included. Similarly, as most of the business people who had turned up had a sharp interest in ecological issues, a very green vision of the economy was spelt out. However, some fruitful SHARED conclusions were drawn:

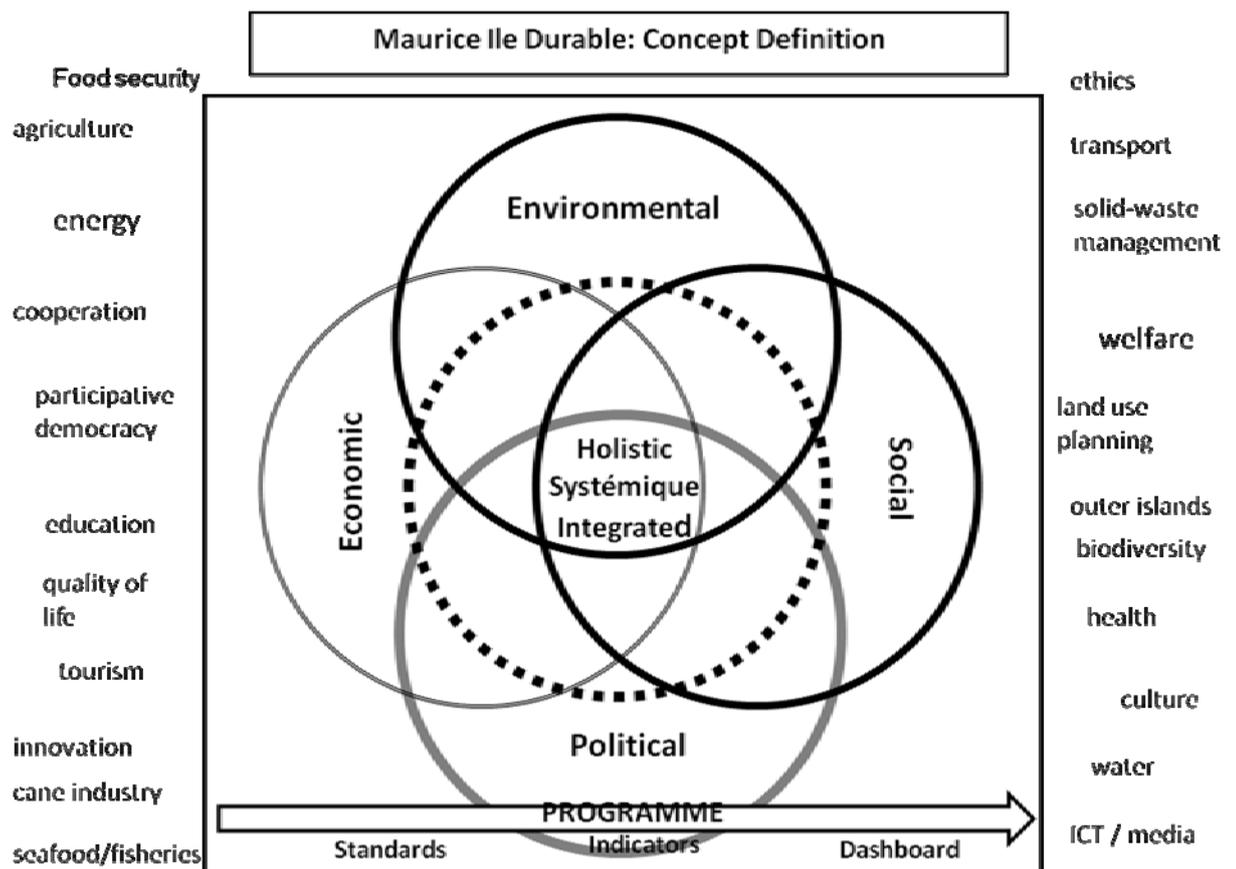
- The vision should be centred not just on the benefit of the individual but that of society ALSO, AND of that of the environment in which people live.
 - The basic understanding of a shared vision rests on equilibrium between economic, social and environmental aspects. An understanding was reached that a long-term vision would be pertinent, rather than short term focus icw decision-making. A multidisciplinary and holistic approach was evoked. Building up on existing strengths, turning vulnerability into resilience, making the specificity of Mauritius a strength/opportunity were also agreed-upon issues.
 - Green projects/ sustainable infrastructure development should be a high priority.
 - Spots/Clips on MBC at peak-time on basic ideas/concepts e.g on sorting of wastes, water conservation/harvesting, energy management, integrated farming, sustainable lifestyles, etc were recommended. In the context of UN decade on Sustainable Development particularly.
 - A wider exercise should be organised by Government to define the shared vision. Following that process, specialists should be mandated to work out the details of a consensual action plan.
 - It was recommended that the University should set up a Centre for Studies on Sustainable Development.
 - It was proposed that emphasis should be put on education, training and sensitization in the context of MID.
- UTC conducted a brainstorming on the MID concept (*Maurice Ile Durable Atelier Projet*, UTC, 2008, p24). It is indeed important to grasp what MID could mean to the world. In an era of globalisation and concern on ecological issues, we should not run the risk of being incoherent with the rest of the world, at least when it comes to the meaning of MID. In the team of young researchers of the Département Génie des Systèmes Urbains of the UTC we have found a sound and educated population to gauge what others make out of the MID concept. In brief, the following conclusions were noted:
 - MID was considered as a concept linking in a balanced manner together the notions of economy, technology, ecology, society, politics, natural environment and lifestyle in view of achieving self-sufficiency or independence.
 - Emphasis was laid on the need for changing lifestyle to make MID a reality, that is, towards a more sustainable lifestyle.
 - Involving the population in decision-making and in all activities was acknowledged as a vital aspect of MID.

The UTC perception of MID reminds us that the world is watching us. Our insular nature may cause us to neglect at times the holistic nature of our problems or the involvement of a wider population in decision-making. The external scrutiny of UTC also points out that our vulnerability as a SIDS may also be considered as an indication that we should move faster towards self-sufficiency or independence, for example in terms of resources. A most pertinent remark indeed from the team of bright young Europeans...

- Other vision-defining exercises conducted at various levels, often informally and in an impromptu fashion, reinforce the above observations to a large extent. Invariably the reference to equilibrium or a balance is highlighted, often laying

emphasis also on the judicious use of resources.

- Many young people and non-specialists, as well as many among the common laypeople, often respond by equating 'MID' with 'green', 'environmentally-friendly', 'non-polluting', 'healthy', 'clean' or even 'renewable energy'. People are also quick to identify 'what is not MID'. Although most of the latter have heard of MID, they may not be capable of explaining it beyond giving one or two words. This should, however, not be considered as an indication that they are ignorant of the concept.
- The website www.maurice-ile-durable.com has after two months of its setting up enlisted around 200 articles all related to MID. It has recorded some 5000 hits and more than 100 comments on its forum from more than 60 authors/contributors (Ref. RR 14 to RR19). It is significant to note that around 80% of the contributions are in French and 20% in English. The article on the definition of MID (Ref. RR15) holds the highest number of hits, that is, 443 to date. With respect to the definition of MID, the follow remarks are pertinent:
 - The debate has been ongoing on the web, and elsewhere, on the issue of MID-compliance of the waste-to-energy project proposed for Mauritius. The opponents find it contrary to MID while the promoters of the project advocate that it is in line with MID. Hence, the importance of having defined criteria for MID-compliance cannot be understated.
 - MID has the amazing ability to group together both advocates of free-economy and hard-line leftists, all eager to help save the planet.
 - A Junior Section based on a publication entitled '*Mon Ile Durable*' (editions VIZAVI, 2008) exposes the MID concept to young children aged 7 to 12. This initiative has been much appreciated, one school using the website to explain MID to its students.
 - A survey was conducted to assess the opinion of visitors on the meaning of 'sustainable development'. Asked whether sustainable development is about a) protecting nature, b) engaging in energy research, c) change of lifestyle or d) all of these, more than 90% out of 135 persons responded by replying that all the three measures are needed (Ref. RR6). This confirms the holistic nature that needs to be given to MID.
- RR00 shown below is a schematic presentation of the concept definition of MID. It has been the subject of numerous amendments before the version presented in RR00 has been achieved. The MID concept is dynamic and further refinements to the model are not excluded.



- The following comments are helpful:
 - Although the end is to find an equilibrium between the different spheres, it is more of an illusion to conceive these as perfect circles as shown above. The circles may well be skewed one way or another in order to achieve the required balance depending on the specific situation.
 - The social and environmental spheres refer to the real domains of MID, at the heart or centre of MID. The political and economic spheres refer to a process and are simply tools towards the MID vision turning into reality. The simplistic view of three circles overlapping partially and in full symmetry is probably misleading.
 - The systemic/holistic/integrated approach is critical in the MID concept.
 - The fields where MID applies are listed around the spheres. The list is certainly not exhaustive. And these fields are indeed mutually interacting.
 - MID concept in concrete terms should be defined by a programme which can be monitored through standards, indicators and a dashboard.
- MID has been defined as ‘a *projet de société*’, ‘a way of being’, ‘an attitude’, ‘a culture’ in some articles on the web and elsewhere as well as during many discussions. Whilst such a wide and open understanding is not a mistake *per se*, the fact remains that without clear-cut boundaries the concept will have no meaning in the end. In fact, on the basis that MID is also a social and an economic project, its devoted funds are proposed to be used respectively for housing rehabilitation and for saving jobs.
- Quite interestingly, MID has been summed up also as meaning ‘Myself, Immediately and Decide for the long-term’ (Ref. RR8). While the original article where this appears is addressed to children, this acronym can be indeed very

useful. In French it reads ‘*Moi-meme, Immédiatement, Decision durable*’. It may be emphasized further that ‘M’ is not for ‘Myself’ in the egoistic sense, but rather that ‘I act responsible for myself, for others and for Mauritius’. Therefore, ‘M’ stands for ‘Myself for Mauritius or ‘*Moi-meme pour Maurice*’

2.4 Conclusion

- At a first level of understanding accessible to all, we propose that MID stands for ‘**Myself for Mauritius**’, ‘**Immediate Action**’ and ‘**Deciding for the long-term**’. Such a definition covers the holistic nature of the MID Concept whilst being easy to understand by all. Moreover, it focuses on the need of local and daily action starting with the individual himself or herself. It englobes the essence of our nation-building spirit, for the sake of Mauritius with a long-term consideration...
- At a second level of understanding, MID itself can be reckoned as a **criterion for judging our actions**. We should ask ourselves before every deed, every initiative and every project whether it is compatible with MID. Hence, the idea of MID-compliance, that is, sustainability, should be at the core of our decision-making process.
- At a third level of understanding, MID should be defined explicitly in terms of:
 - d) A Shared Vision based on participative democracy.
 - e) A Set of Priority Orientations, Projects, Targets and Expected Outcomes within a Time-frame, ie a coherent and consensual **action plan**.
 - f) Reference to agreed-upon standards and indicators within a dashboard signalling the level of progress towards turning the MID vision into reality.
- The above elements of the MID concept definition, particularly (b) and (c), are dynamic in nature and should be reviewed at intervals of every five years. Above all, in order to initiate such action plan, Government should call a national consultation forum in order to define together with all key stakeholders (a), (b) and (c). The specific contents of the action plan along with the resources to be allocated can only be defined through such a participative democratic process similar to the Grenelle de l’Environnement in France.
- As a result of the national consultation, two pillars of MID should emerge:
 - I. A **loi-cadre** defining the orientations of MID, its programmes, its mechanisms, conditions, targets, timeframe and monitoring.
 - II. A **MID-compliant business framework** reducing our current economic, social and environmental vulnerability and creating added-value out of our local and regional renewable resources, including marine assets.
- It goes without saying that there will be no MID without education, training, research, communication and sensitization. These should be cut-across issues within the MID action plan. **Teaching and learning** of ‘*savoir*’ (knowledge), ‘*savoir-faire*’ (know-how) and ‘*savoir-être*’ (art of living) should be done holistically, globally, systemically. The pursuit of new knowledge, including knowing self and others, has to be promoted. Others include our environment just as we are part of others’ environment. MID is about discovering ourselves, together.

3. Participative Democracy

3.1 Synthesis

The Reference Report RR41 provides details on the work accomplished on this Theme/Volet at the UoM. UTC reports its findings on this topic in its report '*Maurice Ile Durable, Atelier-Projet, UTC, 2008, p54-76*'. The former particularly refers to a series of surveys conducted among stakeholders on the Participative Democracy (PD). In general it is observed that:

- PD is a much neglected and ignored concept.
- PD is crucial for MID.
- PD is a transversal concern applicable in all fields from Energy Policy, to Sustainable Agriculture through Ecotourism.
- PD is not possible unless the basic needs of people are taken into account.
- PD allows empowering vulnerable groups into decision-making, deciding for themselves and participating in their advancement. Instead of having others to decide for them.

3.2 Comments on PD

RR41 includes 5 key recommendations including the need to adapt existing legal framework and legislation to the reality of PD. UTC has underlined on the basis of critical review of the literature that PD is not just an added value, but in fact an essential tool for MID.

PD is also about transparency in the context of MID. In spite of the relative good health of our democracy, access to information in many cases is difficult. For instance, several contracts between the Central Electricity Board and Independent Power Producers have not been made public. Transparency on such an issue crucial to both energy policy and planning as well as to the future of the sugar-cane industry can only strengthen the confidence of stakeholders, including customers who will at the end have to foot the bills.

There is a relatively very high level of freedom for the media and for organisations in Mauritius. PD should flourish if the right conditions are created. Two measures can thus further help promote PD:

- I. Introducing private television stations and local radio networks, and
- II. Introducing NGOs driven by people involved at grass-root level, not lobbies.

It has been noted that people are not interested in policy-making in some cases. This is a serious handicap and no effort should be spared towards restoring their trust in institutions and involving them in decision-making. This often starts by listening to them and responding to their needs. Consumerism and debt are, in many instances, modern forms of slavery preventing people from fully fulfilling their active role as citizens.

3.3 Conclusion

PD is about empowering people. It is the process through which the vision of MID and its action plan should be defined. A national consultation like the Grenelle in France is recommended. RR41 gives details on the stakeholders that should be included, but the list is

not exhaustive.

PD is not only aimed at involving stakeholders in decision-making but also in engaging the latter in concrete tasks within the defined action plan. PD goes beyond collaborative democracy wherein people are merely consulted and informed, rarely made actors of the transformation required. PD ultimately leads to stakeholders assuming relevant levels of responsibility and partaking in the action plan.

As noted earlier, the legislative framework is not always compatible with PD. Although the Mauritian democracy is a fact and an example for much of the world, MID requires more from it in terms citizens' participation in both decision-making and action. Three recommendations may be pertinent in that direction:

- I. Promoting PD with focus on MID in the public sector, in private enterprises, in schools but also, very importantly, within the family.
- II. Decentralisation of government with more powers to local authorities, independent regulators, facilitating agencies and other grass-root structures that lie closer to the public, most particularly the vulnerable groups. MID can be a vehicle for such a process.
- III. Electoral reform towards further PD including the election of the Head-of-State by universal suffrage, of local representatives directly accountable to the people, and of more women in Parliament as well as in Government. The Head-of-State will guarantee the safeguard of MID by being its main champion.

4. Institutional Framework

4.1 Synthesis

UTC has submitted a report entitled '*Livret des actions menées à la Réunion et étude de la transposition des ces actions à ile Maurice*' (UTC, 2008). This report was graded by peer-review as the best out of the works completed by UTC thus far. It has the merit of analysing the Agenda 21 for Sustainable Development applied in Réunion and assessing critically the potential application of similar measures in Mauritius.

It is indeed easy to point out that Réunion is not Mauritius and that we cannot transpose measures from one country to another. No doubt, everyone understands that fact. However, what the comparison with Réunion teaches us, in brief, is that Mauritius does have a social advantage over its sister-island. We may suffer from a politico-economic deficit, but this is not unrelated to the social advantage we have. We have also to reckon with environmental characteristics that are specific to each island.

RR21 presents the findings of the UoM on the Institutional Framework comparison between Réunion and Mauritius. The focus is especially on energy-related regulatory and facilitation mechanisms. This is highly relevant since the MID Fund in Mauritius was built to replace the National Energy Fund.

12 short-term and 4 long-term recommendations were made focusing on energy. In brief, three points stand out:

- I. Need for holistic, coherent and consensual policies
- II. Need for well-defined action plan
- III. Need for autonomous, well equipped and flexible facilitating agencies.

4.2 Comments

Indeed, whether referring to sustainable development or energy, the importance of the above cannot be overstated. In the particular context of MID, energy is just one of the issues to be addressed within its agenda. The UNDP is understood to be working on a MID Support Project aimed at strengthening the MID Fund and providing technical expertise in that sense. Fruitful sessions were held with Pr F. Odendaal, the UNDP expert, both in the context of a special workshop at the UoM and during the MID Seminar conducted during the MID Week at UoM. It is not our purpose to duplicate the work and we trust that Pr F. Odendaal will provide the necessary answers towards the conversion of the MID Fund into an institution that can fully assume its role. However, a few fundamental questions should be addressed:

- a) Energy is a central Theme/Volet of MID. Multidimensional, *par excellence*, in its nature. Should its facilitating agency, ie a Energy Management or Sustainable Energy Agency, be independent of the MID Fund or not? Without anticipating the conclusion of the UNDP, we may point out that this should be the case if we adapt the model functioning in many countries, including Réunion. However, such a strategy has a cost which needs to be evaluated. In the long-term it may be necessary, although an organic link should be maintained between the MID Fund and the Energy Management or Sustainable Energy Agency.
- b) The Millennium Development Goal on Environmental Sustainability (MDG7) has

no quantitative targets. Two out of three targets under MDG7 refer to issues not relevant in the Mauritian context. However, the integration of sustainable development in national policies, for example on production and consumption, energy or environment is most pertinent. The indicators to be identified to monitor MID need to be innovative, reflecting Mauritian specificity. Adapting models from elsewhere, even from Réunion, should not be the first option. Local solutions should be preferred.

4.3 Conclusion

In order to address the issues raised in 4.2(a) and 4.2(b) above, again PD can be of significant appeal. Instead of thinking for people and requiring them to act, we need to think along with them and act together, each one in the way he or she serves best.

It is known that institutional framework, in particular regulatory aspects of it, can lead to tremendous bureaucratic practice. MID is not compatible with red-tape. This concern must be an integral part of any reform towards implementing the MID vision. Again PD can help a lot in that direction,

Last but not least, the role of private sector and NGOs should not be merely conjectural. The former must move beyond the voluntary spirit of Corporate Social Responsibility (CSR) to a real commitment towards MID. The latter should shift from benevolent part-time community service to full-fledged involvement to defend causes, not lobbies.

An appropriate institutional framework defined on the basis on PD through a national consultation of Grenelle-type should help put these two vital stakeholders into their new roles.

5. Sustainable Energy

5.1 Synthesis

UTC's report on Sustainable Energy includes a '*Fiche technique pour l'énergie*' (UTC, 2008) that sums up the potential of renewable energy in Mauritius. However, no thermo-economic analysis is included. Elsewhere, UTC does pinpoint the need for demand-side management, particularly in buildings (*Maurice Ile Durable- Atelier Projet*, UTC, 2008, p78-111).

RR29 presents the work conducted on Sustainable Energy at the UoM. The potential of various energy sources is technically assessed in depth, but the work is not exhaustive. As already pointed out elsewhere, for example in the Outline Energy Policy (MPU, 2007), the scope for sustainable use of energy is significant. This has been again confirmed by the draft Energy Policy document prepared by a team of international experts recently, a report unfortunately not made public to date.

In other words, the latest objective set by the Government of achieving 70% of energy self-sufficiency over the next 50 years should not be difficult to meet (Government Information Service, 19 April 2009). In fact, the Outline Energy Policy(OEP) is more precise in putting several targets including 43% of electricity from renewable by 2025. This is much still much less than the proposal put forward by Pr de Rosnay in the context of MID, that is, 65% instead from renewable by 2028 (Ref. RR6).

5.2 Comments

- Immediate Actions should have been triggered following the OEP publication in April 2007. To date, almost all of the targets set have not been met. There should be serious concern on whether the OEP objectives will be met, not to mention those set by Pr de Rosnay for MID.
- With the cancelling of the 15MW additional capacity that was scheduled in Savannah in mid-2008, the capacity margin currently stands at -27 MW. Catastrophic black-out would have happened had it not been for the success of the Demand-Side Management (DSM) efforts of the Central Electricity Board as well as pressure on the use of reserved capacity. It is understood that the increase in electricity prices last year, sustained sensitization, solar water heaters and the introduction of CFL have, together, contributed to a drop of at least 20 MW in the peak consumption. The introduction of summertime may also have contributed to about 7 MW peak reduction in the evening, but very high morning peaks have also been observed related to the massive use of air-conditioning.
- As per the Compromise Scenario in the OEP, the Waste-to-Energy plant and the coal-fired plant should be in operation by the end of this year. In the absence of the above, the capacity margin will be at an extremely dangerous level of -60MW.
- The Compromise Scenario in early 2009 rests on two highly controversial projects, namely, the 20 MW Waste-to-Energy plant and 55 MW coal-only power plant. The former may face further delay and not meet the new deadline. The later will be to the detriment of the new cane industry and will not be in line with the MID vision, not to mention the coming-up of another 55 MW one year later.
- A new MID scenario is proposed as shown in the table below. It replaces the coal-fired power plants by bagasse-coal cogeneration plants that operate in the context of the re-engineering of the sugar-cane industry. Moreover, coherent with Integrated Solid Waste Management practice, it limits the capacity of the Waste-to-Energy plant and subjects it to

strict conditions of waste segregation, EU emission standards and implementation of an environmental monitoring system to be set up by the authorities in consultation with the 'forces vives'. Finally, it favors the active and immediate implementation of the wind power projects.

- The 20 MW peak reduction due to DSM should be sustained under the MID Scenario and consolidated as from 2011 by a further 10 MW peak reduction. Looming world recession indeed points to a reduction in the growth of both peak and absolute electricity demands from 5 % to a lower value of around 3 % on average annually provided that DSM is applied. This is why the MID action plan is essential.

Proposed MID Scenario.

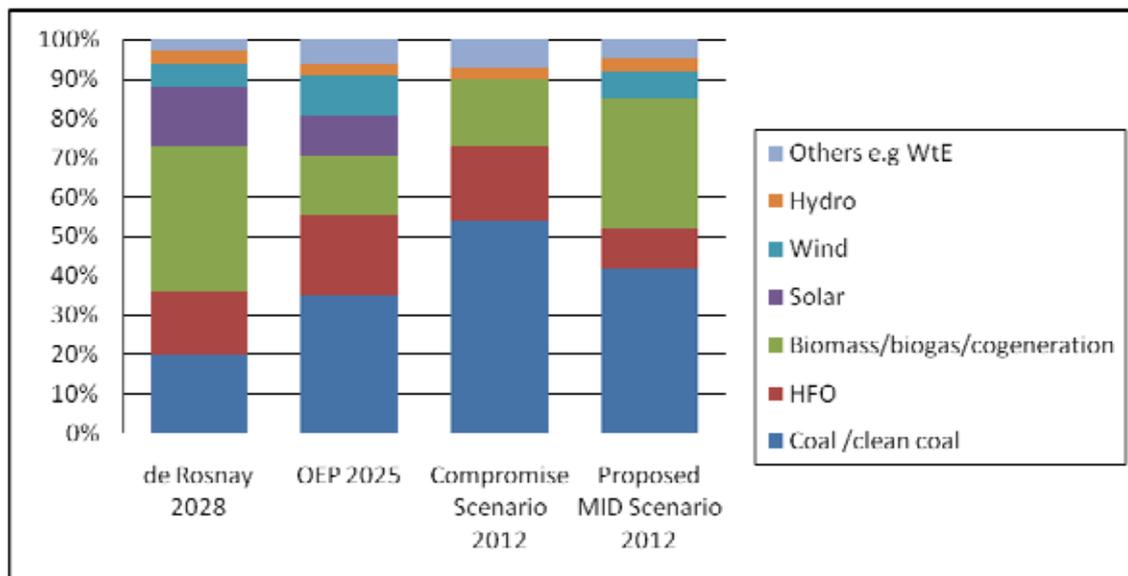
Year	Proposed MID Scenario
2009	50 MW Bagasse/Coal + 10 to 16 MW Waste-to-Energy + 20 to 40 MW Wind
2010	50 MW Bagasse/Coal
2011	
2012	50 MW Wind

- The proposed MID scenario responds to immediate priorities related to energy security, the re-engineering of the cane sector and ensuring availability of electricity. The above projects are technically ready to be implemented, some having lingered in the development stage for more than five years. The scenario paves the way towards reaching two of the key targets set by Pr de Rosnay for 2028, namely, 37% of electricity from biomass/biogas and/or cogeneration and 6 % from wind power. The Compromise scenario will drift the country away from that vision with the reliance on coal peaking at 54% for electricity generation by 2013. It is to be recalled that the price of coal has known a rapid increase recently and that its access costs, as well as other hidden costs, are more than 40% of the mine-to-user cost. Above-all in an era of global climate change, turning towards imported coal at the expense of indigenous resources is simply ridiculous.
- The main obstacle to the MID Scenario, however, is of a politico-administrative nature. A new partnership must be defined between the public and private sectors. The agreement reached by the Prime Minister with sugar-producers in December 2007 should serve as basis for innovative win-win agreements between the two parties.
- Furthermore, in order to discourage investment in unsustainable energy and support the feasibility of sustainable energy, a tax should be envisaged on fossil fuels, including coal, as well as on energy-inefficient products. In the context of low energy prices, this is a most timely measure. The tax may be reduced as energy prices rise because under such conditions sustainable energy is in lesser need of incentives. Such a measure will promote not just the use of renewables like bagasse, cane residues and other biomass instead of coal, but also energy efficiency. Furthermore, Research and Development in high-pressure boilers, process integration and gasification technology will be further stimulated.

- CEB's plan to invest in 30 MW fuel oil/diesel engines next year, apparently in view of replacing old equipment, will also be unnecessary within the proposed MID scenario. Such an investment has been estimated at about Rs 1.7 billion.
- New public-private partnerships will be meaningful only if the Utility Regulation Act is promulgated and an independent Regulator is installed. Previous CEB contracts with IPPs should ideally be renegotiated with due consideration given to the incentives and taxes related to sustainable energy and fossil fuels respectively. Thus far, CEB has been acting as judge and party, with the ability to sign contracts on unclear basis with unsolicited bidders, leaving little room for transparency. This practice should discontinue whilst ensuring, however, that the CEB is not pushed into financial instability.
- The CEB has embarked on a series of projects like Time-of-Use Tariffs, Smart-Metering or still connecting Small Independent Power Producers (SIPP). It should be provided with all the means required to ensure their timely completion. Moreover, the problem of day-time peak during summer is serious enough to justify the elaboration of a specific strategy. For instance, partners may be identified who will intervene by cutting down activities or production in case of the day peak approaching too closely to its limits.

5.3 Conclusion

- i. Therefore, the first recommendation should be the institution of an agency, say an Energy Management Office (EMO), responsible for facilitating the implementation of the national energy policy. Separating policy-making from implementation; defining distinct roles for the policy-maker, the CEB, the Regulator and the EMO; and detailing an action plan for the EMO, funded, amongst others, from the tax imposed on unsustainable energy are immediate priorities.
- ii. A new Public-Private Partnership framework must be launched, within the MID business plan, at the highest level, embarking key stakeholders, together, in new win-win projects. The cane industry, the transport sector and the energy efficiency/renewable energy industry are areas in need of investment. The international, if not regional, dimension of these partnerships should also not be overlooked. The implementation of the proposed MID scenario is recommended. As shown in the figure below, it is a critical stepping-stone towards achieving the MID targets set by Pr de Rosnay.



Energy mix – Sources for Electricity Generation

- iii. The onus has been thus far on the Government, through the CEB, to provide electricity to consumers, including investors. In the modern context, this burden is not sustainable anymore, particularly during peak hours. A culture of Energy Management must be inculcated at all levels through the active involvement of the EMO. Investors must share the burden of meeting additional energy demand by turning to renewables and DSM right from project design stage. TIANLI project should be inspired, for example, on the Chinese Dongtan model. Oil companies should, in partnership with the Government, work towards ensuring that the country is provided with a strategic and safe storage capacity of petroleum products of at least 60 days.
- iv. Future energy needs and supply scenario should no more be understood in a fragmented or piece-meal manner, but systemically take into account all the dimensions of Energy Management. The role of the Ministry of Renewable Energy and Public Utilities is vital. The possibility of re-styling it into a Ministry of Energy, Transport, Environment and Sustainable Development should be envisaged if the coordinating action emphasized is difficult under the current system.
- v. Sophisticated methodologies and techniques should be applied at the level of the EMO to improve the effectiveness of its activities from data collection and analysis to project monitoring and communication. In particular, demand forecasting using Genetic Algorithm can provide accurate prediction as well as deep insight into the factors that affect demand.
- vi. A detailed technical survey is needed to encompass the potential of renewables and energy efficiency in different sectors as well as the costs of tapping part or the whole of that potential. The following information should be carefully scrutinized, if required with recourse to modern instruments like 3D seismic sensing, wind surveys, and satellite mapping. The Mauritius Research Council should be given the responsibility of such a task.
 - o An annual technical potential of producing 1000 GWh of electricity from bagasse and cane residues by 2013 using current technology. With an ultimate technical annual potential of more than 3000 GWh in 20 years with new varieties of cane and Bagasse Integrated Gasification Combine Cycle turbines. Related ethanol production levels have to be determined according to the different scenarios.
 - o A technical potential of about 10 MW of additional hydropower, particularly through microturbines and picoturbines.

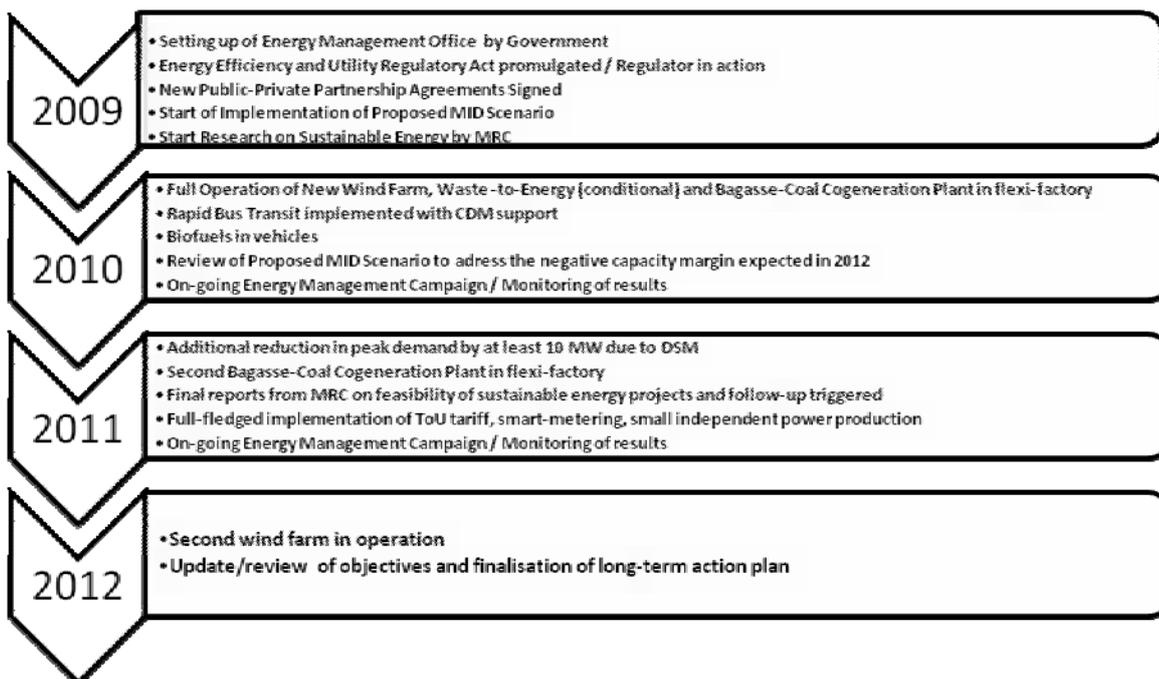
- An inland wind power technical potential of between 60 and 140 MW. And a total technical potential, including offshore, of 250 MW by 2025 producing 550 GWh annually.
 - An annual thermo-economic potential of 10 GWh of solar thermal energy by 2010 and 80 GWh by 2025. The corresponding photovoltaic potential has been estimated at 100 MW with 200 GWh generated.
 - Full assessment of the potential of geothermal energy, wave energy, ocean thermal energy conversion (OTEC) including cold-sea water air-conditioning, first and second generation biofuels including algae-derived ones, etc.
 - The potential of Waste-to-Energy within an Integrated Waste Management policy, including the feasibility of a second plant of 20 MW in a decade.
 - The potential of energy efficiency improvement in different sectors estimated broadly at between 20 and 40 %. Over 3 years, at least one third of that potential can be apparently tapped with a pay-back of less than two years. A report has estimated investment in energy efficiency in the next 20 years at around Rs 16 billion with a saving of around Rs19 million (NPV).
- vii. The Energy Efficiency Bill should be introduced and promulgated without delay. The proposed MID scenario depends on DSM to curb the growth in energy demand from 5% annually to an average figure of 3%. Energy Management, for example through process integration, is important towards achieving optimum use of energy in flexi-factories at the heart of the re-engineering of the sugar-cane sector. Green buildings, energy-efficient public lighting and DSM in the tourist sector are concerns that should be high on the EMO agenda. All these are coherent actions in the MID context.
- viii. In order to promote the introduction of more renewable energy, special incentive packages should be designed. The following are three pertinent examples:
- a. Currently IPPs obtain bagasse in exchange for supply of electricity and steam to sugar mills. Also their ratio of electricity production from bagasse to that from coal is 1:2, not to mention the fact that the price of electricity from bagasse is indexed on that from coal. Power-purchase agreements should, henceforth, be more craftily designed to force a shift to the use of more renewables, including cane residues and woody biomass.
 - b. Gradually the subsidy on LPG should be reduced and households should be encouraged to use more sustainable energy. The recent craze for air-conditioning equipment is another matter of concern. Whilst applying taxes on energy-inefficient appliances, subsidies must be directed towards the purchase of solar cooling systems, photovoltaics, micro-wind turbines, biogas exploitation and the bioclimatic design of houses.
 - c. Rodrigues and outer islands are in need of energy for sustainable development. Since these are often poverty-struck areas, generous facilities should be made available to their inhabitants for using wind energy, solar energy, biodiesel as well as for desalination. Subsidies directly to the poor to improve their quality of life through access to energy-efficient appliances and technology is a measure that must not be excluded.
- ix. Electricity generation from nuclear power has been discussed by several parties, including previous consultants. It is probable that more developing countries will have access to the technology in the near future under the strict control of the International Atomic Energy Agency (IAEA). For Mauritius, the key issue is that we lack the critical mass to consider such an option. If this is done, all other scenarios, including renewables like bagasse, will have to be abandoned. There is little scope for cross-border connectivity and DSM is a core activity in line with the philosophy of the MID project. Moreover, there is a clear indication that our economy will

reduce in energy intensity. Hence, moving to another order of magnitude in terms of energy demand and supply is not relevant.

4.3 Conclusion

While RR29 and other documents (e.g UTC’s) have focused on the long term, the above analysis has been an attempt to provide a transition strategy. Decisions have to be taken urgently and it is believed that it is still possible to insert current projects within the MID framework. The urgent calling up of a national consultation forum to finalise the MID vision and action plan can only help clarify our situation.

The chart depicted below summarizes the actions recommended over the next four years in order to move towards a more sustainable energy future. It should be noted that a review of the Proposed MID Scenario is set for next year in 2010 and a second one, more in depth and wider in scope covering the whole ‘blue-print’, is required in 2012. Along with continuous monitoring of progress made, such a dynamic approach will ensure that the country is capable of responding to locally- as well as to globally-changing conditions. A key decision to be made in 2010 is the strategy to adopt to prevent a negative capacity margin in 2012. Photovoltaics may be the solution, but other options may also be considered particularly in the light of the DSM results and world prices.



Summary-Plan 2009-2012

Consensus and Coherence have many a time being conflicting pursuits. Reconciling short-term availability, medium-term term affordability and long-term acceptability is a daunting challenge. The understanding of Energy Management as a holistic issue requires stakeholders to leave aside vested interests and share a common future with other parties. And to think about the future of the planet and the legacy we want to leave to our children...

It is never too much to recall that the country has achieved significant progress in a relatively short

time-span. Institutions like the CEB and the private sector, along with political and other leaders endowed with vision and commitment, have helped shape modern Mauritius, including the energy context.

In spite of conjectural difficulties, the Government, and above all the Prime Minister, has expressed unflinching commitment to make the MID project a reality. The vision of Pr de Rosnay is also largely shared by younger and older generations alike, conscious that the world has entered into a new era of ecological responsibility.

Industry stalwarts are also increasingly embracing the green economy. ISO 50 001 standards on Energy Management will soon sweep through businesses and Corporate Social Responsibility will be meaningless without each business monitoring its carbon footprint.

While oil will be around for quite a long time and the hybrid future is here to stay, Copenhagen 2009 may well see the emergence of a global carbon market. The post-Kyoto era may also witness a global energy market with close links to a more regulated world economy. The Obama Administration commitment to put in 150 billion dollars yearly for the next decade in renewables is a clear sign that the United States is willing to lead the sustainable revolution.

Yes, we can believe that one day, in our country, bagasse will be back in force, wind power will surge in the sky, the sun will be harnessed and, everywhere, we will get more with less energy thanks to the art and science of Energy Management. That day has to come now because our planet and our people cannot afford to wait any longer. The future will depend much on what we'll do next.

6. Ecotourism

6.1 Synthesis

A comprehensive set of recommendations is provided in RR20 by the UoM team working on that Theme/Volet. This was a highly multidisciplinary effort related to tourism and its relation with marine biodiversity, culture and energy. The proposals made would also fit within an action plan directly. However, it is expected that in the course of a national consultation of Grenelle-type, the recommendations should be debated in a real spirit of participative democracy (PD). It should be noted that although UTC did not work specifically on this topic, through their reports elements could be found largely supporting the findings of the UoM researchers.

6.2 Comments and conclusion

- There is a need to pay special attention to aesthetics in the context of MID. Site selection, architecture, landscaping and decorations should be in harmony with the MID concept. This aspect should be fully debated and all views should be considered. The multicultural nature of MID can only make this process just more challenging, if not more complex indeed.
- Biodiversity-related tourism should be high on the MID agenda. It can create jobs provided that people are properly educated and trained in the field.
- A key concern is the fact that surveys do confirm the negative perception of tourism by many stakeholders, particularly among the local communities. This should be addressed urgently in a holistic manner. Participative democracy again should be of help to ensure that MID is in the interest of everyone.

7. Transport and Land Use

7.1 Synthesis

This Theme/Volet has not yet been considered at UTC level. RR34 refers to the studies at UoM on Transport and Land Use/Planning. No less than 20 concrete strategies or alternatives are discussed. Reinventing the wheel cannot be a possible option: the latter proposals are, therefore, not totally new. In fact, there is no dearth of proposals coming from experts, concerned citizens or stakeholders. The same question that comes up many-a-time is 'why is there so little action?'. Particularly in view of the transport congestion problems experienced almost every day in and around the capital. Government has reacted by proposing in the 2009 Budget a series of investment projects in infrastructure.

The UoM work, by relating transport to land use, has the merit of opening up a holistic approach as pruned by MID. Further studies are required to assess the mutual interactions between energy, environment, engineering, economics, land use and social impact.

7.2 Comments and conclusion

- It is essential to assess the MID-compliance of all new infrastructure projects. The need of a national consultation to define the MID vision and its action plan, including details of infrastructure investment, is more urgent than ever. The remaining points below refer to immediate or short-term problems that need also to be addressed.
- In spite of the production of more than 20 million litres of ethanol annually, not a single vehicle uses the latter biofuel locally. Again this is an area of significant opportunity of public-private partnership, particularly in the broader context of the urgent need to re-engineer the sugar-cane sector. The objective of the OEP (2007) of introducing biofuels in transportation by 2010, including biodiesels, is still achievable provided the following steps are also taken:
 - i. A gradual reform of the Automatic Pricing Mechanism is initiated towards a policy-driven pricing mechanism that will ensure the long-term feasibility of 10% substitution of petrol by ethanol (E10) and 20% substitution of diesel by biodiesel (B20).
 - ii. Monitoring is done through the State Trading Corporation (STC), in collaboration with the fuel suppliers, to guarantee consistency of fuel standards and respect of specifications at source.
 - iii. Test-and-control programmes, sensitization and communication campaigns are conducted, with the help of oil companies and distributors, prior to the full-fledged introduction of biofuels. Special attention should be given to two-wheelers and older vehicles.
- The local vehicle population is increasing at an alarming rate despite the limited road capacity, or even the dire worldwide economic situation. Traffic congestion is becoming everyday more and more acute. A survey conducted and interviews of key decision-makers reveal that there is unanimity on the necessity for an alternative mode of transport. However, the sheer magnitude and time-span of such a project has not played in its favor. The options of bus-lanes and bus-ways have been officially retained thus far.

- It is to be noted that Rapid Bus Transit systems have obtained funding under the Clean Development Mechanism, for example in the case of Bogota. This is an avenue to explore before the situation deteriorates any further. Locally, a Bus Modernization Programme amounting to Rs 250 million has been earmarked under the MID Fund. This is a laudable initiative particularly if it induces passengers to turn to public transport and allows the introduction of biodiesel-run or hybrid vehicles.
- A timid attempt has been made in the 2008/09 Budget to put a levy on vehicles with high fuel consumption. This should be strengthened whilst looking into any social implication that may arise. Other instruments like limiting the ownership of motor-vehicles, as in Singapore, are also pertinent. Car-pooling indeed deserves to be given more serious attention e.g by involving companies keen on Corporate Social Responsibility.
- Recently, the speed-limit has been increased to 110 km/hr on some of the main motor-ways. Although this is normally linked with higher energy losses, the impact is expected to be relatively limited as far as fuel consumption is concerned. However, the benefits of decentralization, teleworking and flexitime are highly overlooked leading to a waste of resources. Cycling is also an activity to be promoted within the wider context of integrated town-and-country planning and healthier living.
- Similarly, while it is most urgent to switch to 500ppm sulphur automotive diesel, both for efficiency improvement and pollution limitation, further reduction to 50 ppm may not be warranted in the short-term.
- Currently the same diesel is utilized for both automotive and marine purposes. With increasing inland storage capacity and the advent of an oil jetty, it should be possible to import automotive and marine diesels separately.
- The emergence of the sea-food hub and of increasing port activities implies that both marine diesel and fuel oil, corresponding to international standards, should be available at all times and at affordable prices. Ships berthed in the harbor will also need to be provided with electricity, particularly for refrigeration purposes. The supply of biodiesel in the harbor may add value to its provided services, particularly in the eyes of tourists and yacht-owners.
- Our reliance on fossil fuels should not hamper efforts to offer possibilities of ecotourism to visitors arriving by air or by sea. Apart from the introduction of mechanisms to offset carbon footprints, tourists should also be given the opportunity to use electric or biofuel-driven vehicles, to sail to nearby islets on wind-powered boats or to walk to gorgeous natural spots or to meet people of different cultures. To those who are contemplating a longer stay, ecological trips by sea to Réunion, Rodrigues or even Madagascar, may be advertised. On overall, their carbon footprints will be much reduced taking into account the long distances covered.

8. Health and Environment

This Theme/Volet was studied only at UoM. More works should follow. The main findings thus far were reported during the MID Seminar in the MID Week.

In brief it is observed that human health sustainability should be a key issue. Health, in fact, should also be interpreted to include not just physical health, but also the mental and psychological states of being. The interrelationship between health and environment is also fully recognized, but there is a need to come up with a concrete action plan in this respect. The spread of NCD or HIV/AIDS can seriously affect the MID project.

On another note, health research on plants or on ocean resources can provide a new cutting edge to the MID project.

9. Sustainable Agriculture

This Theme/ Volet started up functioning quite late but has provided results to be included in Phase I (RR50). It has also been introduced, partially, as a new topic of research at UTC.

It is noted that the Government, in response to the threat of food crisis last year, has initiated a Blueprint for a Sustainable Diversified Agri-food Strategy extending to 2015. This is indeed a positive step that can be integrated in the MID action plan. Food security also should be a key objective of MID.

As noted by one participant in a recent MID workshop ‘Food production, processing, storage, distribution, sale and consumption have a significant impact on the environment and society. Integrated and sustained efforts throughout the food chain (from the farm/sea to the consumer) are required to ensure that people have access to adequate, quality, safe and nutritious food, in an environmentally friendly manner. This approach to achieve food security plays a key role in the realisation of MID’. It may be added that sustainable agriculture can also help fight consumerism, create jobs, improve the health of people and reduce negative economic and environmental impacts related to import of food.

Organic standards should also be promoted whilst at the same time familiarizing breeders, farmers and planters with the benefits of sustainable agriculture.

Finally the project identified in the course of the research which consists of planting coconut trees around sugarcane fields can be indeed a visible symbol of MID in the near future.

10. Water and Waste-water / Waste Management

These are new Themes/Volets that have been added at both UoM and UTC levels. Findings and reports will follow in the course of Phase II research. However, these topics should be holistically integrated in the course of any national consultation on MID vision and action plan.

11. Reengineering of the cane industry

11.1 Synthesis

This Theme/Volet is only now being looked into at UTC, focusing on biomass energy. RR24 describes the findings of the MID studies under Phase I at UoM. These are largely based on the Multi-Annual Adaptation Strategy of the Cane Industry (MAAS 2006-2015) adopted by the Government. UoM reports 8 key recommendations towards re-engineering of the cane sector and proposes the introduction of sustainable indicators for the industry. There is, however, no detailed cost benefit analysis.

11.2 Comments and conclusion

The implementation of the MAAS has been marked with a degree of success with respect to a number of issues like decentralisation, voluntary retirement schemes or still the opening of refineries. However, the strategy is not on schedule as far as the setting up of flexi-factories is concerned. The energy aspect of MAAS with emphasis on bagasse and ethanol is indeed lagging behind.

It is highly time to ensure that the agreement reached between the Prime Minister and the Mauritius Sugar Producers Association in 2007 is transformed into action. This will indeed open the way for new win-win situations for all stakeholders.

An independent consultant is looking into past agreements between the IPPs and CEB related to power production and sales. As it is understood that the consultant's report will not be a binding one, it looks unlikely that past contracts will ever be renegotiated. In any case, if they are reviewed, it will be long after the damage, if any, has been done.

We believe it is better to look forward to the setting up of a Regulator under the Utility Regulatory Act and to define a new playing field in the context of the MID economy, based on social equity as well as environmental concerns whilst ensuring business feasibility. This should be within the MID vision and action plan to be finalised as a result of a Grenelle-type national consultation.

12. Culture

Again this Volet/Theme has not been attempted at UTC. It has been considered within the Volet/Theme on Ecotourism, but soon it has been found that it deserves special attention.

RR61 is a first report that points out to Cultural Heritage Preservation as an essential part of MID. It relates to fundamental questions concerning the Mauritian identity, values underpinning the MID concept, the role of religion, traditions and customs in the local context as well as the ethical basis of MID.

Cultural ecosystems are just as vital as natural ecosystems. Not just for the sake of having new economic opportunities, but because these have to be transmitted to future generations.

On a different note, heritage buildings and architecture can inspire green economy promoters because in many instances they are bio-climatic references in terms of construction and use.

Last but not least, this Volet/Theme can also explore the emergence of a shared Mauritian culture, intrinsically linked to the shared MID vision. However, although participative democracy (PD), for example through a national consultation, may help in the definition of this shared Mauritian culture, the process is a long one. Akin to nation-building...

13. Standards, Indicators and Dashboard

13.1 Synthesis

UTC initiated a comprehensive research task on the above Theme/Volet (*Maurice Ile Durable, Atelier-Projet*, UTC, 2008, p114-145). No less than 16 sets of labels or standards are compared. Some 134 Sustainable Development Indicators as proposed by the UN are analysed and a short-list of 32 indicators is made for consideration in the MID context (p135-136).

These indicators are fed into a '*tableau de bord*' or dash-board and, then, a feedback and monitoring mechanism is proposed (p137-141).

RR25 at UoM considered the feasibility of applying some of the proposed indicators as well as others. It is noted that data are available for only 22 out of 51 such indicators.

Furthermore, as pointed out earlier, MDG7 has no defined targets and may not be most pertinent in the case of Mauritian. It is easier to define indicators sector-wise (e.g for cane industry as in RR24) or topic-wise like for Energy.

RR25 in fact depicts how a holistic approach can be applied to define Sustainable Energy Indicators based on Engineering/Technological, Economic, Environmental and Social/Ethical dimensions. The results plotted in terms of star-diagram show the evolution of sustainability over the years. A bursting star implies decreasing sustainability and collapsing star signifies increasing sustainability. On the dash-board, these two conditions may be represented by RED or GREEN respectively, an ORANGE possibly introduced to signify caution.

The above technique may also be used to assess future scenarios also, e.g a MID scenario or a business-as-usual scenario. RR28 refers to a study undertaken to identify the influence of different factors of an indicator. Such studies may provide insight not just into the forecast of performances, but also into how to shape the future.

13.2 Comments and conclusion

Standards are well known e.g on energy efficiency, building codes, organic food, environmental or energy management, etc. However their implementation and enforcement is often lacking. The holistic approach based on participative democracy, institutional framework reforms and the setting up of a MID action plan will give new impetus and a coordinated boost towards solving such problems. Private sector is required to think beyond CSR and to get involved along with other stakeholders in making a success out of the new MID business framework.

Indicators are absolutely essential for monitoring and feedback. However, as pointed out above, the set of indicators, and also the parameters they define, is a difficult choice. The following recommendations are proposed:

- i. As a result of a national consultation, a set of parameters is agreed upon to constitute together the parameters to make up the MID dashboard. The following list is suggested but it is certainly not exhaustive. The focus is on favouring sector-wise or topic-wise parameters that are based on indicators that can be fairly easily compiled AND that are understandable, pertinent and reliable. Departing from established UN indicators should not be an inhibition if justice is to be done to the specific context of MID.

PARAMETER 1: EDUCATION
PARAMETER 2: HEALTH
PARAMETER 3: FAMILY-LIFE
PARAMETER 4: CULTURE
PARAMETER 5: BUSINESS
PARAMETER 6: ENERGY
PARAMETER 7: WATER
PARAMETER 8: AGRICULTURE
PARAMETER 9: PARTICIPATIVE DEMOCRACY
PARAMETER 10: INSTITUTIONS
PARAMETER 11: TRANSPORT
PARAMETER 12: TOURISM
PARAMETER 13: LAND
PARAMETER 14: FOOD
PARAMETER 15: BIODIVERSITY

- ii. The Parameters above reflect the social and environmental domains where the centre of gravity of MID lies. The political and economic dimensions are only processes towards the MID vision, not its goals. It is not also surprising that most of the parameters above reflect Themes/Volets identified within the MID concept definition. These are indeed multidisciplinary issues *par excellence*. Each parameter, as shown in the example of Energy in RR25, has economic, environmental, social and other indicators.
- iii. From the list of 134 or more indicators identified, many are not available because of lack of data. The Central Statistical Office should play a pivotal role in the national consultation forum proposed in order to obtain from stakeholders in a consensual manner the list of indicators that they propose to be considered. Many indicators are available but some will have to be invented. In particular, indicators relating to family-life, culture or health should aim, if it is agreed, to include elements related to happiness, prosperity and well-being. A difficult and challenging task, but a worthwhile one indeed.
- iv. It goes without saying that monitoring and feedback mechanisms are essential. UTC already refers in its report to the Global Reporting Initiative and to Management Systems (p140). In the context of the national forum, the monitoring and feedback mechanisms should be finalised by participative democracy. In the end, it should be remembered also that MID is not about long, heavy and expensive bureaucratic practice.

14. Time-frame and holistic approach

- In the reference reports (RR), the recommendations made are classified as short term (within 5 years), medium term (5 to 10 years) and long term (beyond 10 years). The list is not reproduced here, not because it is too long, but the merit of the different proposals needs to be assessed thoroughly before being considered for implementation. Several of the recommendations lack cost-benefit analysis but this is not a shortcoming *per se*. The MID business framework can have a chance only if environmental and social costs are integrated in a gradual manner. Current market forces do not favour the progress of the MID vision. Finally, there is some element of overlapping among the recommendations made. Coherence is required in considering mutually inter-acting recommendations.
- Hence, the foremost measure that should be taken is indeed the calling of a national consultation forum in a spirit of participative democracy towards redefining the shared MID vision and its action plan. Initially, it was proposed that the UoM should call such Grenelle/Colloque, in collaboration with UTC. This has not been possible because of the difficulty to have a high-level UTC delegation in Mauritius in the time-frame of Phase I. More significantly, such an activity is better organised under the aegis of the Government, preferably as a personal initiative of the Prime Minister. It can only be a most timely event to precede by a couple of years the much-awaited World Ecological Forum to be hosted in Mauritius in 2011.
- The MID action plan cannot be defined by other than the stakeholders to be actively engaged in its implementation. What Phase I provides is a methodology for the MID project based on the concept definition. However, it has been felt that a number of key urgent decisions have to be made in order to ensure coherence with MID. This is why for Sustainable Energy a number of transitory measures are recommended as an alternative to the much compromised Outline Energy Policy of 2007. Similarly for Ecotourism the recommendations are well-developed and await consideration and approval by stakeholders. For Sustainable Agriculture, the Government has already a relatively sound action plan as it is also the case for Environment to a large extent. The missing elements seem to be enforcement, implementation and monitoring. In the case of transport and land use as well as the re-engineering of the cane sector, clear signals are required on the way ahead and on the MID compliance of the proposed strategies.
- UTC in its report suggests a holistic framework for integrating the proposals on MID it provides. The scheduling of the MID action plan in time and in terms of systemic interaction should be a matter of priority once the national consultation forum has met to deliver its priorities. Resource allocation and role distribution will have to be clearly defined.

- To conclude it may be worth summarizing the key milestones ahead as given below. When do we start? ‘Now’ is the answer in view of meeting key targets e.g for 65% renewable energy for electricity by 2028, in less than two decades when we will celebrate 60 years of independence.
 - e) Calling of a national consultation forum on MID
 - f) Finalising the shared vision, mission, priorities and action plan
 - g) Setting up of the relevant institutional framework and a *loi-cadre*
 - h) Continuous monitoring, feedback and communication on the MID progress.
- Without being comprehensive, the findings of Phase I point to the sequence of events below in view of ensuring that a systemic or holistic approach is respected. It is to be noted that as far as the MID Scenario for energy is concerned, we are already running late and the sooner that we rectify our orientation, the better will it be.
 - VI. Responding to immediate areas of concern e.g with respect to energy, transport, new buildings and cane industry in order to ensure that MID-compliance is not overlooked.
 - VII. Responding to the needs of the population, particularly vulnerable groups as a condition to participative democracy.
 - VIII. Sustaining MID in its initial stage through education, training, sensitization and communication campaigns.
 - IX. Combating consumerism and debt through the promotion of a sustainable living.
 - X. Introduction of standards, indicators and dashboard for MID as part of the MID action plan.

15. Conclusion

We have a living out of what we get, but we have a life out of what we give. If we are referring to 'sustainability' today, it implies that we do have been favoured with many a blessing.

We should be proud not because we have received so much from our parents, from others and from nature. But because we are capable of offering so much to our children, to others and to nature. To give more than what we get if we make the most of what modernity offers to us as an opportunity.

Prigogine stated that when any system, whether biological, chemical or social, deviates too much and too often from its equilibrium, it ends up irreversibly losing its stability. We believe that the point of non-return has not been reached in the case of Mauritius. And hopefully for the world as well...

Provided we avoid the greater sins, Paradise will never be lost. There is a need for us to turn, if not to return, to a simple lifestyle. We should not wish to have always more than others or than what we had. But we need to be grateful for what we have and be contented with it. In no way this should deter us from making efforts for a better life. For ourselves and for others. With the understanding that we do not make a living out of our life, but a life out of our living.

Waiting for all the plans to be perfect may not be the right attitude. We need to act intelligently without fear of making mistakes. Because for sure we are going to err somewhere. However, the price of indecisiveness and not acting can be much higher.

MID is not a choice but a destiny that awaits to unfold.