The PNG Context and Key Capacities in Developing the Next Generation of Professionals

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Abstract
1. The PNG socio-cultural setting, in which young professionals operate, displays multi-layered value systems. These include traditional-customary, Christian, good governance, opportunistic-exploitive, sorcery and warrior values. Contemporary ‘decision-making’ is often compromised by this complexity.

2. The present global economic and environmental context is characterized by an immature economic model that is usually driven by supply and demand market forces. This framework seldom recognizes or pays for additional components e.g. ecological services, option, bequest and intrinsic values. Here capitalism has been cannibalizing the resources of the planet.

3. Further in the current circumstances, the breakdown in good governance in those more loosely regulated financial providers e.g. sub-prime loan finance brokers in the western world particularly in US and associated financial management systems) has led to major turbulence in these economies.

4. In environmental terms two major processes are driving major constraints on our species. The first is the almost ‘global blindness’ human society displays regarding the finite resources of the biosphere, and the lack of restraint concerning the world’s escalating human population. At a fundamental level, Impact on the biosphere comprises Population X Resource Use + Pollution. A crucial consequence of this complex impact is climate change.

5. The second constraint is that the unpredictability of climate changes places extreme risks on the future of our species. If the mean global temperature remains below a 2°C rise between 2010 and 2050 we should be able to persist in modified but sustainable life systems. If the mean temperature rise approaches 4°C, our habitat for life, as we know it, is likely to change substantially.

6. How does the next generation of professionals cope with these challenges? 6.1 The UPNG Graduate Profile provides a platform for coping. This lists an ideal set of characteristics. 6.2 However, each individual needs to avoid being caught in the corruption trap. They need to live and work employing the principles of good governance viz. transparency, accountability and ownership.

6.3 Good attitudes are essential to attain and maintain a professional approach. They are also essential if the nation is to prosper. 6.4 To support this, each of us needs to develop a personal code of ethics for day-to-day living and work. This will also give us the tools to make good and positive decisions.

7. If sustainability is harvesting the interest rather than exploiting the capital of our resources, we as world citizens will need to act with great intelligence, energy and adaptation to survive. All relevant strategies for renewable energy, resource conservation and recycling; pollution management; and population containment will need to be rapidly implemented to minimize impacts and maximize sustainable processes. Can we do it? In preparing professionals it is crucial that UPNG undergraduates and graduates need to have internship or attachment opportunities to enable them to build a bridge to real world professions in bureaucracies, commerce, industry, services and the arts.

8. Many new business opportunities will arise. How can we revolutionize and recreate business environments to proactively contribute as crucial agents of change – to solutions, rather than being perpetrators of the status quo?

9. The complexity involved will demand the highest levels of human cooperation and capacity to understand and apply whole systems approaches to find solutions across scales in space and time. We presently face perhaps the most challenging period in the history of the human species. The next generation of professionals will need to be ready and not too late!
1. Introduction

The socio-cultural setting, in which young professionals operate, displays multi-layered value systems. These include traditional-customary, Christian, good governance, opportunistic-exploitive, sorcery and warrior values. Contemporary decision-making is often compromised by this complexity.

Why is it so challenging in a nation like Papua New Guinea to achieve what international bodies might describe as good governance? How can the principles of good governance be best expressed and used in this country of such rich and complex cultures?

The values of a number of cultural strands influence our behaviour:

A. **Traditional customary values**, which are often unique, rich, functional and when followed - largely effective

B. **Modern international democratic values**, which ideally seek to focus on good governance and good management and the optimization of best or good practice - under ethical codes of practice

C. **Christian or other religious values**, which seek to focus on ethics and morals, for instance loving thy neighbour, tolerance of differences, kindness, sharing and caring

D. "**Kisim Chance values**", which are expressed through opportunistic and exploitive behaviour, is intolerant, impatient, and follows an assumption that what is not fully protected is available for taking and thus is often expressed as criminal behaviour.

![Diagram](image)

Figure 1 diagrammatically presents these value strands as parts of a two dimensional graph. (Score your self for each value strand. Plot the score in the 2X2 matrix to produce a polygon that is a first approximation of the ‘shape’ of your value system).
Figure 2 presents a conceptual view of trends and relationships of value strands over time. (*Hynes 2006*)

What is the shape of the population within which these value strands can be expressed?

- A comparatively - very small powerful rich elite of senior politicians, senior bureaucrats, senior businessmen and professionals.
- A relatively small, attenuated "middle class", ranging from a small number of doctors, lawyers, business leaders, some politicians, administrators, bureaucrats, academics, researchers to - larger numbers of nurses, teachers, small business.  

Figure 3 presents a generalized schematic diagram of the shape of the Papua New Guinea population. Here age cohorts and gender ratios are rolled-up to give a simple overview.

How can these strands of values be reconciled?

- First, we need *Patience, Tolerance* and *Active Adult Learning* and *Reflection*. Younger people sometimes find these virtues and processes challenging. This is normal.
- Second, we need clear definitions, understanding and practice of *Roles and Rules*
- Third, we need to work daily to understand each other by carefully *Listening to Each Other*.
- Fourth, we need to appropriately develop *the right messages for the right social group* and *effectively deliver to those groups*. What is the significance of the changing status of Traditional-customary, international governance, Christian or other religious and "kisim chance" values in the groups you are interacting with?
- Fifth, we need to look for *Mutually Positive Outcomes*. We need to achieve Win - Win results for all parties at all necessary levels.
- Sixth we need to be *adaptable and tolerant to change* in a changing world. Leading by example e.g. the PNG Human Resource Institute.
- Seventh, we need to be *constantly vigilant of understanding what these changes are doing to the value systems that affect us*.
Eighth, we need to creatively bring all these elements together in our lives to reach our full potential.

2. The immaturity of the current international economic financial model and the need to make it more complete

The present global economic and environmental context is characterized by an immature economic model that is usually driven by supply and demand market forces. This framework seldom recognizes or pays for additional components e.g. ecological services, option, bequest and intrinsic values. Here capitalism has been cannibalizing the resources of the plant.

This is the first factor contributing to current global economic turbulence. Consider Figure 4.

Figure 4, shows resource stocks, flows and the global economy (after Young 1992). Notably there are no direct links between ecological functions and financial values within the broader economy. Resource flows have, during most of our recent history, been assumed to be infinite. Further, bequest, option and intrinsic values have not usually been considered.

Can sustainable development be explained by linking economics with ecology? Can this in turn contribute to reducing financial turbulences such as the one we are currently experiencing?

An economist could define sustainable development as a set of development indicators relating to each person’s possessions or wellbeing, which should increase overtime. This definition involves feedback where environmental requirements must be met.
This can be assessed in terms of ‘non declining wealth’ that involves equality of wealth from one generation to the next. However, some modification is required in order to allow for irreversible losses of natural assets or compensation for their loss. Another assessment is in terms of ‘non-declining natural wealth’ in that actions should be taken to ensure each generation should inherit at least a similar natural environment (Pearce et al., 1989).

The key question is whether or not human modification and transformation of ecosystems irreversibly affects their cyclic stability and resilience and hence their sustainability.

For managed and natural ecosystems, a system’s resilience may differ depending on whether or not the external disturbance is a sudden shock or a cumulative, continuous stress. ‘Stress’ here might be a regular, sometimes continuous, relatively small and predictable disturbance on productivity over time. ‘Shock’ might be defined as an irregular, infrequent, relatively large, unpredictable disturbance.

Man-made assets often lack an important feature of natural assets – diversity. Justification using resilience for conserving natural basic stock is based on the principle that diverse ecological and economic systems are more resilient to shocks and stress than are simple systems (Pearce et al., 1989). Whereas this is often the case, the magnitude of shock and/or accumulative stress can override this resilience.

Even so diversity must be maintained to avoid irreversible changes. Irreversibility involving man-made assets is rare, but ecological irreversibility is not. Every year natural species become extinct and unique ecosystems are destroyed.

Sustainable development is not about trade-offs between environment and development, but about the blending of economic and ecological values to ensure future generations can live as biological and economic beings in a sustainable environment. Sustainable development begins with the proposition that it is our responsibility, as far as possible, to ensure that the atmosphere, the seas, soils and water, and the diverse populations of plants and animals are maintained and where required, restored. Sustainable development is an ongoing process not an end point.

Preserving our ecosystems is a basic requirement for sustainable resource use. Hard decisions need to be made. The challenge is not a stark choice between preserving the environment and continued economic growth. Rather, we must make decisions that are ecologically right. We need to find new processes and new technologies to provide products and services we want without destroying our environment (Kelly, 1990). To achieve this we need to deliver technically sound information to the right people at the right time to enable the right decisions (Hynes and Mott, 1992). Only co-operative, creative deep environmental strategies will be able to develop new alternatives that will fulfil these commitments to our future generations.

Sustainable resource use and efficient economic investment: An understanding of the nature of relationships between natural resources and an open market economy highlights the incompleteness of contemporary economic systems concerning achieving total resource accounting. A wider view of resources, not only recognizes use value, but acknowledges that many renewable resources:

- Maintain ecosystem integrity;
- Provide ecological services by accommodating wastes; and
- Significantly contribute to environmental amenity, aesthetic and cultural values.

In examining economic value, it is useful to distinguish between actual use value, ecological function value, option value, existence value and bequest value.

Ecological Function Value is a fairly new idea that encompasses ecological services and resource functions. He then uses the 'marginal opportunity cost' concept, viz. that all resources are bought and sold, at least, at their marginal opportunity cost. He states that this is a necessary, but not sufficient, condition for sustainable investment and resource use. Most competitive market prices fail to include lost ecological function, option, existence and bequest values (Young, 1992).

The problem for resource ecologists here is the assumption that everything can be adjusted at the margin. The concept of economic alternatives or product substitutes can break down in ecosystems where thresholds are passed and irreversible changes occur. By incorporating both 'Polluter Pays' and 'Beneficiary Compensates' principles, and necessary sustainability constraints to maintain future options and values, into the equation, Young has developed a model for the Sustainable Price for a Resource. It is comprehensive but demanding to apply and needs streamlining.

Environmental degradation exposes symptoms of maladaptive resource management and inadequate resource accounting. Only by substantially strengthening sustainability management and resource accounting practices can the impact of resource exploitation be reduced. Proper resource pricing needs to be part of this process. Such models seek to summarise key economic components necessary for basic resource accounting. The foregoing has highlighted the complexity of the issues involved in achieving sustainable resource use. This is exacerbated by difficulties that relate to achieving effective, efficient information transfer to stakeholders. These include problems concerning:

- Information delivery and acceptance;
- Information incorporation;
- Attitudinal change; and
- Management behaviour change (adoption) (Hynes and Mott, 1992).

$^1$ "Option value" is the present value of opportunities to utilize the resource at some stage in the future.

$^2$ "Existence value" is the intrinsic value to society of irreversibility, uncertainty and uniqueness of the resource.

$^3$ "Bequest value" is the value that the community collectively places upon its desire to preserve the characteristics of a resource for future generation.
3. Achieving good governance in financial systems and the development of transparent, accountable system’s architecture to reduce turbulence risks in the 21st Century

Further in the current circumstances, the breakdown in good governance in those more loosely regulated financial providers e.g. sub-prime loan finance brokers in the western world (particularly in US and associated financial management systems) has led to major turbulence in these economies.

In the more marginal institutions the quality of transparency, accountability and ownership of necessary regulations within effective management systems, particularly in the big US financial markets, had by late 2008, been eroded to a point where financial risk management had been discarded or ignored. The consequences have resulted in uneven but very serious turbulences in the global economy.

We can usually learn lessons from financial crises. The present global financial crisis is said to be the most severe since the Great Depression, which began in 1929 and persisted to the mid 1930s.

Worldwide, a number of more regionalized turbulences have followed. Here I focus on the present global challenge. The current financial crisis has been blamed on the lack of supervision over mortgage lending. In other words mortgage banks and associated institutions were lending to clients - who had little or no collateral at all (high risk borrowers) and - who did not have the ability to repay these loans, which were being lent at sub-prime rates (very high rates to cover the additional risk). Now the US government is calling for financial reform in much same way the financial system was reformed particularly in the 1940’s (Manoka personal communication 2009).

The details of this story are too messy to examine here. However a chronology of the types of derivative presents an unnerving picture of increasing layers of undisciplined financial complexity:

- Prior to 1938 US mortgages were almost entirely of the ‘originate and hold’ type.
- With the establishment of Fannie Mae in 1938 a secondary market in mortgages was created, which allowed banks to shift risks. These were diversified mortgages that satisfied underwriting standards (e.g. conforming mortgages).
- 1968 Fannie Mae was privatized and de-linked from the Federal Bank with an emphasis on mortgaged backed securities (MBSs).
- 1970 Freddy Mac arrived and gave competition that boosted the MBSs market.
- From 2003, private banks became the major issuers of MBSs and ABSs (asset-backed securities) and underwriting standards began to fall as MBSs were issued against ‘Alt-A’ mortgages. These sit between high-risk sub-prime mortgages and lower risk prime mortgages. Buyers were concerned and two ideas were introduced to remove the ‘logjam’: Collateralised Debt Obligations (CDOs) and the support of a good rating.
- With CDOs sub-prime loans could be pooled and compartmentalised into ‘senior tranches’, ‘mezzanine tranches’ and ‘equity tranches’. These categories have first, second and third order calls on risk cover.
- Risk transformation through CDOs entails a further risk of ‘information fog’.
- In this mess, hedge funds faced demands from brokers for more assets to back the leverage. As ‘fire sales’ would only increase the losses the other option was to default.
- Commercial banks remained exposed to the sub-prime markets through off-balance sheet Structured Investment Vehicles (SIVs), which were investing in CDOs/MBSs by borrowing in the short-term commercial paper (CO) market.
- With fast growth in SIVs and markets for ABS, MBSs, CDOs, and CDSs (Credit Default Swap) the shadow banking system fuelled a credit bubble that went largely unnoticed by the conventional indicators of money and credit.
- One worrisome aspect of the CDS market is that while starting as a hedging instrument it became a haven for speculative trading.
- CDSs not only emerged as substitutes for bonds, but also helped to magnify the market. So on an outstanding corporate bond market of US$1 billion, CDS contracts worth US$10 billion could be written.
- As the CDO market started to wilt it had repercussions on the CDS market of US$50 trillion.
- The performance of monolines (those selling insurance against default on bonds) came into sharper focus.
- Given the financial infrastructure that developed around the sub-prime loans at the core of the business process, the fate of all market players became interlinked.
- The extent of market decline in toxic paper in 2008 was particularly alarming. Risk aversion rose and liquidity became scarce.
- The unsettling developments took a turn for the worse in September 2008 as number of systemically important institutions failed. The global bail out package came to US $4 trillion by November 2008.
- Fannie Mae and Freddy Mac were bailed out by the US government, but Lehman Brothers went bankrupt and other groups were taken over e.g. Merill Lynch by Bank of America
- The disappearance of trust because of these failures led to a severe credit squeeze.
- The decoupling argument that emerging markets may weather the crisis had started to fade by October 2008.
- The dangers of globalisation and integrated markets in the face of weak regulation and faith in the efficiency of markets had to be realised only by experiencing it.
- The sub-prime crises offered that painful opportunity to the global policy making community (summarised after Pattanaik 2009).

- The estimated US Debt by 2010 will be US$9.9 trillion (Mark Buchanan 2009).

Two conceptual models are now considered - to seek more insight into this unsettling situation. Figures 5 and 6 explore the financial meltdown.
Generally under-regulated or poorly tracked and documented connections between the major financial institutions and the sub-prime loans and their derivatives.

These included the 5 large US investment banks.

Shadow banking system

~35% of the transactions

~65% or more of the transactions

Generally regulated banking transactions in the large traditional banking and finance institutions.

Figure 5. Given the financial infrastructure that developed around the sub-prime loans at the core of the shadow banking business process, the fate of all market players became interlinked.

The ‘fur ball’ or ‘transaction—disconnect’ model seeks to explain the international financial meltdown in very simple terms. It proposes that the more clearly delineated and regulated transaction densities of most of the larger established institutions have remained largely accountable. But that the density of transactions of the smaller derivative-based and sub-prime loan ‘high risk carrying’ financial agencies - have created layer upon layer of pseudo-securitisation to a point where the complexity could not be effectively tracked. These agencies have largely imploded. It is one way of thinking about this situation but perhaps too simplistic. You may or may not agree.
Figure 6 shows the changing shape of societies as a civilization grows. With growth, a civilization develops from a hierarchy into a highly interdependent network. In some ways these networks are less resilient (MacKenzie 2008).

Take for example electricity grids and their associated networks. These networks because of their extensive connectedness can amplify shocks. As connexions increase complexity increases and this can lead to higher vulnerability.

Complex natural ecosystems such as mature forests become extremely efficient systems for remaining constant in the face of a normal range of conditions. But more unusual conditions such as fire or drought can trigger dramatic changes. The outcome might be the collapse of the old forest and its replacement by a younger, simpler one.

The interconnectedness in the global production system has now reached a point where 'a breakdown anywhere increasingly means a breakdown everywhere'.

This seems especially true of the world's financial systems where the coupling of layers of complexity is very dense. The debt and financial systems crisis, with the US as the biggest operator, has led to very serious financial conditions across many of the smaller economies. Ironically the people with the least to lose are the subsistence farmers. Perhaps 'the meek really will inherit the Earth' (MacKenzie 2008).
4. The challenge of growth - of human populations, resource use, pollution and the consequences we face.

In environmental terms two major processes are driving major constraints on our species. The first is the almost 'global blindness' human society displays regarding the finite resources of the biosphere, and the lack of restraint concerning the world's escalating human population. At a fundamental level, Impact on the biosphere comprises Population X Resource-Use + Pollution. A crucial consequence of this complex impact is climate change.

Impact = Population X Resource Use + Pollution

Figure 7 shows 3 models, three basic curves, which can appear in nature. These are
A. Exponential; B. Sigmoid (growth rate and carrying capacity model); C the 'Bloom Crash' model (Hynes 1989).

Ideally human populations should seek to persist in densities below the carrying capacity of their local ecosystems (Graph B).

It is a sobering reality that human societies in pursuing ever increasing growth have followed trends – in natural resource use, - in population growth and, - in the vulnerability...
of overextending the capacity of the current financial systems concerning sub-prime house loans and derivative securitisation, which have almost blindly followed a path to the "Bloom Crash" model.

The Club of Rome Report 'The Limits to Growth' suggested this type of scenario in 1972.

It is a symptom of this blindness that not one of the 7 Millennium Development Goals mention population increase and population control.

Yes, the world is being encouraged to;
1. Eradicate extreme poverty and hunger,
2. Achieve universal primary education,
3. Promote gender equality and empower women,
4. Reduce child mortality,
5. Improve maternal health,
6. Combat major diseases and
7. Develop a global partnership for development (UN Millennium Project 2005).

But, it is commonly taboo to mention population growth constraint as it is seems to be so intimately and widely woven into various societies' expectations that it is considered as a right to have larger than replacement sized families. (China is an exception. Japan is also and with its welfare state is below population replacement levels and by 2025 there will be two bureaucrats for each elderly person. This has created other problems.) So while in many countries population growth constraint may be implied, cultural sensitivities have kept them covert beneath cultural establishment values, social expectations and perceived rights. It remains a very sensitive issue.

From around 1750 until about 1950 Human population increase was relatively gradual. From the early 1950s until the present the world population has exploded exponentially to over 6.5 million people and generally continues to increase exponentially. Are we becoming a plague on the planet? If this is so, nature will make us pay dearly.

Associated with this massive population growth is a raft of other variables that have also grown in consort with and contributed to - environmental degradation, human disease and more recently clearly recognized climate change.

Some of these indicators, which have continued to expand in their impact include:
- CO₂ Concentration
- Loss of tropical rainforest
- Species extinction
- Fisheries exploitation
- Water use
- Northern hemisphere increase in average surface temperature
- Ozone depletion
- GDP
- Motor vehicles
- Oil consumption
- Paper consumption
- Foreign investment and
- The crucial driver - population growth increase.
Literally all these variables have increased exponentially in impact since the early 1950s and are increasing today. Is it no wonder the biosphere of the planet is approaching a tipping point?

Traditional economists see no limits to growth – ever. And here is the catch. Yes we can always have growth in quality, but in terms of sheer quantity we have gone past many crucial thresholds.

5. Our uncertain future – human survival and different scenarios of the impact of climate change on human survival

The second constraint is that the unpredictability of climate changes places extreme risks on the future of our species. If the mean global temperature remains below a 2°C rise between 2010 and 2050 we should be able to persist in modified but sustainable life systems. If the mean temperature rise approaches 4°C, our habitat for life, as we know it, is likely to change substantially.

While the rapid growth of renewable energy has been encouraging, overall progress falls far short of what is possible. For the current generation the challenge is to keep open the window of opportunity by bending greenhouse gas emissions in a downward direction.

The 21st Century carbon budget is set for early expiry. Refer Figure 8.
Figure 8 shows IPCC scenarios that describe plausible future patterns of population growth, economic growth, and technological change and associated CO₂ emissions. The A1 scenarios assume rapid economic growth and population growth combines with a reliance on fossil fuels (A1F1), non-fossil energy (A1T), or a combination (A1B). The A2 scenario assumes lower economic growth. Less globalization and continued population growth. The B1 and B2 scenarios contain some mitigation of emissions, through increased resource efficiency and technology improvement (B1) and through localized solutions (B2).  

Whichever of the above scenarios we examine, the present trends will not be able to approach the 50% reduction on 1990 levels needed to give even a 50% chance of a <2°C rise in temperature. Halving emissions by 2050 could avoid dangerous climate change. There is much to done – and quickly.
6. How does the next generation of professionals cope with these challenges?

The UPNG Graduate Profile provides a platform for coping. This lists an ideal set of characteristics. However, each individual needs to avoid being caught in the corruption trap. They need to live and work employing the principles of good governance viz. transparency, accountability and ownership.

Good attitudes are essential to attain and maintain a professional approach. They are also essential if the nation is to prosper. To support this each of us need to develop a personal code of ethics for day-to-day life and work. This will also give us the tools to make good and positive decisions.

6.1 The Graduate Profile

The objective of the University is to produce graduates who:

- Care for ethical values, and provide leadership in national development with a clear understanding of national values and needs;
- Are committed to self development through the continuous acquisition of knowledge and experience and are able to survive in an environment of continuous change in a rapidly evolving society;
- Are capable of providing political leadership, national unity and social development;
- Are technologically literate, receptive to new ideas and prepared to be innovative;
- Have social responsibility and strong identity with their own communities;
- Have acquired adequate knowledge, skills and creative ability to meet specific national manpower needs;
- Have acquired adequate skills in communication, information technology, critical inquiry and problem solving;
- Have acquired basic understanding about fundamental national issues and sustainable development;
- Will promote critical and free inquiry into the great questions of human nature, society and the world;
- Can understand, interpret and educate people to enhance their contribution to the social and economic development of the country;
- Accept criticism and self-criticism as self-development processes and are able to face the realities of hardship of life in communities.

If you are strong in these values and capabilities you can, if you have the will, make an important contribution to good governance in PNG’s Democracy.
6.2 However, each individual needs to avoid being caught in the corruption trap.

Figure 9 The Good Governance or 'Virtuous Triangle Model' can be deduced from studies of good practice that focus on financial management and proper effective business behaviour. Lessons can also be learnt from studying cases of corrupt business behaviour.
(After Hallack and Poisson, 2007).

Three major strategic axes for improving transparency and accountability in management incorporate the creation and maintenance of transparent regulatory systems, the strengthening of management capacities for greater accountability and encouraging enhanced ownership of the management process:

- **Clear Rules**: The creation and maintenance of regulatory systems involves adapting existing legal framework so that they focus more on corruption concerns (rewards and/or penalties), designing clear norms and criteria for procedures (e.g. with regard to funding allocations or procurement of financial risk management), developing codes of practice for bureaucracies, industry and business, and defining well-targeted measures, particularly for risk management;

- **Good Management**: The strengthening of management capacities to ensure the enforcement of these regulatory systems. This involves increasing institutional capacity in a range of areas, particularly information systems, setting up effective control mechanisms against fraud, risk management-linked corruption and promoting ethical behaviour; and

- **Ownership**: Encouraging enhanced ownership of the management process. This involves developing decentralised and participatory mechanisms, increasing access to good information, particularly with the use of ICTs, and empowering business and financial management communities and key stakeholders to help them exert stronger ‘social control’ (After Hallack and Poisson 2007).
We cannot achieve - good, corruption free governance in financial systems without these three essential strategic components operating in tandem

6.3. Attitude and attitudes

- There are claims that the difference between the poor countries and the rich ones is not the age of the country.
  - This can be shown by countries like India and Egypt that are more than 2000 years old and are still mainly poor.
  - On the other hand, Canada, Australia and New Zealand, which 150 years ago were barely recognized, are today developed countries and are rich.

- The difference between poor and rich countries does not reside in the available natural resources.
  - Japan has a limited territory, 80% mountainous, inadequate for agriculture and cattle raising, but is still the third world economy. The country is like an immense floating factory, importing raw materials from the whole world and exporting manufactured products.
  - Another example is Switzerland, which does not grow cocoa but which has the best chocolate in the world. In its little territory they raise animals and plant the soil during only 4 months of the year. Not enough, they produce dairy products of the best quality. It is a small country that transmits an image of security, order and labour, which has made it the world’s strong room for international monetary funds.

- Executives from most rich countries who communicate with their counterparts in poor countries show that there is no significant intellectual difference.

- Race or skin colour is also not important: immigrants labelled lazy in their countries of origin are the productive power in rich European countries.

- What is the difference then? The difference is the attitude of the people, framed along the years by education and the culture.

- On analysing the behaviour of the people in rich and developed countries, we find that the great majority employ the following principles in their lives:
  - Ethics, as a basic principle
  - Integrity
  - Responsibility
  - Respect for the laws and rules
  - Respect for the rights of their citizens
  - Work loving
  - Strive for savings and investment
  - A will of action beyond the ordinary
  - Punctuality.
• In poor countries only a minority follow these basic principles in their daily lives.

• We are not poor because we lack natural resources or because nature has been cruel to us.

• We are poor because we lack attitude.
  
  o *Attitude is the vanguard of your true self*
  o *Its root is inward but its fruit is outward*
  o *It is your best friend or worst enemy*
  o *It is more honest and consistent about you than your words*
  o *It is your outward look based on your past experiences*
  o *It is what draws people to you or what repels them*
  o *It is never content until it is expressed*
  o *It is the librarian of your past*
  o *It is the speaker of your present*
  o *It is the prophet of your future* (Maxwell 2006).

*You may not agree with any of these statements.*

• Do we lack the will to comply with and teach these functional principles of developed societies?

*Whatever, your attitude colours every aspect of your life. It is like the mind’s paintbrush.* (Maxwell 2006). The sum of all your thoughts comprises your overall attitude.

On the other hand you cannot disconnect attitude from reality and expect success. If you think you can do something that is confidence. If you can do it, that is competence. Both are needed for success. Your attitude cannot substitute for experience. It cannot change the facts. It cannot substitute for personal growth. Your attitude will not stay good automatically.

Your attitude makes a difference to your approach to life. It makes a difference in your relationships with people. It makes a difference in how you face challenges. Your attitude is the difference maker (Maxwell 2006).

*If you love your country, let this message circulate to the majority of people in your area of influence, to let them reflect on this and change and ACT!* (Adapted from an anonymous author by Hymes 2009).

**6.4 Making good decisions on a day to day basis**

"*Mankind has a natural aptitude for virtue, but the perfection of virtue must be acquired by means of some kind of training*" (Thomas Aquinas).

How can we develop a workable code of ethics?

Firstly we need to define *ethical* in this context.
'Ethical refers to behaviour considered right or wrong according to our own beliefs—no matter what is the culture or society'.

This should not be confused with moral.

'Moral in this setting refers to behaviour that is customary in our culture or society—or someone else's culture or society.'

How can we then make sensible ethical decisions?

What follows is an outline of an approach that moves through 4 stages and includes 7 steps.
This is not the only way, but it may give some ideas on how to best develop a way that is meaningful to you.

Some questions for which we need to find answers.
Are we almost ethical? How can we wake up to compromise? "The chains of habit are usually too weak to be felt until they are too strong to be broken" (Attributed to Samuel Johnson 1709-1784).

What follows is a suggested pathway.

Stage 1 Develop an awareness of ethical temptations and compromises.

Step 1
Sensitize yourself to the most common ethical temptations—to lie, deceive, steal or harm.

- Aim to become aware of these temptations.

Stage 2 Learn how to use ethical logic and ethical principles to achieve clear thinking.

Step 2
Learn the distinctions necessary to reason ethically between positive decisions and behaviour and negative decisions and behaviour.

- Aim to become thoughtful about ethical reasoning.

Step 3
Identify ethical principles derived from our religion, up-bringing and culture.

- Aim to become mindful of your "inner voice". 'To thyself be true'.

This is a keynote address and should not be formally cited until it is published in final form with a fully completed Reference List.
Stage 3 Learn to make ethical choices.

Step 4 has three parts
1. Identify common ethical challenges in your life.
2. Evaluate these with ethical reasoning skills.
3. Then commit yourself to new ethical principles.

- **Aim to create an ‘ethical code’. Use the code to make disciplined life enhancing decisions.**

Step 5
Learn to use the three part process for creative, ethical decision making. Identify defensible choices.

- **Aim to become ethically skilled and decisive.**

Stage 4 Go beyond the basics to use ethics as a lever for better living.

Step 6
Use the three part method to do the ‘best thing’.

- **Aim to transform your personal life through wise ethical choices.**

Step 7
Learn to do the best thing at work as well. Use a ‘whole of truth concept’. Reframe situations to focus on relationships.

- **Aim to transform our worklife through wise ethical choices.**

We live in a very complex cultural setting with changing social values.

- **Traditional customary values** still tend to be the main driver.
- The Papua New Guinea interpretation of Christian ethics provides another layer of values.
- Good governance more recently has placed much of our work life in a wider national and global setting e.g. values such as transparency and accountability.
- The above value streams are complicated by values of people who are opportunistic and exploitive and use ‘Kisim Chance’ approaches to life.
- This in turn in some instances can be made more difficult by Sorcery or Violent intimidating Warrior Behaviour.

In PNG it is often very challenging in day to day situations to walk a straight pathway through these value mazes. We usually face situations involving many different values in every day life. For this reason, it is crucial to develop our own day-to-day ‘code of ethics’, which can enable us to make good ethical decisions.

This is a commitment to which we should all give 100%. However, it is a life long process (Howard. & Korver, 2008)
7. The environment and sustainability

If sustainability is harvesting the interest rather than exploiting the capital of our resources, we as world citizens will need to act with great intelligence, energy and adaptation to survive. All relevant strategies for renewable energy, resource conservation and recycling; pollution management; and population containment will need to be rapidly implemented to minimize impacts and maximize sustainable processes. Can we do it? In preparing professionals it is crucial that UPNG undergraduates and graduates need to have internship or attachment opportunities to enable them to build a bridge to real world professions in bureaucracies, commerce, industry, services and the arts.

If sustainability is harvesting the interest rather than exploiting the capital of our resources, we as world citizens will need to act with great intelligence, energy and adaptation to survive. All relevant strategies for renewable energy, resource conservation and recycling; pollution management; and population containment will need to be rapidly implemented to minimize impacts and maximize sustainable processes. Can we do it? Many new business opportunities will arise. How can we revolutionize and recreate business environments to proactively contribute as crucial agents of change - to solutions, rather than being perpetrators of the status quo?

![Diagram](image)

**Figure 10:** Can we have both a better environment and better living standards? (After Vincent and Stoeckel 1991)

To move towards Option C will require very substantial adjustment in a substantial number of business enterprises and the effective and sustainable implementation of resource use minimisation strategies and environment pollution mitigation technologies.
Figure 11 Shows a comparison of two response models (a) disturbance-independent, and (b) disturbance-dependent ecosystems. Dependent systems show more rapid recovery, temporary peak values and decline in the absence of further disturbance. Ideally, natural ecosystems used sustainably would best be disturbance dependent or be systems with great capacity for self-regulation and vigorous regeneration (Adapted after Vogl, 1980).
Figure 12. Show changes in standing crop ('the above ground biomass') in natural ecosystems through time. In the absence of any major disturbance, the system will tend to grow to some maximum potential biomass determined by the severity of the habitat. The effects of harvesting and subsequent recovery will cause the system to fluctuate around a lower level, the maximum persistent biomass. However, we need to aim for an optimum persistent biomass. Harvests in sustainable systems therefore should remain at levels well within the major tolerances of processes and species that characterize their biological communities (Hynes 1994).

What the above implies is that cropping in originally forested areas is a practice that holds the ecosystem at early stages of succession. This occurs at a cost to the nutrient base of the ecosystem. The natural tendency would be to recover and return this land system to forest cover. In cases where the sequestration of CO₂ is a high priority this option would be the most effective land use.

8. Sustainable Business Enterprises

Sustainable development is a challenge most business enterprises have yet to tackle with rigour. In a sustainable future we would not lose quality. Our economic prosperity would be based on practices that work in alignment with natural cycles (Crocker 1997)
Figure 13 presents the "Funnel Strategy" a systems approach to chart a course away from the walls and into the opening of the funnel, which represents a sustainable and prosperous future. (Crocker 1997).

The funnel strategy is linked to a method developed by researchers led by K.H. Robert (1996) and used in Sweden by over 50 municipalities and corporations. It provides a secure frame for evaluating whether or not scenarios for the future can be sustainable or whether they will lead to further degradation and social inequity. It also provides a clear communication tool, which can be understood by people from all sectors of society.

The Natural Step method, as it is called, identifies four system conditions for a sustainable society.

Condition 1. *Substances from the earth's crust must not systematically increase in nature.*
Condition 2. *Substances produced by society must not systematically increase in nature.*
Condition 3. *The physical basis for the productivity and diversity of nature must not be systematically degraded and deteriorate.*
Condition 4. *Fair and efficient use of energy and other resources to meet human needs.* (Crocker 1997).

The approach employs techniques that raise awareness, train key people, plan, implement, demonstrate results, develops a community of interest within the company, develops strategic partnerships, networks and an integrated approach to business. It also uses tools to assist in investment infrastructure that will maintain viability over a 10-20 year period. Current technologies need to be used as a platform to migrate to new technologies. As new technologies emerge they will increasingly be designed to met the needs of a society moving towards sustainability (Crocker 1997).

Sutton (1997) developed the concept of the 'The Sustainability – Promoting Firm'. This is a firm, which seeks to move rapidly in its economic strategies and achieve a sustainable approach that leap-frogs the current economy. This may be difficult to achieve but he reconized that governments have been moving too slowly. Transformative technologies in this framework can be be very profitable. He submits
examples such hybrid cars and ultimately the hypercar. This is all very well, but more
relevant examples are needed for developing countries. Developing countries need timber.
Plantation timbers have totally changed the timber industry in a number of countries e.g New
Zealand.
Radical solutions can stir the establishment in both bureaucracies and industry.
Notwithstanding this, such technologies can dramatically change environmental impacts.

Figure 14 presents concepts as schematic graphs depicting the scope of business opportunities arising from
responses to environmental issues. (Sutton 1997)

There is a clear and urgent need for Win-Win macroeconomic policies. Few corporations
will accept sustainable development if they think the economy will contract. Win-win
macroeconomic outcomes mean that resource use no longer grows in step with GDP
growth and that contractions in the sections of the economy responsible for high
environmental impacts are offset by growth in other sections of the economy (Sutton
1997). This is an ambitious vision. But we need to take these insights more seriously and
explore and build on them.
9. Overview and Concluding Remarks

The complexity involved will demand the highest levels of human cooperation and capacity to understand and apply whole systems approaches to find solutions across scales in space and time. We presently face perhaps the most challenging period in the history of the human species. The next generation of professionals will need to be ready and not too late!

9.1 Concluding remarks – the economy

A whole system's approach to economics is needed that articulates ecological services with the function of the narrower market driven supply and demand model. This evolving architecture also needs to accommodate the estimates of values and prices of option, bequest and intrinsic values in fiscal transactions and accounting processes.

Policy Response to the current economic impact of the global meltdown in PNG

a) Consolidate the fiscal balance

Most of the region’s governments have already been put under pressure by high world prices – via calls for subsidies to electricity utilities and relief for the broader community from rising inflation. It is important that Pacific Island governments now exercise fiscal conservatism. This would provide some fiscal space to respond to any downturn in economic growth or external shocks (ADB 2008).

In PNG, the end of the commodity price boom calls for an early winding back of expectations for new government initiatives and rising government expenditure.

Recent Land Act reforms could enhance and cushion the effects of economic vulnerability in PNG. Notably 85% of the people (mainly subsistence farmers) own 97% of the land. These amendments to the land legislation enable the delineation and registration of customary land. They further enable owner or owner groups by mutual agreement to further delineate their land to define areas available for lease to small holders or as appropriate large scale

If this trend grows in acceptance and implementation, Fairhead, Kuizi and Yala (2009) concluded that agriculture particularly, then manufacturing and services will be the big areas of GDP expansion between 2010 and 2020 and not necessarily Liquid Natural Gas and minerals which have been predicted from other proponents in industry. This is sure to raise lively debate. Whatever the outcome, it could be a win-win for Papua New Guinea if well managed. Refer to Figure 15.

Figure 15 presents the outcome of economic modelling predictions where land reform has released customary land for sustainable development (Fairhead, Kuizi and Yala 2009).
b) Ease monetary policy
The downside risk of slowing economic activity is rising as external conditions deteriorate and inflation starts to moderate. This shift may justify a gradual easing of the monetary policy stance, for example, through a reduction in interest rates. Because PNG has its own currency it has a capacity to operate monetary policy.

However, inflation pressures driven by past increases in world oil and food prices are still a concern. Policy makers need to strike a careful balance when considering the appropriate rate in which to ease monetary policy settings. PNG has sufficient levels of international reserves to accommodate of relaxing of monetary policy (ADB 2008).

c) Renew banking surveillance
Although relatively well insulated from the direct effects of the banking crisis, Pacific banks may be affected indirectly through possible reductions in liquidity and deterioration in loan quality as economic growth slows. Local regulators and financial supervisors, backed up by offshore supervision of the overseas banks that have set up operations in the Pacific, should maintain very close contact with the region’s financial institutions as the situation develops. Central banks should carefully monitor liquidity conditions and take action to inject further liquidity where necessary.

Once the immediate global financial crisis subsides, there are likely to be international moves toward a macroprudential and regulatory architecture that is more integrated in its approach and uniform in standards, and that involves closer and more effective cross-border coordination and collaboration among supervisors, regulators, and central banks (ADB 2008).

d) Revisit the management of offshore investments
A mix of stocks, bonds and property investments in a range of international markets (developed and developing) provides a “balanced” portfolio and remains a sensible strategy for a long-term fund, despite the current financial shock. Recent events should not deter Papua New Guinea from carrying the risks inherent in investments in offshore stock.

A regional approach could offer benefits from extra bargaining power and an associated greater exposure to up-to-date portfolio management techniques and systems. A regional approach would also help ensure that the investment funds are managed by appropriately trained and experienced staff. The result is likely to be improved strategies to achieve the portfolio mix that suits PNG to avoid investments in unnecessarily risky investments, and to time the purchase and sale of assets to maximize fund returns (ADB 2008).

e) Reinvigorate structural reform
Structural reform provides the PNG economy and other Pacific Island economies with the best path to achieving sustainable economic growth. Recent events reinforce the importance of structural reform, as it provides a means of lessening the downside of the global downturn. The priority is to address constraints to private sector-led economic growth in the region (ADB 2008).
It is important to keep in mind, that prices of oil and food are projected to remain at historically high levels (even though below recent peaks) and be a source of ongoing pressure on living standards and economic prospects. Structural reform that helps the adjustment to relatively high oil and food prices remains important.

Efforts to improve rural productivity are the key to improved livelihoods for the bulk of the population of the agriculture-based economies. Structural reform can include actions to improve transport and communication and other basic services including agriculture extension in PNG. Such actions will lower costs and help keep net returns to agriculture and fishing as high as possible even though prices are falling (ADB 2008).

For economic growth through tourism, structural reform can include continued efforts to lower transport and communications costs. It is also important to help build the human skills needed by the industry. In transport and communication, the key is to create a more enabling environment for higher private investment. The benefit of deregulation has already been shown by the expansion in mobile telecommunication services and fall in prices that followed the entry of private providers. Structural reforms strengthen the economy’s resilience to external events and also remain an important path to tourism-led growth (ADB 2008).

Many of these initiatives require public sector reform that focus governments on core activities and free up budget resources (e.g. for investment in infrastructure and maintenance). The imperative to pursue efforts to improve the enabling environment for the private sector is also raised by the global financial crisis. Sensible actions in these areas have been mapped out for PNG; implementation has, however, often fallen short of plans. Ways of overcoming the slow rate of change are needed if PNG to minimize the adverse impact of recent events (ADB 2008).

9.2 Concluding Remarks – a sustainable future

Principles for a sustainable society

Court (1990) suggested the following principles could assist in clarifying sustainable resource use and maintaining ecologically viable systems and their survival.

1. Sustainable development must grow from within a society. It cannot be superimposed from outside. Cultural integrity needs to be maintained.
2. It must maintain and restore biodiversity and employ sustainable resource use practices.
3. It must, with equity, provide basic necessities of life and secure living conditions.
4. It must foster self-reliance and responsible local control over resources.
5. It needs to be peaceful.
6. While it must allow for mistakes, these should not endanger the integrity of the ecosystem and its resource base.

Understanding Environmental Systems and integrating both ecological and economic processes

- The above principles need to be linked to research and management actions that address and embody the generic nature of sustainable resource management problems.
These problems are essentially systems problems. Aspects of behaviour are complex and unpredictable. Causes are multiple. **Interdisciplinary and integrated modes of inquiry are needed for understanding.**

They are fundamentally non-linear in causation. They demonstrate multi-stable states and discontinuous behaviour in time and space. **Here useful concepts come from non-linear dynamics and theories of complex systems.**

They are increasingly caused by slow changes reflecting accumulations of human influences on landscapes and seascapes. They can cause sudden changes in environmental variables affecting sustainability. **Analyses should focus on interactions between slow phenomena and fast ones and monitoring should focus on long to medium term changes in key structural variables of fluctuating environments.**

Spatial connections are intensifying so that problems are now fundamentally cross-scale in space and time. **The science needed is not only interdisciplinary but needs to be cross-scale. Hierarchical theory, spatial dynamics, event models network analyses remote sensing imagery, geographical information systems, parallel processing, can assist in opening new ways to handle effectively - analyses of more than two orders of magnitude.**

We have only usually been able to achieve satisfactorily the latter up to the present. We must improve on this performance.

The economical and sociological components, as well as the natural science components, of these problems have an evolutionary character. **The focus for natural science components relates to the dynamics of environmental and ecological change and is evolutionary, the best approach for economics and organizational theory is learning and innovation; and for policies - the best is adaptive designs that yield understanding as well as products (Hynes 1994).**

The complexities of biosphere and human habitat sustainability issues are deliberately reinforced here. It is of no advantage to close this address without a deep recognition of this fact. We need to think of relationships here in a new way. In the past there has been a tendency to place economy as the major driver. So in a three concentric circle framework Economy would occupy the larger outer circle, Society the middle circle and Environment the inner circle. I suggest this should be reversed with Environment occupying the outer larger circle and Economy occupying the inner circle. Sustainable resource use practices are components of a critical process that is concerned with the future survivorship of ecosystems and consequently the future survival of human life as we presently experience it. This is why we rapidly need to reprioritize how we treat our planet for our generations to come. We have little time but all of our human spirit and collective minds and bodies will need to address this challenge and win a future for our species.

To accelerate the development of the essential expertise required, I would like to suggest that a new science of complex analysis be created: A discipline that we might name *Ecologics*. Here economics and ecology are integrated as never before in the service of humankind and the biosphere.

Climate change threatens the whole human family (*Ban Ki-moon, UNDP Development Report 2007/2008*). Material growth using finite resources as if they have no limits – further