

**Policy makers' knowledge and practices of intellectual
property rights on Indigenous Knowledge Systems in
Botswana**

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DECLARATION

I declare that this dissertation handed herein with for the degree of Med: Science and Technology Education at the University of Pretoria is my own work except where I have fully documented references to others, and has not been submitted previously for a degree or examination before at this, or any other university

Oabona Clifford Monngakgotla

Date



DEDICATION

To Sekgabo, Manuel and Letso

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Acronyms

ARIPO	African Regional Intellectual Property Organisation
BEDIA	Botswana Export for Development Investment Agency
BNRST	Botswana National Research, Science and Technology
BOTEC	Botswana Technology Centre
BTA	Botswana Telecommunications Authority
Btv	Botswana Television
CBNRM	Community Based Natural Resource Management
D&T	Design and Technology
DFRR	Department of Forestry and Range Resources
DID	Department for International Development
GDP	Gross Domestic Product
GE	Global Environment Fund
IKS	Indigenous Knowledge Systems
IP	Intellectual Property
IPO	Intellectual Property Office
IPR	Intellectual Property Rights
IVP	Indigenous Vegetation Project
MCST	Ministry of Communication, Science and Technology
NDETEBO ...	National Design and Technology Exhibition of Botswana
NDP (9)	National Development Plan (9)
NFRTC	National Food Research Technology Centre

NGO	Non-Governmental Organisation
PCT	Patent Corporation Treaty
PS	Postal Services
R&D	Research and Development
RIIC	Rural Industries Innovation Centre
RIPCO	Rural Industry Promotion Company
RST	Research, Science and Technology
S&T	Science and Technology
SADC	Southern African Development Community
SARIMA	South African Research, Innovation Management Association
T&I	Trade and Industry
TK	Traditional Knowledge
USA	United States of America
USSR	Union of Soviet Socialist Republic
WIPO	World Intellectual Property Organisation
UNDP	United Nations Development Programme

Summary

In the wake of diversifying economy through science and technology, the government of Botswana is particularly inclined to Intellectual Property Rights (IPR) and Indigenous Knowledge Systems (IKS). IPR in its nature of advocating exclusive rights by the creator comes into direct conflict with the practice and understanding of IKS as community property, and a shared resource. To date, there is very little research work that explores policymakers' knowledge about IPR and IKS in developing countries. Botswana, a developing country is yet to benefit from this type of research.

This research investigated policymakers' knowledge and practices of IPR on IKS in Botswana. The focus was on policymakers' knowledge and practices, interaction with policy, and how their actions could be understood and explained. The study was conducted in four government departments, and one non-governmental organisation. Semi-structured interviews and document analysis were used to collect data. The findings of the study show that there is general lack of understanding about IPR in the public domain. Policymakers nonetheless know quite substantially about IPR and very little about IKS. This position puts indigenous knowledge on the periphery, and on the brink of being swallowed by other technologies.

Moreover, the study uncovered evidence that the IPR and IKS activities are fragmented and policymakers treat each other with a great deal of suspicion and misunderstanding, hence affecting successful implementation of policy and projects particularly between two units in the study- the ministry of Communication, Science and Technology and the ministry of Trade and Industry.

The study concludes by arguing that policymakers still require a great deal of assistance to really make sense of their practice. A lot of teaching and learning about policy is necessary to encourage broader participation in

science policymaking in the context of a developing country like Botswana.



Keywords

Cognitive process

Coordination

Domain knowledge

Indigenous Knowledge Systems

Intellectual Property Rights

Policy Implementation

Prior knowledge

Science and Technology

Situated learning

Working knowledge

Definition of Terms

Collateral learning: learning in context of potentially conflicting knowledge

Decision making: extracting relevant information, applying general values in specific setting.

Domain knowledge: content knowledge necessary for proficiency in a given intellectual domain

Epistemological beliefs: beliefs about the nature of knowledge

Indigenous Knowledge Systems: unique traditional knowledge developed around specific conditions and being part of a community.

Intellectual Property Rights: sole rights given to originator over creative ideas to benefit directly from the creation

Knowledge: the psychological result of perception and learning and reasoning

Operationalisation: ability to apply a specified decision rule

Prior knowledge: knowledge influenced by one's background and likely to influence decisions taken

Procedural knowledge: knowledge to do something

Schema: a cognitive construct that permits treatment of multiple elements of information as a single element categorised according to the way in which it

will be used

Sense making: encoding information to construct meaning

Traditional knowledge: ideas, practices, uses and inventions associated or not to biological diversity, created by local communities in a traditional and informal manner as an answer to the challenges to physical and cultural environment

WIPO: a United Nations body responsible for the promotion of the protection of intellectual Property Rights in the world.

Working memory: a temporary store of limited capacity for recently obtained information

Chapter One

1. Introduction

Botswana's pursuit to diversify her economy is propelled largely by the realisation that dependence on minerals alone forms a narrow economic base. The diversification challenge has also been driven by issues of sustainable use of natural resources, especially that there is evidence of a decline in species, and land degradation (IVP Annual Report, 2003:9). It is in this context that Botswana's first science and technology policy was approved by parliament in 1998. The Science and Technology policy outlines some objectives and strategies. One of the core strategies calls for the introduction of science and technology in all education programmes (Science and Technology Policy, 1998).

Indigenous Knowledge and Technology Systems have been identified as priority areas, amongst others, in the Botswana National Research, Science and Technology Plan (Draft, 2005). The 2005 draft, however, hastens to acknowledge a persistent problem in Botswana's weakness in the intellectual property domain and specifically as far as IP protection is concerned; hence the need for redress. This emphasis on Indigenous Knowledge and Intellectual Property protection in respect of the country's science policy comes at a time when the fields of Indigenous Knowledge Systems (IKS) and Intellectual Property Rights (IPR) are becoming increasingly more complex and academic.

The proposals for more intellectually demanding science policy making required in IPR regarding IKS, and the realisation that the current IPR ideals require fundamental changes in the current IPR laws, puts policy makers in a dilemma. The dilemma results from the opposing pulls that go with intellectual property, through application of new knowledge and technology,

and the preservation of cultural identity that holds the society together through Indigenous Knowledge over many years. There is a need to set standards that represent new directions in the science policymaking process. Research abounds on the topic of science education and policy, much of it however, focuses on teachers and learners and not on policy makers. This is in spite of consistent findings that policy makers play a key role in the success or failure of the policy (Berman & McLaughlin, 1978; Datnow, Hubbard, & Mehan, 2002). There has been very little focus given to research on the role of policy makers in IPR and IKS. Little is therefore known about science policy makers, particularly how their practices and knowledge influence understanding, interpretation, interaction and sense-making of IPR and IKS especially in Botswana.

Intellectual Property Rights are the rights given to persons over creative ideas of the human mind. IPR usually offer the creator an exclusive right over the use of his/her creation, and more importantly, prohibit others from unauthorised use or sale of the property for a certain period (Robbani, 2005).

Indigenous Knowledge on the other hand, refers to unique traditional, local knowledge existing and developed around specific conditions and being part of a community, a tribe, group of people or clan (Onwu and Mosimege, 2004). Indigenous Knowledge Systems include management of natural environment, learning systems, local classifications, human health, soil and agriculture. These knowledge systems are cumulative, and they represent generations of experience, careful observations, trial and error, and are matter of survival to people who generated them (International Development Research Centre: Science for Humanity 2005).

The present study sought to explore the contradictions between these two approaches of preservation and sharing of knowledge in the context of

science policy making in Botswana. The study focuses, in particular, on science policy makers' knowledge and practices, about IPR with respect to IKS. The research studied policy makers' knowledge and practices about Intellectual Property Rights (IPR) because: first; policy makers play an important role in the success and failure of science policy, and secondly because Intellectual Property Rights and Indigenous Knowledge have become critical areas of science and technology education in Botswana and elsewhere.

1.1 Background

The ministries of Communication, Science and Technology; Health; Environment, Wildlife and Tourism; Trade and Industry and one non-governmental organisation known as Dingaka tsa Setso Association (Traditional Healers), are all recognised as important stakeholders, and policy makers on issues of Intellectual Property Rights and Indigenous Knowledge in Botswana. All these departments bring into the processes of policy making their own understanding of Intellectual Property and deal with it from different points of view and levels of operation.

The ministry of Communication, Science and Technology is the primary player in the science and technology activities of the country, and this embraces Indigenous Knowledge and Intellectual Property issues. The ministry has a dedicated department of Intellectual Property that plays an "advisory role" in intellectual property and rights.

The ministry of Health is interested in enlisting the services of traditional healers into the Health mainstream, particularly on research that relates to indigenous medicine and herbs. The ministry of Health, through its Public Health Promotion department, is working towards harmonising the relationship between modern and traditional health practitioners. Public

Health Promotion is 'courting' a reciprocal relationship between the two since are all working towards ensuring health and safety of people (National Consultative workshop on Traditional Health Practice Bill, 2004: 7).

The ministry of Environment, Wildlife and Tourism is responsible for, among other things, issuing of research permits in national parks and game reserves, and other places that fall under the department's jurisdiction. In response to the use of natural resources, the ministry has established a unit called the Department of Forestry and Range Resources. This new department has been engaged in activities that encourage communities to manage and use natural resources in a sustainable way.

The Ministry of Trade and Industry, on the other hand, has a unit in the department of Registrar of Companies, which is responsible for all Intellectual Property. The Ministry of Trade and Industry, through the Intellectual Property office registers trade marks, copyrights, patents and other forms of Intellectual Property. This department is also responsible for legislation on Intellectual Property, and are currently working on the amendment of the Intellectual Property legislation because they have realised that some other aspects of intellectual property have been left out. These include Indigenous Knowledge System, folklore, and genetic resource.

Dingaka tsa Setso association is a non-governmental organisation (NGO) formed in 1999 as a result of the realisation that indigenous medicines and health practice are on the brink of fading into oblivion. The association's major role includes resuscitating indigenous practices and to improve their reputation. The practice, according to the association has lately been littered with fraudsters, and 'fly by night' traditional healers. These activities have been seen to tarnish the image of traditional healers, and thus perpetuating stereotypic thinking that traditional health practice is out of date.

With the Botswana Science and Technology policy (1998) proposal for more intellectually demanding science policy making, policy makers in Botswana face a major challenge. The policymakers are in a dilemma as a result of IPR with respect to indigenous knowledge systems; to allow for change while providing for local autonomy. Their role is made more difficult by the internal and cross-border researchers in Botswana, who have shown overwhelming interest in the development of indigenous practices in the country. Like many other developing countries, Botswana often lacks the 'bargaining' power and is usually relegated to a position of a 'new comer' on IPR matters about IKS (Botswana National Research, Science and Technology Plan (2005 Draft)). Ironically, this powerlessness occurs in spite of the fact that the developing countries have 'control' of much of this knowledge.

1.2 Rationale

Nothing more than the complexities of Intellectual Property Rights on Indigenous Knowledge System has evoked interest to want to study this area. Many legal and practical problems relating to protection of IPR are yet to be fully understood and addressed. IPR is primarily business oriented and focuses on the nature and extent of the rights available to protect intellectual property. In Botswana, I am primarily a design and technology teacher at a teacher training college. Our students are often involved in different types of creativity and technological products and processes. These are protectable. Exposure to the forms of IP protection that are designed to protect each type of intellectual creation, and the effectiveness of the protection available, is important to students as much as it is to policy makers and implementers.

Design and technology (D&T) students are expected to design and make technological products as part of their formal assessment. The artefacts serve to demonstrate students' ability to put together all skills and knowledge

acquired throughout their learning process. Most students put a lot of effort and commitment to these products and assignments. They always think they will be allowed to take the products home when they finish. Teachers alike have 'felt' the products belonged to students and may take them once assessment has been done. However, the College's position (where I work) has always been that the products remain school property because they have been funded by the College.

Funding of students' work seems to give the College custodianship, which is sometimes confused with 'ownership'. As a design and technology teacher I have battled to understand this position of 'ownership' between the collective and private (student) ownership. Is the custodianship concerned with commercial exploitation, the commercial value as revenue generated is much greater than the knowledge or is the custodianship based on moral imperative to protect the artefact? It is in this context that the question of 'rights' arise. The question has always been; who has rights and how do teachers deal with the issue of IPR, even while the country's policy makers are themselves struggling with the issue? I was therefore interested to explore how policymakers in Botswana understood and dealt with some of the issues relating to IPR, especially with respect to IKS.

1.3 Research Questions

To explore these issues, the present study focussed on the following critical questions;

1. What knowledge do policy makers in Botswana have about IPR with respect to IKS?
 - a. What ideas do policy makers construct from the recent debates about IPR and IKS?

- b. How did they acquire the knowledge about IPR and IKS?

2. How is the knowledge used or not used in their day-to-day interaction with policy and legislation on IPR and IKS? That is, what are the policymakers' practices with respect to IPR and IKS?

3. How can the policy makers' actions regarding policy on IPR and IKS be understood and explained?

1.4 Significance of the study

Intellectual property issues as component of science and policy making in Botswana and in many other developing countries is often fragmented and compartmentalised. IP issues relate little to education in the country. The Botswana Science and Technology policy (1998) acknowledges this as a problem. For many years, the knowledge about IPR and IKS was confined and limited to selected groups of government departments and agencies dealing with patents, copyrights, trade marks, and other registrations. This was possibly due to lack of knowledge regarding the extent and cross-cutting nature of science.

A new level of awareness about the impact of IPR has emerged in a lot of developing countries. The new wave of awareness has illuminated the participation of other stakeholders in education, public health, environment, research and development, trade and other equally important spheres. This interdepartmental relation has nurtured and given rise to convergence and sharing of opinions by those involved in the partnership. The convergence of opinions has 'unearthed' an important notion that, science policy-making regarding IPR and IKS, should be the result of a coordination of efforts across many government departments.

Shen (2005) argues that many developing countries have inherited the IPR laws from their former colonial rulers, while some others have established their IP legislative system in the face of international pressure. In either case, a common problem is that the enforcement mechanisms do not function well, and the causes for this are diverse including the lack of expertise in academic institutions and a serious shortage of legal professionals within the national litigation system; and more important, low awareness and understanding of IP even among key stakeholders and the general public.

The lack of awareness on IP is trivialised as reference to general public and key stakeholders down plays the acute lack of research on policy makers and their role. Policy makers have been consistently found to play key role in the success or failure of policy, and yet there has been very little focus in terms of research on the role of policy makers especially the kind of research that uses the cognitive frame (Spillane & Callahan, 2000). Developing countries are working to develop IP regimes but their efforts are undermined continually by the generally weak IP systems. While Botswana, like many other developing countries has IP laws on their statute book; that is one thing, implementing them is another.

The study uses the cognitive frame to explore policy makers' knowledge and practices with regards to IPR and IKS in the context of science policy making in Botswana. The cognitive frame enabled this study to focus on how policy makers understand intellectual property rights, how they handle complex situations created between IPR and IKS, and execute certain critical decisions; and also how they have benefited from current IP debates as far as legislation is concerned. The cognitive frame helped draw attention to the importance of prior knowledge and how it is important in designing and implementing policy. Through this study, it is hoped that policy makers will better understand the processes by which science policy can be developed, and implemented, and how the government can better support them. It will also open up a relatively unexplored area in research about science policy makers and policymaking, thereby contributing to academic debates regarding IP policy and science education.

1.5 Organisation of the mini-thesis

Chapter One presents the research problem, and identifies the conflict that exists between intellectual property rights and indigenous knowledge

systems. It also provides the background, the rationale, and the significance of the study. This chapter presents a more global picture of intellectual property rights and then narrows down to a more specific situation of Botswana, and how the science and technology policy is constructed by policymakers in the country.

Chapter Two offers insights into different bodies of literature I have reviewed for the study, and how the literature review has been used to hold the study together. The literature in the chapter builds a theoretical framework in which the frames of practices and knowledge are used to examine policy makers' understanding of intellectual property rights and indigenous knowledge systems.

Chapter Three outlines the actual process of data collection for the study and the instruments used in the research.

Chapter Four presents the actual data and the analysis. In this chapter different facets of the study are presented using critical research questions of the study. These research questions have helped to cluster questions and answers according to how data interpretation was done in the study.

Chapter Five presents a review of the major findings, my interpretations, conclusions, limitations and suggestions and recommendations for further research.

Chapter Two

2. Literature Review

2.1 Introduction

Drawing on the Cognitive theory enabled me to gain insights into the way policy makers process information, solve problems, make decisions and expand their knowledge (Eloff & Ebersson, 2004:14). This study is generally directed by the research questions on what policy makers' knowledge and practices are, about Intellectual Property rights and Indigenous knowledge Systems. Also the study is directed to how the policy makers' knowledge is used or not used in the day-to-day interaction with policy and legislation, and how their actions regarding policy and legislation can be understood and explained.

2.2 Policy

The major role of policy and policy making in general is to, among others, define general goals and acceptable procedures and actions of various stakeholders and actors affected by the policy. Taylor et al. (1997: 35) define policy as, "whatever governments choose to do, or not do. However, policy intentions are not often clear since they are largely political and result from some fine balancing act. There are therefore serious problems regarding the implementation and success of policies and these problems have put policy makers under the spotlight. This literature review discusses some barriers found to cause policy implementation failure, and address the issue of how and to whom policies are communicated, and opposition to policy implementation. Some explanations for implementation failure focus on the

inability of 'principals' to formulate clear policy outcomes or to adequately supervise the implementation of their goals (Spillane, Reimer & Reiser, 2002).

Spillane, Reimer & Reiser (2002) posit that the behaviours that a policy targets for change and the extent of the changes sought affect the likelihood of successful implementation. Policies that press for incremental changes are more likely to prompt a positive response and be implemented. The behaviours that a policy targets for change and the degree of the changes expected often affect the likelihood of successful implementation. Opposition to policy implementation is most often examined as part of a political process, of groups, 'winning' or 'losing' a struggle to implement policies that will most benefit them (Wolf, Lang, Mount & Prouty, 1999).

Sabatier and Mazmanian (1983) further suggest that when policy directives pair a clear implementation goal with tractable procedures (i.e., policies that have a valid theory connecting behavioural change to outcome and an effective and efficient way to measure change in local behaviour), they are more likely to be implemented, in part because in such cases the principals can monitor their 'agents' behaviour more effectively and efficiently.

Mazmanian & Sabatier, (1981); Pressman & Wildavsky, (1974); Weatherly & Lipsky, (1977), have all identified the problem of implementation failure as largely a result of the inability of the state policy makers to craft clear and consistent directives with respect to the behaviours desired from implementing agents and agencies undermining local implementation.

There are many other reasons studied that are believed to lead to implementation failure, including social problems, the governance system and the organisational arrangements in which the policy must operate and then the will or capacity of the people charged with responsibility of implementing the policy.

All these explanations according to Spillane, Reiser and Reimer (2002) are premised on the principal-agent and rational choice theory. This theory is important here because the policy maker requires the assistance of stakeholders to achieve desired outcomes. Many studies have concluded that the key ingredient to successful policy implementation is the participation of a wide range of stakeholders in the policy formulation process. The implementers' decisions are guided by rational choice ideas in which utility maximisation are the guiding principle for human behaviour. This type of consideration given to policy is crucial because both are motivated by self interest; hence appropriate incentives and monitoring systems are essential.

The claim by Pressman & Wildavsky (1974), however points to the importance of understanding and taking cognisance of the policy maker's cognition to process information. Information processing is a complex process because of the influences involved. For instance, crafting clear and consistent clear directives depends on policy maker's ability to notice and interpret stimuli or policy, and how prior knowledge, beliefs, and experiences influence construction of new knowledge and new understanding. Policy makers need not assume conversely that implementing agents understand what is expected of them, because of the complexity of human sense-making. Sense making is an active process of comprehension of interpretation that draws on the individual's rich knowledge base of understandings, beliefs, and attitudes (Bryan & Atwater, 2002). Differences in interpretation all the same or in acting on understandings are a necessary aspect of the human understanding process.

2.3 Policy and Implementation

Studies about beliefs and how they influence decisions policy makers carry, points to the importance of noticing the existence of structures that can be

very resistant to change, and an individual's own experiences that are more reliant on reasoning. Policy-makers and any other person's experiences carry more weight in judgement and decision making than does abstract information (Nisbett & Ross, 1980). Policies that are made and never taken to important stakeholders on their own lack motivation: policies with a strong motivation affect the way reasoning is carried out.

This leads people to pay more attention to information consistent with the desired outcome thus enabling the same people to discount inconsistent information (Klayman & Ha, 1987). For instance, if policy makers present a problematic situation such as a need to change the way local communities share information with outsiders, local communities are likely to focus on value of information and realise why they should preserve the information. Once policy makers achieve this, motivation toward an outcome can also affect the way local communities assess their reasoning, and then commit more effort to understanding and evaluating undesirable and short termed benefits.

In addition to popular perceptions that policy implementation failure could be due to implementing agents' misinterpretations, and/or agents sabotaging or making modifications to the policy, there are other indications that policy implementation failure occurs because of a communication breakdown. Policy implementers rarely encounter policy proposals as "neat packages" assembled and disseminated by state policy makers (Spillane & Callahan, 2002).

Policy makers rather encounter policy documents and ideas in different forums and formats including meetings and professional publications. The choice of how the policy is communicated is not influenced by who is to be reached, but also by the trade-offs associated with each approach to communication (Wolf et al, 1999). Important to note in the communication is

the fact that the documents are received by all, also whether the documents require any level of skill, or that they provide opportunity to questions.

Communication to whom is another important aspect; knowing about existence of a policy irrespective of the contents is important, and often there is a large communication gap (Wolf et al, 1999). Some gaps occur because policy makers decide to limit their communication on a need-to-know basis. They seem to believe the idea that everyone should know about the policy as much as possible is 'wrong', even when such knowledge could lead to greater power or a large share of resources. Policy makers make very little effort toward explaining and publicising policies, explaining purpose of policy or how to implement it. Hence policy understanding is minimal, for instance, the lack of awareness about IP issues in Botswana is one case.

Policy failure in certain instances is due to "resistant bureaucrats" (Spillane, 2002) when policy makers/implementers deliberately do not attend to policy. This situation arises when agents fail to notice or select policy aspects that are consistent with their own interests and agenda, and those that are not are likely to be opposed or modified so that they fit. Other studies have evoked cultural resistance to explain policy implementation failure, and that policy makers are often aware of it.

However it is not clear, according to research why the same policy makers cannot anticipate the resistance due to different perceptions a policy will create. Some researchers (Wolf et al, 1999) speculate that failure to anticipate could be that policy makers focus upon design of the policy and the politics of its creation, and do not see its implementation as part of their role. Another speculation they claim might also be that while the possibility of resistance is acknowledged, it is not given enough priority to commit resources necessary to overcome it.

The nature of communication in most developing countries is generated from the centre or from a particular ministry or from a top down approach. Developing countries mainly inherited the approach from their colonial masters. This policy approach advocate limited contribution from affected stakeholders. The 'affected' stakeholders only participate at selected stages of policy process. Weible, Sabatier, & Lubell (2004) posit that the approach is ineffective, limited by scientific uncertainty, and does not address the concerns of the affected stakeholders.

2.4 Sense-making

Knowledge according to Anderson & Krathwol (2001) is a cognitive process that has four dimensions; factual knowledge, conceptual, procedural and meta-cognitive knowledge. Factual knowledge is perceived to be discrete, includes terminology and specific details of elements. Conceptual knowledge deal with theories, principles and classification, whilst procedural knowledge on the other hand is knowledge of to do something, consisting of technique, method and procedure, and meta-cognitive knowledge refer to the awareness of one's own knowledge. Policy makers are in a different position from that of local communities because they have a responsibility of developing policies that guide community activities. As policy makers are more likely to be influenced by their backgrounds (Brown & Campione, 1990) in how and what they understand from a policy proposal, they (policy makers) may make sense of policy differently from local community.

Sense-making is fraught with ambiguity and difficulties (Lindblom, and Cohen, 1977) and as important in making inferences or relying on heuristics that make cognition powerful, it can also lead to biases and errors in understanding and decision making. Sense making nonetheless in policy is

essential and need to be understood as not just encoding information. It focuses on the active attempt to bring policy makers' past organisation of knowledge and beliefs to bear in the construction of meaning from the present stimuli or current policy document. Mandler (1984); Rumelhart (1980) contend that all acts of understanding require accessing prior knowledge and applying it to guide the noticing, framing, and connecting of new ideas and events to what is already encoded in memory.

Policy makers' prior knowledge and experience, including tacitly held expectations and beliefs about how the policy works, serves as a lens influencing what the policy maker notices in the environment and how the stimuli that are noticed are processed, encoded, organised, and subsequently interpreted.

Making sense of information and assimilating new experiences is influenced by prior knowledge, the social context within which policy makers work, and the nature of their connections to the policy intentions. The way policy makers take action is based on how they notice or select information from the environment, make meaning of that information, and then act on those interpretations, developing culture, social structures, and routines over time (Porac et. al. 1989). Prior knowledge, beliefs and experiences play an important role in shaping policy makers' understanding of policy and the way they relate with it. Studies by Spillane et al (2002) have underscored the importance of understanding that policy makers do not just choose to respond to policy, they also must understand themselves what they are responding to.

Interpretation is situated and according to Spillane (2000) policy makers' sense-making is situated in the historical and institutional context of where the policy is constructed; the social and material contexts may enable and

constrain human sense-making (Brown et al., 1989; Suchman, 1988). Situation is a multifaceted construct that includes everything from national and professional identities to where one works. In this organisational plethora, implementing agents encounter policy as a complex web of organisational structures, professional affiliations, social networks, and traditions. As mentioned elsewhere in the text, differences in interpretation are common and part of human understanding processes: this then suggests that our rich or not rich schemata are situated in our experiences. Hence when one policy maker sees integration of different approaches and activities to achieve policy targets as necessary and appropriate, another policy maker with schemata not so diverse sees that as sending a melange of mixed signals.

This brings in the 'institutional theory' that suggests that thinking and actions are situated in institutional sectors that guide the norms, rules and definitions of the policy environment either constraining or enabling (DiMaggio & Powell, 1991). Where actions are constrained due to resources policy makers are often forced to simplify their policies through policy measures that target as large a section of the population as possible (Department for International Development, 1998[DID]). To do this, policy makers tend to demand aggregated information about the target, and this contributes to a perception of the target at the policy level as a large, undifferentiated mass. Policy makers tend to focus on organisational dominance than particular individual responses or activities that may be unique to individual organisations.

What policy makers fail to notice from this perception is that it can seriously compromise their ability to address the diverse and often very specific needs of different groups in the target. In return and not unexpected is the translation of policy at implementation level that often leaves little room for adjustment to local variations. This in most instances is contrary to initial

intent as the policy position and policy makers run the risk of ignoring how social actors or implementers make sense of, and shape their situations (Giddens, 1984; Weick, 1995).

2.5 Domain Knowledge and Experience

Sense-making as well involves mechanism of accessing and applying knowledge structures. For policy makers there is need to see the salient concrete features of a situation and the superficial aspects, this is important because people often rely on superficial similarities when accessing related information from memory, even when knowledge structures connected through deeper principles might be relevant (Gentner, Ratterman, & Forbus, 1993). This analysis is important because it relates to domain knowledge where policy maker build knowledge structures that encompass more diverse cases and are organised around deeper principles. Experts in policy making can see deeper meaningful patterns in problem situations that may not be apparent to novices (Chase & Simon, 1980).

According to Spillane (2002) policy makers as experts focus their attention on features of stimuli that are more significant conceptually; i.e. they can see situations in terms of the “big ideas” and core principles of a specific domain. According to Metcalfe (1994) effective policymaking depends on how policy makers learn and adapt from experiences with existing practices.

In this approach policy makers are aware that individuals consider knowledge as personal though it may have been in another situation, it is not a model that exists as a panacea. At the same time where policy makers want to gain insight into alternatives, necessary for success of policy, they may adopt a dualistic position. In this position policy makers will concede that though there could be absolute truth in certain things, they may not be accepted with

certainty. An adaptive policy maker will work with models as a guide but will be able to apply personal understanding of the policy making process that will be reflective and commensurate with the existing structure. The policy maker will attach certain commitment to particular beliefs but in a flexible manner.

As a result, experts are less likely to be distracted by similarities that are only superficial because they can access situations connected by deeper principles. The implication in this observation therefore is that policy makers with less expertise in the policy making process may rely more on superficial similarity, assuming that two situations are similar in important principled ways because they are similar in salient superficial ways (Spillane et al 2000). For instance a policy maker who transferred from a department to another may not distinguish between two scenarios of for instance, “Indigenous Vegetation Project” in the former department and the current department and continue to treat the project similar to the way the project was treated in the former department.

2.6 Policy makers and policy language

For purposes of implementation and functionality of a policy document language as medium of communication is used to guide interpretation. However research has shown multiple interpretations of language including policy makers, where a single descriptor would be understood differently. Spillane and Callahan (2000) found that language used by district policy makers to describe their understanding of and efforts to respond to the standards were not precise indicators of the changes they understood standards to be suggesting about science education.

In this situation, according to Spillane and Callahan (2000), policy makers draw surface comparisons with structural analogies between the ideas they

attended to in the science standards and their existing knowledge and experiences. The study found that interpretation of surface instead of structural analogies by policy makers missed the core epistemological and pedagogical intent of the standards. Hill (2001) elaborates on what he calls “a meeting place of policy and actor cognition”. This refers to language, and standards that exist at a level above that of the local setting and thus are limited in the message they are to relay, leaving policy implementers with the difficult task of interpretation. Any and every domain area may have its language that may not easily carry the same meaning in another domain area.

Specific words that comprise State standards often hold specialised meanings within the policy, and these meanings often do not meet. If for instance the Ministry of Communication, Science and Technology developed its plan using words like “indigenous”, “intellectual property”, and “piracy” to define certain policy concepts that must be observed by all stakeholders, only to find that the stakeholders do not have access to the vocabulary, instead the stakeholders have their own like “veldt products”, “traditional”, and “communal” respectively, then there are bound to be more problems as a result of language than policy intent. Effectively therefore (Hill, 2001) lack of common professional language threatens to weaken the systemic policy process.

2.7 Working knowledge and Interaction (importance)

Coburn, (2005) in a study exploring teacher sense-making, claims that the cognitive approach through sense-making theory explains how teachers come to understand and enact instructional policy. The study reports that sense-making is influenced by prior knowledge, the social context within which they work, and the nature of their connections to the policy reform message.

Action is based on how people notice or select information from the environment, make meaning of that information, and then act on those interpretations, developing culture, social structures, and routines over time (Porac et. al. 1989).

The meaning of information or events in this case, messages about reading are not given but are inherently problematic; individuals and groups must actively construct understandings and interpretations.

Policy makers do so by placing new information into pre-existing cognitive frameworks or working knowledge. Working knowledge is described as the organised body of knowledge that people use spontaneously and routinely in the context of their work. It includes an array of beliefs, assumptions, interests, and experiences that influence the behaviour of individuals at work.

As policy makers and implementers interact with each other, they are provided with a reservoir of individual and collective knowledge to determine what particular policies mean, and how to respond to them. The interactions not only aid sense-making as individuals learn from each other but also aid group interactions that bring insights and perspectives that may not have been evident to individuals or groups (Brown & Campione, 1990; Brown et al., 1989). For instance, when individuals and groups discuss ambiguous situations of the policy with colleagues they are exposed to alternative interpretations of the discussed policy. Social interaction help policy makers and implementers to show tacit opinions, open to discussions, debates, negotiations, and support 'group sense-making' to find inconsistencies and flaws and to resolve them.

2.8 Policy makers' knowledge and practices about IPR and IKS

Many developing countries (Shen, 2005) including Botswana inherited their IP

laws from their former colonial rulers. Colonialism in most countries provided framework for the organised subjugation of cultural, scientific and economic life that ignored indigenous knowledge systems (Higgs, 2002). In the process, people's ways of seeing and acting in the world were heavily impacted. For instance, Botswana has a copyright Act of 1965, developed before Botswana gained her independence in 1966. Some other countries according to Shen (2005) have established their IP legislative system in the face of international pressure.

The case of many developing countries transplanting IPR laws from colonial rulers also illustrate that many developing countries for most of their history have not exercised a meaningful sovereignty over the setting of IPR standards.

Developing countries therefore negotiate from a position of relative weakness. The difficulty being that they are "second comers" in a world that has been shaped by the "first comers" (Report on IPR, 2002). This relationship of 1st and 2nd comers between developed and developing countries' in IPR issues impacts on positions policy makers take or adopt. Policy makers from the developing countries may be made passive or take any other positions less favourable to the position of a developing country. The position is usually from a narrow 'technical' perspective that does not take into consideration the wider development dimension of the IPR issues under discussion, particularly, into other important public policy objectives.

This position of negotiating from a 2nd comer is more likely to have a bearing on the policy maker's ability to make decisions. Decision making skills include extracting relevant information, applying general values in specific settings, and integrating pieces with a coherent whole (Parker & Fischhoff, 2005). The ability to execute these skills account to four fundamental skills: assessing beliefs; assessing values; combining beliefs and values in order to identify

choices; and having a meta-cognitive understanding of one's abilities (Edwards, 1954; Raifa, 1968). Belief assessment involves judging the probabilities of events occurring (or more generally, of statements being true). Value assessment in decision theory is understood to suggest that values are a matter of individual taste. In this perspective, value accuracy cannot be evaluated in terms of external standard, nonetheless understanding social norms is necessary for having values that reflect or reject what others think.

2.9 Conceptual Framework

The interpretive framework used in this study is informed by literature on knowledge and beliefs about science policy, science education and literature on policy implementation failure (Spillane & Callahan, 1999; Spillane, Reimer & Reiser, 2002; Spillane, 2000). The literature review used in this study relied heavily on the cognitive framework to explore how policy makers make sense of policy during implementation, and how the instructional ideas in the policy help both implementers and policy makers.

Cognitive theory is constructivist; it suggests that people use their prior knowledge and experiences to construct new understandings. The frame argues that coming to know involves the reconstruction of existing knowledge rather than passive absorption of knowledge. Sense making is influenced by the social, physical, and cultural contexts of the sense maker (Brown, Collins, and Duguid, 1989; Resnick, 1997).

Constructivism is a theory about knowledge and learning. According to von Glaserfeld (1984), it describes knowledge as inextricably tied to the circumstances in which it is constructed and used. von Glasersfeld further posits that knowledge is like a set of tools which can only be fully understood through good use;

...people who use tools actively rather than passively just acquire, by contrast build an increasingly rich implicit understanding of the world in which they use the tools and of the tools themselves (von Glasersfeld, 1984)

However this rich implicit understanding of the world is varied and multiple, Creswell (2003) posits that the basic generation of meaning is always social, arising in and out of human interaction. Hence, social constructivism; where 'learning' is viewed as occurring within the context of dialogue and social interaction.

The cognitive framework as used in the current scholarship in education (Spillane, 2000) was used to investigate the role of enactor's sense-making in the implementation process.

The investigation, according to Spillane (2000), also underscores the importance of ideas policy implementers make from policy. The ideas constructed by implementers are critical in understanding their enactment of the policy. The cognitive framework provided an important perspective to the implementation process as it enabled us to look at ways that make implementers change their minds in response to policy. Cognitive frame used in other educational studies as well helped contribute to an understanding of the implementation process by revealing the conformist stimulus-response model of the implementation process. According to literature (Spillane, Reimer and Reiser 2002) conformist views often portray policy as a motivation and the choices facing implementers concern whether to change their existing behaviour and implement the policy, ignore it, or work at defeating or manipulating it.

This according to Spillane (2000) is a result of taking policy as a given. This is necessary because implementers must not just appreciate policy as

motivation, but must be able to make sense of the stimulus.

Pressman & Wildavsky (1973) argue for the use of cognitive perspective since it puts emphasis on implementers' interpretation of policy proposals, thereby challenging the conception conformist hold about the stimulus/response theory.

The key areas discussed above helped me examine how policy makers interpreted the current Science and Technology policy in Botswana. How policy makers incorporate departmental policies and activities into the main policy framework, since the Science and Technology (S&T) policy is relatively new to most departments. The cognitive frame thus helped us understand how the current S&T policy presented itself as new schemata in the sense-making process of the policy makers, with a possibility that the learning processes and modes of adoption and adaptation could become conservative (Spillane, 2000).

The use of the cognitive frame allows explanation and understanding of policy makers' experiences.

Individual policy makers and implementers seek understanding of the world in which they live and work and develop subjective meanings directed towards certain objects or things (Brooks & Brooks, 1993). Once these (implementation process, sense-making and importance of existing knowledge and beliefs, and interpretation) are understood and taken cognisance of, at policy making level, then policy makers in return will understand the same processes that implementers will be faced with. Those necessary solutions are in great part constructed by implementers with the assistance and support of policy makers.

Policy makers need to understand that their involvement is not only at policy design in terms of authority, clarity and consistency. Also that, their

knowledge and practices influence what implementers do and do not do. Sense-making enables implementation and implementation is dependent on interpretation. Implementers must make sense of policy meaning in order to decide whether and how to ignore, adapt, or adopt policy recommendations.

The cognitive framework allows for the investigation of knowledge and practices, regarding Intellectual Property Rights and Indigenous Knowledge Systems, by policy makers, as an integral part in the science policy making process in Botswana. Spillane et al (2002) holds the view that policy makers play a vital role in the implementation of policy and that a lot has to be understood in the way prior knowledge and thought processes influence what implementers do and do not do. Overall, the framework is used to explain an emerging pattern characteristic of gravitation to policies and practices that policymakers are familiar with, than with the current policy (Science and Technology). Current scholarship claim that most policies are colonial (Shen, 2005) thereby lack active participation by affected stakeholders. The cognitive frame will give impetus to the recognition of participation of all stakeholders. Participation by all stakeholders is important because it gives convergence and sharing of ideas by those involved an opportunity. Science and Technology by nature is cross-cutting hence science and technology policymaking regarding IPR and IKS should be a result of coordination of efforts across all stakeholders, who naturally bring different experiences and practices.

Chapter Three

3. Research Design and Methods

3.1 Introduction

This chapter describes the research design, approach and data collection techniques used in this study. The selection of subjects and sites, the procedures for data analysis, issues of validity and reliability, limitations of the study. Ethical concerns are also discussed.

3.2 Research Design

The study is an interpretive inquiry based on a multiple case study methodology, in which cases are represented by four government ministries and one non-governmental organisation (traditional healers' association). In this case study the role of being a naturalistic researcher were adopted to observe the cases from a non-participatory, non-aligned position in order to observe scenes more objectively. The case study data was collected using multiple methods of data generation. They included semi-structured interviews and document analysis. These two techniques were informed by the research question mentioned in chapter one.

In this chapter a descriptive account of the research design is provided, details of insights into how the research design developed is provided, a description of the methodology adopted, and reasons for the choice of the case study method and sampling.

3.3 Methodological Approach

3.3.1 Case Study

A type of case study approach was used, often referred to as the instrumental case study (Stake, 1994). Instrumental case study examines a particular case in order to gain insight into an issue or theory. Yin (1994) defines a case study as the study of contemporary phenomena in a real life context. Case study whether used qualitatively or quantitatively, distinguishes itself with a belief that human systems develop a characteristic wholeness or integrity, and are not simply loose collection of traits (Sturman, 1999). A case study researcher according to Sturman (1999) holds that to understand a case, to explain why things happen as they do, and to generalise or predict from a single example, requires an in-depth investigation of the interdependencies of parts and of the patterns that emerge.

In the present case studies, individual policy makers' knowledge and practices on intellectual property and Indigenous knowledge system were investigated using the three research questions in chapter one. These provided insights into how individuals understand the issues in science policy making. Miles and Huberman (1994) define case circumstances as the physical location and the relevant aspect of the social system in which the actors appear, such as departments. The study wanted to find the meaning of phenomena such as events or practices that influenced science policy making, by placing the events and practices within the specific social context of Intellectual Property Rights and Indigenous Knowledge Systems in the different government units.

Case study approach on government departments presented pro-government views. As such, the inclusion of traditional healers association was an attempt to solicit a different view from that of government. Multiple cases were

chosen because they were involved with intellectual property and were all struggling to be seen to move towards the inclusion of indigenous knowledge systems in their activities on the Science and Technology policy of Botswana (1998).

3.3.2 Sampling Procedures

When the research began, the intention was that my sample would comprise nine interviewees in the different departments within the IPR and IKS fraternity in Botswana. This choice of multiple case analyses was premised on the understanding that multiple cases increase the methodological rigour of the study. Miles and Huberman (1994: 29) share these sentiments when they argue that multiple cases 'strengthen the precision, the validity and stability of findings'.

In the same view, evidence from multiple cases is often considered more compelling (Yin, 1994:45). I therefore proceeded to conduct interviews and collect data from all nine interviewees. The interviews were conducted between March and June 2006. At the end of the interviews I was faced with huge volumes of data, against the time available for completion of my study. As I went ahead and compiled the data, I realised that there was a great deal of overlap across the data provided by the different role players.

This voluminous data presented a dilemma of how best to narrate the policymakers' stories without compromising the quality of the report, in the time period available for this dissertation of limited scope. I shared and discussed this with my supervisor who suggested that I should instead focus on two departments with the most variations. This reduction of the number of cases allowed me to increase methodological rigour by focussing more on depth rather than numbers. The sample size of the interviewees was still adequate for me to provide sufficient discussion for conclusions and

recommendations. Cole and Knowles (2004) argue that the formation of relationships is crucial in conducting research, and believe that fewer participants should be used as the goal should be one of depth, rather than breadth.

As a consequence, my presentation of the individual cases relied a lot more on the life history approach. This technique focuses on the ways in which individuals account for and theorise about their actions in the social world over time (Musson, 1998: 10). Life history therefore prioritises individual explanations and interpretations of actions and events, viewing them as lenses through which to access the meaning which individuals attribute to their experience. The technique provided me with an essential source of knowledge about how the discussants experience and make sense of themselves and their work environment, as they were able to speak out on their views and opinions.

For this reason the two departments proved to be suitable choices for sampling. Three respondents within the two departments made up the sample for my report, and provided enough variety of issues between them to enrich the analysis while keeping the study focused and manageable.

In making these decisions, I was then faced with the moral obligation of not disappointing any of my subjects by choosing certain discussants over others. All the discussants had expressed the willingness to be included in the report. Some had even wanted hard copies of the report within three months of publication. How was I to make this choice? Since my original intention had been to base my sample on policy makers' knowledge and practices, I used that as a guide and chose interviewees that had mandatory responsibilities over IPR. The Department of Research, Science and Technology is charged with the responsibility for providing advice on IP to all government

departments handling IP. The Department of Registrar of Companies is charged with the responsibility of registering all IP related activities, and ensuring compliance to all set regulations. These two departments became the focus of my presentation in this report.

3.4. Characteristics of areas of study

3.4.1 Site and Subject Selection

In using the non-probability sampling approach I was aware that the individuals identified would not represent a wider population, but would represent themselves rather (Cohen et al, 2002). I used the purposive sampling method, where I identified the individuals in the sample on the basis of my judgement of their suitability (Cohen et al, 2002). I was aware that purposive sampling has the attribute of convenience, but was not as justifiable as random sampling (Weiss, 1999:164). The purpose of the present study was focused more on gathering preliminary data on the complex phenomenon of science policymaking than presenting representative stories on the phenomenon. Mine was an exploratory study at this stage.

In summary, three interviewees were sampled using the following criteria: Firstly, the department of Research, Science and Technology was by designation divided into Policy and Legislation, and Intellectual Property. Each section is headed by Principal, Research, Science and Technology (Policy) and IP respectively. At Registrar of Companies, IP wing section is headed by Chief Registrar who was able to handle both policy and intellectual property during the interview.

The Ministry of Communication, Science and Technology in which two discussants were interviewed (IP and Policy and legislation), is responsible for the coordination of the science and technology policy and is essentially the custodian of the policy. The Ministry of Trade and Industry in which one

discussant was interviewed, is responsible for establishing trade links within and outside the country on behalf of the government. It is in this Ministry that the Registrar of Companies is situated. The office of the Intellectual Property is situated in the Registrar of Companies.

In the Ministry of Health three discussants that included two people in the department of Public Health, and Chief Pharmacist were interviewed. The ministry of Environment, Wildlife and Tourism is equally an important stakeholder on the issue of natural bio-diversity, regulation of research activities in national parks and game reserves, issuing of research permits to interested parties, and the general maintenance of natural resources. In this department two discussants that included Deputy Director and Chief of Conservational Management Division were interviewed. Inclusion of experts and the traditional doctors' association in the sampling is premised on the perceived neutrality and objectivity of these experts. Their views may not be clouded by the day-to-day operations of the issues investigated in the research. In the original sample I interviewed the founder and member of the Traditional Healers Association. Each of the respondents was interviewed once, in an interview session that lasted about an hour.

In the end, my write-up focussed only on the 1st three respondents; two from Science and Technology; and one from Trade and Industry, as explained earlier.

3.4.2 Data Collection

For data collection semi-structured interviews, and document analysis, were used. Semi-structured interviews have the advantage of allowing open-ended questions and are flexible to allow for unexpected information. Such interviews also enabled further probing on issues in order to get rich interview material. Documents have a special status because they are public records,

and often represent an official position. The narrative context in which documents are written, and used, is important to their interpretation. It was important as well to collect information on dates, authors, personalities, contextual matters, people's opinion on the documents, and policies that are used in the day-to-day activities.

Document analysis included a wide range of documents I collected from the site, including letters, workshop reports, brochures, follow up letters of meetings, Acts, policy documents, memos, Savingram, and Draft Acts. In these documents, the focus was to establish accuracy of what the documents say against the realities of the different situations, the significance of the documents in every-day activities, how the documents are used and how relevant they are to the sites where they were collected. The techniques I used also served to triangulate the data sets as they substantiated and strengthened the patterns that emerged. Multiple case sampling added confidence to the findings (Miles and Huberman, 1994), and one important point in this data collection process was the iterative nature or the 'rolling' quality of the research.

3.4.3 Data Analysis Process

For purposes of accuracy and relevance, data analysis commenced simultaneously with data collection to safeguard any lapses or gaps that occurred during data collection. Early data analysis enabled follow-up data that I used to fill up gaps; this early analysis also helped me confirm certain patterns that emerged during analysis (Miles and Huberman, 1994). Two other important reasons for an early analysis of data were to help me: first, to cycle back and forth between thinking about the existing data and generating strategies for collecting new, often better data, and to make analysis a continuous, lively enterprise that contributes to the emerging process of data

gathering.

3.4.4 Detailed Analysis

Through out this process of grouping emerging patterns I drew conclusions from trends and patterns that emerged, why people wanted certain issues to be left as they were, why certain groups of people were not able to make breakthrough in any efforts they felt should have long been recognised by both government and other stakeholders. From this stage, I then used the coding process to generate themes or categories. I eliminated pre-conceived categories and followed-up emergent categories that needed further refining, and then identified patterns, connections within and between categories. Some categories had to be combined to show relative importance and relationships. After all these stages I then presented the themes bringing it all together; answering the question of what does it all mean?

3.4.5 Validity and Reliability

Triangulation, according to Tawney (1975) is central to achieving credibility. It is central to achieving validity of a piece of evidence which could be assessed by comparing it with other kinds of evidence on the same point. Triangulation ascertains the validity of the source of the evidence which could be evaluated by collecting other kinds of evidence about that source. As a researcher in this case study and a primary instrument for data collection and data analysis, there was a possibility of bias. In anticipation of this, and my responsibility as researcher to represent views of respondents accurately and fairly, I made use of a variety of techniques. I used a tape recorder to record the proceedings of the entire interviews, used field notes I made during my familiarisation visits to the various cases.

I realised that during the visitations, some respondents were comfortable to talk about what they are doing in their respective sections. This provided me with insight into what the departments were doing and it helped to even shape some of the conversations that I was going to have with the respondents. I also made use of member checking, and worked with a colleague during transcriptions. I used him as a 'springboard' to bounce ideas and thoughts I had about data, and how best I could capture it. He checked my scripts against the recorder and I did the same with his scripts. In this study I used pseudonyms to protect the identity of the respondents.

Case studies naturally provided little ground to make generalisations because each case was treated as an entity with its own findings. In these case studies the choice of cases was made on conceptual grounds rather than for representative grounds (Miles & Huberman, 1994).

Loss of information or damage to recorded information in terms of audio cassettes was also possible and as such a challenge to data management and security. The loss of data could have resulted in lack of continuity and inconsistency in the study. In this situation therefore, I created some back up documents of the data by photocopying written transcriptions, and then keeping original transcriptions. I then created an electronic back up file in the computer, where I stored all transcriptions, data analysis, and coding process. I also made back up copies of all documents I obtained from the respondents.

Recorded proceedings of the interviews in an audio tape enabled truthful representation of my experiences. The nature of field notes was usually descriptive records, points of view, biases and speculations (Miles and Huberman, 1994). I was fully aware of the time consuming nature of the process of the data collection. Recorded experiences in an audio device proved very important because at later stages of data analysis I was able to

go over the data again and re-discovered chunks of information that I nearly dismissed as not necessary. I also did member checking and document analysis and involved a colleague to help provide a neutral view to my analysis. The documents gathered provided a recorded view of the informants and I was able to use it against the interview proceedings.

3.5 How it was done

Before starting data collection process I had already formulated key questions and research strategies that I planned to use in my study. It was quite rare as I discovered during research to stick to the initial plan of data collection process. Changes were inherent in data collection. I made a couple of changes and adaptations to the research process. This was due to specific requirements that my cases obligated me to follow particularly with data collection.

The university that I am studying in has established protocols to be followed during the research. The requirement was that before research was conducted, there was an ethical clearance certificate issued by the University. This clearance was an assurance that your research had met all the requirements set by the university regarding ethics. There was also a consent letter that had to be completed in which you inform your research participants of the purpose of the interview, and all other ethical considerations that the subjects may need to know about. The consent form did not give me automatic entrance to the sites because I was still required to solicit permission of the Head of the institution first, and then negotiated with the subjects relevant to my study. The subjects were still at liberty to decline even when the Head had agreed to the interview being conducted in the premises.

Ethics and consent letter were important but not as the interview itself; how do you make your research retrieve relevant information from the subject? I worked with my supervisor who played a critical role in guiding and putting weight into my research questions to enable me to get right information or data. My supervisor guided me through appropriate techniques necessary in an interview, and that an interview needs a relaxed atmosphere. What is still vivid in my memory even today is the caution: “don’t lead, ask first and then base your questions on the responses’.

As my study used purposive sampling, I identified my subjects on the basis of their suitability to the research, and my subjects included Directors and or Deputies directors of departments, or any persons holding positions of authority on issues that involved policy, legislation, intellectual property and indigenous knowledge systems. Though there was provision for other people to have participated in the interview, Directors and Deputies as key policymakers were the most suitable.

3.5.1 Data Collection (interview protocol design)

Access and acceptance

As an employee of the government of Botswana negotiating access to conduct interviews was not a problem because as an employee I have the privilege of accessing government facilities as long as I bring credit and value to the development of the department(s). However, arranging interview appointments with the discussants turned out not to be easy. They were always busy with other managerial responsibilities. In addition there were some who sounded surprised by how as a teacher I was interested in research that appeared at face value to be irrelevant to teacher development.

In March 2006 I began communicating my intentions to conduct interview

sessions with the identified respondents in the various government departments, and the one non-governmental association to the relevant authorities. I had initially made some informal visitations to the Heads of department who advised me to formalise the request with a letter addressed to the Directors of the departments, requesting permission to conduct my research in the department.

Letters were written and personally handed to the six respondents. In one department I wrote two letters; one letter seeking permission to conduct the interview, the other sought permission to translate the data into English because the respondent used Setswana in the interview. In the letters I was formally telling the respondents of my intention to conduct interviews and hence requesting for their assistance and support. This was also an opportunity to formally introduce myself and the study.

After delivering the letters it was fairly easy in three departments to negotiate access as the Directors and Deputies knew me and I had become acquainted with them. The respondents acceded to my request to communicate with me through electronic mail because I was staying in Pretoria. Two of the Directors in the departments of Revenue and Loapi House had expressed their inability to participate in the interview because of their busy work schedules, and had instead identified a few other officers I could choose from. At the Badimo Association, the founder and chairperson of the association readily accepted my request, and he did not see any reason for him to write back to acknowledge and approve of my request.

Mr Tammie in the department of T&I had also agreed to communicate with me through electronic mail though he never found time to do that. He seemed to be working on very tight schedule because I came to his office three times on different days and could not find or meet with him. I was only

able to secure an appointment with him around April (2006), and he appeared to be quite helpful and considerate because he allowed the interview to run into his lunch time break. I thought he was making up for his inability to grant interview all the other times I had come. He even apologised for not being able to communicate with me using electronic mail.

The Director of DFRR responded to my request after almost three weeks. He wrote a letter that he advised me to come and collect from his office, and it was then that I suggested to him to send electronic mail so that I come to arrange for the interviews and he did.

The ministry of Health remained the only department that had different requirements to be met. Despite having delivered the letter and consent form at the department, they insisted I completed an almost similar ethics form to that of the University of Pretoria (Faculty of Education). The department also wanted copy of my proposal, and interview questions, and even suggested changes to my proposal, and these included definition of terms. The department made it very clear to me that failure to adhere to the suggestions and conditions would result in my request being rejected.

After making the necessary changes, the department took some time to respond. In one of the follow ups I realised the officer whom I worked with went on leave and my application had not been acted on. Eventually around June, I received an electronic mail from the department that my application had been considered and that permission had been granted.

3.5.2 Snowballing

I made some changes to my data collection instruments before the interview commenced. Some key respondents that included Chief of Policy Planning,

Monitoring and Evaluation, Director of Research, Science and Technology (DRST), and Director of Forestry and Range Resources (DFRR) expressed their unavailability for interviews. This changed my interview questions in that some of the questions had to be re-designed to accommodate other respondents who were not in the identified ranks above.

Since in the sampling of the respondents in the Ministry of Health, RST and DFRR were chosen for me I had to adapt my interviews to the new set of respondents because I did not readily understand why those were selected. They may have been selected for various reasons. In this sampling method I could have interviewed as many respondents as I could but because of time factor for my study I interviewed two respondents in each of the departments. The interviews could have continued as long as found more new sites, but I stopped only when I realised I had interviewed a large enough group, and also that I was not getting any new or different information or ideas (Drever, 1995:36).

As my interview was built around Directors and/or Deputies as my primary sites respectively, who had in turn identified for me other respondents, I visited the new subjects and identified myself as the researcher. In the meeting I explained what my study was about and I learnt from the respondents there, which other subjects would be relevant to the study. More other sites rolled out (Weiss, 1998:194).

I interviewed the Deputy Director and Chief of Conservational Management in the department of DFRR, Chief Pharmacist in department of Policy, Evaluation and Monitoring (Health) and two in the Public Health Promotion. Also in the interview group, I interviewed the Chief Registrar in the department of Registrar of Companies (IP wing) and lastly I interviewed the founder and leader of Traditional Healers Association (a non-governmental traditional

healers association). In the department of RST, the Deputy Director identified two respondents all holding influential positions of Principals. One principal officer specialised in Policy and Legislation and the other in Intellectual Property. In the event that the respondents were not Directors but were identified on the basis of their specialised knowledge on intellectual property and legislation, I re-designed questions around intellectual property and IP legislation (Drever, 1995:36).

Gaining entry into the offices involved security checks at the reception desk. The main door to the foyer opens from inside at the 'discretion' of the janitor inside. At the security desk, I was asked the purpose of the visit and whether the officers to be visited were aware of the visit. The janitor asked for my identity card by which he seemed to want to verify my nationality. After that he phoned the officer(s) to get approval and only then did he register my name in the visitors' register. This procedure is common in government departments now that there is talk of improved productivity and security.

3.5.3 Table below show Data Collection Instruments

Target group	Data collection technique(s)	Material
Policy Makers	<ul style="list-style-type: none"> • Semi-structured interview with deputy Director (Forestry and Range Resources) • Semi-structured interview (Chief of Conservational Management Unit) • Semi-structured interview (Principal Research, Science and Technology (Intellectual Property) and Principal Research, Science and Technology (Policy and Legislation) • Semi-Structured interview (two Public Health Promotion officers) • Semi-structured interview (Chief Pharmacist) • Semi-structured interview (Mr Tammie) 	<ul style="list-style-type: none"> • <i>Indigenous Vegetation Project documents given out</i> • <i>No documents</i> • <i>No document from the two participants</i> • <i>Documents given</i> • <i>Documents given</i> • <i>Documents given</i>
<i>Non-governmental Organisation</i>	<ul style="list-style-type: none"> • <i>Semi-structured interview (Founder of Badimo Association)</i> 	<ul style="list-style-type: none"> • <i>Documents given</i>

Chapter 4

4.1 TELLING THE UNTOLD STORY OF INTELLECTUAL PROPERTY RIGHTS: KNOWLEDGE AND PRACTICES OF SELECTED SCIENCE POLICYMAKERS IN BOTSWANA

4.1.1 Introduction

This chapter presents in detail the data collected, background and personal experiences of some of the policymakers interviewed, and the findings of the study in general. Data was collected from two interviewees in the department of Research, Science and Technology and one interviewee in the department of Intellectual Property Office. The reason for collecting data from these three sources (interviewees) was because in the Research, Science and Technology Department, Intellectual Property and Legislation are separated and handled by different interviewees (Taboka and Mass respectively), while at the Intellectual Property Office, Tammie the interviewee handled both Legislation and Intellectual Property.

The data presented in this chapter was collected through interviews and analyses of some key documents. The documents are in the form of Acts of Parliament, Departmental Policy documents, and Draft Bills or legislation. Through these documents the authenticity of the processes against the realities of the different situations and the significance of the documents in every-day activities was established; that is, how the documents are used and how relevant they are to the day-to-day activities of the discussants. I also used documents to resolve uncertainties that could not be cleared through questioning during the interviews. The technique used also triangulated the data sets and substantiated and strengthened patterns that emerged. Multi-Case sampling added confidence to findings (Miles & Huberman, 1994: 29) by increasing the methodological rigour of the study.

This chapter is divided into three sections. In section one, I analyse the S&T

Policy of Botswana (1998) and the implementation framework document; that is, The Botswana National Research, Science and Technology Plan (Draft) 2005. The focus of my analysis is on how the documents address the challenges highlighted in the main Science and Technology Policy document. The information from the documents is supplemented with data from interviews conducted with the discussants.

In section two, detailed narratives built from the semi-structured interviews conducted with the discussants in the Intellectual Property Office (operational level), and the Research, Science and Technology (advisory level) are used. I used semi-structured interviews and document analysis to collect data from the participants. Although I had control of the interviews, I allowed the discussants to express themselves as much as they could. I also assured the discussants of confidentiality and made them comfortable and relaxed to answer the questions. The questions posed during the interviews required discussants to explore:

- their knowledge and practices about IPR on IKS,
- ideas policy makers constructed from the recent debates about IPR and IKS,
- how they acquired the knowledge about IPR and IKS,
- how the knowledge was used or not used in their day-to-day interaction with policy and legislation on IPR and IKS, and
- how the policy makers' actions regarding policy on IPR and IKS could be understood and explained.

The discussion is constructed around the responses given by the participants.

In the last section, each segment of the chapter is summarised by comparing patterns and trends that emerge, with the intentions of the S&T policy document and as explained by policy makers.

4.1.2 Botswana Science and Technology Policy of 1998

In this section, an analysis of the Science and Technology Policy as presented in the official documents mentioned earlier in the study is provided. Taylor et al. (1997: 35) define policy as, “whatever governments choose to do, or not do, and document analysis as the “study of what governments do, why and with what effects”. These scholars posit that policy is more than merely text and therefore the nuances and subtleties of the context in which text is written must be considered when interpreting the textual meaning. The text represents “political compromises between conflicting images on how change should occur” (Taylor et al, 1997: 16).

The nature of policy construction involves different stakeholders and this makes it multi-dimensional. The contributors to the policy construction bring particular, contestable and different world-views (Spillane et al., 2000). According to Taylor (1997) policies exist within context and therefore there is always a prior history of significant events, a particular ideology and political climate, social and economic context- and often, particular individuals as well which together influence the shape and timing of policies as well as their evolution and their outcomes. Furthermore, policy-making is a state activity and the state should be regarded as a complex and non-unitary entity of competing parts.

To establish how discussants understand and make sense of intellectual property rights on indigenous knowledge systems particularly in the current global and local debates, the Ministry of Communication, Science and Technology was visited. At the Ministry I was directed to the department of Research, Science and Technology where I met with the Deputy Director of the department. I explained the objectives of the study and how his department is relevant to my study. The Deputy Director then ushered me to

one officer within the department because he felt she was the most appropriate person to participate in the study.

Thereafter, I arranged for individual interviews with the officials who were responsible for Intellectual Property and Legislation respectively. The two offices mainly provide advisory guidance to all stakeholders in the Science and Technology 'sphere'. Essentially I interviewed two Principal Research Officers; Intellectual Property and Legislation Officers, respectively. Each of the discussants holds a Masters Degree in Intellectual Property and have both worked for the Registrar of Companies (Ministry of Trade and Industry) before joining the Ministry of Communication, Science and Technology.

I was however not able to collect any documents for analysis from these respondents because according to the discussants they either had limited copies or the documents were in draft forms. I however, managed to secure some documents of great significance from some stakeholders who attended seminars and workshops organised by the department in previous meetings.

In the interviews we conversed about a number of issues, including the nature of intellectual property rights, underlying principles, activities, personal experiences and perceptions. Before describing Taboka's experiences and practices, a description of the context is necessary to help locate the responsibilities of the department in the broader context of science policymaking in Botswana.

4.2 The background of the Science and Technology policy in Botswana

4.2.1 Science & Technology Policy Objectives

I begin my analysis with a focus on the conception of the Botswana Science and Technology policy of 1998. Botswana, as a developing country that is heavily dependent on mineral wealth (diamonds) and the precarious cattle industry is grappling with alternative ways of diversifying her economy.

Though the economy remains strong in spite of the mining and agricultural setbacks, future challenges for development particularly in Science and Technology are important nonetheless.

Political and economic changes in the Southern Africa region such as the attainment of majority rule in South Africa, political stability in Angola, expanding and competitive regional and international markets create challenges to the economy of Botswana (S&T Botswana: 1). The relatively new Science and Technology (S&T) focus was developed to help steer the country forward in its endeavour to exploit all science and technology related activities, including indigenous technologies. The core policy strategies identified in the Science and Technology policy (1998: 5) include, to

1. develop, adapt and apply appropriate technologies for small, medium and large scale processing and manufacturing industry
2. promote and develop traditional technologies and encourage their wider diffusion and application
3. create an efficient system for the protection of Intellectual Property Rights (IPR)
4. introduce Science and Technology (S&T) in all education programmes and ensure systematic institutionalization of S&T in the Botswana culture and society

5. develop human resources to implement the Policy and its programme of activities

The Ministry of Communication, Science and Technology was therefore established, in 2002, as a result of the new S&T policy in the country. The Ministry then established a specialised department of Research, Science and Technology to facilitate investment in specific scientific research areas that have been identified. The latter department has an office that specifically handles all issues of Intellectual Property, albeit at an advisory level. The department is headed by a Director, who holds a PhD, a Deputy Director and other high ranking officials.

However, the S&T policy document is not without technical faults regarding its conception and processes relating to its adoption. Some major developments that took place after it was approved by Parliament in 1998 have resulted in the document desperately needing some alignment (RST: Policy). A number of in-house studies have, according to the RST Official (Mass), established that the Science and Technology policy has not been aligned to the country's Vision 2016. The tenets of the country's Vision 2016 include; an educated, informed nation, a prosperous, productive and innovative nation, a compassionate, just and caring nation, a safe and secure nation, an open, democratic and accountable nation, a moral and tolerant nation, and a united and proud nation (Vision 2016). Furthermore it was revealed (Mass, 2006) that the S&T policy is also not aligned to the country's National Development Plan 9 (NDP 9 of 2003)

4.2.2 Botswana National Research, Science and Technology Plan (BNRST)

The Botswana National Research, Science and Technology Plan (BNRST, 2005: 4) identified Botswana's priority areas for investment in science and technology, research and development and presents an implementation programme thereof. In the Plan, science and technology are considered influential for the competitiveness and productivity of the country. Furthermore, science and technology through innovation is seen as a vehicle to improve the use and value of natural resources, as well as competitiveness. The aim of the Plan is that through investment in different identified priority areas, among them Intellectual Property Rights and Indigenous Knowledge System, there will be improved competitiveness. According to the plan, competitiveness requires improved capacity of personnel in terms of skills and new knowledge acquisition and through continuous research. Capacity depends on sustainability and commitment to produce desired results (BNRST, 2005).

The Plan concludes that there is currently low expenditure on Research and Development (R&D), low conversion of research results, limited involvement of the private sector, and few collaborative partnerships thus the need to prioritise some specific aspects of science and technology in the country.

4.2.3 Indigenous Knowledge Systems

The Plan (BNRST) begins its focus on Indigenous Knowledge and Technology Systems with an acknowledgement of the abundance of such indigenous knowledge in the country, which unfortunately is for the most part not exploited appropriately. Over and above the problem of lack of appropriate use of such a resource looms the possibility that such knowledge may be lost through piracy or through marginalisation by other forms of technologies

(BNRST, 2005). As a result, the Plan proposes a centre for indigenous knowledge and technology systems to focus on the: evaluation, protection and commercialisation of indigenous medicines, treatment of infectious diseases through use of traditional medicine, and sustainable use of traditional medicine and substitutes to mention just a few.

4.2.4 Intellectual Property (IP)

With respect to IP, The Plan expresses a 'polemic' situation wherein first of all, Botswana is not even a major player in the intellectual property domain and IP protection; and second, IP protection is largely outward looking such that IP protection is only sought in Botswana for IP that originates from outside the country. To combat these challenges the plan advocates developing an Intellectual Property (IP) Policy to provide guidance for the management and exploitation of IP and establishing a legislative or regulatory framework to ensure better practice and returns from IPR.

The Plan also pushes for the development of an Indigenous Knowledge Systems (IKS) policy, and provides for funding to build institutional capacity for the transfer of knowledge, provision of specialised IPR and commercialisation support, and development of capacity building programmes that will develop competencies in IPR management, licensing and commercialisation. The policy also sees education and sensitising of all Batswana in matters of IPR as primary.

It is on the basis of this fairly ambitious science and technology programme outlined in both the policy and the Plan that my study arose. Given the ambitious ideas discussed in the previous section, how have policymakers responded? What are the policymakers' views and practices with respect to IKS and IPR in the country?

4.3 LOCUS/UNITS OF SCIENCE AND TECHNOLOGY POLICY

As discussed earlier, I will focus my discussion of this chapter of policymakers' views and practices on three key officials working with IPR. While the decision of focusing the writing on three interviewees might have dealt fairly adequately with the problem of volume, it was still very difficult to decide on the single most suitable way to capture the subtleties and nuances of the data as shown through suggestions and guidance from my supervisor. I worked through many drafts and eventually settled on presenting the data in the form of detailed narratives as told by the interviewees in the study. This makes for easy reading and provides the reader with the opportunity to (re)live the process and experiences as they developed in each of the cases during data collection.

4.3.1 INTELLECTUAL PROPERTY RIGHTS AS A WAY FORWARD: DESCRIBING INTELLECTUAL PROPERTY RIGHTS IN MS TABOKA'S KNOWLEDGE AND PRACTICES

Ms Taboka is a female in her late 30s who works as Principal Research, Science and Technology Officer in the Ministry of Communication, Science and Technology. Ms Taboka completed her degree in Commerce with the University of Botswana in 1996, and worked briefly in the Ministry of Trade and Industry upon completion of the degree. She obtained her Master's Degree in Intellectual Property in 2000 in the United States of America. She then worked as a Trademark examiner for five and half years in the Ministry of Trade and Industry's IP wing. Before joining the department of Research, Science and Technology, she also worked as an IP consultant in a law firm. The Ministry of Communication, Science and Technology was established less than a decade ago in response to emerging challenges in science and technology, and particularly that the government of Botswana is pursuing

economic diversification avenues. Ms Taboka occupies an office on the fourth floor of an eight-storey building housing different government and non-government departments including the Botswana Telecommunications Authority and Postal Services. These two organisations are statutory entities with the Ministry of Communication, Science and Technology.

Taboka appears to have amassed a great deal of experience from working for government and the private sector. She first worked at the Department of Trade and Industry as a trademark examiner. In that job, she was involved in the formal and substantive examination of patents. Formal examination of patents involves receiving applications and checking them to ensure that the minimum formal requirements have been met. Substantive examination involves determining whether the invention applied for meets the requirements; newness, usefulness, and non-obviousness. These are requirements discussed under "Requirements for Patentability" (Botswana Patents, Utility Models and Industrial Designs Manual, 2006: 11).

At Armstrong Attorneys where she worked for some time, Taboka was mainly responsible for filing applications. However, Taboka felt that the jobs she was engaged in at both organisations were less challenging and did not expose her to other aspects of registration of patents. This is what she had to say:

As a trademark examiner at Trade, I did not have um... exposure to, in international patent application, by then I did not know about it to, mainly because my job did not involve any knowledge of PCT (Taboka, 2006).

Among the variety of experiences she had in that position, she was able to visit a number of countries to learn about IP issues. In 1999 she was invited to attend a seminar on IP and E-Commerce in Kenya. In 2003 she went to Namibia to attend a seminar on IP. Similarly she was also invited to participate in a seminar that was held in Pretoria on 10th May 2006 where she made a presentation. The

seminar was organised by South African Research Innovation Management Association (SARIMA) under the theme “Building Industry-Higher Education-Government Partnerships as the Engine for Research and Innovation for Regional Development”.

Taboka's turning point regarding IP came when she attended a two-week long course in 2006 in New Hampshire in the United States. She characterises that experience in New Hampshire as the most memorable in her working life, because it exposed her to International and Comparative Laws, an area of IP she had realised would expose her to understanding international IP laws. Here is how she described these experiences during the interview:

I attended a three week long course on International and Comparative Law, in-fact it was two-weeks because the other week was for travelling. It was kind' a upgrading because I did not do Patent Corporation Treaty at school, PCT is amongst what I do at work (Taboka, 2006).

The course she attended in 2006 was in her words an 'eye opener', because she had felt PCT to be irrelevant to her job and little did she know that her move to Research, Science and Technology (RST) would require that knowledge base. Patent Cooperation Treaty (PCT) deals with the filing of international applications for the protection of inventions, in particular patents and utility models. PCT allows inventors to file a single international patent application either directly with the PCT receiving office of the International Bureau of WIPO (IB), or through a national or regional office of the member states to which the applicant is either a resident or a national, provided that the national office can act as a receiving office for international applications (Botswana Patents, Utility Models and Industrial Designs Manual, 2006: 17). Her experience gained at Armstrong Attorneys and Trade and Industry placed her in a better position to combine her practical experience with the theoretical knowledge acquired through her Masters degree. That combination seems to have been useful and blended well with what

she does in her current position. Taboka also disclosed that she is a nominated member to the ARIPO (African Regional Intellectual Property Organisation), a post she has been nominated to twice in succession on a two-year-long duration. Her tenure as ARIPO Board member comes to an end at the end of the year (2007).

In her relatively short stay (18 months at the time of the interview) in the department she has already participated in some IP awareness workshops and was personally organising workshops and seminars for her department. Taboka sees the department as faced with a litany of challenges that include lack of awareness on IPR issues and she constructs her job around the need to craft a more 'fruit' bearing approach. This is how she described it:

My view on that is that if Batswana are educated and are aware of IP laws and their rights, if somebody comes from outside they can negotiate; they stand in a position of negotiating, they do not lose out like they are losing out now because they don't know you see, unlike if they are not informed they just give out to these people, its true yes finances are a disadvantage compared to ... I mean when we compare ourselves with developed countries but I believe with information you also be able to negotiate when you give out information to say no I can't give you this information for free because you are going to make money out of this, why don't you give me something (Taboka, 2006).

She envisages an approach that not only looks at stakeholders knowing about Intellectual Property Rights but also how the system could benefit the science and technology activities including indigenous technologies. After the S&T policy (1998) was approved, it was coordinated by the Ministry of Finance and Planning until the Ministry of Communication, Science and Technology was established in 2002. Asked to describe her challenges other than coordination of research activities, Taboka used some descriptors like, the need and urgency to review 1998 Science and Technology, some inadequacies, scattered activities,

information dissemination, importance of IPR, economic benefits, and science and technology:

Well, as you might appreciate that policy was put in place in 1998, and the Ministry of Communication, Science and Technology was established I think in 2002, somewhere there, and then this department was established in 2004 therefore the...at that time when the policy was established it therefore suggest that this science and technology was *scattered*, it was *not coordinated* centrally so mainly the role of the department is to try and pull together all the *recent science and technology* issues and bring them under the same umbrella if I may say.

Asked how the issues of Intellectual Property debates taking place affected her work, Taboka said:

Well, what I would say firstly is that um... the department is *considering to review the 1998* science policy because there is a feeling that there *are some inadequacies* like you rightly mentioned that in it is mentioned that *science activities are scattered*, so basically it is trying to address quite a number of issues which were not adequately addressed, the review is trying to address quite a number of issues which were not addressed in the 1998 policy and I for the intellectual property, I'd say one of the main challenges is that there is eh...lack of awareness in intellectual property by Batswana generally that's one of the main challenges that we have, so this means that the role of this department is actually to *disseminate information* about the importance of Intellectual Property, how it can *benefit the economy*, and the individuals who are engaged to creating works (Taboka, 2006)

When I looked at the descriptors in the context of providing advice as the responsibility of her department, it appears like the department has a mammoth task. The role of providing advice places a lot of 'strain' on pedagogy and conception of the whole system, and what as an individual she intended to achieve. Ms Taboka's descriptors suggest a need for a more well thought

understanding of Intellectual Property Rights on Indigenous Knowledge Systems. When she made reference to knowledge holders having to change from being primitive users to innovators, it again highlighted the fact that her hopes and tendency have shifted. She seems to suggest that IPR is a way forward.

An example she gave about the integrated approach is in the need to organise and coordinate existing government research institutions to achieve any proposed plans. This is what she said:

One of those things which am currently dealing with is the Act, we are still thinking about that where we have organisations like BOTECH, RIPCO, NFTRC which are falling under this ministry, they are funded by this ministry but they are companies limited by property, now the ministry is trying to put this together sort of try to have control, see to it that they are doing things which are related to research, science and technology (Taboka, 2006).

The BOTSWANA NATIONAL RESEARCH, SCIENCE AND TECHNOLOGY PLAN (BNRST, 2005) charges Taboka and her ministry with responsibility for managing the research institutions, and fostering collaboration, proper targeting and streamlining of activities. This acknowledgement was made against the background that the absence of the Ministry of Communication, Science and Technology (MCST) had resulted in science and technology activities being fragmented (Taboka, 2006). The mandate of the ministry is to ensure that there is Policy, functional guidance and overall coordination of the BOTSWANA NATIONAL RESEARCH, SCIENCE AND TECHNOLOGY plan by availing resources. The management of S&T depends on the ministry's support in ensuring that national priorities are clarified and foster results orientation and alignment of efforts toward national priorities.

The Plan (BNRST 2005) also emphasises partnership for S&T development as being important for capacity building and innovation. The partnership is built

around private industry, regional R&D institutions, national institutions, and international funding organisations.

Clearly much of S&T policy hinges on streamlining activities, proper targeting, coordination, and collaboration with other stakeholders. These responsibilities are achievable provided IP awareness levels are reasonable. Therefore Taboka's major responsibility is that of raising awareness. This is how she related her challenges:

I'd say one of the main challenges is that there is eh...lack of awareness in intellectual property by Batswana generally that's one of the main challenges that we have, so this means that the role of this department is actually to disseminate information about the importance of Intellectual Property, so in that way we are going to work with other colleagues to see how we are going to give out information (Taboka, 2006).

This discussion with Taboka and the interrogation of the S&T policy together with the Botswana National Research, Science and Technology (2005) all seem to suggest that Taboka places a lot of emphasis on giving up-to-date information, empowerment and partnership in IP and science and technology. She underscores the importance of collaborative working, as failure to do that might defeat policy intentions of economic prosperity through S&T diversification.

Reading from the S&T Policy (1998) and BNRST (2005), the two documents acknowledge the country's 'weaknesses' in the intellectual property domain; that IP protection is inward as protection in Botswana for IP that originates from elsewhere (BNRST: 29). To address this problem the BNRST advocates comprehensive support to S&T institutions to encourage them to exploit the results of their work and to ensure that they receive recognition and reward in doing so.

According to the S&T Policy (1998), Intellectual Property Rights deal with the protection of inventions and artistic creations in order to afford the creator an opportunity to benefit materially from his/her creations without unfair competition. The policy supports the creation of an IP office to facilitate technological and industrial development. One core strategy outlined in the S&T Policy is the need to educate and sensitise Batswana in the field of IP.

In our conversation three key issues emerged, that according to Taboka have contributed to the current levels of IPR and IKS understanding in Botswana viz; educational awareness, cultural practices and lack of legislation.

4.3.1.1 Educational Awareness

Continuously in the conversations with Taboka, the low levels of understanding regarding IPR appeared to be a major concern. For her, there is a need to intensify educational campaigns with respect to IPR. Regarding the nature of educational campaigns embarked by Taboka, the focus has been two fold: First, there is a focus on key research institutions of BOTSWANA TECHNOLOGY CENTRE (BOTEC), RURAL INDUSTRIES INNOVATION CENTRE (RIIC), and NATIONAL FOOD TECHNOLOGY RESEARCH CENTRE (NFTRC). This is what she had to say about this initiative:

In May this year we are actually organising a seminar and is going to be held on 30th of May for BOTEC, RIPCO and NFTRC, you know them (Taboka, 2006).

When pressed further to explain why they targeted those institutions, this is what she had to say:

The purpose of the workshop was basically to create awareness about IP; we had conducted a mini survey that revealed lack of awareness about IP in the institutions, it revealed that there were no internal IP policies (Taboka, 2006)

BOTEC is engaged in activities that include research, development and technology transfer primarily on renewable energy technologies, electronic systems, sustainable architecture, energy efficiency and energy audits. RIIC on the other hand, undertakes research and development to support industrial, entrepreneurial and socio-economic development. Similarly, the NFTRC was established to enhance national food security and safety, economic diversification, economic empowerment to mention. For the most part, the research carried out at the three institutions involves Intellectual Property issues, and thus the importance of the awareness programmes targeting these institutions. This point was later confirmed by Mr Tammie, in the Intellectual Property Office, when he lamented the fact that they (research institutions) were losing 'ownership rights' over their products largely because of the lack knowledge.

RIIC developed a good patent for a rubbish bin and they never moved an inch. They developed a sorghum threshing machine, there was no need to sell that; license someone and start research and development on another product. BOTEC came up with eh...a water level sensor, an electronic water level sensor to measure water in boreholes, and the best patent. There were only three at the time, when we searched we came up with seven (7) documents from all over the world and then they got a patent they gave it to somebody who claimed ownership, and if I were to quit my job today and go manufacture that thing because it is now in public domain, they did not maintain the patent. That's why there is need to have a patent...intellectual property wing in order to maintain these things (Tammie; 2006).

In the midst of all these developments, Taboka has taken it upon herself to raise awareness about IP. She, however, does not have a clearly defined plan to follow when engaging in such additional activities. This is what she said about those activities:

I would say yes in a way because we have just finished

working on our annual strategic plan and one of the things that we have in there is to give out up to date information about science and technology so we are going to...the definition of the initiative is still broad. We are going to work with other colleagues to see how we are going to give out information like I mentioned NDETEBO (National Design and Technology Exhibition of Botswana); because NDETEBO brings some products and most of the time you find that these are students from secondary schools who are competing, (Taboka, 2006).

Second, the educational campaigns embarked upon by Taboka seem to focus on schools - both secondary and tertiary.

Taboka refers to awareness raising initiatives as a major challenge, and in spite of the limitation (lack of action plan) she makes efforts and contributions and plays a leadership role on intellectual property issues. She views the lack of IPR awareness activities as not entirely the fault of her department though.

Her view is that she is relatively new in the department having joined less than two years previously, and that her Ministry as a whole is also relatively new. Notwithstanding that however, she has been involved in IP issues elsewhere where she took the initiative to raise the levels of awareness regarding IP. Here is how she described these efforts:

I worked for Armstrong Attorneys for two years as an intellectual property consultant. I did some presentations of even before I came to this ministry, like the other time when I gave a number of presentations for BOTEC eh...before joining the department I did a presentation at the Ministry of Agriculture, and then um... I also did...while working at Armstrong's I organised a seminar for our clients and then I did a presentation there, I also did a presentation for the University students... (Taboka, 2006)

The quote above illustrates Taboka's determination to pursue awareness raising activities in spite of the absence of a guiding plan within her new department. She relied more on her own experiences gained through exposure while she

worked with different departments. She observed a dire need to take up the initiative herself and whilst working on a departmental manual she made presentations for some targeted audiences and stakeholders.

An analysis of Taboka's attempts to raise the levels of public awareness suggests selflessness, sacrifice and a personal drive to achieve. Her initiatives seem to be guided rather by intuition that her clients may need her services. Taboka's knowledge of Science and Technology is synonymous with IPR and her understanding of NDETEBO (National Design and Technology Exhibition of Botswana) as a forum enabling schools and students to share design activities guided her towards identifying such forum. NDETEBO forum can indeed be an ideal environment to share and show case possible benefits through direct contact with students' exhibits, and discussing and sharing ideas with attendees about IPR.

This interactive nature of Taboka's intervention enables her to cover a wide range of Intellectual Property Rights including copyrights, patents, trademarks, and logos. The diversity of products brought to the exhibition by the participants provides an opportunity to cover a wide range of the IP components in a more informal setting. A further reading of Taboka's engagements reveal a view of education as a life long investment and the realisation that changes in attitude will not be immediate. This is what she had to say in this regard:

I believe if somebody from a tender age grows up knowing that he could make a living out of eh... my artwork, my music, my poem or I can make a living let's say I think most of the time they design things, they come up with products so some of the things are science related so if somebody has that capability, and they know that there is a potential of them making a living out of that from a tender a very tender age. I think it puts them in a position where somebody as they grow up they have like a vision about their future and I see it as a tool that can empower them to pursue research in science and technology (Taboka, 2006).

Her point of emphasis in the above quote is that knowing about copyrights in artistic works like music and poetry, designing of artefacts (patents, logos, trademarks etc) involving science and technology from an early age will help shape the perceptions people have about IPR.

Taboka was however unable to provide any documents she uses to facilitate her work, either because the documents are still in draft form or that they did not have any copy to spare. This is what she had to say as justification:

Well, I joined the department last in July so, so far I have been working on what we call part and process manual, we hope that it will be published by August this year, it was supposed to have been published by March this year we had to extend it because while am working on it I had to do a lot of work and there are areas that I feel that I need like formal introduction to those like the ...corporation treaty, the ARIPO system, those ones I have not done them in class, I only went through materials after joining the department, so I feel that to enhance the document I'll need such exposure before we actually come with the document (Taboka, 2006).

Unavailability or lack of documentation to use may be responsible for what seemed to be lack of criteria for the systematic selection of target groups. It was clear from the interview with Taboka that she did not have specific criteria for systematically working with stakeholders. This is how she put it:

...I mean our role is to look out and see where we need to go and preach the IP gospel (Taboka, 2006).

Other than working with departments under her Ministry, she seemed to have no specific procedures for identifying beneficiaries for her awareness campaigns. She identified NDETEBO as one forum to use, where her audience was largely the secondary school students. Taboka has also worked with Botswana Telecommunication Authority (BTA) and the Postal Services (PS), who are

statutory authorities under her jurisdiction. The latter organisations may have benefited from her programmes, largely because she shared the same building with them. Relying on following intuition (rather than a systematic plan) was always going to result in inconsistencies because as she acknowledged the Science and Technology activities of her unit were rather scattered around.

In our conversation, Taboka affirmed that the lack of coordinated efforts is affecting the intention of the science and technology policy. This was also shared by Tammie of the Intellectual Property Office that lack of coordinated S&T efforts by a particular unit (for instance S&T) affects streamlining and proper targeting:

4.3.1.2 Cultural practices

On the other hand, cultural practices that encourage the free flow of information or sharing by most communities in Botswana have not helped communities realise the value of intellectual property. Taboka explained that though the sharing is communal and characteristic of indigenous knowledge practices, it has now been permeated by Western Culture of open access to all knowledge constrained by confidentiality, privacy and security.

This was the dilemma faced by Taboka in modern societies like that of Botswana wherein according to her, indigenous knowledge holders need to change their practices to accommodate the new practice of IPR. As she argued:

My personal view is that culture is dynamic, that's the first thing and secondly, given that we are talking about globalisation, globalisation we can not as Batswana say we are going to hold onto our culture no matter what, because at the end of the day you will find that other people are benefiting from us with us not benefiting from them, again another thing over the years I mean I have seen this sometimes it also worries me as Motswana (Taboka, 2006)

As such drastic measures and steps need to be undertaken to help shift the mind-set particularly of communities that are in the habit of freely giving out valuable information.

In her view (Taboka), some community members had developed highly successful technological products that changed lives in the communities, and yet the inventor(s) did not claim intellectual property. This is what she cited as an example:

I believe that there are people out there who have come up with products that can be patented, they qualify for patenting but they have not come forth they never knew. I mean if you look at some of the problems solved in the villages in some cases you think something is very minor you see but on the other side you realise that it is something that makes a difference in the whole community or in the whole country, and its just being shared freely I mean as a farmer if I have seeds I can share them with my neighbour, you know? If I come up with something I feel may solve a particular problem instead of saying ok am going to get protection over it am going to sell it to somebody, instead I tell others how I did it so that they do not come keep coming to me (Taboka, 2006)

Taboka sees IP as a way forward in-spite of what appears to be complexities regarding IPR and IKS:

As an Intellectual Property Officer sitting here not standing for my own personal opinion, I will say intellectual property laws are a way to enhance advancement, enhance innovation and creativity that's how I see them (Taboka, 2006).

In the interview she alluded to the fact that one major challenge she faced involved the capacity to invest in IP because potential benefactors do not have both the knowledge and financial resources. The current situation whereby finance institutions have not yet realised any IPR project as financially viable

compounded the problem:

The biggest challenge that they have especially innovators and designers is that at the end of the day they don't have sufficient funds to enable them to exploit their works so in a way somebody can come up with something very innovative, something very beneficial, if they are not able to commercialise it and if they don't find anybody who is willing to buy it means at the end of the day they are not making any progress, that's one of the challenges that we have (Taboka, 2006).

In her view and conviction, this situation defeats all intents by policy as it continues to marginalise indigenous technologies, as they remain vulnerable and relegated to the periphery by the holders themselves.

4.3.1.3 Current practice and lack of legislation

Taboka's department is involved in developing programs aimed at addressing the problem of public awareness. She is working on developing an annual strategic plan to use to give up to date information about Science and Technology. Taboka conceded that indigenous knowledge systems were important to social, economic, and educational needs. But it was equally imperative for the community to appreciate changing dynamics. As far as Taboka is concerned, communities that hold onto indigenous systems and regard the system as cast in stone may fail to benefit from reciprocal relation between countries or communities that observe and apply private ownership.

The community would only be giving out information to those seeking it and with very little benefit (Taboka, 2006). Whilst this is true about local communities, it is important to look on the flipside of the coin. The BNRST (2005) observed that IP protection in Botswana is inward because the protection originated from elsewhere. There is therefore a need to strike a balance between accepting the changes that are brought about by IPR and existing practices with regard to IKS.

In the interview with Taboka, she mentioned that lack of Indigenous Knowledge legislation compounded the problem of lack of interest in deriving benefits from intellectual property activities.

Well I would say with indigenous knowledge I cannot really comment as much as I would with other IP rights mainly because the discussions are still on-going. Even at international level nothing has been finalised as to how indigenous knowledge is going to be protected, they are...because of that there is no like legislation that has been established for Botswana... (Taboka, 2006)

According to her, very little could be done if there is no legislation or framework to refer to. With these sentiments Taboka confirms the importance of the legislation to promote and protect knowledge holders. The current situation or practice whereby knowledge holders freely 'share' valuable information without seeking intellectual property rights may only be controlled if there is legislation. Earlier in the report, she laid blame on culture; that the knowledge holders freely share the information because cultural practices dictated. This therefore calls for an approach that tries to acknowledge the complex nature of the two systems, especially that one system already enjoys the ambit of law and the other does not. Practices and activities that Taboka engaged in seemed to suggest a pattern more inclined to IP activities that were inanimate (objects).

Now am looking at um...targeting other departments in the Ministry like Btv (Botswana Television); you will find that IP affect them more on the copyright side just enlighten them about copyrights so that they are empowered (Taboka, 2006).

The non-existence of Indigenous Knowledge System legislation as singled out by Taboka may be responsible for bias to copyrights as captured in the above quote.

Intellectual Property as acknowledged in the study, particularly in Botswana is an entirely 'foreign' practice. The reason to address copyrights issues may be interpreted as corrective in the sense that she is addressing a specific challenge in a particular department. A corrective approach in any endeavour tends to be short lived as it usually focuses on what it is intended for at that particular time. Of course in the current situation of Botswana and IP issues there is a likelihood of a dual approach of corrective and preventative 'maintenance', but the former is usually not sustainable. All the same, a more preventative approach to tackle the challenge (lack of awareness) as adopted by Taboka (Research, Science and Technology) tends to 'swing' between two very important pinnacles; secondary school students and tertiary students. But equally important in her targeting are policymakers and the general public who seem left out.

The issue of sharply departing from common practice by the rest of the public become critical because the process of science policy making still remains the responsibility of those not within the target audience. This is an important investment though because students ultimately are the future and one may cherish a legitimate expectation that knowledge and practice will dissipate and bring about the expected results.

The analysis of the approach undertaken by Taboka underscores the difficulty in awareness raising or teaching for conceptual change even in focused approach like that of leading 'learners' to fundamentally restructure their prior beliefs. Even with the use of exhibitions like NDETEBO focused as they seem, Smith et al. (1993) argue that such dramatic changes are rare. People encode new information by adapting it to fit what is known, or they encode it without exploring the implications of the new ideas for what they already know, resulting in pockets of inconsistent knowledge. In a way the absence of Intellectual Property in the formal education complicates this matter. It is Taboka's aim to use every educational opportunity to 'spread' awareness about IPR and the

choice of NDETEBO as an example may be premised on simultaneous collateral learning; learning a concept in one domain of knowledge to facilitate the learning of a similar or related concept in another milieu (Jegede: 1995).

Clearly she is not making sense of her world in a vacuum; her sense-making is situated in particular “thought communities” (Resnick, 1991; Zerubavel, 2000). Communities are central to our changing behaviours, and Taboka’s selflessness would have been an activity that will have had practical implications to her community:

So this means that the role of this department is actually to disseminate information about the importance of Intellectual Property, how it can benefit the economy, and the individuals who are engaged to creating works, mainly with a bias to how intellectual property rights relate to science and technology; I mean given that specific department of Research, Science and Technology (Taboka, 2006).

The discussion with Taboka seem to suggest that she is aware of the level of awareness and lack of meaningful benefits that communities and departments could derive in IP. She acknowledges that this situation might mitigate government’s intention of economic diversification efforts through science and technology.

According to the Science and Technology Policy (1998) to derive benefits from IPR and IKS requires the involvement of all sectors (economic, educational, political and social). The policy places a lot importance on the conservation and sustainable use of natural resources particularly by communities that source a living from the resources. Intellectual Property Rights use in the Indigenous Knowledge Systems dwell more on community participation and involvement of all relevant stakeholders. The creation of the Ministry of Communication, Science and Technology was as well aimed at collaborating and coordinating all science and technology activities including indigenous technologies.

Taboka's engagement suggests her work involves a wide range of Intellectual Property Rights like trademarks, copyrights, patents, using collaborative approach through sharing of information with the identified stakeholders towards making them realise IPR economic benefits.

4.3.2 POLICY INTENTIONS AND PRACTICE DILEMMAS IN MODERN SCIENCE AND TECHNOLOGY POLICY

4.3.2.1 INTRODUCING MR MASS, HIS VIEWS ON CURRENT POLICIES, HIS BACKGROUND AND COMMITMENT TO INTELLECTUAL PROPERTY RIGHTS AND LEGISLATION

In this section, I examine Intellectual Property Rights in the context of policy and legislation. This is to give a complete picture of IPR on IKS by the discussants in the science policymaking process in the Research, Science and Technology. In order to get an informed understanding of how policies are constructed and implemented in the Research, Science and Technology, I began my investigation with a visit to the Office of Policy and Legislation in the Department of Research, Science and Technology. Some of my conversations were with the Principal Researcher, Science and Technology, Mr Mass.

Mr Mass is a fairly tall man in his late 30s who originates from a village in the North-Eastern part of the country. He is a hefty man with a preference for black and navy blue suits. His appearance could be misleading – as a very reserved executive who would not be forthcoming in interviews. Nothing could be further from the truth. Mr Mass studied for a Bachelors Degree in Accounting and Economics at the University of Botswana. On completion of his first degree, he worked in the Ministry of Trade and Industry, promoting investment and trade.

The Ministry of Trade and Industry is responsible among other things for negotiating trade links with investors, local and international. When the Promotion and Trade Investment department converted to Botswana Export for Development Investment Agency (BEDIA) in the early 2000, a government agency that looks at business and market opportunities Mr. Mass was redeployed accordingly.

Mass found himself at the Registrar of Companies dealing with copyrights issues, a job he did until he went for his Masters Degree in Intellectual Property in the United States of America at the beginning of August 2000. Upon completion of his Masters Degree, Mass returned to the Registrar of Companies, a unit overseeing registration of companies and IP, where he was in charge of Indigenous Knowledge Systems. After a brief stint at the Registrar of Companies, he ultimately joined the Department of Research, Science and Technology in the Ministry of Communication, Science and Technology. He was assigned to the policy and legislation wing of the Department of Research, Science and Technology. Mass brought with him a wealth of experience gained from his previous postings and studies abroad.

He occupies an office in the same building with Ms Taboka and security procedures are similar. Mass was more candid and willing to volunteer more information that involved, among others, his personal up-bringing and personal views. One such instance where he made his views known was when he differed with the government on what he termed 'unfairness on traditional healers'. He believes government tends to favour modern health system in observing their 'rights' to privacy and not so with traditional healers. He sounded 'worried' by the attitude of some people that traditional healers had to perform their duties publicly in order to gain sympathy from the government, when the same is not expected of modern health practitioners.

His description of the treatment of the health systems was in sync with his concerns of unfair regard for tradition and the possible bias to modern practice in policy and legislation. This is perhaps aggravated by lack of laws or legislation to protect them (traditional health practitioners) against any form of unfair practice. Mass was elated to know that my study covered the Ministry of Health and he advised me to ask them about the 'protection' of traditional healers. Mass had openly differed with the approach used by previous policy makers regarding for instance the Copyright Act. It also takes a lot of courage and wisdom to openly make such observations especially if one is in the same position.

In a nutshell Mass talked about lack of expertise on IP, lack of laws and legislation, cultural practices, lack of education about IP, and lack of incentives to retain experts in the various government departments. About staff retention he observed that in the past, very few people were trained in specialist domains, and recently more people are trained specialists. He viewed this as an improvement that unfortunately is not sustained because there is a lot of disgruntlement and people are moving out for 'greener pastures'. Before discussing these ideas in detail, perhaps some insight into the review of the Science and Technology that he talked about is equally important.

4.3.2.2 Policy review

As described earlier, Mass brought with him a lot of experiences into his new position at the Department of Research, Science and Technology (Policy). In his new position, he was responsible for among others, the establishment of a regulatory framework and development of legislation regarding Intellectual Property issues. Here is how he outlined his responsibilities during our conversations:

I was given the policy and legislation division and one of those things we have to do here is to review the science and

technology policy of 1998. We are still thinking about it on giving support to those who are doing some science and technology related initiatives we are thinking of coming up with a policy to address that. In addition to that we are also looking at coming out with legislations which would address whatever will be needed by this ministry or department in terms of research in science and technology (Mass, 2006).

It is evident from his description of the responsibilities that his is an important and multi-faceted unit. It is a unit that requires such expertise as knowledge of public participation and policy approach and implementation to be effective in its roles. Mass however saw the revision of the science and technology policy of 1998 as his major task at present:

This document was done in 1998 and that was prior to us having the Vision 2016, that was immediately Botswana acceded to a number of international conventions or treaties on Intellectual Property, , the document had been there over a decade now but you can agree here that for a technology based document for it to have stayed for such a long time really it is overtaken by events, outdated, it have to be revisited to align it to I mean it is even mentioned in one of the studies which was done immediately in 2000 (Mass, 2006)

He affirmed that science and technology are changing and so should the policy guiding them, and the review is inevitable because the document is almost a decade old. Mass also mentioned that the review sought to assess what has been achieved since the creation of the policy, and what needed to be improved on. He mentioned that the policy was drafted at a time when IP activities were low and little was known about IP in the policy.

The S&T and BNRST policies were formulated to meet challenges that included the country's lack of S&T environment conducive to technology transfer, and the inadequate human resource that resulted in failure to absorb imported technology. Botswana is an expanding and modernising economy and the

demand for qualified professionals is huge, hence the reliance on expatriates has become expensive and difficult.

Clearly, both the S&T and BNRST policies have acknowledged challenges that face the country and rigorous steps that need to be taken in order to address these problems. Mass in that respect says:

In anticipation the government has moved step further; acceding to IPR treaties, coming up with laws on Intellectual Property. I mean they are not perfect laws but at-least they meet the minimum standard required for intellectual property protecting system (Mass, 2006).

He mentions efforts that have been undertaken by his department, though he felt it was all not enough. Mass identified further training, that incidentally he was a beneficiary of, and went on to acknowledge such efforts as the provision of scholarships that his department made available for people. Such opportunities included PhDs and Masters Degree scholarships that were advertised in local newspapers for people to apply.

Mass continued to single out legislation and laws as not good enough, but as better than having no laws at all. Basically these attempts underscore the rather low levels of understanding of IPR, in the opinion of Mass, and hence the need for educational campaigns to raise the levels of understanding.

4.3.2.3 Mass's views about awareness

Mr Mass, like Taboka, observed the low level of IPR awareness in the country and attributed that to little educational activities. Mass blamed little awareness on lack of expertise, mainly because the IPR regime is new in the country.

The lack of expertise has according to him resulted in the country's laws not being relevant to specific situations (Mass, 2006). He regrets this lack of

understanding of IPR as having led the country to being reactive, because some agreements and treaties that had been entered into were binding on the country. According to Mass the country rushed the drafting of laws/legislation, particularly IP legislation because of external pressure. The rushing of the legislation or laws at the moment, coupled with limited knowledge about the subject matter, is reminiscent of a time during colonial rule when representation was limited to a select few. This situation results in laws that are weak in many respects because they tend to leave out important information. This is how Mass observed this situation:

As a developing country, one of the things which we have noted is that this is a new area, we do not have the expertise, even when we come up with the laws they are not done...it is not us who came up with them (Mass, 2006).

My interview with Tammie in the IPO hinted at a similar observation about lack of expertise as a cause of the delays in adopting the revised IP legislation in 2000. It transpired in the interview with Tammie that the delay was due to omissions of what Tammie described as key issues in today's debates. These issues were initially left out in the legislation and they included folklores, genetic resources and traditional knowledge.

In his (Mass) observations about the 'newness' of IP in Botswana, Mass referred to the 1965 Copyrights Act that according to him was conceived even before the country got its independence. This is what he had to say:

I will give an example of an area which I am comfortable with, that is copyright, many don't know that we have copyright laws before we became independent, we have a copyright act of 1965, before we became independent in 1966 but that law was never implemented, Why? Because we did not know, we did not have the expertise or at that time our focus was on development issues, we had nothing to do really with um...issues relating to intellectual property, we only became aware of it I guess when we acceded to

organisations... and we only thought of reviewing our Act, that of copyright in 2000 (Mass, 2006).

Literature on IPR and developing countries (Higgs, 2000) suggest that some countries have established their IP legislative system in the face of international pressure.

Mass observes that lack of expertise and awareness were mainly results of lack of foresight on the part of policy makers because economic diversification had never been conceived of in light of Science and Technology. According to him government did not see Intellectual Property as an economic activity. On the contrary development and capacity to engage in innovation depends on the country's science and technology capability. He further highlighted the lack of publicity about the Act, arguing that since its adoption in 1965 it was only reviewed in 2000. While the review dates back to 2000, the new Act is yet to be implemented, and this according to Mass is due to lack of expertise. This is what he had to say:

From 1965 to 2000, we revisited, we reviewed our act in 2000 and since 2000 up to date the act has not been implemented despite the fact that we had the Act in 2000. Why? because we don't have the expertise, so the issue of intellectual property is very new to us even the laws which we are coming up with they are not addressing the situation of Botswana, so those are the challenges we are going to face (Mass, 2006).

4.3.2.4 IPR and Indigenous practices

In pursuit of the government's drive to diversify the economy, Mass mentioned the observance of local practices as important. Mass shares the view that IPR application to local situations, must be suited to those local situations. He argues

that since IPR is foreign, it will often conflict with indigenous practices:

In the intellectual property field they tend to be monopolistic and they are exclusive, once we give it to you for instance no one is going to use it until they get your permission. Now when it comes to communities like ourselves who have been living in communities, how are we going to then say an individual who gets to know something has been used for/by the entire community should go and benefit solely at the expense of the other group, I mean those are the issues we have to battle with and see how best we can address them (Mass, 2006).

To help achieve the reconciliation that is needed, a great deal of important stakeholder involvement is required. Mass was not comfortable with the current practices that appeared to marginalise indigenous practices only because they are not protected by any laws:

One thing that has always surprised me is that in Botswana we always encourage traditional healers to come out in the open to tell us they are using their medicine and all the other stuff but at the same time we do not have anything to protect them or protect what they are going to do (Mass, 2006).

Mass is seemingly worried by this treatment of one practice that he believes forms part of most communities' lifestyle and that is not protected against absorption into other technologies. He further shared similar sentiments when he said:

We haven't even gone to tell Coca Cola for instance; can you tell us your recipe, so I have always found it very interesting that you can go out there and encourage people to come up and do their business openly or in public knowing quite well that we don't have anything to protect, and at the same time knowing that there is something known as 'trade secret' which you can just use to protect what you have which is of value (Mass, 2006).

Mass believes 'what is sauce for the goose is sauce for the gander' in that both practices must be protected by law. It is unfair, as far as he is concerned, to expect traditional health practitioners to perform publicly when the same is not expected of the other practice under the guise of 'trade secrets'. His position was that traditional healers too have 'trade secrets'.

During the interview Mass alluded to the fact that his mother was also a traditional healer, which is where some of his first hand experiences and strong ideas on IKS came from. According to Mass, modern science is 'single vision' as it deems any other forms of science that do not observe the status quo to be 'unsafe'. As an officer he preferred defining science in a manner intended to demystify Science. The department has worked on a standard definition of science that is much broader:

We had come up with a definition of what we mean by science and that definition tries to cover, we try to if I were to say 'demystify' science the way we think of people, we talk about science to anybody else who doesn't know anything, may be we talk about going to the labs but now in our definition we are trying to exclude as many things which when people ordinary people might not think is right (Mass, 2006).

Demystifying science entailed educational campaigns that would aim at changing people's perception of science.

The benefits of a clear and open understanding of science are that more people may find science more attractive as a result and this would improve the innovative potential of the country (Mass, 2006). This would counteract the current understanding where many people understood science as working and carrying experiments in laboratories alone (Mass, 2006).

IPR is broad and encompasses even indigenous technologies that he himself is not familiar with. Therefore in his department they have started with internal workshops for their colleagues. They have also attended seminars outside the country to strengthen their own understanding and knowledge regarding other forms of IP:

Um... just early this year I think within; internally in our department we did conduct a seminar where we were telling our colleagues what intellectual property; what it is; to raise awareness level in, in areas where we are working, where we have influence, of course all these other guys who are falling under our ministry. We do in Botswana itself send or get some invitations to make presentations in seminars (Mass, 2006).

Mass stressed the fact that their official activities were mainly concerned with raising awareness, because Intellectual Property Rights knowledge is lacking and so IPR awareness is one of the most necessary and basic approaches to adopt. During our discussion, Mass remembered one workshop he had attended in Namibia where they discussed policy and legislation matters and one such policy was on Indigenous Knowledge Systems. IKS sounded like a new area to Mass, because he had not fully engaged in any extensive discussions about traditional knowledge as he preferred to call it.

4.3.2.5 Loss of trained personnel

On the loss of trained personnel to other department particularly, in the field of Intellectual Property, Mass blatantly blamed poor working conditions. He argued that:

The most unfortunate thing again that if I were to tell you, you have somebody being trained in intellectual property for instance, when you go and look for that person you find that maybe he is no longer working in the very same area, and if you go to the people who have trained them and ask them,

'why is this the case', they will tell you 'is green pastures' and all the like (Mass, 2006).

However in Mass's view this reasoning did not hold. He argues that not all the time should people work for money. This situation as far he is concerned will continue to frustrate and force capable people out of the government. Mass had also observed another problem that he felt 'bred' some friction between the old and new 'vibrant' and 'energetic workforce as he reasoned:

I mean us in Botswana I don't think we have a history of having trained a lot of people who can handle IP maybe the generation I don't know after which I can say. Maybe the late 90s and the like, that's when we can say we started changing we had more people coming in but reason why we don't have um...we have the implementation capacity problem is expertise really, and when it comes to issues of intellectual property it touches on that, we don't have any expertise, we don't have any experience whatsoever on implementing issues relating to

In the conversation above Mass laments a rather different form of expertise, which is a level higher than his. He mirrored a conflicting situation of the higher authority lacking basic understanding of what the IPR system would require to be successfully implemented in the country, including the retention of trained and knowledgeable personnel.

4.3.2.6 Lack of guiding framework

Lack of policy and legislative framework was another area that Mass felt led to the current state of IPR:

...we don't have a policy on intellectual property rights and that in-itself tells you that whatever we are coming up with it is being reactive, we don't have any policy to guide us on those issues like intellectual property, and then without a

policy because I have been here for... a policy will guide you like take for instance science and technology policy, the ministry was established, whatever we are going to be doing are guided by policy, and then if you don't have a policy on intellectual property whatever we are coming up with is a trial and error (Mass, 2006).

For Mass any activity that the government comes up with, as long there is no policy or legislation, is simply a knee jerk reaction that is unlikely to be sustainable.

Mass views 'public participation' as a key to developing a functional public policy and he argues as follows:

We want to engage our stakeholders; consult them from the beginning, um...right now we have done our internal report see what needs to be done? How we want to do it? The next stage is to invite those key stakeholders which we think are relevant to the ministry here, bring them to a table and say, this is what we want, how do you think we can approach it? We want to involve them from as early as drafting in terms of until the last stages where we will be having a policy in place. So to me I think the best thing is to like we say consultation; start involving people from the onset until you have the final product (Mass, 2006).

In the quotation above, Mass emphasises his preference for a "Bottom-up perspective" to policy development. The Bottom-up approach seeks to show how and why policy implementation is inevitably a product of negotiation between actors who in 'real world' situations, have to make compromises and choices between conflicting policy objectives. Mass understands policy construction to involve different stakeholders thereby making it multi-dimensional.

The multidimensionality of the policy, particularly the Science and Technology policy, is born out of the realisation that S&T incorporates both modern and indigenous science and technologies. The complexity of IPR and IKS in its ideology, methodology and conception further complicates science policy making

in Botswana and elsewhere. Mass recognises the conflicting ideologies of the two regimes (IPR & IKS) because IPR advocate absolute ownership and IKS community or shared ownership.

The participatory approach championed by Mass and the Science and Technology and Botswana National Research, Science and Technology Plan to make good use of Intellectual Property Rights is aimed at ensuring economic sustainability taking into account the socio-economic situation of most communities dependent on natural resources (S&T, 1998).

However the lack of concerted efforts of systematic and clearly defined ways of working with other departments results in lack of coordination between the Ministry of Communication, Science and Technology, rural communities and other government departments. This gap constrains any serious attempts to achieve the ambitious intentions of the policies (S&T, 1998 and BNRST, 2005)

4.3.3 MR TAMMIE'S KNOWLEDGE AND PRACTICES REGARDING IKS AND IP IN BOTSWANA

4.3.3.1 INTRODUCTION

Our next focus in the quest to locate science and technology policymakers and policymaking was the Ministry of Trade and Industry. The Ministry established a unit responsible for the registration of intellectual property including copyrights, patents, and trademarks. Botswana as a member of the World Intellectual Property Organisation (WIPO) is guided by trade policies of the WIPO, to be more productive and competitive through treaties and agreements entered into. The creation of the IP Office in the Registrar of Companies was a response to the enforcement of Intellectual Property Rights.

The Registrar of Companies unit is headed by a Director, while the Intellectual Property Office (IPO) is led by a Registrar who according to the World Intellectual Property Organisation (WIPO) manual is the Head of the Industrial Property Office.

Mr Tammie is the Chief Registrar in the IP office. He is in his mid-fifties and has been working in the Ministry of Trade and Industry since completing his secondary schooling. His duties as outlined in the Industrial Property Act of Botswana (2006) included processing all applications made in terms of the Industrial Property Act, granting patents and utility model certificates, registration of industrial designs, marks and collective marks, administration of granted patents and utility model certificates and registered industrial designs, marks and collective marks, establish and maintain a journal of marks; patents and designs in which he shall publish all matters that are required to be published under the Act.

Within the responsibilities of protection and registration, he is charged with conception and implementation of intellectual property legislation, and at the time of the interview the department was working on some new intellectual property legislation. In the view of the Chief Registrar, the legislation could have been effected in 2000 when the plan to effect the IP legislation was realised, but was delayed after some further consultations on the legislation. The major issue in the revised legislation was the realisation that there was an omission of indigenous knowledge, genetic resources and folklore (Chief Registrar: IPO). The legislation was therefore withheld to facilitate the inclusion of such (Tammie, 2006).

During my conversation with him, Tammie sounded as a well travelled official, both locally and internationally, under the aegis of IP. At one point during the interview, he sounded more 'poetic' about one aspect of IP; folklore. He recited

what seemed like a history of his tribe and how he was part of the Royalty. Once he got going on this folklore, he seemed not to want to stop.

Mr. Tammie is light in complexion and comes from the Southern part of the country. He occupies a large spacious office on the ground floor of a two-storey building. There are two blocks of offices; one block was occupied by employees who do the actual registration and other clerical work, while the other block was reserved for officers in high ranking positions, including Tammie. Gaining access to his office was less cumbersome compared to the Ministry of Communication, Science and Technology and other government offices I visited.

During the interview, Tammie related the history of IP in the Southern African Development Committee (SADC). He narrated how as a region the formation of the regional IP committee alleviated the problem of lack of capacity in the member countries. When asked about the advantages of having a regional body he mentioned financial setbacks, qualified personnel and lack of patents from member countries that no single country would have been able to function fully by itself. Tammie went further to tell the history of the African Regional Intellectual Property Organisation (ARIPO), how it changed from being known as ASARIPO (French acronym) to the current (ARIPO). According to Tammie there was a problem in the composition of membership because not all member countries spoke English as their official language.

Member countries did not want non-English speaking countries like Angola and Mozambique to form splinter organisation and Franco-phone countries too following suit. Tammie went on to show his involvement on IP issues when he related his meeting in 1999 with the Director of World Intellectual Property Organisation (WIPO), where they discussed some loopholes in the Berne and Paris Conventions for IP. According to him the meeting discussed the exclusion of Indigenous Knowledge Systems, Folklore and Genetic Resources, which

apparently affected developing countries more. After providing the background about the history of IP and formation of the ARIPO, he shifted his focus to the local setting by dwelling on his day-to-day chores, as involving registration of trademarks, copyrights, patents and copyrights.

He was quick to mention the shortage of person power as a problem that affected his department heavily. In his view the department could not do its work well because of this shortage of personnel. According to him, the unit is expected to have a staff compliment of twenty six (26) officers, but at the time of the interview there were only six (6) officers employed.

His story was woven to illustrate how he was making sense of his experiences, gained through interaction with influential figures at the highest level in the field of IP generally. An analysis of his account revealed two major assumptions: first, that it is economically sustainable to have one regional IP organisation despite the language barriers; and second, that individual member countries would still have their own unique problems and challenges to work with in spite of the existence of a regional framework. Tammie like Taboka and Mass conceded that IP awareness was not only low in the country, but that his office was not known even within other government departments. This is how he put it:

A lot people don't know we exist, even in the government enclave, even in the government enclave and that's a major, major weakness in this particular field (Tammie, 2006).

The fact that they were not known in other government departments, as Tammie acknowledged, complicated the story about IP understanding further. In our conversation about his efforts to improve levels of awareness Tammie attributes the problem to lack of personnel, which at the same time is not unique to him alone, other government departments are experiencing the same problem:

We are trying to do that (protect IP) in all fields of intellectual property but unfortunately due to the manpower

shortages in the whole government enclave we are not able to, we are not achieving our goal (Tammie, 2006).

In an attempt to follow the issue further, to establish whether plans were in place despite human power shortage, he acknowledged that there were none:

Not at the moment, if I can take you around you will see how we are suffering. These are produced by individuals and I have to screen each and every application, they have to be entered into the system, checked and examined thoroughly (Tammie, 2006)

Tammie acknowledged that very little was known about them and that as an individual he had not done enough even in the face of increasing demand and interest on indigenous technologies. Unlike the Research, Science and Technology, the department of Registrar of Companies has been in existence for a lot longer. However, it has not been aggressive enough to develop coherent programs in terms of educational or awareness campaigns.

Unlike Taboka who despite the lack of a working plan has engaged in what I describe as 'personal engagement' premised on the understanding that something needs to be done. It seemed that Tammie on the other hand has not moved an inch. Both interviewees (Tammie and Taboka) experienced similar and/or related problems of lack of personnel as far as Tammie reported, but Taboka somehow did not talk about that as a problem to hold back her ambitions in developing community awareness. Tammie blamed it on lack of personnel and maintained a 'positive image' about himself.

But we are not sleeping like somebody was suggesting the other day that we should use the television we don't have to go any further now, use the radio (Tammie, 2006).

Emotions determine the choices people make in social interactions and are thereby important part of memory. Emotional associations are an important part of knowledge structures used to reason about the world and may affect reasoning about value-laden issues (Bower & Fagas, 2000; Ortony, Clore, & Collins, 1988). Reasoning about changes in one's core practices is likely to evoke affective responses, and these responses may color perception and judgment.

Consequently a person may concentrate only on behavior or practices that have been 'rewarding' in the past. It is therefore possible that Tammie's account that places the blame for the lack of educational awareness of IP on staff shortage was defensive and an attempt to exonerate himself from the situation. In the interviews, it emerged that Tammie did not have any plans or program in place to raise awareness as Taboka, who despite the fact that his department was new had already developed a plan that included educational campaigns.

This observation is very important particularly as it resurfaced later in the interview with Tammie, when he mentioned the loss of IPR by some research institutions. Tammie magnified the problem of lack of awareness when he referred to one Research and Development institute that lost a patent to the public domain and he was in a dilemma as he claimed:

BOTEC has just lost a beautiful patent, they filled an application and a lady in the IPO tells me she said to them, look you file it today it is maintained annually and you have to pay maintenance fee, ...the poor man forgot, it's a dilemma to me, I like the product, its one of the best...(Tammie, 2006)

Was the dilemma caused by loss of patent into the public domain and that the patent would be up for grabs? Was the dilemma recognition of their failure to have advised the company to renew its registration? Was it that he could take the patent and the dilemma would have been that he had an unfair advantage since he had privileged information? These are all pertinent questions when it

comes to science and technology policymaking in a developing country like Botswana.

IP jurisdiction between the two discussants seemed in the view of Tammie, ambiguous and in a way, created difficult working relationship. Tammie seemed not to view Taboka as an IP colleague as he in the interview made some references that suggested some 'hostilities' between the two departments.

This will be discussed in detail in the next section, where I examine the context, more specifically the organizational arrangement for science and technology policymaking in the country.

4.3.4 Organizational Arrangements for Science and Technology Policymaking and how they shaped the Inter-relations between IP Office and Research, Science and Technology

I have used the metaphor a 'Cold War,' popularly used in political circles to describe the relations between the former Union of Soviet Socialist Republic (USSR) and the United States of America (USA). The 'cold war' between the two blocks was a result of political, economic, technological and social differences. The USSR subscribed to a socialist ideology and the USA to capitalist and the two countries did not see eye to eye as one ideology was believed to be better than the other, hence the 'cold war' because these two blocks never contemplated going to a real physical war with each other.

This metaphor in our study therefore is used to describe and tell a story by building on anecdotal notes of two departments. The anecdotes describe how the two units related with each other on matters of IP. Tammie 's department is situated in the Southern part of the capital city Gaborone while Taboka and Mass work in a department situated in the Northern part of the city. Between the two departments, there is just a telecommunication highway that instead of being congested with endless IP messages between them, the 'highway' is rather silent. Only occasional spats of suspicion and distrust seem to fill the 'highway'.

Both interviewees dealt with IP in different ways and at different jurisdictions.

Hence, to understand silent 'conflict' and its outcomes requires an appreciation of the historical context. What follows therefore is a brief 'catalogue' of the two discussants' history. Taboka and Mass have worked under the supervision of Tammie before joining Research, Science and Technology. They are relatively new in the department, just as is the Ministry. Both Taboka and Mass went for their masters' degrees while they were in the department headed by Tammie. Upon their return (from further studies), they almost left simultaneously and joined Research, Science and Technology, where they both have been promoted to higher posts of responsibilities.

On the basis of their highly sought after expertise regarding IP their move may have dealt a heavy blow to Tammie's section. It is therefore possible that Tammie's department is plagued with challenges ranging from staff retention to staff development. The department on the other hand is quite old and holds a critical position in economic matters of the country but continues to lose valuable people. Tammie has always worked in this department since completion of his secondary schooling a few decades ago.

Tammie like other discussants holds a similar view that IP awareness is low and that something needed to be done. Naturally therefore one would expect them to have a common and mutual working relationship towards alleviating the problem. For instance Tammie at IPO registers copyrights, patents and trademarks and Taboka (RST) provides conceptual and functional understanding of IP. This is how Tammie expressed his views about Taboka:

We do not know how they are operating, we are the custodian of the legislation on intellectual property, I...we do not know what they...but we can see that there is something from them, they feel, there is a feeling, they think this department, they want to come...actually they want to, they would love to see intellectual property office being moved to

them, it's a guess ... (Tammie, 2006).

In a similar situation involving Taboka and still depicting lack of working together, she said:

The document is in draft form right now after that there are just a few things to add thereafter am going to send it to ARIPO (Taboka, 2006).

The above responses points to a situation that seem to suggest little working relationships between these two interviewees and their departments. In the interview Tammie even confirmed an instance where Taboka appealed for assistance from outside the country and he (Tammie) only learnt about it from a friend who appeared to have received the request. This is how Tammie related it:

Last week a friend of mine from Harare ARIPO was telling me that some people from the same office have eh...requested to be trained, and I say what is the training for, what is the training, what is it they want you to do? It seems there is going to be a clash of some kind but we are not aware because they keep on saying we are dealing with policy issues, you are Trade and Industry at the operational level (Tammie, 2006).

It was surprising to uncover the fact that both departments did not work with each other even after both highlighted the fact that IP was an important economic activity that required a collective approach. This relation was complicated even further by one department that confessed in the interview that she was not so sure about certain aspects IP and would need assistance. This is what she said:

There are areas that I feel that I need like formal introduction to those like the ...corporation treaty, the ARIPO system, those ones I have not done them in class, I only went through materials after joining the department

(Taboka, 2006).

During the interviews with discussants, very little evidence of interactive activities came out, except where Taboka worked on the theory of 'proximity'. According to Taboka she held workshops with some departments that share the building with her.

Evident in this working relation is its lack of opportunities to talk and share ideas by departments. This consequently contributes to substantial differences among the departments in the meaning(s) they construct about the practices on the basis of the policy. Organisational arrangements, according to Spillane et al (2002), are influential in the sense-making process at all levels of departments, and can contribute to the construction of multiple and often contradictory understandings of policy.

4.3.5 Summary

The Science and Technology Policy and the Botswana National Research, Science and Technology Plan are designed to guide science and technology endeavors in the government pursuit to diversify economy. The Science and Technology policy provides a framework and the BNRST provides an implementation plan of how the aims and objectives of the policy will be implemented and monitored.

The discussions in the interviews have shown that Intellectual Property as one priority area followed in the diversification of the economy is laden with a number of challenges. These challenges have had some negative impact on the envisioned economic benefits that the system (IPR) is expected to bring. The discussions showed that very little is known about Intellectual Property Rights by the public and that very little seems to have been done about this. Interviewees' lack of educational awareness plans limited the pace at which intended goals could be achieved. In this study, it surfaced that the three discussants (Taboka,

Mass and Tammie) did not work in any coordinated and complimentary way. One is responsible for the provision and dissemination of IP information while the other (IPO) is responsible for the operationalisation of IP activities.

The study revealed that IP working relation between the interviewees despite their common and conceptual understanding of IP have not moved in the direction of working collectively to realise the policy intentions. The discussants tended to question and shut each other out in conversations and developments aimed at exploiting Intellectual Property activities. Lastly, the problem of human capacity was a real one in science policy making with respect to IP and IKS.

There is a ray of hope though, at the instance where one of the interviewee's determinations to personally engage in IP awareness raising initiatives is likely to yield some good results, even though such an engagement usually lacked selection criteria, and was thus generally inconsistent.

Chapter Five

5.1 SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1.1 Introduction

This chapter summarises the findings and discussions, and presents the conclusions and recommendations. The study sought to explore critical questions related to science policymakers' knowledge and practices on Intellectual Property Rights and Indigenous Knowledge Systems in the two Ministries in Botswana. My analysis focused on the following themes: policy makers' knowledge regarding IPR, policymakers' knowledge of IPR regarding IKS, patterns of sense making and prior knowledge, awareness, and organisational arrangements.

5.1.2 Summary of the findings

The study has established that the two departments of Research, Science and Technology and Intellectual Property Office are in agreement that IPR awareness in the country is low. This was also observed across government departments, and that educational awareness campaigns would provide a sustainable solution to this problem. Despite this observation, however, only one department seemed to be working towards providing the necessary education- viz. the Department of Research, Science and Technology. The other department continued working on a normal 'schedule' of just providing their portfolio responsibility of registration of IPR. In this binary opposition between members' accounts, the former in her quest to address the problem appeared to largely work without a systemic plan, which in most instances resulted in activities that were inconsistent. This inconsistency was as explained before, a consequence of the officials being new in the organisation. It also emerged that the lack of consistency in the awareness programmes was caused by lack of proper selection criteria to enable identification of stakeholders for the campaigns.

Furthermore, the study uncovered some patterns of sense-making among the policymakers and practitioners. Anyone who must regularly attempt to get things done with and through other people has the problem of generating agreement, or perhaps just consent, or at least compliance, with regard to what will be done, how, and when and on what terms (Paton, 2004). Characteristically, opinions will differ on the importance of the different goals and on what is an appropriate, or fair, basis to proceed.

The two departments seemed to have conflicting understandings of each other's roles in the implementation of Intellectual Property issues. This 'conflict' was rather strange because both were aware of each others' roles and yet seemed not to draw a line separating their portfolio responsibilities. As a result of these conflicts the working relations between the two departments were affected. Our evidence suggests a lack of partnership between the two departments contributes to the continued lack of understanding about IP in country. As a result, the intentions of the Science and Technology Policy have remained elusive.

In the next section, these and other major findings are discussed further.

5.1.3 Discussion of themes and major findings

Spillane and Callahan (2002) and Spillane, Reiser, Reimer (2002) discuss the importance of ideas that policy makers construct on policy, and in understanding what they do, and do not do by way of implementing policy. The key argument in these studies is that sense making is a complex process because policy makers do not decode policy message, or construct new understandings by simply replacing previous knowledge with new information. People rely on their existing knowledge and beliefs.

The use of the cognitive frame in this study thus enabled me to examine the role of prior knowledge and beliefs in the actions policy makers take. Policymakers construct new knowledge through interaction.

There is a general consensus among the policymakers regarding the fact that public knowledge of IPR content and policy is generally low in Botswana. In spite of this general lack of understanding of IPR in the public domain, science policymakers interviewed seemed to have a good command of IPR content and policy processes. Much of this knowledge seems to have come from experience as the policymakers interacted and participated in forums that dealt with IPR issues over the years. Many have participated in seminars and workshops organised at National and Regional levels and collaborated with different stakeholders on IPR issues. According to Fullan and Hargreaves, (1996) collaboration provides access to new ideas and knowledge and can also contribute to improvements in performance.

Furthermore, some of the policymakers I interviewed have worked in different government and non-governmental departments where they worked as IP officers and consultants. They seemed to rely heavily on the experiences gained in their former departments to handle situations that were new in the areas of IP. These Officers argued that newly established departments' were experiencing 'teething problems' and that perhaps their recruitment as experienced officers to those departments may have been justified.

In Botswana, the recent trend is to craft representative policies that would serve the interest of the public. The shift towards spending more on IPR relates to policy and the emergence of new technologies. Botswana's investment in the education and training of the policymakers is in line with the importance attached to such processes of policymaking. In the framework of globalisation of economic activities and the growing importance of IPR's-intensive international

transactions, many developed countries have pushed for stronger protection of IPR. The emergence of new technologies on the other hand has led to the continuous adaptation of IPR protection mechanisms. It is these developments that have necessitated the training and development of policymakers from developing countries on IPR.

The policymakers interviewed in the present study seem to be well educated in their respective areas. For example, interviewees at the Department of Research, Science and Technology hold masters degree qualification in Intellectual Property, placing them in an ideal position to provide informed guidance regarding Intellectual Property issues. Furthermore, they have all previously worked in other departments that dealt with IP issues and their relocation to the current workplace could be read as developmental because they have not only changed offices but have also moved to higher positions of responsibility.

The current IPR legislation of Botswana has been under review that dates back to 1996. The review is a feature that acknowledges the need for the country to adopt new comprehensive legislative and policy instruments, and create new or renovate old institutions. The policy was scheduled to take effect in 2000 but was delayed due to some observed omissions deemed critical in the policy. In pursuit of this endeavour however, two important themes are advanced. First, it is that IPR reforms are geared towards maximising the benefits from IP protection rather than simply complying with international standards. Second, in reforming the IPR system, governments in developing countries should match their role to their capabilities (Braga & Fink, 1998).

Given the different structures of demand for IPR protection and more limited government resources in developing countries, it would not be efficient to simply copy the institutions and procedures developed by industrialised countries over a period of time. Botswana Patents, Utility Models and Industrial Design Manual

(2006) posit that the Act (Copyright Act of 1965) was a mere extension of protection granted in the United Kingdom and South Africa. Owners of rights, which were protected in these countries, forwarded the certificates of grant and registration to Botswana's IP office and the Registrar would simply enter the details of the protected IPR in the registers.

Furthermore, Higgs (2000), suggest that some developing countries have established their IP legislative system in the face of international pressure.

In a move designed to reverse this tendency, Botswana's copyright law (2000) is designed and constructed to recognise registration than use, and contrary to the Copyright law of the United States of America that recognise use (Taboka, 2006). Similarly the Industrial Property Act (1996) that deals with protection of patents, trademarks, utility models and industrial designs are regulated by the Industrial Property Act of 1997. It is implemented by the Office of the Registrar of Companies in the Ministry of Trade and Industry.

Significantly, while the policymakers interviewed seem to have good command of the IPR content and policy, almost all of them were uncertain when it comes to IPR with respect to IKS specifically. IPR means the legal rights which result from intellectual activity in the industrial, scientific, literary and artistic fields (WIPO IP Handbook: Policy, Law and Use). Those legal rights compel countries to have laws to protect IP. First, the protection is to give statutory expression to the moral and economic rights of creators in their creations and the rights of the public in access to those rights. Second, to promote, as a deliberate act of Government policy, creativity and the dissemination and application of its results and to encourage fair trading which would contribute to economic and social development.

To this end, the protection and promotion exacerbated by Botswana's mediocre position on IP, has posed serious consideration to the possible protection of

indigenous knowledge. The general feasibility of linking IPR to IKS creates challenges of fitting IKS into certain accepted notions of IPR regarding originality, fixation, inventiveness, uniqueness and duration.

It is evident that no economic benefits have been attached to IPR in Botswana. This perception is more compounded by lack of protective mechanisms in the form of laws to be used for the protection and promotion of IKS. The absence of protective mechanisms causes ambiguity over what should be done or should not be done.

Policymakers make sense of new science and technology policy regarding IPR and IKS using their prior knowledge. Knowledge is context-specific, particular, or localised, in that they were produced in a certain locality under certain local conditions (Gitari, 2003). Knowledge and skills that the policymakers in our study used in everyday problem solving were, for the most part, not learned at school. Rather, they seemed to have developed skills out of the day-to-day experiences of the natural world and the need to effectively explain, understand, and survive, both intellectually and professionally. Situated here therefore, is the cognitive frame to understand policy and the policy processes. The frame (cognitive) postulate that styles of thinking and learning and of ideas and knowledge generated differ in relation to the contexts in which they were initially learned and are to be expressed (Layton, 1991).

Implicit in the theory is the attempt to explain why the science and technology policymakers in the study who seem well versed in IPR for purposes of economic development may seem to be failing in applying their knowledge to IKS. Take the example of the (songwriter and the Copyright act) and his relationship with celebratory singing (Christmas and New Year). When he joins in the singing, his relationship with the practice is entirely governed by common sense. Involving (copyright act) theory to guide him in its domestic use would completely contrast

and relegate the traditional practice to the periphery. The Copyright act process may well be of no more relevance to the same music artist in his contextualised view of celebratory singing, than it is to public who are uneducated in the Copyright Act theory.

When he uses policy process theories, however his specific context no longer obtains. What he has to do with celebratory singing is placed in wider and integrative causal context than localised and or particular; and he can only do this by viewing it in the light of scientific policy process (Western world view).

The policymakers' understandings of IKS are possibly part of alien sub-culture (Jegade, 1995; Aikenhead, 1996). Therefore, expecting policymakers to learn and adapt IKS within the context of IPR is asking the policymakers to cross sub-cultural conceptual borders or asking them to resolve 'conflicts of cognition', as existing theories compete for the explanation of either system/regime (Swift, 1982). This was the dilemma for many of the policymakers interviewed in this study.

The apparent bias to IPR than IKS evident in our study, by the policymakers, defines an understanding of IPR in the context of industrial economies. Intellectual property activities in the study are not clearly defined, as the policymakers interviewed appeared to follow their intuitions more than what the newly developed policy pronounced. Mashelkar (2002) contends that Industrial Property systems were set up centuries ago for inanimate objects, and as informal systems of innovation. Hence the challenge that emerge now is for policymakers to look at the systems that will deal with animate objects (such as plants and animals) and with the informal systems of innovation (such as indigenous knowledge holders).

But given that IPR evolves within the definition of industrial economies, it is not strange that they are usually understood in that context than within the

indigenous economies. As such and on the contrary, the problem of border crossing (Jegade, 1995) may be more pronounced in indigenous knowledge than in industrial economies. In a study by Gitari (2003) in Kenya about the teaching of Biology using indigenous knowledge, a pattern of industrial property understanding dominated indigenous knowledge understanding. Literature on 'cultural border crossing' (Jegade, 1995; Aikenhead, 1996) suggest that our policymakers may have been trained to think in terms of explicit propositional formal logic. There is therefore, no guarantee the policymakers will apply the knowledge acquired to improve the current IKS condition. The policymakers' understanding of IPR than IKS may suggest a situation of being 'educated away' from their culture and traditions (IKS) and have associated more with 'alien' values and tradition (IPR).

Policymaking processes or policy practices, so to speak with respect to IPR and IKS are rather fragmented in Botswana at the moment. There is a great deal of suspicion and misunderstanding among the various role players and stakeholders involved in science policymaking. I motivate my story by a simple metaphor of the 'cold war' between the role players. The department of Intellectual Property in the Registrar of Companies (T&I) has been in existence for a reasonably longer time than the Research, Science and Technology (RST). Some of the people in the RST have worked at T&I before joining RST, and the establishment of Ministry of Communication, Science and Technology was to coordinate science and technology activities through RST. The establishment of that ministry had not been a great surprise. It emerged during interviews that time had come for such a move as both realised the importance of a coordinating agency regarding science and technology.

In approximately five years since RST started its operations, some significant strides seem to have been made. RST has been particularly concerned about research activities in its three key research institutions.

The three research institutions were rather lacking in IP knowledge even though they dealt with IPR related activities, hence the workshops and seminars to facilitate, among other things, establishment of internal IP policies. In other government departments, similar experiences emerged in the study whereby non-statutory departments to RST handled IPR related activities that were not known to RST. This could largely be a consequence of lack of coordination within government science policy making and implementation.

Policymakers in the Trade and Industry Ministry, IP department, responsible for the operationalisation of Intellectual Property, put forward their observation that there is a need for a coordinating department. While this was a generally positive view, it was not taken up in practice. In fact, while at one time the IP office would appreciate the RST, at other times RST existence was viewed with suspicion by those from Trade and Industry.

Different people interpret situations in different ways. Eden, Jones and Sims (1994) argue that we have much in common with others in social worlds-language, shared beliefs about the nature of things and relationships between them. Many of these come to have a meaning so institutionalised that they are taken to be 'matter' of fact. Nevertheless our individual histories are unique to each of us. Different people interpret situations in different ways because they bring to a situation their own particular mental framework of personal beliefs, attitudes, practices, prejudices, personal values and objectives with which they make sense of the situation. Thus it was not surprising to observe that policymakers in the study pay attention to certain things, ignore others, and regard some as having particular significance for them in the future.

5.1.4 Limitations of the Study and Ideas for Future Research

Some limitations in this study have been identified, although they do not in any way compromise the significance of the study. They serve rather as a basis for future research on some other aspects of the problem of science policymaking in Botswana.

The present study looked primarily at individuals who worked with IPR within the Ministry of Communication, Research Science and Technology and Intellectual Property Office in the Ministry of Trade and Industry. The study focused intensively on the individuals' knowledge and practices about IPR in Botswana. Based on the study we are in a better position to know how intellectual property rights issues present challenges to those individuals in the science and technology policy arena. The study focused intensively on three individuals within the identified units of policymaking in the country. As a result, our understanding of the complexities of science policymaking in the country will be limited to the experiences of this small sample.

While a larger sample would allow for exploration of the issues on a larger scale, the present study has nonetheless allowed us an opportunity to engage with the complexities of science policymaking with respect to IPR and IKS in the country. We are better informed about what some policymakers bring to the process of policymaking, and what the dilemmas and challenges are in general.

In spite of the rich descriptions of the policy processes in the present study, we still know very little about the complexities of IPR and policymaking in other government departments. Some data was collected from the other departments on these policy processes and issues, but could not be explored in any great detail because of time constraints vis-à-vis the timelines for this

Masters level research.

Secondly, the present study relied a lot more on the reconstructions of the participants through interviews and document analysis. No actual observations of the policymaking processes were possible at the time of my data collection. In a study of a different kind, observations might yet be able to reveal further complexities and insights regarding science policymakers' knowledge and practices.

Finally, it has become clear from the present study that the problem of science policymaking around IPR and IKS specifically is a relatively new area of practice for most policymakers, especially in a developing country context like Botswana. The history is relatively brief, experiences are inadequate, and the knowledge is not as definitive or clearly formulated. These are all ingredients of a fertile area for future research in general.

5.1.5 Conclusion

From the results and discussion of the findings presented in this study about the individual policy makers in the Ministries of Communication, Science and Technology and Trade in Botswana, it may be concluded that awareness raising processes about IPR still lag behind. The extent to which individual(s) charged with such responsibility attempted to raise awareness seemed minimal and not well targeted and streamlined nor coordinated. This study has revealed that there are no scheduled programs to follow and instead individuals worked and relied on their intuition than being systematic.

This lack of clearly defined program has led to inconsistency and lack of clearly formulated programmes and campaigns on raising awareness. Present efforts to raise awareness have hitherto had a fairly insignificant impact on the economic goals and intentions of the policy with respect to the benefits of

Intellectual Property Rights and IKS. A more deliberate and well-formulated public programme of “teaching” about IPR and IKS is required.

Secondly, there was clearly a misunderstanding (and maybe mistrust also) among the various policy actors in the IPR sector that resulted in working relations that were not well coordinated and properly aligned. Clear understanding of the roles of the respective units and individuals would go a long way towards improving and expediting the realisation of the IP policy in the country. Opportunities where the various role players and stakeholders can come together to share ideas and collaborate around IPR policy activities are urgent at this stage to avoid unnecessary duplication and policy failures.

Furthermore, the present study sought to understand the science policymaking processes using the lenses of three key participants in the processes. Using the cognitive frame, we have been able to uncover the policymaking process as a sense making process for these individuals that are involved. The policymakers grappled with various interpretations of knowledge and practices, using their prior experiences and knowledge to try and construct a coherent set of policies around IPR in Botswana. To the extent, that such policymaking processes are constructive (in the conceptual sense of individuals making sense of their experiences), then it is clear that policymakers still require a great deal of assistance to really make sense of their practice. A lot of teaching and learning about policy is called for in this regard – what Cohen and Barnes called “A Pedagogy of Policy” (Cohen and Barnes, 1993). This is even more urgent when the goal is to encourage broader participation in science policymaking in the context of a developing country like Botswana.

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Appendix A1

Yahoo! Mail - jama662001@yahoo.com

Page 1 of 2

Yahoo! My Yahoo! Mail Tutorials More **Make Y! your home page** Welcome, **jama662001** Sign Out Help

YAHOO! MAIL

Search:

Web Search



GET 15% OFF AT BANANA REPUBLIC
and a chance to win \$1000 towards a new wardrobe!

YAHOO! hot
Find the right on

Enter Now

Mail Addresses Calendar Notepad

Mail Upgrades - Options

Check Mail

Compose

Search Mail

Search the Web



Hot Web Finds
Daily on THE 9

Previous | Next | Back to Messages

Delete

Reply

Forward

Spam

Move...

This message is not flagged. [Flag Message - Mark as Unread] Printable View

Subject: RE: Your application for permission to do research

Date: Thu, 6 Apr 2006 14:19:31 +0200

From: "Keoagile Fanoel Molapong" <kmolapong@gov.bw> View Contact
Details Add Mobile Alert

To: "Jama monngakgotla" <jama662001@yahoo.com>

CC: "Victoria Otsisitswe Kgosimokgalo" <vkgosimokgalo@gov.bw>

Folders

[Add - Edit]

Inbox (1)

Draft

Sent

Bulk (2)

[Empty]

Trash

[Empty]

My Folders

[Hide]

Research folder

Search Shortcuts

My Photos

My Attachments



See top video
game trailers



Your Next Career Move
Start Your Search Now



Get the top 100
music videos



Your Next Career Move

Dear Ms Monngakgotla,

We have approved your application. In my absence please collect the letter from my Secretary.

Best regards,

Molapong

-----Original Message-----

From: Jama monngakgotla [mailto:jama662001@yahoo.com]

Sent: Wednesday, April 05, 2006 12:26 PM

To: Keoagile Fanoel Molapong

Subject: Re: Your application for permission to do research



Appendix A2

Yahoo! Mail - jama662001@yahoo.com

Page 1 of 2

Yahoo! My Yahoo! Mail Search the Web

YAHOO! MAIL Welcome, **jama662001** [\[Sign Out, My Account\]](#) Mail Home - Help

Mail | [Addresses](#) | [Calendar](#) | [Notepad](#) | [Mail Upgrades - Options](#)

Folders [\[Add - Edit\]](#) [Previous](#) | [Next](#) | [Back to Messages](#) [Call or Instant Message](#) [lemphim](#)

Inbox (1)
Draft
Sent
Bulk (2) [\[Empty\]](#)
Trash [\[Empty\]](#)

My Folders [\[Hide\]](#)
Research folder

Search Shortcuts
[My Photos](#)
[My Attachments](#)

This message is not flagged. [\[Flag Message - Mark as Unread \]](#) [Printable View](#)

Date: Mon, 12 Jun 2006 03:44:24 -0700 (PDT)

From: "LEMPHI MOREMI" <lemphim@yahoo.com> [View Contact Details](#)
[Add Mobile Alert](#)
Yahoo! DomainKeys has confirmed that this message was sent by yahoo.com. [Learn more](#)

Subject: Re: research application form

To: "Jama monngakgotla" <jama662001@yahoo.com>

I am pleased to inform you that your research permit is ready for collection. The permit can be collected at HRU at anytime.

Best regards

Mr. Moremi

Jama monngakgotla <jama662001@yahoo.com> wrote:



APPENDIX A2A

TELEPHONE: 3632000
FAX: 3914467
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD



MINISTRY OF HEALTH
PRIVATE BAG 0038
GABORONE
BOTSWANA

REPUBLIC OF BOTSWANA
MINISTRY OF HEALTH

REFERENCE No: PPM&E 13/18 PS Vol I (26) June 12, 2006

Oabona Monngakgotla
P.O. Box 601907
Gaborone

Research Permit: "A study of policy makers knowledge and beliefs about Intellectual Property Rights and Indigenous Knowledge Systems in Botswana".

Your application for a research permit for the above stated research protocol refers. We note that you have satisfactorily revised the protocol as per our suggestions. **Permission is therefore granted to conduct the above-mentioned study.** This approval is valid for a period of 1 year, effective June 12, 2006.

This permit does not however give you authority to collect data from the selected Ministries without prior approval from the Ministry. Similarly, consent should also be sought from all the participants.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal will need to be resubmitted to the Health Research Unit in the Ministry of Health.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research Unit, Ministry of Health within 3 months of completion of the study. Copies should also be sent to relevant authorities.

Approval is for academic fulfillment only.

Thank you,


S. El-Harabi
For Permanent Secretary Ministry of Health





APPENDIX A4

appendix 01

National Traditional Health
Practitioners Reference Committee
P. O. Box 797
Gaborone

25 October 2002

The Registrar of Society
Private Bag 002
Gaborone

Dear Sir/Madam

**RE: FORMATION OF AN UMBRELLA BODY FOR TRADITIONAL
HEALTH PRACTITIONERS**

During a 2 days Conference Organisation by Traditional Health Practitioners Reference Committee on the 8th – 9th October 2002 it was agreed that an umbrella body be formed to regulate all matters pertaining to Traditional Health Practice.

Each registered association was then requested to submit (2) names of people who shall represent their association in matters relating to the drafting of the constitution, registration and running of the umbrella body.

We therefore would like your office to assist us with addresses of all registered traditional healers associations. We would also like your office to confirm if the following associations are properly/fully registered with your office.

1. Botswana Dingaka Association
2. Botswana Dingaka Medical Association
3. Dingaka tsa Setso Association
4. Diepamere Association
5. African Dingaka Technicians
6. Bamalete Dingaka Association
7. Legwane/Kwame Dingaka Association
8. United Herbalist Associations

We look forward to your early response in this matter.

I remain,

Yours faithfully

PETER MBENGE



APPENDIX A1A



TELEPHONE: 3954050

TELEGRAMS: MEWT

TELEX:

TELEFAX: 3954051

REFERENCE: DFRR 6/12/11(3)

REPUBLIC OF BOTSWANA

MINISTRY OF ENVIRONMENT,
WILDLIFE AND TOURISM
DEPARTMENT OF FORESTRY &
RANGE RESOURCES
PRIVATE BAG 00424
GABORONE
BOTSWANA

ALL CORRESPONDENCE MUST BE ADDRESSED TO

THE DIRECTOR

28 March 2006

Mr Oabona Monngakgotla
Faculty of Education
University of Pretoria
PRETORIA
Republic of South Africa

Dear Sir,

PERMISSION TO CONDUCT EDUCATIONAL RESEARCH

Your letter dated 27 March 2006 refers.

We have noted your intention to conduct a research by interview within our department. We are pleased to inform you that you have been granted a permission to conduct an educational research titled "Knowledge and beliefs about intellectual property rights with regard to indigenous knowledge system in Botswana.

Permission is granted to the following conditions;

1. Copies of any report/papers as a result of the interviews are directly deposited with the Ministry of Environment, Wildlife & Tourism, Department of Forestry and Range Resources, National Archives, National Library, University of Botswana, Office of the President and National Assembly.



APPENDIX A1A (contd)

2. You conduct the study/interview according to the particulars furnished in the application.
3. This permission does not give authority to enter any premises, private establishment or restricted area. Permission for such entry should be negotiated with those concerned.
4. Failure to comply with any of the above-stipulated conditions will result in the immediate cancellation of this permission.

Thank you.

Yours sincerely

Dr. K.F. Molapong
Director

Department of Forestry & Range Resources



APPENDIX A3

36

SAVINGRAM

From: Attorney General's Chambers


S.S Chikanda

Telephone : 3613600

To: Permanent Secretary Ministry of
Health
Att: L. Mazhani

Reference No: L2/4/977 (I) (26)

17 March 2006

TRADITIONAL HEALTH PRACTICE BILL, 2006

Please refer to your DPH CMED 21/2/2 (34) dated 2nd March 2006.

Please receive a copy of above mentioned Bill for your consideration. Your instructions have been incorporated as appears in the Bill. Please note that the penalties under sections 11, 14 and 17(8) have been amended to be consistent with the penalties under paragraph 3 of the instructions.

Your speedy consideration of this Bill will be much appreciated.

SSC



Appendix C-a

Interview instrument for Department of Research, Science and Technology (Intellectual Property)

1. Tell me about yourself; academic and professional qualifications
2. How long have you been working in the department?
3. Have you worked anywhere else before joining the department?
4. Could you talk about the activities of your department
5. How long has your department been in existence?
6. Could you discuss reasons that may have led to the establishment of the department?
7. What are the challenges that your department is faced with?
8. How are you tackling those challenges?
9. How have Intellectual Property debates both locally and internationally affected your day-to-day activities?
10. How does the science and technology provide a framework for creation of efficient system for protection of IPR?
11. What do you think of a policy that is to be understood in context of sustainable social and economic development of the nation and challenges in the new millennium?
12. How do you view Intellectual Property Rights since they have now become alternative forms of development?
13. How does your office reach out to departments dealing with IP issues

APPENDIX C-b

Interview instrument for Department of Research, Science and Technology (Policy)

1. Tell me about yourself; academic and professional qualifications?
2. How long have you been working in the department?
3. Have you worked anywhere else before joining the department?
4. Could you talk about the activities of your department?
5. How long has your department been in existence?
6. Could you discuss what may have led to the establishment of your department?
7. What are the challenges that your department is faced with?
8. How are you tackling those challenges?
9. How do you go about designing and conceptualizing the science and technology?
14. How do you think the science and technology will shape the perception of the communities (rural and urban)?
15. What do you think the introduction of Science and Technology Education would do to the culture and society of Botswana?
16. What are your thoughts on policy and delivery under increasing evidence that delivery in many instances is a challenge?
17. What are views on the importance of 'knowledge' in policy formulation and implementation
18. What are your views on this issue that information flow between disadvantaged communities and policymakers is sometimes 'weak' and this affect both policy formulation and policy implementation?
19. How do you develop your own policies under the current structures like Trade Related Aspects of Intellectual Property Rights (TRIPS)?
20. Do you see any benefits in the inclusion of other stakeholders in the consultation process of policymaking?

APPENDIX C-c

Interview Instruments for Intellectual Property Office

1. Tell me about yourself; academic and professional qualifications?
2. How long have you been working in the department?
3. Have you worked anywhere else before joining the department?
4. Could you talk about the activities of your department?
5. How long has your department been in existence?
6. Could you discuss that may have led to the establishment of your department?
7. What are the challenges that your department is faced with?
8. How are you tackling those challenges?
9. What do you think is meant by Intellectual Property Rights?
10. Why do you think they have become debatable issues locally and internationally?
11. How is your department disseminating this information to communities that are affected?
12. How would you describe your relationship with the Department of Research, Science and Technology since you are both dealing with issues of Intellectual Property?
13. What policies do you have as a department regarding Intellectual Property?
14. Are your policies affected by the increasing interest and pressure that countries must develop their own IP policies?
15. How are other affected stakeholders involved in the policies you have made or you are making?
16. There is increasing evidence that policy delivery in many instances is weak, what are your thoughts on this?

APPENDIX C-c (contd)

21. Why do you think 'knowledge' is important in policy formulation and implementation? (b) What are your views on the importance of knowledge in policy formulation and implementation?
22. Do you think the current science and technology provides a framework for creation of efficient system for protection of IPR?
23. How do you think the science and technology policy will help shape the perception some people have about IPR and IKS?