Assessment of Needs in

Science & Technology

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Executive Summary

In the preparation of the 'National science and technology policy for Guyana', priority areas were identified for which science and technology inputs were required to support national development. As a follow up to this document a more in-depth assessment of the science and technology (S&T) needs for these specific areas were analysed and developed.

The areas were divided into the following sectors:

SECTOR	SPECIFIC AREAS
Productive	Mineral Development
	Forestry
	Agriculture
	Manufacturing
	Design Engineering & Engineering Consultancy
Service	Telecommunication
	Health & Nutrition
	Energy
	Environment
Support	Information Technology
	Technology Transfer
	Research & Development
	Standardisation
	Education & Training

In this presentation, an attempt was made to
(a) quantitatively assess the current situation in these priority areas,
(b) define appropriate future strategies within the context of the development plan for these areas, and
(c) identify S&T inputs required to achieve the objectives identified in (b).
It should be noted that the information gathered was formulated from policy statements from the various relevant agencies. This was done to ensure a collective perception was presented that reflected the views of decision-makers.
The specific S&T inputs required in the various priority areas and their most significant effects are presented in Section 3.

Assessment of Needs in Science & Technology

1. Introduction

This paper is intended to support the National Science and Technology Policy (NSTP), which was developed after much consultation with several organisations and persons with diverse interests in the field, as well as after study of the Science and Technology Policies of other countries. A policy statement is meant to set the general course, the specific direction of which has to further defined for the specific needs of the society. This paper is expected to lead to a clearer definition of these needs and to focus Science and Technology initiatives to help achieve coherence and best results in our efforts at national development.

In order to effectively address the needs in Science and Technology (S&T), the National Priority Areas (NPAs) already identified in the NSTP have been divided into three sectors: Productive, Service and Support (Table 1). The Productive sector includes the extractive, agricultural and manufacturing priority areas which are geared towards revenue generation. The Service sector includes the social, physical infra-structural and environmental services and programmes which are oriented towards increasing the quality of life. The Support sector is focused on providing the necessary input to enable the maximal utilisation and optimal distribution of resources in the productive and service sectors. In our development process, our goal is to improve and expand on the Productive and Service sectors, using the Support sector which includes those areas that are scientific or technological in nature.

In this paper, the present status, and possible areas for improvement using S & T inputs in the Productive and Service Sectors will be identified, and from this, the specific inputs into the Support Sector will be identified insofar as they are related to S & T. The final outcome of this exercise will be to develop a conceptual approach to dealing with the shortcomings in the Productive and Service Sectors that may be satisfied by S & T inputs, the evolution of which will only be achieved by participation of a wide cross-section policy makers.

1.1 Indicators for Involvement S & T in NPAs

A sector can be developed by either improving the quantity or quality of output.[(1)] S & T inputs may be invaluable in increasing the quantity of output by increasing the efficiency and/or rate of "production" or, in the quality of the product or output through the use of improved quality assurance and control, standardisation, and overall process control.

[(1)] Output refers to the useful product. In the case of waste generation, increase in output may be achieved through utilisation or conversion into valuable material.

Table 1. Categorisation of NPA into Various Sectors.

SECTOR	NPA
Productive	Mineral Development
	Forestry
	Agriculture
	Manufacturing
	Design Engineering & Engineering Consultancy
Service	Telecommunication
	Health & Nutrition
	Energy
	Environment
Support	Information Technology
	Technology Transfer
	Research & Development

	Standardisation
	Education & Training

In most areas, it will be possible to define "quantitative" and "qualitative" indicators which can be used to ascertain the present level of development in each area. In those instances where a potential benefit from S & T inputs may be obtained, these indicators may then be used to identify what inputs would be valuable for development in the area. These indicators have been identified specifically for the purposes of this study and thus have been narrowly chosen. The quantitative indicators are used to assess the potential of the particular industry, process or service to generate high revenue with maximum use of local resources, and establish linkages within the community. The qualitative indicators are used to assess to what extent the present product, process and/or service compares to standard and universally accepted practice.

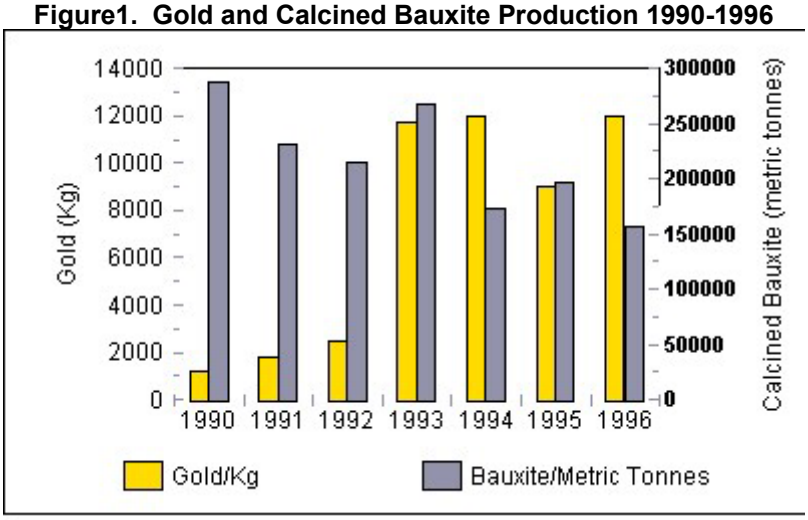
2. Present Status of Sectors

2.1 The Productive Sector

2.11 Mineral Development

The major commercial activities in the mining area essentially consist of mining and processing of gold, bauxite, silica sand, diamonds etc. The rate and extraction of diamonds is relatively low, and does not create major environmental problems. The required S & T inputs in this sub-sector will be restricted to bauxite and gold operations as these are the most significant revenue generators. Figure 1 [GSB. P. 33-34, Table 4.5&4.6] shows the production figures for gold and calcined bauxite during the period 1990-1996. It should be noted that the high increase in gold production in 1993 was primarily from the start-up of the Omai Operations.

Figure1. Gold and Calcined Bauxite Production 1990-1996



In order to determine the present state of the sub-sector, the quantitative and qualitative indicators listed in Table 2 may be used.

Table 2. Quantitative and Qualitative Performance Indicators in the Mineral Sub-Sector

	Indicator
Quantitative Indicators	Percentage Recovery
	Utilisation of Waste Material
	Variety of other mineral deposits
Qualitative indicator	Level of Environmental Management

Apart from Omai, present recovery rates in the gold industry are as low as 40%, while in the bauxite industry recoveries are about 25%. In the latter case, the waste stream which is discharged into the environment contains another high-quality material which cannot be recovered because of the present technologies being used.

Gold and bauxite, which are the most significant revenue earners in this sub-sector, have been delineated extensively, and their markets have been well established. In contrast to this, other mineral deposits have not been extensively delineated, nor have their true value been ascertained.

Environmental concerns associated with the gold and bauxite industries are related to the efficiencies of the mining and extractive processes which are influenced by technologies presently being applied. In most instances, there is little management of waste, e.g. tailings are uncontrollably released to the receiving environment, although this material may actually contain much value which can be exploited later. With particular reference to the bauxite industry, particulates are released directly into the atmosphere, although this material is very valuable.

2.12 Forestry

Most of the material that is harvested is sold by the forestry producer after dressing and with no further processing. The exception is in the plywood and furniture industries, where sawn material is converted into products of much greater value. The distribution of round wood usage for 1994 is shown in Figure 2 [NDS p. 30-7, Fig 30-1].

Figure 1