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Intermediate Technology in Papua New Guinea: A Review of SPATF

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I. INTRODUCTION

This paper is based on a study of the South Pacific Appropriate Technology Foundation (SPATF) undertaken in 1983 as part of an ITDG institutional initiative which includes the collection and dissemination of information on the achievements and problems of government-supported technology centres in developing countries. Its main purpose is to inform and assist governments, institutions and individuals proposing involvement in or undertaking tasks similar to those tackled by SPATF in Papua New Guinea.

The story of the South Pacific Appropriate Technology Foundation starts in 1972 with a conviction on the part of a group of Papuan politicians to do something practical about living standards in the hitherto neglected villages. This resulted, after independence in 1975, in the establishment of an Office of Village Development (OVD) within the Prime Minister's Office; and, in 1977, in the establishment of SPATF as the technical arm of OVD. From a small centrally based unit SPATF has grown in the space of six years into a large umbrella organisation with several units operating with varying degrees of autonomy and differing degrees of success. The scope of the organisation has widened considerably, from a concentration in the early days on technical inputs to training courses for village development workers to coverage of a wide variety of activities, including import/marketing of tools and equipment and development and promotion of village and small-scale urban industries. SPATF has accomplished a good deal in a relatively short space of time and has, largely as a result of its publications, become well known internationally. However, as frequently happens with organisations of this type, its reputation is less at home than abroad and there is still some way to go before SPATF becomes, as it was

originally conceived, a focus for AT philosophy and practice in all its dimensions in Papua New Guinea. Even more effort and resources will be required if SPATF is to become, as implied in its name, a focus for AT in the entire South Pacific Region.

There are a number of particularly interesting themes involved in the SPATF model and experience. First is that of organisational development through creation of decentralised operational units rather than centralised growth. Second is that of evolution from an essentially software and rural welfare orientation to a greater focus on R&D and commercial production. Third is the relationship of SPATF with government departments and the multitude of NGOs operating in the country. And fourth is the perception of SPATF as an 'appropriate' technology centre in its narrow sense, and the consequences of this in terms of national development.

Since the SPATF model cannot be properly understood outside the context of its geographical, socio-economic and institutional environment, Section II of the report gives a brief account of the PNG economy and of the policies, programmes and agencies which relate to technology development and application. Section III looks at the history and growth of SPATF, while its objectives and methodology, along with some examples of its work, are described in Section IV. Finally, Section V attempts to assess what can be learned from the SPATF experience.

II. THE ENVIRONMENT FOR TECHNOLOGY DEVELOPMENT AND APPLICATION IN PAPUA NEW GUINEA

A. GENERAL BACKGROUND

The mainland of Papua New Guinea lies immediately north of Australia and forms the eastern half of the island of New Guinea, the rest of which is now a province of Indonesia. The main characteristic of the mainland, which is 1,200 miles long, 750 miles wide and comprises 85% of the country's total land mass, is the extent of its physical barriers. These include the central mountain range which reaches up to 15,000 feet and the great swampy basins of the Fly, Strickland, Purari, Ramu and Sepik rivers. In addition to the mainland, Papua New Guinea also includes some 600 islands of which the two most important groups are Manus, New Ireland, New Britain and Bougainville to the north-east, and Trobriand, Woodlark, D'Entrecasteaux and Louisiade to the south-east.

These physical features have led to substantial problems of transportation and communication for the members of the many small groups who make up the country's present population of three million. Even today, roads connect few of the 19 provinces to one another while the capital, Port Moresby, is not linked to any other substantial town in any way other than by aeroplane. One result of this situation has been an extreme degree of cultural fragmentation manifested by the existence of over 700 recorded languages (over half the world's total) and an exceptionally low level of urbanisation, with only eight towns having populations in excess of 7,000 people. Urban populations have been growing more rapidly in the 1970s (at the rate of 7% to 8% per year) but even so almost 90% of the population still live in rural areas in over 12,000 essentially independent villages. The most populous areas of the country are the provinces in the central highlands,

but, even here, population densities rarely exceed 20 persons per square kilometre.

There is a high reliability of rainfall in most parts of the country and it is blessed with a more than adequate supply of natural resources: significant mineral wealth (mainly copper and gold); extensive forests; abundant hydro-power resources and large tracts of highly fertile soils (30% of the total land area comprises soils topographically suited to agriculture). Despite this, PNG is a relatively poor country which with a GNP *per capita* of \$840 (in 1981), is classified by the UN as one of the less developed amongst developing countries. Major obstacles to development of resources have included lack of capital and acute shortages of skilled manpower at all levels.

Inputs in the form of aid and foreign private investment have, of course, been forthcoming and have resulted in a significant degree of socio-economic transformation in the past 20 years. Gross Domestic Product *per capita* grew at a rate of 6.5% per year between 1960 to 1970 and continued to rise at the rate of 2.3% each year in the subsequent decade. Public services, notably in marketing, transport, health and education, have also expanded enormously. Infant mortality and child death rates have decreased significantly, and life expectancy at birth has risen from 41 years to 51 years. Sixty-four per cent of children of primary school age are now enrolled in school and 13% of the age group attend secondary school as opposed to only 1% in 1960. No tertiary education was available in 1960: there are now two universities and nine teacher training colleges.

However, despite these impressive average, aggregate statistics, benefits have been experienced very unevenly, with only a small proportion of the population being able to take full advantage of the new opportunities and reap the benefits from them. Such inequalities were well documented in a 1980 survey commissioned by the National Planning Office which revealed that: average earnings of expatriates were eight times higher than those of Papua New Guineans; average earnings derived from agriculture were less than one-sixth of earnings derived from other types of production; average urban earnings were 60% higher than in rural areas (1970) and 87% higher in 1973; and in large areas of the country, average rural earnings were less than K50 *per capita*

per annum (less than 1/10th of the national average).

Approximately one quarter of the population is now wholly engaged in economic activities in the monetary sector, with the remainder of the people gaining their livelihood principally from subsistence agriculture and, in some areas, fishing and hunting. However, the majority of people in the 'subsistence sector' now have some income from partial cash-earning activities to complement their subsistence output. Thus, the majority of the people are employed in agriculture or are producers of cash crops or livestock or fishery products. A major source of cash for villagers in the highlands comes from coffee. Coffee is PNG's second most important export and over half the output comes from small-holders in the highlands, many of whom rely on the country's vast network of small aircraft operations (450 airstrips) for access to markets.

The formal manufacturing sector is extremely small and very under-developed. Secondary industry contributes about 7% of the gross domestic product, employs less than 10% of the workforce in formal employment and is characterised by capital-intensive, labour-saving technology. As a consequence, employment in the sector increased by only 3,000 people between 1972 and 1978 despite significant increases in investment and output. Slightly more than one-third of the workforce are in the metals and machinery sub-section: the other major sub-sector being food, drink and tobacco. Apart from the narrowness of the industrial base, other striking factors about the sector are the high percentage (95%) owned and managed by expatriates and the paucity of linkages within the economy (only 8% of primary agricultural output feeds into the processing and manufacturing sector and almost no processing is done of the substantial output from the mining sector). An informal manufacturing sector is almost totally lacking and apart from the artifact industry (which employs 150,000 on a part-time basis) rural industry as such is also virtually non-existent.

The country has a substantial dependence on imports, including agricultural tools and other agricultural inputs and significant food imports. Tariffs and import duties are low (3% for most essentials, 13% for most luxuries) and tariff facilities for protection of local industries have been applied only in the case