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"LAW OF THE SEA CONVENTION - THE EMERGENCE OF A NEW LEGAL MECHANISM FOR THE TRANSFER OF TECHNOLOGY TO DEVELOPING COUNTRIES."

A. ROHAN PERERA

Introduction

(i) Brief Survey of Transfer of Technology issues in International Negotiations

The transfer of technology from the industrialized developed countries to the developing countries, is perceived as a major factor in achieving the development objectives of the Third World. The UNCTAD Report, "An International Code of Conduct on Transfer of Technology" (1) referring to the objectives of the developing countries, states that the task of the Code is, "to restructure existing relationships between suppliers and recipients of technology, so as to facilitate the Third World's access to the accumulated promise of mankind's scientific and technological achievements."

The desire to restructure the existing legal relationship between the suppliers and recipients of technology has been motivated by an awareness on the part of the developing countries, of their technological dependance on the industrialized countries, a dependence, further accentuated under the existing legal mechanisms for the transfer of technology.

The existing legal mechanisms for the transfer of technology are usually in the form of direct foreign investments, joint ventures and licensing agreements. These mechanisms, particularly the licensing agreements, contain restrictive conditions for example, restrictions on research and development, restrictions on use of personnel and adaptation, restrictions on exports, price-fixing and exclusive sales or representation agreements and a host of similar constraints, which on the one hand, accelerate the high cost of technology to the developing countries and on the other, increase the technological dependance of these countries, thereby prejudicing their efforts to achieve an indigenous technological capability.

Surendra J. Patel, in his paper "The New International Economic Order and the technological transformation of the Third World",(2) draws an interesting analogy between the leasing of land under feudal conditions and the transfer of technology under the existing legal mechanisms.

> "...Then landlords owned the land which was cultivated by serfs, share-croppers or tenants at will. These cultivators did not enjoy fixity

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(1) U.N.Doc.TD/B/C.6/AC1/2/Suppl.1/Rev.1,3(1975).

(2) Surendra J. Patel, "The New International Economic Order and the technologica transformation of the third world - A paper presented at the workshop on the NIEO-Hague Academy of International Law - See Academie De Droit International, 1980-pg 221 at 225.

of tenure, ... or in general invest labour and resources in the improvement of land from which they would be entitled to benefit. No wonder, a complete restructuring of the legal fabric of land relationships in Europe had to precede the modernization of both the techniques of the agricultural production and the management of farms ... There is a parallel between leasing of land under feudal conditions and technology transfer now. Technology is generally leased, not sold. The agreements for the transfer of technology contain several restrictive practices ..."

Underlining the need to liberalize these restrictive conditions which govern the unequal relationship of the "landlords" and "tenants" of the present day"technological feudal order" the developing countries have launched several important initiatives, directed towards the re-structuring of the existing legal mechanisms governing the transfer of technology. These efforts of the developing countries, must necessarily be viewed in the wider perspective of their efforts to restructure the entire North-South relationship.

As far back as 1961, General Assembly Resolution 1713 (XVI) of 19 December 1961,(3) called for "a study of the efforts of patents on the economy of under-developed countries." The Resolution also requested, inter-alia, an analysis of the patent legislation in least developed countries in the light of economic development objectives. In 1964, the Secretary-General of the U. N. in his report "The Role of Patents in the transfer of technology to developing countries"(4) underlined the need to counter the difficulties experienced by developing countries, in gaining access to appropriate technologies.

An important landmark in the initiatives of the developing countries was the UNCTAD III Conference, held in Santiago, Chile, in 1972, which endorsed the work of the UNCTAD and of the Inter-Governmental Group on Transfer of Technology. The Conference called on developed market economy countries to improve the means of access to technology by the developing countries as well as the terms and conditions under which the technology could be obtained.

The culmination of these initiatives was reached with the inclusion, in the Declaration on the Establishment of a New International Economic Order, NIEO at the Sixth Special Session of the UNGA in 1974, one of the principles on which the NIEO should be founded was:

> "giving to the developing countries access to the achievements of modern science and technology and promoting the transfer of technology and the creation of indigenous technology for the benefit of the developing countries in forms and in accordance with procedures which are suited to their economies;"(5)

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(3) U.N. Doc. TD/B/AC11/12 (1974).

(4) U.N. Doc. E 3961 (1964).

(5) Resolution 3201 (S - VI) General Assembly, Official Records, Sixth Special Session, Suppl.No.1.(A/9559) Paragraph 4(p).

The Programme of Action on the establishment of a New International Economic Order, elaborated the measures required for an effective transfer of technology to developing countries.(6)

These measures lay emphasis, inter-alia, on the need to adapt technology to the varying stages of development in the developing countries and on the creation of suitable indigenous technology within these countries. The Programme of Action called for the formulation of an International Code of Conduct for the Transfer of Technology and to adapt Commercial practices governing transfer of technology to the requirements of the developing countries.

The initiatives of the developing countries for better terms in respect of transfer of technology for its social and economic development, received further impetus, with the adoption, at the Twenty Ninth Session of the UNGA, in December 1974, of the Charter of Economic Rights and Duties of States.(7) Article 13 of the Charter relating to transfer of technology, refers to the following:

> "...In particular, all states should facilitate the access of developing countries to the achievements of modern science and technology, the transfer of technology and the creation of indigenous technology for the benefit of the developing countries in forms and in accordance with procedures which are suited to their economies and their needs."

A direct consequence of these initiatives, was the convening by the UNGA in 1977, of an international conference under the auspices of UNCTAD, to formulate a code of conduct for the transfer of technology.

Negotiations at the UNCTAD over the past several years reveal that, although agreement has been reached in several areas, major differences still exist, between the developed and developing countries on several fundamental issues with regard to the code. The key outstanding issue concerns the determination of "restrictive business practices" to be prohibited by the code. The Group of 77 and the developed countries have presented separate drafts on the proposed code. The Group of 77 draft lists some forty items to be categorized as "restrictive business practices." (RBPs)(8) This has not met with the approval of the developed countries.

In order to achieve a satisfactory compromise, the developing countries have shown at the UNCTAD negotiations, a sense of compromise and flexibility and have been willing to accept the code, even without its legally binding character, as a code of voluntary guidelines, provided the developed countries were prepared to accept some of the outstanding fundamental issues such as the definition of RBPs. However, these efforts of the developing countries have not been matched by a similar response on the part of the developed countries.

The Paris Convention of 1883 governs patents, trade-marks and other industrial property. The provisions of this Convention still apply to the technology transfers of the present day and is weighted towards the protection of the rights of the owners of technology.

(6) Resolution 3202 (S - VI) General Assembly, Official Records, Sixth Special Session Suppl.No.1.(A/9559).
(7) A/RES/3281 (XXIX).
(8) U.N. Doc.TD/CODE TOT/33 - 12 May 1981.

The UNCTAD Report on "The International Patent System as an Instrument of Policy for National Development"(9) states that the Convention represents "a reverse system of preferences" granted to foreign patent holders in the markets of developing countries.

Discussions have been initiated within the UNCTAD and WIPO to balance the monopolistic rights of patent holders with an obligation on their part to respond to the broader interests of developing countries, by facilitating the use of patents and by restricting abusive practices in licensing agreements.

These issues, as in the code of conduct negotiations, have proved to be the key areas of fundamental difference between the developed and developing countries, retarding the substantive progress of the negotiations.

(ii) Preliminary initiatives in the United Nations, leading to the convening of UNCLOS III.

The tremendous technological developments that took place in the post-war era, with regard to the exploitation of ocean resources, prompted a parallel initiative by the developing countries which underlined on the one hand, their awareness of the vital importance of ocean resources for their economic development, and on the other, an appreciation of the need to have access to marine technology, science and skills, in order to effectively utilize and develop these resources.

The forum for this parallel initiative was once again the General Assembly of the United Nations. UNGA Resolution 2172(XXI) of 6 December 1966 on Resources of the Sea requested the Secretary-General of the U.N. to undertake, "a comprehensive survey of activities in marine science technology, including that relating to mineral resources development.." Persuant to this resolution, a report on "marine science and technology, survey and proposals" (10) was prepared by the Secretary-General.

A series of similar resolutions were adopted in the U.N. in the succeeding years, which clearly demonstrated the concern of the developing countries in the acquisition of marine scientific knowledge and technology for the effective utilization and development of the ocean resources.

These preliminary efforts culminated in the adoption in the United Nations of Resolution 2749(XXV) of 17 December 1970 on the Declaration of Principles Governing the Sea-bed, Ocean Floor and the Sub-soil thereof beyond the limits of National Jurisdiction. The Declaration, adopted unanimously, incorporated the historic "common heritage" principle propounded for the first time in 1967, by Ambassador Arvind Pardo of Malta. in Article 9, it is declared that:

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(9) U.N.Doc.TD/B/C.6/AC.2/3(1974).

(10) U.N.Doc.E/4487.

"... The regime, inter-alia, provides for the orderly and safe development and rational management of the area and its resources and for expanding opportunities in the use thereof and ensure the equitable sharing by States the benefits derived therefrom, taking into particular consideration the interests and needs of the developing countries, ..."(11)

The "equitable sharing" of ocean resources, the "expanding opportunities" in the use of such resources, necessarily pre-suppose the access to technology. Transfer of technology issues had therefore surfaced even in the early stages of Sea-bed Committee deliberations.

Delegates of developing countries stressed the need for "... a new determined effort ... to devise a more just and human system for sharing the World's resources and pooling knowledge and technology", the need to "Compensate for the existing technological imbalance and meet the interests of the developing countries." Paul Engo of Cameroon, Chairman of the First Sub-Committee referred to the "need to bridge the gap between the developed and the developing countries".(12)

The question of access to technology by developing countries for the equitable sharing of the ocean resources, had thus assumed major significance in the context of the Law of the Sea negotiations and background papers on the transfer of marine technology had been prepared by the Secretariat. The Conference had on its agenda, the item "development and transfer of technology" and the Third Committee of the Conference was assigned the task of formulating draft articles on this item. The ground had thus been prepared for UNCLOS III to consider all aspects of transfer of technology with reference to the equitable sharing of ocean resources.

The inconclusive nature of the UNCTAD and WIPO negotiations on transfer of technology, brought into sharper focus and introduced a greater sense of relevance to the UNCLOS III negotiations in the formulation of a new legal mechanism for the transfer of technology to developing countries.

II

(i) Definition of Marine technology.

According to the United Nations Report, "Description of some types of marine tehnology and possible methods for their transfer,"(13) the term "technology" usually consisting of five important elements, namely, (a) hard -ware, (b) operating procedures, (c) maintenance procedures, (d) operating and maintenance skills and (e) management capacity. The term "marine technology" has generally been understood to mean "the body of knowledge and hardware needed for using ocean space and for surveying and developing marine resources."

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(11) Article 29 of the Charter of Economic Rights and Duties of states incorporates the principles contained in Resolution 2749(XXV).

(12) Sub-Committee, Sea-bed Committee,
A/AC.138/SC.1/SE.5/, 20 July 1971, P.5;
A/AC.138/SE.52, 18 March 1971 P.82;
Also see R. P. Anand, **Legal Regime of the Sea-bed and the Developing countries**; 1976, Ch.6; "Interests of the Developing countries and Developing Law of the Sea-bed."

(13) U.N. Doc.A/CONF.62/C3/L22 of 27 February 1975.

In other words, the term "technology" is a comprehensive concept embodying both the elements of a "body of knowledge" and "hardware". These two elements are interwoven into the concept and does not as a general rule, require treatment in isolation.

The definition of the term "technology" in the LOS Convention, takes into account the comprehensive nature of the term. Article 5(8) of Annex III states:

> "... technology means the specialized equipment and technical know-how, including manuals, designs, operating instructions, training and technical advice and assistance necessary to assemble, maintain and operate a viable system and the legal right to use these items for that purpose on a non-exclusive basis."

Although the concept is thus a comprehensive one, embodying within itself the dual elements of "knowledge" and "hardware", in actual practice the tendency has been to treat these as distinct elements. Even the LOS Convention refers to the dual notions of "transfer" and"advancement" of technology. Perhaps, the rationale for such treatment is a need to emphasise the importance of building up the technological capacity of the developing countries.

This distinction between "hardware" and "knowledge" underlines the need for the existence of certain pre-conditions within a country in order to make the access to technology a meaningful one. It pre-supposes the existence of a national technology frame-work with an emphasis on a rapid process of technological education and knowledge to ensure the existence of qualified manpower resources within the country.

Article 144 relating to activities in the International Sea-bed Area introduces the dual notions of "transfer" and "advancement of technology". Sub-paragraph(a)of this Article, deals with the issue of transfer and technology, **per se,** to the Enterprise and the developing countries. It requires the Authority and States parties to initiate and promote transfer of technology programmes for the Enterprise and developing countries with regard to activities in the area. The Authority and States parties are required under sub-paragraph (b) to initiate and promote "measures directed towards the advancement of the technology" of the Enterprise and the domestic technology of developing states. Such measures will provide opportunities to personnel from the Enterprise and from developing countries for training in marine science and technology.

This dual approach is further reflected in Part XV of the Convention on the "Development and Transfer of Marine Technology" relating to activities in the general marine environment. Articles 266, 268 and 269 stress the development of the technological knowledge and skills, particularly of the developing countries. Article 268 stresses the importance of the acquisition of technological knowledge and skills and refers, inter-alia, to the "acquisition evaluation and dissemination of marine technological knowledge ..." and "the development of human resources through training and education of nationals of developing states ..."

These provisions underline the vital need for the developing countries to acquire a technological capacity with regard to a wide range of activities in the general marine environment.

(ii) Nature of Marine technology.

The activities in the general marine environment, such as fisheries and the production of petroleum and natural gas from off-shore areas, involve the employment of existing technology. Even with regard to such existing technology the developing countries have encountered considerable difficulties since such technology is under the ownership and control of the multinational corporations. Under the existing arrangements for the transfer of technology, restrictive conditions are imposed which prevent the acquisition of knowledge and the adaptation of this technology to suit the needs of the developing countries. The initiatives of the developing countries within the UNCTAD for Codes of Conduct on the transfer of technology as well as on transnational corporations, has been the inevitable outcome of the experience of the developing countries with regard to the transfer of existing technology under present conditions.

In contrast to the traditional areas of marine activities, the new areas of ocean resource exploitation, namely, deep sea-bed mining, is dependant upon "technological innovations".

The United Nations Report "Description of some types of marine technology and possible methods for their transfer" published in 1975, states:(14)

> "In contrast to shallow water mining ... mining operations on the deep sea-bed will require large scale and capital intensive technological innovations. Technology for extended activitiy at depths greater than 5000 meters is still under development."

However, the position with regard to deep sea-bed technology has undergone considerable change, since the publication of this U.N. Report in 1975. In an Article published in 1980, (15) Conrad G. Welling, a Senior Vice-President of Ocean Minerals Company, California, states that the first stage of initial technology development, started 17 years ago, is essentially complete now and what is left is "to refine the technology and scale-up the basic system to obtain operational reliability and production data."

The following description from Welling's article provides a realistic picture of the nature of the innovative marine technology that will be used in deep sea-bed mining operations.

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(14) **Supra** n. (13).

(15) Conrad G. Welling - "The Ocean's waiting mineral resources"; **Stockton's Port Soundings**; August 1980, pg.6.
Note: The Ocean Minerals Company is one of the four Consortia identified in Secretariat Publication "Sea-Bed Mineral Resource Development. Rcent activities of the international Consortia" (Doc.ST/ESA/107 and add.1.) and would thus become a pioneer investor under Resolution II of the Conference.

"The mining system uses a much heavier and larger pipe than used in the oil industry. In addition, it employs a bottom, self-propelled mining vehicle, completely remote controlled, that crawls on the ocean bottom and picks up nodules. Through a flexible conduit, the bottom crawler sends nodules upto an intermediate "pumping station" suspended in the water a few hundred feet above the bottom crawler. The pumping station then sends the nodules up a three-mile pipe string to the "mining ship" at the surface..."

The well-known multinational Consortia, who are the principal actor in this field of innovative marine technology for deep sea-bed mining, are believed to have spent over 400 million dollars on the devlopment of this technology.

The position of the developed countries and that of the multinational Consortia, on the transfer of this innovative marine technology to developing countries are reflected by the views of Welling, that this technology cannot be meaningfully transferred until it has been fully developed and used commercially for a few years. Accordng to this view, the developing countries must bide their time, until technology is ripe for transfer.

III

(i)

"Transfer and Development of marine technology with regard to activities in the general marine environment - A formative legal mechanism."

Part XIV of the Convention provides a mechanism for the transfer of marine technology, with regard to all activities in the general marine environment. The provisions of this part are drafted in very general terms and represents a legal mechanism for transfer of technology in a formative stage of development.

The principal mechanisms provided for in the Convention, in this regard, are, International Cooporation among states and international organisations and the establishment of National and Regional Marine Scientific and Technological Centres.

The formative nature of the legal mechanism provided for in this part of the Convention, is well illustrated in Article 266(3), which reads:

> "States shall endeavour to foster favourable economic and legal conditions for the transfer of marine technology."

The legal conditions for the transfer of marine technology are thus left to states who are only required to "endeavour to foster" such conditions. The basic legal obligation is thus drafted in very general terms and lacks the stringent conditions, which characterise the transfer of technology mechanism provided in the Convention with regard to activities in the deep sea-bed.

Article 270 of the Convention dealing with ways and means of achieving international cooperation, provides a more specific basis for the transfer and development of marine technology. The fundamental basis for such transfer and development will be "existing bilateral regional or multilateral programmes" and also "expanded and new programmes."

Despite the formative nature of the mechanism provided for in this part of the Convention, these Provisions represent a modest degree of development, in that it provides a minimum framework for technology transfer.

While Article 270 thus provides for existing bilateral, regional or multilateral programmes and also expanded and new programmes, as the means through which international cooperation for the transfer and development of marine technology could be achieved, Article 271 provides an institutional element in achieving this cooperation.

This Article deals with "the establishment of generally accepted guidelines, criteria and standards for the transfer of marine technology". In the absence of a central institutional authority, this is again left to the initiative of states. In promoting the establishment of such guidelines, criteria and standards, however, states could take measures, either directly or on a bilateral basis, either through existing or new programmes referred to in the preceding Article or within the framework of International Organizations. This Article read with Article 270, therefore introduces a certain institutional element, to an otherwise formative legal mechanism for the transfer and development of marine technology.

The institutional element introduced in the preceding Articles, is further developed by the provisions of the Convention on Cooperation among International Organizations. The formative legal mechanism is somewhat strengthened by utilising existing institutional structures such as the United Nations System, for the transfer and development of marine technology.

Among the "competent international organisations" whose scope of activities will have a bearing on the marine environment, are the Inter-governmental Maritime Organization (IMO), United Nations Environment Programme (UNEP), Food and Agriculture Organization (FAO), particularly the Committee on Fisheries (COFI) and the Intergovernmental Oceanographic Commission (IOC).

Article 278 of the Convention imposes a general obligation for cooperation among international organizations. This must be viewed in the light of Resolution V of the Conference, sponsored by the Group of 77.(16) The Resolution declared that the maximum use of the new opportunities for economic and social development offered by the Convention would be facilitated through action aimed at strengthening national capabilities in marine science, technology and ocean services, particularly in the developing countries. The Resolution recommended assistance to the developing countries in the preparation and implementation of their marine science, technology and ocean service development programmes. In this context the Resolution recognised the special role of competent international organizations envisaged by the Convention and recommended that "all competent international organizations within the U.N. system expand programmes within their respective fields of competence" for assistance to developing countries.

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(16) A/CONF.62/L.127 - Adopted by the Conference at the 182nd Meeting of the Plenary on 30th April 1982. (Annex VI of Final Act).

The role of International Organizations under the Convention would therefore require, that they first coordinate their activities within the system in order to perform an active participatory role in the transfer and development of marine technology to the developing countries. Articles 272 and 278 of the Convention stresses the need to coordinate the activities of competent International Organizations in the transfer and development of marine technology.

As recommended in Resolution V, the special role of competent International Organizations would require a re-structuring and a broad-basing of their present scope of activities.

Already studies have been undertaken by various Organizations within the United Nations System, on the effects of the new legal regime created by the Convention, on their traditional technical cooperation functions. A study prepared by the Secretary-General of the United Nations "on the future functions of the Secretary-General under the draft Convention and on the needs of countries, especially developing countries, for information, advice and assistance under the new legal regime"(17) underlines "... the fundamental importance of relating the substantive activities provided for in the Convention to the overall economic and social development efforts of developing countries and to the activities of the United Nations System in support of these efforts

Under the provisions of Article 272, on Coordination of International Programmes, states are required to ensure that in the field of transfer of marine technology, competent International Organizations, coordinate their activities, including, "any regional or global programmes" taking into account, inter-alia, the needs and interests of developing countries.

Among the sigificant regional programmes by International Organizations, is the Regional Seas Programme undertaken in different regions by UNEP in collaboration with regional organizations and Governments of the states of the region. The study of the Secretary-General on the Needs of Developing Countries, cites by way of illustration several programmes of relatively new and important global and inter-regional projects which have been developed by International Organizations within the U. N. System, as a consequence of the evolution of the New Law of the Sea. These include, the FAO Programme on the Exclusive Economic Zone, IOC Programmes to enhance the marine scientific capabilities of developing states and the UNESCO/ ECA project for marine scientific and technological development in Africa.

An illustration of an initiative directed towards the formulation of a regional programme, within a regional Inter-governmental Organization, is the proposal of Sri Lanka, placed before the Twenty-Second Session of the Asian-African Legal Consultative Committee held in Colombo in May 1981, on "Economic, Scientific and Technical Cooperation in the use of the

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(17) A/CONF.62/L.76 - P.46.

Indian Ocean".([18]) This proposal is to the effect that "The Asian-African Legal Consultative Committee should carry out a study of the ways and means of promoting economic, scientific and technical cooperation, for mutual benefit among Asian and African States, in the exploration, exploitation and the rational use of the **Indian Ocean** and its resources." The proposal stressed that the institutional framework contemplated for such regional cooperation should be of a consultative character and should work in close collaboration with existing regional and global institutions such as FAO, IMO, IOC, UNEP (Regional Seas Programme) and ESCAP.

The Co-ordination of such regional programmes for technical collaboration would fall within the province of Article 272 and would assume considerable importance in the transfer and development of marine technology to developing countries, in a regional context.

Thus the Law of the Sea Convention had already, even during its negotiating phase, made a considerable impact on the policies, plans and programmes of International Organizations. On the one hand it has had the effect of broadening the scope of activities of Organizations within the U. N. System and on the other it has generated important regional initiatives within the framework of regional Organizations. The Co-ordination of these activities, taking into account the needs and interests of developing countries, as required by Article 272 would be an essential pre-requisite, if these initiatives are to be meaningful to the overall social and economic development efforts of developing countries.

On the means for ensuring this all important element of Co-ordination of International Programmes, for transfer of marine technology, an interesting view has been expressed by a foremost writer on the Law of the Sea, Elizabeth Mann Borgese. Referring to the necessity for an "effective integrative machinery" of competent International Organizations, Borgese suggests "a joint assembly where problems of ocean policy and management can be debated in a comprehensive, trans-sectoral manner."([19])

(ii) Transfer and Development of Technology with reference to the Protection and Preservation of the Marine Environment and Marine Scientific Research.

The concept of international cooperation and its relevant principles, embraces technology transfer with regard to all activities in the general marine environment. These principles are therefore incorporated in Part XII of the Convention dealing with the protection and preservation of the marine environment, as well as in Part XIII on Marine Scientific Research.

Article 200, envisages international cooperation "for the purpose of promoting studies, undertaking programmes of scientific research and encouraging the exchange of information and data ..." Article 201 requires international cooperation, for the establishment of " appropriate scientific criteria for the formulation and elaboration of rules, standards and recommended practices and procedures" for the protection and preservation of the marine environment.

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(18) Proposal of Sri Lanka pursuant to Article 3(b) of the Statute of the Asian-African Legal Consultative Committee, dated 29 May 1981; see Proceedings of Twenty-Second Session of the Asian-African Legal Consultative Committee, Colombo, 1981.

(19) Borgese; " Law of the Sea: The Next Phase" **Third World Quarterly**; Vol.4, No.4, Oct. 1982, p.717.

Article 202 deals with the provision of scientific and technical assistance to developing countries and re-emphasises the aspect of "advancement" of technology. The assistance contemplated under this Article, includes the training of scientific and technical personnel of developing countries, as well as facilitating their participation in relevant international programmes. The technological assistance to developing countries for the protection and preservation of their marine environment includes assistance with respect to major incidents which may cause serious pollution.

International Organizations are further required, under Article 203, to grant developing states preferential treatment in the allocation of appropriate funds and technical assistance.

In the field of marine scientific research, too, the mechanism of international cooperation is designed to promote the transfer and development of marine technology and here again the means to achieve such cooperation is through the framework of bilateral and multilateral agreements.

Articels 242 and 243 require the promotion of international cooperation and the creation of favourable conditions for the conduct of marine scientific research and the integration of efforts of scientists, through the framework of bilateral and multilateral agreements.

Article 244 requires international cooperation in respect of the publication and dissemination of information on proposed major programmes and knowledge resulting from marine scientific research, and for this purpose international cooperation is requires to "promote the flow of scientific data and information and the transfer of knowledge resulting from marine scientific research, especially to deveolping states...'

The transfer of knowledge resulting from marine scientific research is further strengthened in Article 249, which requires as a pre-condition to the undertaking of marine scientific research in the exclusive economic zone or the continental shelf of a Coastal State, the participation of the Coastal State in the marine scientific research project as well as the dissemination to the Coastal State of the preliminary reports as well as all data and samples of the project.

Certain special characteristics, which are consistent with the formative stage of development of the mechanism under consideration emerge from these provisions relating to the transfer and development of marine technology in the general marine environment.

The foundation on which the notion of international cooperation rests is the concept of a duty to cooperate. The "duty to cooperate" has been in a gradual process of evolution as a legal norm through state practice, pasticularly in the context of U. N. initiatives.

Among the many Resolutions adopted within the U. N, which give clear expression to the concept of a duty to cooperate, are, the Declaration on the International Development Strategy for the Second United Nations Development Decade and also the Declaration of principles governing the Sea-bed and the Ocean Floor and the Sub-soil thereof, beyond the limits of national jurisdiction.

Many Resolutions in the field of development assistance refer specifically to a "duty to cooperate" and States tend to follow such Resolutions through subsequent state practice, which eventually lead to the norm hardening into a customary rule of International Law.(20)

The incorporation of the concept of international cooperation in the LOS Convention and the state practice that may develop in this regard, would further enhance the development of "the duty to cooperate" as a legal obligation.

The utilization of the existing bilateral and multilateral programmes and the existing organizational infrastructure of the U. N. System are also important characteristics of the regime under consideration. The recourse to existing arrangements and infrastructures has the advantage that they provide an existing and a time tested framework to build up the new mechanism. Further they would impose less financial burdens on member states than the creation of new superstructures.

Thus a mechanism for the transfer and development of marine technology in the general marine environment, though in a formative stage of development, encompasses within itself, an existing institutional element. In this way, it draws upon the past experiences of the U. N. System, while at the same time, creating new challenges, which demand that these Organizations refashion and adjust their scope of activities, to meet the needs of the new regime created by the Convention. The experiences gained in the light of these challenges, could over the years, result in the new mechanism transforming itself into a formal mechanism.

(iii) Role of National and Regional Marine Scientific and Technological Centres, in the Transfer and Development of marine technology to developing countries.

Resolution V adopted by UNCLOS III on Development of National Marine Science, Technology and Ocean Service Infrastructures,(21) states, in its preamble,

> "**Considering** that national and regional marine scientific and technological centres would be the principal institutions through which States and, in particular, the developing countries, foster and conduct marine scientific research and receive and disseminate marine technology".

Thus National and Regional Centres, emerged through the UNCLOS III negotiating process, as the principal institutions for the transfer and development of marine technology with particular regard to the developing countries,

The emphasis by the developing countries on a regional approach to the transfer and development of marine technology, had developed over a period of time before it found clear expression in the LOS Convention.

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(20) Dr. Wil D. Verwey, (1972) Economic Development, Peace and International Law - "The Recognition of 'Mankind' as a supreme legal value and the duty to cooperate for global welfare" - pp.273 - 281.

(21) Supra n((16).

The Report of **Pacem in Maribus,** held in Yaounde, Cameroon, in 1979 states:

> "With regard to marine sciences and technology, participants suggested the institution of regional survey ships, under the authority of the regional mechanisms for marine science and management."(22)

The relevance of national and regional technological centres, in the wider context of the international transfer of technology, is that they would provide an effective institutional mechanism at the national or regional level which could facilitate the adoption of international standards and criteria to suit the particular needs of a developing country or of a particular region.

Articles 275 - 277 of the Convention, once again, underline the formative nature of the mechanism relating to the general marine environment and has as its basis, the concept of International Cooperation, comprising both direct cooperation among states and through International Organizations. The objectives sought to be achieved under these provisions re-emphasise the notion of "advancement" of technology and lay stress on the acquisition of technological knowledge and skills. The establishment of national centres are "to stimulate and advance the conduct of marine scientific research by developing coastal states ..." International cooperation is required under Article 275(2) to"facilitate the establishment and strengthening of such national centres so as to provide for advanced training facilities and necessary equipment, skills and know-how ..."

Under Article 276, relating to the establishment of regional Centres, States are required in coordination with the competent International Organizations, the Authority and National Marine Scientific and Technological Research Institutions, to promote the establishment of Regional Marine Scientific and Technological Research Centres, particularly in developing countries, "in order to stimulate and advance the conduct of marine scientific research by developing states and foster the transfer of marine technology".

The functions of the Regional Centres, set out in Article 277, emphasise the acquisition of technological knowledge and skills, inter-alia, through access to technologica l information.

The existing mechanisms for the dissemination of technological information, such as those established within the United Nations Industrial Development Organization (UNIDO), for example, Industrial and Technological Information Bank (INTIB) and the Technological Information Exchange System (TIES) are confined to a limited group of technology suppliers dominating the market and the available information, is in consequence, necessarily selective.

Article 277 of the Convention, provides a framework, through the establishment of a regional cooperative mechanism, for the collection and dissemination of technology information, particularly among the developing countries.

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(22) Ocean Yarebook - 1980 - Vol.2 - Pacem in Maribus - (Ed. Burgese and Ginsburg) Pg.429.

The LOS Convention provides only the broad framework for the establishment of National and Regional Centres, and States are required to take cooperative measures with other States, International Organizations and the Authority to faclitate the establishment of such Centres. At the national level, therefore, it is imperative that States adopt appropriate legislative measures to set up national centres, which co-ordinate all activities relating to the marine environment and vest in a central authority, broad competence in Ocean affairs, taking into account their interrelated character. The study prepared by the Secretary-General of the U. N.(23) draws attention to the fact that there is evidence of new initiatives to bring questions of Ocean research and development within the immediate compass of a central authorit y

One of the earliest examples of the setting up of such a central authority, even while the draft articles of the Convention were still in the process of formulation, was the establishment in Sri Lanka of the National Aquatic Resources Research and Development Agency (NARA)(24) as the "principal national institution charged with the responsibility of ccarrying out and co-ordinating research, development and management activities on the subject of aquatic resources."

The objects and functions of the Agency are "to ensure the application and utilization of scientific and technological expertise for the implementation of the national development programme on the subject of aquatic resources" and "to promote and conduct research activities directed towards the identification, assessment, management and development of aquatic resources..."

Among the particular fields identified for this purpose, are Oceanography, advisory and consultancy services on scientific technological and legal matters relating to the exploitation, management and development of aquatic resources and the collection, dissemination and publication of information and data useful for the development of aquatic resources.

The role of NARA, in planning the national use of marine resources and promoting their development under the new regime of the Oceans would be further enhanced by the provisions of the Convention, regarding the strengthening of existing national institutions and the wider mandate sought to be given to such institutions with regard to their collaboration with regional centres.

IV

(i) A developed legal mechanism for the transfer of technology to Developing Countries - Deep Sea-bed mining technology.

The Convention provides a sophisticated legal mechanism consisting of contractual and other legal arrangements for the transfer of both recovery and processing technology, which is strengthened by an elaborate settlement of disputes procedure and different forms of sanctions, both legal and extra legal, to deal with violations of the legal obligations. These specia l

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(23) Supra n.(17).

(24) National Aquatic Resources Research and Development Agency Act No.54 of 1981.

characteristics distinguish the developed legal mechanism relating to the transfer of deep sea-bed technology from the less developed and the formative mechanism for the technology transfer with regard to the general marine environment.

The principal instruments in the legal mechanism for the transfer of deep sea-bed technology, are the International Sea-bed Authority (hereinafter referred to as the Authority) and its operational arm, , "the Enterprise."

Article 156 establishes the Authority. The Activities in the Area, will be organized, carried out and controlled by the Authority on behalf of mankind as a whole. All states parties to the Convention are, **ipso facto,** members of the Authority.

The principal organs of the Authority are, an Assembly, a Council and a Secretariat. An Economic Planning Commission and a Legal and Technical Commission will also be established as organs of the Council.

The Enterprise is the operational arm of the Authority, and the organ through which the Authority will carry out, activities in the Area, directly. The structure of the Enterprise comprises a Governing Board, composed of 15 members elected by the Assembly, a Director-General and the staff necessary for the exercise of its functions. Among the powers and functions of the Board, is the Power to authorise negotiations concerning the acquisition of technology.

Article 153 read with Article 8 of Annex III of the Convention, sets out the 'Parallel System' of exploration and exploitation of the deep sea-bed area. Under the Parallel System, activities in the area shall be carried out, on the one hand by the Enterprise and on the other, in association with the Authority, by states parties or state enterprises or natural or jurisdical persons which possess the nationality of state parties or are effectively controlled by them or their nationals, when these entities are sponsored by such States.

Under the Provisions of Article 8, each application ,other than those submitted by the Enterprise, should cover a total area sufficiently large and of sufficient estimated commercial value to allow two mining operations. The Authority shall designate one part to be reserved solely for the conduct of activities by the Authority through the Enterprise or in association with developing States. The area so designated shall become a "Reserved Area".

Approval may be given to a Contractor with regard to a plan of work for the other Part, the non-reserved area, provided that the Contractors satisfy the criteria set out under Article 153. Among these are the criteria that these States or private entities meet the requirements of Part XI of the Convention and also the requirements of Annexe III on the basic conditions of prospecting, exploration and exploitation.

These requirements of Part XI and Annex III, form the Cornerstones of the developed legal mechanism relating to deep sea-bed technology transfer.

In Part XI, Article 144 deals with cooperation between the Authority and states parties in the promotion of Programmes for the transfer of technology

to the Enterprise and to developing countries with regard to activities in the Area and also the promotion of measures directed towards the advancement of the technology of the Enterprise and the domestic technology of developing countries. Specific reference is made in Article 144.2(b), to the providing of opportunities "to personnel from the Enterprise and from developing states for training in marine science and technology and for their full participation in activities in the Area".

It is a feature of the developed legal mechanism with regard to deep sea-bed technology, that the obligations under Article 144 are not restricted to the field of International Cooperation. These obligations are reinforced by the basic conditions of prospecting, exploration and exploitation set out in Annex III.

Article 2 of Annex III stipulates that prospecting in the Area shall be conducted only after the Authority has received a satisfactory writtemn undertaking that the proposed prospector will comply with the Convention and the relavent rules, regulations and procedures of the Authority, concerning inter-alia, co-operation in the training programmes referred to in Articles 143 and 144.

The written undertakings given by a proposed prospector, would assume a mandatory character in the light of the different forms of legal as well as the extra-legal sanctions that are provided with regard to the activities in the deep sea-bed and the elaborate procedures for the settlement of disputes.

Activities in the Area will be carried out in accordance with a formal written plan of work, approved by the Council, after review by the Legal and Technical Commission. Upon such approval, every plan of work,, presented by states parties and other entities referred to in Article 153,(except those presented by the Enterprise) will take the form of a contract concluded between the Authority and the applicant.

Applicants, other than the Enterprise, in order to qualify to engage in activities in the Area are required to satisfy, inter-alia, "qualification standards" set forth in the rules, regulations and procedures of the Authority. The qualification standards require, that every applicant, **without exception,** shall undertake as part of his application, to comply with the provisions on the transfer of technology.

Article 5 of Annex III sets forth the provisions on transfer of technology and transforms the undertakings of the applicant into mandatory contractual obligations.

When submitting a plan of work, every applicant is required to make available to the Authority, a general description of the equipment and also the methods to be used in carrying out activities in the Area. This obligation on the applicant covers all relevant non-proprietory information about the characteristics of such technology and information as to where such technology is available. Whenever a substantial technological change or innovation is introduced, the Authority is to be informed of revisions in the description and information already made available.

Article 5(3) deals with the different forms of contractual obligations to be undertaken by a Contractor. Where it concerns technology which the Contractor is legally entitled to transfer, he is obliged to make available such technology to the Enterprise "on fair and reasonable commercial terms and conditions". The means for such transfer would be through licenses or "other appropriate arrangements", to be negotiated between the contractor and the Enterprise. This obligation on the contractor, is however subject to the important proviso, that it can only be invoked "if the Enterprise finds that it is unable to obtain the same or equally efficient and useful technology on the open market on fair and reasonable commercial terms and conditions,"

The negotiating difficulties at UNCLOS III primarily concerned the transfer of third party owned technology. With regard to the treatment of third party owned technology, the Contractor is required to obtain a written assurance from the owner of such technology, that the owner will, whenever the Authority so requests, make that technology available to the Enterprise. The means for such transfer will again be through licence or "other appropriate arrangements" and on "fair and reasonable commercial terms and conditions". If the Contractor fails to obtain this written assurance, he is precluded from using this technology in carrying out the activities in the Area. The objections of the Industrialized countries arose from the fact that the Contractor would have no means of ensuring the compliance of a third party with such an obligation. Further difficulties could arise where the owner of technology is no longer in business or has stopped production of a particular type of technology.

In respect of third party technology, the Contractor is further obliged, to acquire from the owner by means of an enforceable contract, the legal right to transfer such technology to the Enterprise. This obligation again applies only to technology, not generally available in the open market. In determining whether all feasible measures have been taken by the Contractor to acquire such a right, the closeness of the corporate relationship, where such relationship exists, between the Contractor and the third party owner and the degree of control or influence of the Contractor over the third party owner will be a relevant factor. In cases where the Contractor does in fact exercise such effective control the failure to acquire the legal right will have a bearing on subsequent applications for approval of a plan of work. This provision reflects the concern of the developing countries that the transfer of technology provisions could be nullified by a Contractor by taking refuge behind a "veil" of corporate personality and makes it possible to "pierce the corporate veil" to determine whether the owner of technology is in reality a third party or not.

The Contractor is further required to facilitate the acquisition of third party technology by the Enterprise from the owner, if the Enterprise decides to negotiate directly with the owner of the technology. The transfer will again be effected through licence or other appropriate arrangements.

Thus the developed legal mechanism, in which the Authority and the Enterprise play key roles, derives its basis, from mandatory contractual obligations for the transfer of technology and functions within a sphere of specific legal rights and duties. The misgivings of the Western industrialized countries to the transfer of technology provisions, flow from their perception

of technology as a concept concomitant with monopolistic ownership. The industrialized countries therefore, attach fundamental importance to the need to ensure that technology must, at any cost, be protected against any form of expropriation.

In the view of the present writer, an interpretation of Article 5 of Annex III, as giving rise to expropriation measures, is not justified. Whether it be technology that the contractor is leaglly entitled to transfer or third party owned technology, the transfers are to be effected through "licence or other appropriate arrangements" and "on fair and reasonable terms and conditions." The question whether the terms are fair and reasonable is not a matter left to domestic laws and regulations, but is made subject to arbitration under the Convention. The provisions of Article 5, furthermore, reflect a substantial compromise which emerged at the UNCLOS negotiations. The Group of 77 position as reflected in the successive negotiating texts, was that the transfer of technology obligation should be a condition **precedent** to the awarding of a contract. Present Article 5, however, is formulated as a legal obligation which can be enforced through the dispute settlement and penalty provisions **after** a contract has been awarded. This was essentially a concession to meet the concerns of the developed countries.

While it must be conceded that the provisions relating to the transfer of third party owned technology may require further clarification, a task well within the functions of the Preparatory Commission, it should not be overlooked that the obligation to transfer third party technology arises, only when it is "not generally available on the market". It is likely that, at least the initial technology would generally be available in the open market. In any event this is also a matter which would be subject to the arbitration procedure.

On another controversial issue, the developed countries took the view that the obligation to transfer technology, applies only to the actual recovery activities in the Area, and therefore only to recovery technology and not to processing technology.

This was on the basis that, after the nodules were recovered from the deep sea-bed, the processing procedure was an activity which came within the jurisdiction of the territorial state, since the processing plant would be located within that jurisdiction. The developing countries however, were of the view that such a restricted interpretation of the term "activities in the Area", would defeat the viability of the Enterprise, and would prevent its effective participation in the activities in the Area.

The Convention now reflects the developing country position and Article 170 stipulates that the "Enterprise shall be the organ of the Authority which shall carry out activities in the Area directly... as well as the transporting, processing and marketing of minerals recovered from the Area". The transfer of technology provisions of the Convention therefore applies both to recovery as well as processing technology.

The Convention envisages a different, legal mechanism (as distinct from the contractual mechanism, discussed so far) to apply to a situation where the Enterprise is unable to obtain appropriate technology, particularly processing technology, to enable it to commence in a timely manner the

recovery and processing of minerals. The legal mechanism envisaged here is a **consultative procedure,** where the Council or the Assembly may convene a group of states parties, composed of those which are engaged in activities in the Area, those which have sponsored private entities and other states parties having access to such technology. The obligation under this Consultative arrangement is to consult together and take effective measures to ensure that the technology is made available to the Enterprise on fair and reasonable commercial terms and conditions. Each state party is required to take "all feasible measures" to this end within its own legal system.

The mandatory transfer of deep sea-bed technology is also to apply direct to the developing countries. The Contractual obligations prescribed in Article 5(a), (b), (c) and (d) are extended to apply for the benefit of a developing state or group of developing states, subject to the safeguard that activities, under the contract sought by the developing countries, would not involve transfer of technology to a third state. This obligation will apply only to a contractor who has not been requested to transfer technology by the Enterprise or had already transferred technology to the Enterprise.

This provision known as the "Brazilian Clause" reflects the position of the more developed of the developing countries, such as Brazil, who at the UNCLOS III negotiations were anxious to ensure a direct transfer of technology to developing countries, to meet their aspirations of full and effective participation in deep sea-bed mining.

From the point of view of the developed legal mechanism for the transfer of deep sea-bed technology, its importance lies in the fact that the "Brazilian Clause" preserves the mandatory nature of the contractual obligation for the transfer of technology to the developing countries. In a broader context, the "Brazilian Clause" had a significant ideological dimension. It established the important principle that developing countries would have a direct right of access to technology, a principle that would have far-reaching implications on the on-going UNCTAD negotiations on the code of conduct for transfer fo technology.

Apart from the contractual obligation between a contractor and the Authority for the transfer of technology, the developed legal mechanism contemplates other legal arrangements.

The question of the mandatory form of joint venture arrangements between contractors and the Authority or the Enterprise was considered by the Conference but met with opposition from both the developed and developing countries. Consequently the Convention now provides for optional joint venture arrangements, with a view to stimulating, inter-alia the transfer to technology to developing countries. Thus the Enterprise may decide to exploit the reserved areas in joint ventures "with the interested state or entity. When considering such joint ventures, the Enterprise is required to offer developing countries and their nationals "the opportunity of effective participation".

Apart from the primary contract for the exploration and exploitation of the deep sea-bed between the contractor and the Authority, joint arrangements in the form of joint ventures or production sharing as well as any other

from of joint arrangements may be entered into between the contractor and the Authority and the operations will be carried out through the Enterprise. The legal arrangements contemplated are optional in nature, and contractors entering into such joint arrangement may receive financial incentives. Among the objectives to guide the Authority, in adopting rules regulations and procedures concerning the financial terms of a contract, is the providing of incentives for contractors to undertake joint arrangements with the Enterprise and developing countries, to stimulate the transfer of technology and to train the personnel of the Authority and developing countries.

It would also be appropriate in this context to consider the relevance of Resolution II of the Conference, "Governing Preparatory Investment in Pioneer Activities Relating to Polymetallic Nodules"(25) in the context of transfer of technology. (hereinafter referred to as the PIP Resolution).

The PIP Resolution recognises and grants priority in the consideration of applications for the exploration and exploitation of activities in the deep sea-bed, to the so called "pioneer investors". The Pioneer investors are certain states and international consortia referred to in the resolution who have already expended considerable expenditure (an amount equivalent to at least US $ 30 million) with regard to the development of marine scientific research and technology, amomg other pioneer activities. The justification for the adoption of this resolution was the belief that the according of priority to such pioneer activities, would encourage the development of deep sea-bed technology.

According to the priority that the Resolution confers on a pioneer investor, such investor could, within six months of the entry into force of the Convention, apply to the Authority for approval of a plan of work, for exploration and exploitation of the deep sea-bed. The plan of work, however must conform to all the requirements of Annex III on the basic conditions of prospecting exploration and exploitation, including "the undertakings concerning the transfer of technology". Therefore the mandatory transfer of technology provisions vis-a-vis the Enterprise and the developing countries will apply to a Pioneer investor. This obligation finds unambiguous expression in the Resolution when it requires that every Pioneer investor shall "undertake, before the entry into force of the Convention, to perform the obligations prescribed in the Convention relating to transfer of technology."

The significance of the PIP Resolution, therefore, in the context of the developed legal mechanisms for the transfer of deep sea-bed technology is that on the one hand it preserves the mandatory contractual obligation of the Contractor regarding transfer of technology and on the other it is designed to ensure that, at the time of the entry into force of the Convention the Enterprise will become a viable entity which is able to carry out activities in the Area, in such a manner as to keep pace with states and other entities.

A developed legal mechanism of this nature, requires the backing up of an effective system of legal sanctions, in order to make the mandatory obligation to transfer technology a meaningful one from the legal standpoint. Thus the settlement of disputes procedure and the types of legal and extra-egal sanctions provided in the Convention assumes major importance.

(25) Draft Final Act of the Third United Nations Conference on the Law of the Sea: A/CONF.62/121 of 21 October 1982.

(ii) Settlement of Disputes Procedure and forms of Sanctions - a strengthening factor.

The requirement of the mandatory transfer of technology, assumes the form of an obligation to be enforced after a contract has been awarded to an applicant. Therefore it requires a well developed settlement of disputes procedure as well as effective sanctions, to strengthen this legal mechanism. Article 5(4) of Annex III, requires that disputes concerning contractual undertakings for the transfer of technology shall be subject to compulsory settlement in accordance with Part XI of the Convention.

Section 5 of Part XI provides for the establishment as well as the jurisdiction of the Sea-bed Disputes Chamber (SBDC) of the International Tribunal for the Law of the Sea. The jurisdiction of the SBDC applies to disputes with respect to activities in the Area.

All disputes between states parties, concerning the interpretation or application of Part XI relating to the Area as well as Annex III relating to the basic conditions of prospecting, exploration and exploitation, in instances where the parties agree, will be referred to a special chamber of the International Tribunal for the Law of the Sea. Where there is no agreement between the parties, the dispute will be referred to an ad hoc chamber of the Sea-bed Dispute Chamber or to the plenary of the chamber itself. Therefore questions of interpretation or application of the transfer of tech fology provisions in the Convention, as between states parties, will be referred to one of the above fora, depending on whether there was agreement between the parties as to the choice of a forum.

Disputes between parties to a contract on the interpretation or application of a relevant Contract or a plan of work will be submitted, either to the SBDC or to binding Commercial Arbitration, under UNCITRAL rules, in the absence of other provision. Disputes as to the terms of transfer of technology itself, is also subject to a system of binding Commercial arbitration.

Disputes as to whether the transfer of technology offers, made by a contractor are within the range of "fair and reasonable Commercial terms" envisaged in Article 5, may, at the request of either party, be submitted to binding commercial arbitration, in accordance with UNCITRAL Arbitration Rules, or other rules prescribed by the Authority.

The legal sanctions which enforce the mandatory transfer of technology obligations are contained in Article 18 of Annex III. The sanctions which flow, ,in the case of violations of transfer of technology undertakings are primarily suspension or termination of the contract, or monetary penalties.

The sanction of suspension or termination of a Contractor's rights will be applied only where, in spite of warnings by the Authority, the Contractor has conducted his activities, in such a way as to result in "serious ,persistent and wilful violations of the fundamental terms of the contract, Part XI and the rules regulations and procedures of the Authority", or if the Contractor has failed to comply with a final binding decision of the dispute settlement body applicable to him.

Where the activities of the Contractor do not amount to "serious ,persistent and wilful violations" the Authority may impose monetary penalties "proportionate to the seriousness of the violation".

Further, in regard to disputes, as to whether offers for transfer of technology made by a Contractor, are within the range of "fair and reasonable commercial terms and conditions" the Contractor will be given 45 days to revise his offer to conform to such conditions before the Authority takes action either to terminate or suspend the contract or impose monetary penalties.

While these legal sanctions certainly strengthen the mandatory obligations to transfer technology, the developed legal mechanism also relies on a form of extra-legal sanctions as a further means of reinforcement of the contractual obligation.

In the case of third party owned technology, which requires the Contractor to obtain a written assurance from the owner, it has already been observed that the failure to obtain such written assurance would result in a prohibition on the Contractor to use such technology in carrying out activities in the Area. In instances where the Contractor is required to acquire from the owner, the legal right to transfer technology to the Enterprise, and where the Contractor exercises effective control over the owner, the failure to acquire such right, will be a relevant factor with regard to the Contractor's future applications for sea-bed mining.

These amount, in effect, to a sytem of black listing, where contractors do not comply with their contractual, obligations for the mandatory transfer of technology. The legal as well as the extra-legal sanctions provided in the Convention, together with the elaborate dispute settlement mechanism, strengthens the developed legal regime for transfer of deep sea-bed technology.

V

A concluding Assessment

A paradox of the UNCLOS III negotiations was the emergenee of an elaborate and a developed legal mechanism with regard to the transfer of deep sea-bed technology while the legal mechanism for the transfer of technology relating to activities of the general marine environment which would have brought about more practical and immediate benefits to the developing countries, took a less developed and a formative nature.

A question arises as to the rationale behind this dual approach of the developing countries. The transfer of technolgy with regard to the activities in the deep sea-bed had ideological implications beyond UNCLOS III negotiations. It reflected the fundamental principles of the NIEO regarding the spreading of scientific knowledge and technology, in a completely new sphere of activity. This prompted the developing countries to adopt a strong unified bargaining position on the transfer of deep sea-bed technology issue. At the practical economic level, the devloping countries viewed their full and effective participation in the activities of the deep sea-bed as a vital factor in accelerating their process of development. It had far-reaching implications, vis-a-vis, exploitation of new resources, scientific research, training of personnel

and the development of indigenous skills in general.Ocean mining technology belongs to the "Third Industrial Revolution". "If developing countries fail to join this revolution on the ground floor ... the development gap will widen to the point at which 20 years from now it may become unbridgeable."(26)

The developed legal mechanism is not however, completely free of certain obscurities. The Provisions relating to the mandatory transfer of third party technology, while reflecting a genuine concern of the developing countries against possible measures to defeat the objectives of the Convention,however requires clarity and further elaboration. Objective criteria must be established to determine what are "feasible measures" to obtain such technology. Similar difficulties could be envisaged in determining the technology "not generally available on the open market". With regard to the obligation to disclose technological information, difficulties could well arise, both with regard to the means available and the criteria to be used in determining whether "a substantial technological change or innovation" has been introduced. All these issues require determination through well-defined, objective criteria.

The Preparatory Commission established pursuant to Resolution I of the Conference could perform a salutory function in clarifying these "grey areas" of the Convention relating to technology transfer. Para 8 of the Resolution calls for the establishment of a Special Commission for the Enterprise and to entrust to it the functions referred in para 12 of Resolutiou II relating to preparatory investment. These functions include, inter-alia, the function of arranging technology transfer to the Enterprise. The Preparatory Commission is thus required to ensure that every registered pioneer investor shall undertake before the entry into force of the Convention, to perform the obligation prescribed in the Convention on technology transfer. In formulating the rules, regulations and procedures for such transfer, the Preparatory Commission should be mindful of its task in clarifying these issues which have become the subject of strong reservations on the part of the developed countries.

The developed countries must also ,on the other hand, demonstrate a greater sense of accomodation with regard to transfer of technology to developing countries. The undertaking given by the developed countries, represented by the now famous "Kissinger Proposals" of 1975, both with regard to financing of and the transfer of technology to the Enterprise, in order to make it a viable entity, formed the very foundation on which a parallel system was accepted at the Conference. This undertaking, guaranteed that if the industrialized countries and private entities were given equal access to the Area, the Enterprise will be provided with the funds, technology and expertise necessary to enable it to keep pace with States and other entities with respect to activities in the Area. If the Enterprise is now required to wait until technology is "ripe for transfer" while developed States and private companies go ahead with such activities, it would tantamount to a serious reversal of this fundamental undertaking and prejudice the participatory process of the developing countries in the international sea-bed area.

(26) Supra; n(19).

There are certain proposals before the Preparatory Commission which have the objective of promoting collective efforts towards research and development of sea-bed technology.

A proposal by Austria presented before the Special Commission II, at the Second Session of the Preparatory Commission held in March 1984 suggests joint venture partnerships which shall, inter-alia, undertake research and development in mining technology transport and processing and to organise training programmes and establish a technology bank.(27)

The consideration by the Preparatory Commission of such proposals in a spirit of constructive cooperation and compromise will make a positive impact and help to transform the legal mechanism for transfer of deep sea-bed technology into a practical and a realistic mechanism which would serve the technological needs of both the Enterprise and the Developing countries.

(27) LOS/PCM/SCN(II)L/II.

Producers' Response to Fertilizer Subsidies The Experience in the Coconut Industry

CYRIL PARANAVITANA

Abstract

The author examines the initial response and actual fertilizer consumption patterns of coconut growers under the government's Fertilizer Subsidy Schemes for the 1956-78 period and finds that the scheme failed to arrest the declining trend in fertilizer use during the 1970s. With the aid of several cross-section studies, the author identifies a number of reasons for low response to the scheme. They are namely: bad weather spells, increasing dominance of the small - holder in the industry, lagged response of the authorities to large price increases, poor distribution network, and the failure of government extension services.

The author argues that a comprehensive policy embracing subsidies, easy credit, efficient distribution of fertilizer and better extension services should have replaced the subsidy **only** policy.

Introduction

In the 1970s, the performance of the coconut industry in terms of output and exports was highly unsatisfactory compared to the 1960s (see Table 1). The total estimated production[1] reached a peak of nearly 3000 million nuts in 1964 which was never achieved again in the rest of the 60s or in the 70s. Coconut output is mainly determined by weather, fertilizer and cultural and management practices (DCCR, 1964). However, bad weather spells experienced in the early 1970s cannot explain the falling trend in production. Weather being an exogenous factor, we concentrate mainly on the effect of fertilizer input on coconut yield. The following table clearly demonstrates the relationship between declining fertilizer consumption and falling production.

TABLE 1: PRODUCTION, EXPORTS, FERTILIZER CONSUMPTION AND PRICES IN THE COCONUT INDUSTRY

(Annual Averages for 5-yearly periods+

Period	Total Production (mn. nuts)	Exports (mn. nuts)	Fertilizer Consumption (Tons)	(Price (Rs. /1000 nuts)
1956-60	2,300	1,100	36.700	151
1961-65	2,700	1,400	45,800	132
1966-70	2,500	1,000	58,300	179
1971-75	2,400	800	41,800	264
1976-62	2,200	500	39,900**	666*

Source: CDA, 1974b; CDA, 1972, 73, 74, and 75; DCCR, 1964-71; CDA, 1983

+ except for the last period which covers 7 years

* estimate for the peried 1976-79

** National Fertilizer Secretariat.

(1) Estimated production is obatined by adding exports to domestic consumption. Domestic consumption is estimated by multiplying per capita consumption of coconut and coconut products by mid-year population. It is important to note that per capita figures which are obtained from Survey of Consumer Finances are not sensitive to price changes and hence do not reflect actual consumption.

The declining trend in production and exports can be attributed to falling fertilizer consumption and to the ever-tightening grip of the small holder on the industry. Between 1962 and 1973, estates of 50 acres and over fell from 26. 8% of the total extent under coconut to a mere 9.1%[2]. This has a disastrous result because of the fact the estates carry out fertilizer applications and management and cultural practices more regularly and quite extensively as compared to small-holdings.

According to previous estimates (Abeywardana, 1978; DCCR. 1969), only 20-30% of the total extent under coconut has been subject to fertilizer applications. Thus there is room for improvement in the applications of fertilizer more intensively and extensively over a wide area·

Until 1973, the government's role in the coconut industry was confined only to subsidising the prices of fertilizer and seedlings. The government's main attention has been centered on the fertilizer subsidy scheme (FSS) which was introuced in 1956 by the Department of Coconut and Cocoa Rehabilitation in order to promote fertilizer usage among coconut cultivators by subsidising the price of fertilizers.

This paper attempts to examine systematically the varying rates of participation in the fertilizer subsidy scheme by different types of cultivators. Attention is also focused on the behaviour of consumption levels in the face of the rapdly increasing prices of fertilizer and the varying levels of subsidies: the response of fertilizer consumption to price movements.

Another objective is to examine why the response of the cultivators to increasing subsidies is very low. An attempt is made to put together the evidence scattered in several cross- section studies on coconut cultivation over the period considered.

An attempt is also made to find out whether the government's role should have been different in the face of changing circumstances experienced by the cultivator and to make some suggestions for improvements in order to arrest falling coconut production.

II: FERTILIZER SUBSIDY[3] SCHEME

Although cultivators with different size holdings have participated in the fertilizer subsidy scheme (FSS), the department of Coconut Rehabilitation has classified these holdings broadly into two groups: small-holding (less than 20 acres) and estates (20 acres or more). During the 1956-68 period. these two groups were treated differently for the purpose of subsidy payments. Estate owners received a subsidy payment equivalent to one third of the price of fertilizer whereas small holders received a subsidy amounting to half of the price of fertilizer. From 1969 the discrimination of

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(2) As a result of the 1972 Land Reforms which affected holdings of 50 acres or more, this ratio would have touched a very low ebb than otherwise.

(3) The subsidy given is an outright grant rather than a loan from the government.

cultivators on the basis of the size of holdings has been abolished. During the 1969-77 period, the common subsidy was 50 per cent of the cost incurred in the purchase of fertilizer and since the beginning of 1978, it has been raised upto 75 per cent of the cost.

Under the scheme, the distribution was done in the following manner. Small holders were given the option of either ordering fertilizer through the co-operatives or obtaining their requirements directly from the Central Stores in Colombo, whereas estates had to purchase their requirements directly from Colombo. This arrangement would have enabled the small holder to save a certain amount of costs involved in transporting his requirements.

Until the formation of the Fertilizer Corporation in 1964, the supply of fertilizer at subsidised rates was handled mainly by private firms. During the 1964-72 period, the Corporation operated from Colombo through its central stores. Since 1972, however, the Corporation has decentralised the distribution network and established several regional stores to cater for small holders of 5 acres or more.

A. INITIAL RESPONSE TO THE FSS

It is possible to carry out a study of initial response of cultivators to the fertilizer subsidy scheme by utilising figures[4] on the distribution of participants by size holdings given in Administrative Reports of the Department of Coconut Rehabilitation (DCCR 1970 and 71). Table 2 gives a summary of this information for the major-coconut-growing areas (coconut triangle[5]) and for the whole island.

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(4) One has to be cautious about the reliability of these figures obtained from the Department of Coconut and Cocoa Rehabilitation. For example, the 1962 Census of Agriculture figure for the total extent of estates (50 acres or more) was about 308,792 acres whereas the rotal acreage of the same class holdings given in the report was 309,554 acres. This discrepancy would have resulted from either an increase in the acreage under coconut between 1962 and 1970 which is rather unlikely or 'double counting' resulting from 2 or more applications being received for the same estate. Similar problems also arose in the case of 10–20 acre group and that of 20–30 acre group. Given these descrepancies, one can still draw valid inferences with regard to the percentage of holdings in each size group that applied for the subsidy.

(5) The coconut triangle comprises of Colombo, Kurunegala and Puttalam districts.

TABLE 2: Distribution of Participants under the Fertilizer Subsidy Scheme:

	Holdings Size (acres) Below 20	20 - 50	50 or more	Total
Coconut Triangle:				
Extent under FSS	322,120	72,948	266,966*	662,033
%	(49)	(11)	(50)	(100)
Total Extent	500,936		251,667	752,604
Participation rate (%)	78.9		100	88
All Island:				
Extent under FSS	417,181	86,406	308,554*	812,141
%	(51)	(11)	(38)	(100
Total Extent	843,726		308,792	1,152,418
Participation rate (%)	59.6		100	70.5
Share of the coconut triangle under FSS(%)	77,4	84.4	86.2	81.5

Sources; DCCR 1970 and 1871
1862 Census of Agriculture (DCS, 1976)
* see note (4)

For the whole island 51 per cent of the extent registered under the FSS is in the small holdings sector (below 20 acres). Moreover, coocnut holdings below 50 acres constituted 62 per cent of the total extent registered under the FSS. However, those holdings (below 50 acres) registered with the FSS include only 60 per cent of the total extent under coconut thus showing a moderate initial response by small holders to the scheme. It can also be shown that only 42 per cent of small holdings below 10 acres were registered under the FSS even though 50 per cent of the total extent under coconut falls into this category. This clearly demonstrates the limited response of the small holder. Nevertheless, it is interesting to note that the participation rate is reasonably high for the less than 50 acre category in the coconut triangle which comprises 65 per cent of the total acreage under coconut. It is clear from table 2 that all estates of 50 acres or more have participated in the FSS.

The share of the coconut triangle in the FSS increased from 77 per cent in the small-holdings (less than 20-acre) category to 86 per cent in the 50 acre or more category. These figures provide clear evidence to support the view that the response of the cultivator to incentives increases with the size of the holding.

B. ACTUAL PERFORMANCE UNDER THE FSS

In this section, an attempt is made to examine how different cultivators respond to the FSS over the 1956-80 period. Because of differing response levels between estates and small holdings, fertilizer purchases are presented in table 3, by 5- yearly intervals.

TABLE 3: Fertilizer Purchases by Type of Cultivator (Annual Averages) For 5-yearly Periods + "

Period	Estates (Tons)	Estates % of Total	Small Holdings (Tons)	Small Holdings % of Total	Total Purchases (Tons)
1956-60	19,595	53.5	17,059	46.05	36,653
1961-65	22,478	49.1	23,318	50.9	45,797
1966-70	30,362	52.0	27,981	48.0	58,343
1971-75	21,003	50.2	20,816	49.8	41,819
1976-80	21,6 0*	52.0*	19,947*	48.0*	41,557,"
1981-82	—	—	—	—	35,682"

Source CDA, 19/2-; CDA, 1974b; People's Bank (1979a, b)

+ except for the last period.

* author's estimates

" National Fertilizer Secretariat

With the introduction of the FSS in 1956, the average annual aggregate consumption of fertilizer increased sharply from a level of 10,000 - 12,000 tons in 1955 (DCCR, 1964) to an annual average of 37,000 over the 1956-60 period (see table 3). This three--fold increase within 6 years clearly demonstrates the initial impact of the FSS on the cultivator's production decision.

The underlying feature of the consumption figures given in table 3 is that aggregate consumption as well as its components increased rapidly during the first 15 years of the inception of the FSS. In contrast, however, the gain realised over 15 years since the inception of the subsidy programme had been almost wiped out in the next 5 years, 1971-75. The consumption in both the estate sector and small holdings sector declined during this period.

One can also point out that during the first 10 years of the FSS, the share of small holdings increased from 46 per cent of total purchases to 51 per cent thus revealing early enthusiasm of small holders to the FSS. However, the estate sector regained its share over the 1966-70 period.

It was observed that with the introduction of higher subsidies, the demand for fertilizer would go up immediately from the previous level and continue to increase for 3 years and then begin to decline rapidly. This adjustment pattern has repeated in 1968 with the increase of subsidy for estates from 33 1/3% to 50% and with the increase of subsidy from 50 to 75% in 1978 for both sectors, In the case of the 1978 subsidy, the total fertilizer consumption increased from 29,000 tons in 1977 to 50,000 in 1980, an increase of 93% within 3 years. However, it fell back to 30,000 tons in 1982, thus bringing eventual fall in consumption, as expected. This clearly indicates that subsidised price alone could not sustain fertilizer consumption at a higher level.

Considering individual components, it is reasonable to assume that both sectors, estates as well as small-holdings, would have increased their fertilizer consumption immediately at varying rates depending on their adjustment patterns. Estates being more price elastic compared to small-holdings, their share in total fertilizer purchase would have gone up immediately but within a short span of time, this would have came back to its trend level.

Although under the FSS, small-holders are allowed to obtain their fertilizer requirements through co-operatives, the proportion of small-holders who participated in the FSS through co-operatives decreased very rapidly from an initial high of 52 per cent of total small holders' purchases to 27 per cent within 20 years.

Since small holdings constituted about 60 per cent of the total acreage, the above consumption figures should be translated into fertilized acreage in order to get a better picture of the actual situation. Fortunately, the Administrative Report of the Department of Coconut and Cocoa Rehabilitation and those of the Coconut Development Authority throw some light on the extent of coconut lands that had been fertilized and on per palm applications of fertilizer. Table 4 gives the proportion of the total extent that had been fertilized and per palm consumption:

TABLE 4 Fertilizer Consumption Patterns

	Proportion of Acreage Fertilized (per cent)			Per palm Consumption (lbs)	
Period	Estates	Small holdings	Total	Estate	Small holdings
1972-65	43	20	29	4.0	6.4
1966-70	46	21	31	5-0	7.0
1971-75	36	15	23	4,3	7.1

source: DCCR, 1964-71; CDA, 1972-75

Figures in table 4 clearly demonstrate the proportion of total acreage fertilized was around 30 per cent during the 1960s but declined rapidly in 1970s. Also, the Proportion of acreage fertilized in the estate sector varies around at much higher level than that of the small holdings sector. In the small holdings sector only 15-20% of the acreage was fertilized. Thus the figures provide enough evidence to support the argument that the response of small holdings to the FSS is very low.

Data on the consumption of fertilizer per palm are also presented in table 4. These figures show that the dosage applied per palm by estate-owners is much lower than that applied by small holders. The level of fretilizer consumption per palm had been in the range of 4-5lbs, for the estate category and 6-7lbs. for small holdings respectively. Another feature emerging from these figures is that the dosage per palm was increasing in the small holdings sector.

In summarising the actual performance of the FSS, one can conclude that the subsidy programme had not been successful in arresting the adverse trend in fertilizer consumption observed in the 1970s. In the first part of the 1970s, it can be seen that both sectors neglected regular application of fertilizer. The drop-out rate from the FSS for each sector was alarmingly high. Moreover, the limited effectiveness of the FSS is obvious since the maximum proportion of coconut lands fertilized did not exceed 31 per cent of the whole 1956-75 period even though 70 per cent of the total extent under coconut had been registered with the Departmeut of Coconut and Cocoa Rehabilitation for the purpose of obtaining fertilizer issues under the FSS.

What has actually taken place under the FSS can be put in a nutshell as follows: On one hand, the maximum acreage fertilized has been going down rapidly and on the other hand, the dosage applied per palm has been increasing especially in the small holdings sector. To a large extent, this situation defeats the purpose of the FSS which was designed to encourage more and more small holdings to take part in the FSS so that application of fertilizer will be carried out over a wide area. Thus, it can be concluded that even with progressive, subsidies, the FSS has not achieved its objectives in the long-run except for a very short period at the beginning. This suggests that certain other factors have been mainly responsible for lack of response.

III. REASONS FOR LOW RESPONSE:

A. WEATHER AND YIELD -

One of the very important aspects that should be looked into is yield variations caused by weather. It is generally agreed that weather conditions have a marked influence on coconut yield. The most important climatic factor which affects yield is rainfall and distribution of rainfall over the year. There is empirical evidence to suggest that drought conditions that prevail in a certain year would be reflected in the next year's yield. The effect of continuing drought conditions for several years would result in a very low yield. Whatever the levels of controllable inputs, there is no way of avoiding disastrous effects caused by weather. Thus it is argued that weather more than anything else has been the main determinant of coconut production. However, the serious aspect of a bad weather spell is that it tends to influence also the controllable factors which determine yield. Since most of the coconut growers are small holders, it is very likely that they tend to neglect the practice of fertilizer application during bad weather spells. In prolonged drought periods, the available data on yield indicate that both small holders as well as estates do neglect, the practice. Since the formation of habits is a long-term phenomenon, it is very likely that once a cultivator neglects the practice of fertilizer application he will not resume it immediately. Thus the neglect of fertilizer application will have long-term consequences which will be observable after 1½ - 3 years.

Under controllable conditions, the results observed are given in table 5.

TABLE 5: Influence of Weather and Fertilizer Usage on Yield

Fertilizer	Climate	Weather	Yield (Nuts/Acre/Annum)
Without	Poor	Poor	1180
With	Poor	Poor	2640
Without	Good	Poor	1500
With	Good	Poor	3790

Source: Abeywardana (1978)

The seriousness of the negligence is clearly demonstrated by the above figures. Under very poor climatic and weather conditions, it is possible to obtain higher yields with regular manuring than without it. Similarly, under poor weather conditions but in a climatically suitable area, the yield can be doubled by the use of fertilizer. Coupled with bad weather conditions, it is not incorrect to assume that other cultural practices, would also be neglected. It appears that this weather fertilizer cycle takes place in every drought, This pattern can be checked by giving substantial aid to cultivators during unfavourable weather spells so that they could overcome their short-term difficulties. However, in the long run, a remedy can be found only by educating the cultivators about the benefits of the consistent adherence to better cultural and management practices.

B. INCREASING DOMINANCE OF THE SMALL-HOLDER:

One of the main reasons for low response is the dominant position occupied by the small holder in the coconut industry. Figures in Table 6 clearly demonstrate that the majority of small holdings are in an economic sense very small.

TABLE 6: Area under Coconut by Size of Holdings (Cumulative Distribution)

Category	Percent of total extent	
	1962	1973*
Less than 1 acre	5 8	-
Less than 5 acres	35.0	-
Less than 10 acres	50.3	-
Less than 25 acres	64.3	-
Less than 50 acras	73.2	91
50 acres or more	26.8	9

Source: Census of Agriculture 1962 & 1973 (DCS 1966 & 1973)
* Comparative figures are not available for 1973, except for the last two categories.

As a matter of fact, 50 per cent of them belonged to the less than 10 - acre category. Moreover, more and more lands under coconut cultivation will be fragmented with increasing population coupled with existing laws of inheritance. As a result, the share of small holdings of the total acreage will increase with the average size of holding becoming extremely small.

Increasing dominance of the small holder can be clearly illustrated by comparing the results of the Censuses of Agriculture for 1962 and 1973

TABLE 7: Coconut Acreage by Type of Cultivator

Census Year	Extent of estates +	%++	Extent of small – holdings*	% ++	Total Extent (acres)
1962	308.792	27	843,626	73	1,152,418
1983	101,131	9	1,014,479	91	1,115,610
% change between 1962 & 1973	67%		+20%		–3%

Source: Census of Agriculture, 1962 & 1973 (DCS, 1966 & 1973)
+ 50 acres or more
* less than 50 acres
++ per cent of row-totals

It is apparent from the above figures that the share of estates shrank from 27 per cent of the total extent in 1962 to a mere 9 per cent in 1973. Since the total extent had been shrunk only by 3 per cent, the share of the small holdings sector had increased considerably at the expense of the estate sector between 1962 and 1973.

It is reasonable to assume that the rapid drop in the estate (50 acres or more) category partly resulted from the initial response to land reforms and partly resulted from the demand for land for alternative uses and fragmentation of land through inheritance.

The problem with the increasing dominance of the small holder is that as a producer, he pays little attention to government incentives, technical know-how, better cultural and management practices etc. As a result, productivity per acre is low in the small-holdings sector. Several survey findings show that the practice of fertilizer usage among small holders is not widespread (CRI/FAO, 1969: DCS,1971). Accdording to the findings of the Survey on Coconut Cultivation conducted by the Department of Census and Statistics (DCS, 1971), it appears that the proportion of small-holders (less than 50 acres) who applied fertilizer regularly in 7 major coconut growing districts[6] was only 14 per cent whereas the corresponding proportion of estates was 66 per cent.

(6) These coconut growing districts include Colombo, Kurunegala, Puttalam, Matara, Hambantota, Kegalle, and Kalutara

Table 8 indicates how the practice of fertilizer usage varies with the size of holding.

TABLE 8: Fertilizer Users as Per Cent of Total Cultivators in the Kurunegala District

Size-group (acres)	1976	1977
0 - 1	-	-
1 - 3	1.5	0.8
3 - 10	1.7	-
10 - 25	12.0	13.2
25 & Over	32.6	24.2
All groups	6.8	4.9

Source: The Survey of Coconut Lands in the Kurunegala District (1977)

These figures reveal that there is hardly any practice of fertilizer application among small holders cultivating less than 10 acres, The data indicate a steady increase in fertilizer application with increasing size of holdings. Thus the apathy of small holders to the incentive scheme is clearly shown.

SECONDARY NATURE

The fact that a large proportion of coconut cultivators have been small - holders brings out another important reason for low response. A large number of small holders grow both coconut and paddy and treat coconut cultivation as a secondary occupation giving more attention to paddy cultivation.

Table 9 identifies the main source of income of the coconut land holders:

TABLE 9: MAIN SOURCE OF INCOME OF COCONUT LAND HOLDERS

Size-group (acres)	Coconut cultivation	Paddy cultivation	Others	Total
0 - 1	57 (31)	67 (36)	60 (33)	184 (100)
1 - 10	430 (37)	422 (36)	307 (27)	1159 (100)
10 - 25	115 (39)	88 (30)	94 (32)	297 (100)
25 & over	87 (41)	49 (23)	77 (36)	213 (100)
All groups	689 (37)	626 (34)	538 (29)	1853 (100)

SOURCE: Survey of Coconut Lands in the Kurunegala District (1977)
Figures in parentheses show % of row totals.

According to this data only 30 to 40 per cent of coconut land holders (irrespective of size of their holdings) derive their main income from coconut cultivation. It is also found that another 35 per cent of coconut land holders obtain their main income from paddy. However, as the size of holding increases, more and more coconut land holders earn their income from coconut cultivation.

Considering the production cycle of paddy, it can be reasonably argued that small holders give priority to paddy over coconut when it comes to the allocation of their limited funds on the purchase of inputs. This situation arises because paddy demands urgent attention, fetches better prices and yields its returns in a short period of time. Hence amounts to be spent on coconut would be small.

It could also be argued that since a large proportion of coconut land holders derive incomes from sources other than coconut cultivation these incomes would increase their resource base which in turn could enhance their capacity to increase fertilizer use. This is particularly relevant as their lesser dependence on income from coconut production could enhance them to withstand the gestation period of fertilizer investment in coconut.

OTHER FACTORS

As argued earlier, falling consumption has been due to severe weather conditions especially during 1970's and to unsatisfactory cultural practices. However, there have been other reasons for not applying fertilizer for coconut.

Table 10 brings out some important reasons for not applying fertilizer.

TABLE 10: REASONS FOR NOT APPLYING FERTILIZER[7] ON COCONUT LANDS

Reason Size-Group (acres)	0 - 10	%	10 -25	%	25 & over	%	Total
Financial	444	36	46	29	15	20	505
Availability	303	24	38	24	19	25	360
Lack of interest	159	13	32	20	19	25	210
Not necessary	61	5	7	4	4	5	72
Lack of transport facilities	71	6	11	7	11	14	93
Others	201	16	24	15	9	11	233
Total	1239	100	158	100	76	100	1473

SOURCE: The Survey of Coconut Lands in the Kurunegala Distict (1977)

(7) The sample consists of those cultivators who did not apply fertilizer.

From table 10, three clear - cut reasons for not applying fertilizer emerge. They are mainly financial reasons, unavailability of fertilizer and lack of interest. In another survey on development of coconut lands in the Colombo district (ARTI, 1975), it was found that 59% of coconut growers did not use fertilizer because of the financial reasons and 26 per cent did not use it due to unavailability, thus confirming the above findings.

C. PRICE OF FERTILIZER:

Figures given in Table 10 indicate that financial difficulties fall more heavily on the level of fertilizer consumption of the 0 - 10 acre category than that of the 25 acre and over category. For instance 36 per cent of the cultivators in the former category complained of this difficulty whereas the corresponding figure for the latter was 20 per cent. Financial difficulties were mainly caused by rapidly increasing price of fertilizer. Although coconut cultivators are assured of a generous subsidy, they have not been able to make use of it because of high prices of fertilizer experienced especially since September, 1973.

TABLE 11: Price Index[8] of CRI Fertilizer Mixtures and Subsidy Rates

Period	Price Index (1965—67 100)	Subsidy Rates (% of Price) small holdings	Estates
1964 Oct - Dec.	100.3	50.0	33⅓
1965 Jan - 1967 Dec.	100.0	50.0	33⅓
1968 Jan - April	106.7	50.0	33⅓
1968 May - Dec.	128.0	50.0	33⅓
1969 Jan - 1973 Sept.	128.0	50.0	50
1973 Oct - 1974 Mid July	163.2	50.0	50
1974 Mid July - Aug.	274.9	50.0	50
1974 Sep - 1975 Dec.	335.0	50.0	50
1976 Jan - Dec.	301.6	50.0	50
1977		50.0	50
1978 - 80		75.0	75

SOURCE: DCCR 1964-71; CDA 1972-75

As can be observed from Table 11 the index of fertilizer prices rose steeply from 128 in September 1973 to 335 in September 1974. At the beginning of 1974 the prices of all standard mixtures (CRI mixtures A, B, C, & Y. P. M.) varied between Rs. 600-650 per ton whereas they were in the range of Rs. 1240 - 1340 per ton by the end of the year, an increase in the range of 100 per cent (CDA, 1974). Along with sharp price increases, levels of fertilizer consumption fell in both small holdings and estate sectors. Even after I974, these higher prices have remained in operation thereby making the reduced consumption of

(8) The fertitizer price index used here is the arithmetic average of the prices of standard fertilizer mixers (CRI, A, B, C' & Y. P. M.) recommended by the Coconut Research Institute (CRI)

fertilizer almost inevitable. Thus it is reasonable to assume that the small - holder cannot afford the practice of regular fertilizer application even at a subsidized price,

In another study (Paranavitana, 1983) it was found that the estimated price elasticity of demand for fertilizer was -0.41 for small - holders and - 0.67 for estates respectively, for the 1960 - 75 period. These results clearly indicate that increasing prices had discouraged fertilizer consumption in both sectors.

An attempt was made to evaluate the impact of fertilizer price increases on the cultivator's decisions and the results obtained are presented in table 12.

TABLE 12: Cost of Fertilizer and Value of Output[9]

Year	Cost of Fertilizer (Rs.) 0-1 acre	1-10 acre	Farm Price (Rs./Nut)	Value of Produce* (Rs./acre	Fertilizer Cost/Value %
1965	74	543	0.17	289	21
1970	95	693	0.24	408	19
1974 I & II qrts	122	896	0.51	867	12
1974 III	203	1498	0.51	867	20
1974 IV	249	1835	0.51	867	24
1976	224	1648	0.43	731	26

* 1700 nuts per acre

Table 12 shows the high cost of fertilization as well as its rapid increase over time. In view of the high cost of fertilization in relation to the average value of the produce, it stands to reason that the financial burden on the small-holder is heavy. These figures indicate that the potential cost of fertilizer application (allowing for 50 per cent government subsidy) was in the range of 20-25 per cent of the value of total produce, Furthermore, an allowance has to be made for own consumption of small - holders, which will constitute a fairly large

(9) The following figures were used in computing cost of fertilizer and value of produce.

Data on fertilizer and output for sall-holnings

Recommended dosage per palm (CRI 'A', 'B', 'C')* ... 8 - 10 lbs
Average number of palms per acre** ... 70
Average size of holding (0-1 acre group)*** ... 0 . 6 acre
Average size of holding (1-10 acre group)*** ... 4 . 42 acres
Total annual fertilizer requirements:
0-1 acre group 420 lbs. = 0. 19tons
1-10 acre group 3100 lbs. = 1. 40tons
Average annual production per acre** ... 1700 nuts

Source : * DCCR, 1964 - 71
** Survey on Coconut Cultivation (1970)
*** Census of Agriculture (1962)

proportion of the produce. According to the findings of 1961-63 survey of cocount cultivation (CRI/FAO, 1969) the ratio of own-consumption to production was about 25 per cent for the 1-10 acre category, In periods of low production, this ratio had even gone up to about 80 per cent for the 0-1 acre category. Thus the size of marketable surplus clearly show that fertilizer application is economical only for very large farms. This line of argument favours a scheme of easy loans to small-holders so that they can overcome temporary difficulties caused by financial reasons.

A scheme was initiated in 1968 to provide credit facilities to the owners of coconut lands to buy fertilizer at subsidised rates. This scheme operated by commercial banks failed largely as a result of the inadequate response shown by coconut cultivators. In 1979, a new credit scheme for coconut fertilizer was introduced with the assistance of commercial banks. Under the scheme credit is provided at a low interest and recoveries would be made after two years.

D. AVAILABILITY:

Another important factor which reduces regular consumption of fertilizer is the unavailability of fertilizer in sufficient quantities at times when it is required. The findings of both surveys mentioned earlier (CRI/FAO, 1969: DCS, 1971) indicate that the proportion of non-users who experienced the unavailability problem is very high. Figures in Table 10 suggest that the problem is more acute for small-holders.

Under the fertilizer subsidy scheme (FSS), small-holders (who owned 20 acres or less) had been allowed to obtain fertilizer requirements either directly or through the local co-operatives. However, there had been a decrease in the purchase of fertilizer requirements through co-operatives over the 1960-75 period. The shift of small-holders preferences from co-operetives towards various direct sources might have been brought about by the inefficiency of co-operatives in satisfying consumers needs in time.

On the question of availability of fertilizer, the findings of the 1977 survery of Coconut Lands in the Kurunegala District show that of 637 respondents, 55 per cent complained about the unavailability and another 36 per cent complained about the poor availability.

E. LACK OF INTEREST:

Data in Table 10 also show that lack of interest is another important factor for low response among cultivators. Some respondents have even stated that application of fertilizer to coconut lands was not necessary Contrary to expectations, this lack of interest is widespread among estate owners (25 acres or more category) as well as among small-holders.

F. TRANSPORT PROBLEMS:

The lack of transport facilities has been more of a problem for estate-owners rather than that for small-holders. In fact 14 per cent of the estate-owners complained about this facility compared to only 6 per

cent of small-holders (0-10 acre group). It may be argued that this situation is a direct result of the method of distribution of fertilizer through co-operatives, which encouraged the small-holder by providing his fertilizer needs with minimum inconvenience. Moreover, since 1971 Coconut Development Officers have been authorised to issue permits to enable owners of less than 5 acres to draw their fertilizer requirements from the regional fertilizer store.

Considering the sources of supply of fertilizer to small-holders, the findings of the ARTI survey on small-holdings in the coconut triangle (ARTI, 1973) indicate that the majority of respondents (about 64 per cent of the total obtain their requirements directly from the central stores in Colombo while a mere 18 per cent of them obtain theirs through the co-operatives. The reluctance of cultivators to obtain their fertilizer requirements through the co-operatives might stem from the reason that it is unavailable when it is required.

G. LAGGED BENEFITS OF FERTILIZER INPUT

There has been a declining trend in the application of fertilizer since the 1968 peak level. The period since 1970, in fact, coincides with the spells of unfavourable weather conditions. During periods of severe weather conditions the net benefit obtained from the application of fertilizer is very low. The following table gives annual average yield per bearing palm (in nuts) in relation to manurial practices during the preceding two years (1968/69).

TABLE 13: AVERAGE ANNUAL YIELD PER BEARING PALM FOR SMALL - HOLDINGS*

District	Manured	Unmanured
Kurunegala	43.9	29.8
Puttalam	47.5	46.8
Colombo	39.2	27.9
Kalutara	41.7	41 9
Kegalle	40.6	40.7
Hambantota	31.2	31.8
All Districts	42.5	35.1

SOURCE: Sample Survey on Coconut Cultivation. 1970.
* less than 50 acre category.

The above figures show that except for the Kurunegala and Colombo Districts, net benefit obtained from fetrilizer application is almost negligible. Comparing the average yields of coconut lands which have been manured and unmanured, one can conclude that additional expenses incurred on fertilizer cannot be recovered since the net benefit associated with the practice of fertilizer usage is minimal. However, it has to be pointed out that the average yield figures for 1968/69 were affected by bad weather conditions.

It is generally agreed that there is a time lag of 1½ - 3 years between application and increase in yield or non-application and decrease in yield. As compared with paddy where the length of lagged response is 3 months,

the time lag for coconut is considerably longer. Thus, it stands to reason that small-holders used to a limited time horizon would not be keen on applying fertilizer to coconut lands.

UNAWARENESS AND LACK OF COMMUNICATIONS:

A considerable proportion of small holders are unaware of the facilities available under the FSS and therefore, the existing facilities are not adequately utilized. Unlike in paddy, the extention and advisory services have had a minimal impact on the habits of owners of small-holdings. According to the findings of the ARTI survey on small-holdings (1973) virtually 90 per cent of small-holders in the sample had not been visited in past 3 years and 72 per cent did not recall a visit at any time by extension officers. These figures clearly indicate the serious problem in the existing machinery of communications.

The low participation rate in the FSS could be directly attributed to the failure of extension services. All the coconut growing areas of the island are divided into Coconut Development Officer's ranges. Each of them is manned by a Coconut Develpoment officer whose task is to advise on fertilizer usage and other cultural and management practices. The total number of Coconut Development Officers to look after 1 million acres was 59 in 1973, 87 in 1974, 100 in 1978 and 200 in 1980. Even in 1980, one Coconut Development Officer was expected to look after 5,000 acres approximately. It has been found that these officers have hardly any time to provide advisory services as their time is taken up by the implementation of the subsidy schemes under the Coconut Cultivation Board.

VI. CONCLUSIONS:

In summarising, it can be concluded that the FSS had failed during the 1970s in reversing the tendency of coconut cultivators to reduce fertilizer consumption, in the face of unfavourable weather spells and rising price of fertilizer. As discussed earlier, the failure of the FSS can be attributed to the following reasons:

Firstly, the FSS had been operating in isolation instead of it being a part of a comprehensive package which embraces all aspects of coconut cultivation.

Secondly, the government has failed to communicate effectively with small-holders on the need for continuing application of cultural and management practices.

Thirdly, price explosions observed in the 1970s were so large that even the subsidised price was not affordable to the small-holder. Besides, subsidies had been lagging behind large price increases thus making it inevitable for large number of participants to drop - out from the FSS.

Fourthly, there exists a hard-core of small-holders who do not apply fertilizer even with generous subsidies because of the fact that their holdings are very small and hence uneconomical.

Considering the above facts, one can argue that the government should have not pursued a policy on price incentives only, since these incentives worked satisfactorily during the periods of stable prices and good weather conditions but failed miserably when conditions were unfavourable. Instead, it should have pursued a comprehensive policy promoting all aspects of management and cultural practices.

V SUGGESTIONS FOR IMPROVEMENT:

As shown earlier, the maximum proportion of acreage fertilized over the period considered did not exceed 21 per cent for small-holdings and 46 per cent for estates. These figures clearly show that there is more room for improvement especially among small-holders whose share in the total extent under coconut increased from 73 per cent in 1962 to 91 per cent in 1973. With ever-increasing dominance of small-holders in the industry, it is important to introduce a programme promoting all aspects of fertilizer use. The programme should aim at encouraging more small-holders to apply fertilizer regularly. The scheme should reward small-holders for regular application of fertilizer in order to sustain fertilizer consumption above a certain critical level. In addition, it is vital to introduce a credit scheme for cultivators especially for small-holders, to cushion the impact of very large price increases.

Secondly, there should be an efficient system for distribution of fertilizer among coconut cultivators. The existing distribution network should be expanded to inculude local co-operatives, village shops and other local distributing agents in addition to regional stores. Existing fertilizer storage facilities should be expanded so that fertilizer can be made available to the cultivator in time. In fact, the establishment of supply sources at highly decentralised level will encourage the small-holder to use more fertilizer because of least cost and minimum inconvenience. Fertilizer should be made easily available to the cultivator without any restriction on the type of buyer. It is self-evident that wider application of fertilizer depends to a large extent on the level of efficiency of the distribution network.

It was argued earlier that the high non-participation rate in the FSS could be directly attributed to the limited effectiveness in extension services. At present, government extension services are understaffed and overstretched. With the appointment of cultivation officers to look after all crops at G. S. division level, it is reasobable to assume that extension services will be able to bridge the gap between the extension officer and the cultivator. However, lack of technical knowledge on the part of cultivation officers will be a hindrance to this decentralised system. Since the group concerned here is mainly small-holders, the need for an efficient and decentralised system of extension services which is geared to communicate effectively with them cannot be overemphasised.

Finally, it can be concluded that along with fertilizer subsidies, a package of easy credit, a decentralised system of fertilizer distribution, better extension services should be introduced as in the paddy sector so that a higher level of productivity could be attained in the coconut sector.

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Shifting Sociological Paradigms and Working Class Criminality*

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Abstract

An attempt is made to explain working class criminality through the shifting approaches of different sociological paradigms. It then tries to link up the political response that parellels each sociological paradigm. Overall, this essay gives an account of the intimate connection that exists between the ideas we have and the sort of life that we lead and it is in this light the criminality of the working class is explained.

Introduction

Like many other sociological subjects crime has been the focus of controversy over the definition of its subject matter. Most modern criminologists agree that crime is behaviour which is defined by the legal codes and sanctioned by the system of criminal justice. However, the rapid growth of liberal sociological empiricism and the interest in white collar criminality have given rise to a methodological and an ethical criticism of the traditional definitions. The positivistic fervour of criminologists such as Thorstein Sellin called for universalistic categories that transcend the legal and political boundaries as a necessity imposed by logic of science. The call was for scientific explanations devoid of moral content identifying the natural properties of human behaviour, ostensibly value free. It would be accurate to say that this traditionalist definition of crime is used by most contemporary criminologists. In our examination of working class criminality, it will be necessary to restrict ourselves to this popular definition and the expositions built around them for an examination of the phenomenon in question[1].

Since the end of the nineteenth century psychological and sociological studies of criminal behaviour have been conducted within a more or less positivist framework. The distinguishing characteristic of criminological positivism has been its devotion to practice.[2] Just as the physical sciences,

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* I have preferred the popular sociological term working class rather than the pejorative term lower class for the purposes of this essay although the use of either term does not substantially affect the main thesis

1. Quinney (1970) writes "Conduct is not regarded as criminal unless these conditions are present... (1 the label of crime has been officially imposed on conduct; (2) by authorized persons and agencies (3) of a politically organized society. It is necessary to note the limitations of this definition. In recent years criminologists have begun to systematically reject the use of official data altogether as measures of delinquency. It is now a matter of record that there is clear evidence of class and racial bias in the administration of law' Richard Quinney (ed). The Problem of Crime, New York: Dodd Mead, 1970 pp. 5-6. Regarding the controversy over definitions of crime, see Herman and Julia Schwendinger, "Defenders of order of Guardians of Human Rights" in Ian Taylor, Paul Walton and Jock Young (eds). Critical Criminology London, R.K.P. 1975 pp. 113-146.

positivism has been its devotion to practice.[2] Just as the physical sciences criminology had to develop accurate and calculable units of crime as preliminary to generalization. The immediate and obvious result was to affec criminal statistics, giving the details of both the quantity and the types of crimes committed. Though it has long been recognized that criminal statistics in themselves do not indicate the true volume of crime- due to a variety of reasons, they have nevertheless been treated as 'straight'[3] by many. Although most criminologists who work with criminal statistics are aware of the great sources of variability that creep into them, they have mattered very little in the explanations that they offer of criminal behaviour as such.[4] Basing themselves on these statistics, they have worked out the assumption that crime as essentially a youthful, masculine, lower class activity - an assumption clearly born out of hard facts. In the criminal statistics lie the topical and political debate as to the significance of the crime rate - a rate which shows an extensive amount of crime among the deprived, the poor, the minority group member and, in general, the working class.[5] Both in developed industrial as well as developing agrarian societies criminal statistics show a striking preponderance of lower class individuals both male and female.

Orthodox criminological formulations have been built upon the summations derived out of criminal statistics and the concomitant statements made on them by responsible experts and the media. Naturally, therefore, there is a preponderance of working class elements in the statistics that need explanation. For most part it was a criminology that sought casual explanations for the working class criminality.

THE CRIMINAL IS INTENTIONALLY WICKED: CLASSICISM

Classicism takes it for granted that criminal statistics measure offences against the social contract entered into by the volitional conduct of all rational men. Man is self seeking and liable to commit crime. He is in need of care, and deviants are definitely missocialized or undersocialized beings of an otherwise healthy organism - the social system. Crime is a freely willed activity occuring when man's passions over-reach his reason. Classicism charaterises rule breaking behaviour as irrational and pathological and such men are unable to hold on to the beneficient social contract because of personl inadequacies. The criterion of rationality is invariably the utility of

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2. It was obviously a Comtean view of positive science–a science of the future and the task of the scientist was to hasten the march along the civilizing road,

3 , Hall, Jefferson, et al, Policing the Crisis, Macmillan, 1978

4. There have been many improvements suggested to reformulate criminal statistics but they pertain very little towards better explanations. Stanton Wheeler, for example suggests that additional statistics be collected on (a) complaining witnesses, (b) social charateristics of the community, (c) nature of the police system. I find it hard to see the value of such a mammoth task if the paradigm of explanation remains the same. See Stanton Wheeler, "Criminal Statistics: A Refomulation of the Problem" Journal of Criminal Law, Criminology and Police Science, Vol. 48 pp. 17-24, 1967:

5. For a criticism of statistics as indices of rate production see Kitsue, J, I and A V. Cicourel, "A Note on the Uses of Official Statistics" soc al problems, 11, pp131-9 1963.

the act. All men are equal by virtue of their ability of reason but they are unequal as members of society. Radzinowicz says, "Though men had been equal in a state of nature, they could not be so in society: authority and subordination must remain although they may cease to be abused"[6]

Seen, thus, crime should be evenly spread throughout the social structure and hence self report studies and white collar crime would come as no suprise to the classicist. But what he is embarassed of is the sheer enormity of working class criminality. The answer given in the nineteenth century, perhaps valid today, according to many conservative politicians and laymen, is that those who are at the bottom of the social structure do not have a sufficient stake in the social contract to justify a rational commitment to it. In pure classicism such an explanation would have been satisfactory only for the small part of the lumpen proletariat divorced from the propertied society but it only partially explains the preponderance of working class over-representation in the statistics. For the working class does have a real stake in the social order, "however much it may be that conservative law and order campaigns are a sham behind which particular interests advance themselves and proclaim themselves to be acting in the interests of all."[7] It is also a simple fact that mojority of working class crimes are intra and not inter in their choice of target area of activity and distribution. Moreover, crime is not the choice of many even in a society where poverty is widespread where the worker finds it still difficult to budget after 'decent' employment. The classicist cannot explain this anomalous position.

The neoclassicist would resolve the issue by drawing on the work of labelling theorists and interactionists by pointing out that statistics showing an over - representation of working class elements is a result of interactional procedures and communication problems of social control agents who have faulty notions of the essential nature of deviance. These misconceptions cause them to select working class offenders more than, scientifically speaking they should, and likewise little of middle class offenders. The classicist will not, however, be able to explain the origin of false conceptions. The ideas will not be shown to be related to the specifics of social structure·

Be that as it may, the controversy that was excited by the white collar crime amongst the conservatives shows the depth of their conviction that crime is essentially a working class phenomenon. George Vold, rather surprisingly, writes "Business leaders and corporation executives by and large play an important role in civic and community affairs. They more often than not constitute an important source of imaginative leadership for community enterprises of all kinds."[8]

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6. Leon Radzinowicz, Ideology and Crime, London Heinemann 1966 p. 5
7. Jock Young "Working Class Criminology, Ch. 2, in Taylor, Walton and Young, (eds), Critical Criminology, p. 254.
8. George B. Vold. Theoretical Criminology, New York, Oxford University Press 1958. p. 254.

Criminological realists, who are a variant of conservatives, would argue that police work is in response to citizens complaints as opposed to police prejudices and 'proactiveness'. Thus, Black and Reiss remark "the moral standards of the citizenry have more to do with definition of juvenile deviance than the standards of policemen on patrol".[9] From this perspective the peculiar nature of criminal statistics is a reflection of the public mood and prevailing public will. In so doing, they obviously divest the class biased nature of crime and lay the explanation at the intentionality of the individual criminal.

It should be no surprise for, historically viewed, classicism begets an inherent contradiction between the defence of equality and the emphasis on property. No real attention is given to the fact that lack of property may predispose men to commit crime. The notion of equality as Gouldner points out is never more than ideology.[10] In avoiding discussion of criminal motivation - in particular the link between inequality and criminal action the supremacy of the propertied class is never questioned. Instead attention is focussed on adiministration and control[11]. Because they could not explain inequality was to their surprise that irrationality came to be concentrated among the dangerous classes. Whilst Locke would cautiously argue that although the labouring classes had a stake in civil society they could not become full members of it due to a lack of property, Beccaria would simply avoid the contradiction.

Classicism translated into political terms results in a conservative theorizing that is largely descriptive. Social order as morally bound together is seen as being largely consensual. Consensus is willed to prevent a return to Hobbesian anarchism. The fundemental value is that of law and order. There is a legitimate hierarchy and dominance based upon this agreed - upon consensus. Society is dominated by those born to rule, necessarily holding the rest of an unworthy population in check via schooling, individnal punishment, institutionalization and segregation. The political programme is one of better education at the grass roots level, greater communication among agencies of social control and responsible participation at this grass roots level.[12]

There is no scope here to expand in detail the political and social programmes that classicists would mount in response to working class criminality. I would regard J. Q. Wilson's hard headed approach as

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9. D. J. Black and A. P. Reiss. "Police Control of Juveniles" in Scott and Douglas (eds), Theoretical Perspectives on Deviance, New York: Basic Books, 1972, pp 119–41
10. Alvin Gouldner, The Coming Crisis of Western Sociology London: Heinemann 1971 p. 71
11. Vold op. cit. p. 23
12. For an appealing simplistic notion of conservatism and crime, see E. C. Banfield, the Unheavenly City, Boston: Little Brown, 1970, also cited in David M. Gordon, "Class and t e Economics of crime" in W. Chambliss (ed), Criminal Law in Action, California: Hamilton, 1975.

prototypal of the classicist response. His political programmes are grounded in his explicitly pessimistic view of human nature. In his Introduction to "Thinking About Crime" he asserts that

> "the proper design for public policies requires a clear and sober understanding of the nature of men, and above all, the extent to which that nature can be changed .. Man is refractory enough to be unchangeable but reasonable enough to be adaptable"[13].

His conception of the crime problem involves the existence of two problematic groups in the population: a finite, identifiable "pathological and predatory" criminal class for whom an incapacitative policy is the answer, and the rational calculative man, for whom a different policy is appropriate. Therefore what the government can do is change the risks... and the rewards of alternative sources of income for those who, at the margin, are neither hopelessly addicted to thievery nor morally vaccinated against it".[14]

The modern variant of this pessimistic view is that deterrent penal policies may have to be reinforced by appropriate social policies which will be additive although in effect they receive slight emphasis. "Anti-crime policies may be frustrated by the failure of employment policies... but if criminal opportunities are profitable many young persons will not take those legitimate jobs that exist. The benefits of work and the costs of crime must be increased simultaneously".[15]

THE CRIMINAL AS A VICTIM: SOCIOLOGICAL POSITIVISM

Eysenck states about the positivist method "It is an approach geared only to practical ends such as elimination of anti-social conduct and not cluttered with irrelevant, philosophical and ethicoreligious beliefs"[16]. The positivists postulated fundamental tendencies in human nature to argue that there is an identifiable consensus of meanings and morals which would act as a yardstick for positive action. The fundamental premise here is that values,norms and morality are given by the system. The deviant is one who has not internalized that underlying morality.

In so far as the positivist is interested in the causes of deviance he therefore looks to environmental, physiological or phychological factors that account for an individual's failure to internalize the norms of the majority. The meaning of behaviour is never problematic, it is to be interpreted alongside the posited consensus. Matza sums up the position cogently in saying that, "The explanation of crime according to the positivist school, may be

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13 J. Q. Wilson, Thinking About Crime, New York; Basic Books, 1976 pp. xi, xvi.
14. Ibid, p. 77
15. Ibid, p. 202
16. M. Eysenck Crime and Personality, 1964, Routledge Revised ed., Paladin, 1970.
17. David Matza, Delinquency and Drift, New York Wiley, 1964 p. 3

found in the motivational and behavioural systems of criminals... This quest for explanation in the character and background of offenders had characterized all modern criminology, irrespective of causal factors espoused".[17]

Unlike in classicism the criminal is neither wicked (fallen from grace) nor ignorant (of the benefits of the contract) but is merely unaware of the forces that drive him. As Durheim would say, social life should be explained not by the notions of those who participate in it but by more profound causes which are unperceived. Criminality in the working classes has to be explained in terms of experiences or circumstances different from the majority of law abiding citizens. The biological positivists fell short of explaining the criminal statistics wherein the majority of law breakers were from the working classes. If Kretshmer, Sheldon, and Glueck found mesomorphism amongst delinquents, then they could not explain that working class children could be found in the statistics because of diet, continual manual labour, and so on. The same could be said of the chromosome theorem. Although Eysenck interprets the existence of contracultural values as a reflection of psychological propensities, he does not see them in terms of the structural position faced by lower class children with their poorly placed situation to be conditioned.[18] Trasler improved on Eysenck's biological explanation to suit working class criminality in terms of permissive, eratic, punitive, unprincipled child rearing techniques· Therefore if extroversion is evenly distributed in the population, the differential crime rate among the social class should be seen in the different socialization techniques of the working class.[19]

Working class criminality received explicit attention in the ecological tradition and the structural - functional schools. The ecologists saw the natural areas as breeding zones of crime. Just as plants that were sown on bad soil, individuals forced into such natural areas committed crime because of a lack of normative guidelines. Later, translated into a theory of differential social organization rather than social disorganization, it emphasized that "to grow up as a mature adult in the East End, demands the inculcation of different norms, by different means than does that needed to produce a well balanced inhabitant of Knightsbridge".[20] The British writers in the ecological tradition have shown that the delinquency of the criminal

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18. T. Sarbin and J. Miller state that Chromosome theorists have failed to distinguish between the efficient (antecedent causes) and formal (reasons to label acts as illegal) causes. Issues in Criminology. Vol 5. 1970 pp, 195-207

19. Biological determinism was a welcome doctrine at the beginning of the nineteenth century for it was a convenient rationalization of the failure of preventative efforts and an escape from the dangerous doctrine that crime was a product of a particular social organization. Radzinowicz claims that at the beginning of the nineteeth century. the main source of danger to society was the disorder among the dangerous classes. They were those who had a miserable share in the aceumulated wealth. To see them as an independent category served the interests and relieved the conscience of those at the top. See Radzinowicz, Ideology and Crime, op cit.

20. Jock Young, The Drug Takers: The Social Meaning of Drug Use, London; MoGibbon and Kee, Paladin, 1970 p, 56

area is a function of the availability of opportunities and of gratification rather than natural outgrowth of the demoralization of the less able or the individual pathological.[21]

Merton attempted to give a functionalist interpretation and a structural base to crime in general. He attempted to explore the beginnings of egoism in the structural position of actors. The structural position of actors does not allow sufficient avenues to attain the goals prescribed by the system. Criminality in the working classes is not so much a function of socialization but a partial demystifiction of the game by the underprivileged. To Merton, disjunction in the social and cultural structure arises out of a maldistribution of opportunities. Though there is considerable evidence to suggest that deviance is far more widespread than Merton would predict, he explains only the strain experienced by the working classes. If Merton is merely explaining the criminal statistics his theory is sufficient as an explanation but this observation does not mean that lower class individuals experiencing the anomia are more committed to criminality than members of the higher class. In any case if it were really the case, as Matza indicates, there ought to be much more officially apprehended delinquency than that there is and too little of bourgeois criminality.

In the positivists explanation of working class criminality the subcultural theorists take the analysis further than Merton. By positing that the social structure of American society is under pinned by set of cultural arrangements which can be used by the disadvantaged in solving problems of structural inequality, Cloward and Ohlin point to the collective adaptations as leading to a peculiar structure of opportunities of success. While Cloward and Ohlin did not highlight the rejection of bourgeois standards, Cohen pointed out the contradictions of working class culture with that of the bourgeois society. In the case of Cohen's working class adolescents it is more likely that what has happened is a realistic disengagement from the succes goals and a focus of their aspirations on leisure pursuits. As a result of the status frustration there ensues a reaction formation leading to a set of values which is malicious, short term, hedonistic, and non- utilitarian. Despite its many weaknesses, the use of the anomie theory by subcultural theorists has led to a pluralist model of society where reaction becomes problematic due to a variety of social values and a variety of notions of deviancy.

It is necessary to consider the positivist mode of thought, its epistemology and ontology, for these philosophical issues of objectivity and reflexivity contribute to its particular relation to the social order and its politics. Positivism, generally, is little concerned with epist emological or ontological questions for its main worry is the 'method'. Given enough knowledge and proper methodology the scientist could predict and control

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21. See John Rex and David Moore, Race Community and Conflict, London: OUP, 1967 D. Downes, The Deli quent Solution, 1966 London R K P.

future events. An orderly society could be brought about by man's control of the outside world. The positivist is interested in casual explanations ostensibly value free, devoid of moral assessments. The failure of positivism is in not being reflective. It therefore leads inevitably to an acceptance of the status quo. Just as there is no questioning of the scientist's assumptions there is no questioning of the established order. The official reality is given and is accepted as such. Schaar says that he (criminologist) accepts the bureaucratic rationality, modern technology, centralized authority and scientism.[22] Because the positivist modes of thought lend themselves to a status quo theory, they are in great demand by those who rule. The scientist cannot operate out of the official reality, for to do so would be to relinquish his role as a scientist. The legal order is taken for granted and if it is questioned at all it is concerned with how to make it more equitable. Inadequacies are to be rectified and the agencies of control are to be made more efficient and honest.[23]

The empiricist culture of the positivist is propagated by social democratic politics. Bourgeois rationalism is substituted by socialist rationalism with the state taking over the control of the economy in place of the invisible hand. The reformism of Fabian Socialism is the typical dramatization of this doctrine. If classicism and conservative politics brushed aside the contradiction of utility as arbiter of social merit and inequality of inherited property, the Fabians were keen to rationalize it by attempting to set up a health meritocracy. The Fabian objective has the creation of equal opportunity by gradually abolishing the gross inequalities of material wealth in order that a truly utilitarian society based on an universally appropriate social contract where everyone had an equal state could be erected. This was reflected in its commitment to welfare. Social reconstruction is the theme; better industrial relations, desegregation in housing; a smooth merit-success-mobility run for everyone. This was also combined with a religious zeal to inculcate the protestant ethic into everyone. Criminals were seperated out from their class origins and identified as those who were unwilling to participate in the welfare reconstruction. It was the British Labour government of 1960 that identified the troublesome youth out of the generally deprived youth.[24]

The social domocratic political parties operate at two levels. Based on environmental determinist theories they try to lessen the harshness of the environment through welfare legislation. (Benevolent Community homes in

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22. John Schaar, "Legitimacy in the Modern State" in Green and Levinson (eds) Power and the Community, New York: Vintage 1970.

23. Norral Morris, and Gordon Hawkins, An Honest Politician's Guide to Crime Contro New York: University of California Press, 1970. They offer suggestions for changing particular laws but the legal system is to remain intact. See, also, The White papers in Britain on children in the 1960's and the bitter conflict they eventuated.

24. See the British Labour Party study group document, Crime - A Challenge to Us All. and also the White Paper, Children in Trouble.

place of poor homes). But when this fails in the face of the inequitous society they embrace psychoanalytic and individualist theories. In Britain, the sociologists place was taken by psychiatrists like John Bowlby noted for his maternal deprivation concepts and in America the Mobilization of Youth Programmes turned to personality maladjustment theories. Social problems tend to get individualized and sorted out for casework treatment.[25]

The political arm of the status quo theory of positivism is predicated on the belief that it is possible to create a well regulated humanitarian system of criminal justice under present economic and political arrangements. Whilst rejecting radical social change, it supports gradualist programmes of social amelioration. Reform agencies such as probation and parole, half way houses, indeterminate sentences, youth service bureaus become the signal posts in a cybernetic matrix to harmonize the atomized deviant.

Labour politics cannot conceive of the possibility of meaningful dissent. Unfortunately deviants are a de classe category, either undersocialized or corrupted by alien ideologies. Punishment for repentance is the appropriate mode for social defence against individual recalcitrance. Thieves and hooligans threaten the meaningfulness of social welfare programmes. Working class preponderance in criminal statistics has been explained away by focussing attention on the individual violator rather than on the legal system itself. Solutions have been in terms of changing the law breaker and not altering the social structure.[26]

We can understand the penal policy that grew as a response to positivist scientific thought clearly in the concept of rehabilitation. By about the 1960s there was a strong consensus of penal thought which believed that rapid strides would be made scientifically to ward the identification of specific types of treatment for specific offenders. Courts needed better information; prisons began practicing group counselling, probation services had gone into psychoanalysis in diagnosis and treatment. There was pressure for an increase in indeterminate custodial sentences so that offender could be let out only when 'treated'. The offender was to receive the correctional treatment best suited to inculcate the law abiding habits in him. In this modal treatment there were other aspects-predictive restraint and individualized decision making.

As long as crime is perceived as a disease in the working classes, social welfare policy will aim at the amelioration of the environment and social stresses that produce deviance. Social disorganization and deviance interact and that is recognized. Galbraith's distinction between insular and case

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25. One could understand the growth of social work professions and also their catchcry mediation and adjustment. Also in this context one should note Wright Mills public issues and private troubles dichotomy.

26. It was only recently that some criminolygists have realised that law is problematic but again these studies have been based on the positivist mode of thought. See Quinney(ed) Criminal Justice in American Society, Boston, Little Brown, 1969.

poverty illustrate the point well. However, working class criminality is seen as having little relationship to social and economic inequality. Emphasis is placed on the social, recognizing conditions as problematic and hence acting through government, in a collective, gradual piecemeal way without disturbing the existing structure of society. The working class criminal is a termporary aberration. The deviants therefore are to be treated humanely. Ryan calls this the 'blaming the victim' thesis.[27]

INTERACTIONISM AND WORKING CLASS CRIMINALITY

The new deviance theorists reacted to the positivist notions of a consensual social order, pathology of the criminal, its determinism, reductionism, and scientism. They noted that such a conception leads to a severance of the criminal from his present predicament and consciousness. In the new deviancy theory deviancy is seen as a problematic product of a series of transactions between the definer and defined, each operating in his own social world. The pathological conception of deviancy; all people are potentially deviant but is the intolerance of power which translates normal action into stigmatized action. Deviance is not inherent in the action; it is a quality bestowed upon the act. Social reaction exacerbates it and leads to amplification or the ossification of the actor in his deviant capacity and moreover the state's selection of criminals is arbitrary and is based by and large on the false conceptions held by the control agents. Working class criminality to them is a phenomenon which occurs because of their relative powerlessness as a class, rather than the fact of greater involvement in criminality.[28] The social processes discredit the positivist hypotheses such as broken home, poverty or even the genetic notions of extroversion and mesomorphism and in the sense that control agents selectively apprehend these types for processing. In this theory, as Young points out, "the deviant is above all, a rational conscious actor, free of the determinants of past events and physical or psychic disturbance, and existing in a homogenous and normatively consistent subculture."[29] Undersocialization and social disorganization (and anomie) are replaced by differential socialization depending on one's proximity to one particular normative nucleus in a total array of such nuclei.

The interest in the working class as such is limited for its concern is with a development of a non utilitarian criminology "whose subjects live in a world not of work, but of leisure".[30] The world of work is generally neglected and attention is focussed on crimes without victims of an expressive nature; illicit drug use, sexual deviance, homosexuality and bohemian crime in general.

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27. W. Ryan, Blaming the Victim, Orbach and Chambers, 1971.
28. D. Chapman, Sociology and the Stereotype of the Criminal, London: Tavi tock, 1968
29. Jock Young Critical Criminology, op. cit., p 67.
30. Ibid, p. 68

The ontology is that there is no objectively possibly reality independent of our minds. The constructs of the social sciences are second order constructs which are in the first place created by the subjects in their social interaction and intercommunication with others. This mode of thought is an advance over the positivist epistemology because of its reflexivity. The scientist reflects on his activity as observer, using to advantage the social and personal nature of his observation. The conservative side of this line of thought is its limitation to the meanings created by social actors. In doing so it ignores a world of events and structures that exist independent of the consciousness of actors.

To accept the world of actors is often to accept the reality that is portrayed by the dominant social order. The social constructionist's thought therefore cannot transcend the existing order. What it does offer is the multiplicity of realities but not a yardstick to determine which is less oppressive than the other. Social relativism becomes the order of the day.

In its opposition to utilitarianism the new deviancy-theory embraces a romantic appreciation of the social reality. The essential man is brutalized by civilized society. This romantic image of man leads the deviancy theorist to attack interventionist stances of correctionalist criminology. The motto of its praxis according to Gouldner is labelled "Theory and Parctice of cool,"[31] and an implicit celebration of the deviant as anti-state.

The new deviancy does not transform itself immediately to any form of political praxis. Its significance lies in its lack of concern with the class basis of crime. The lack of a historical and dialectical perspective sets the stage for nihilism and wishy-washy relativism which fails to capture public enthusiasm. Its achievement was the identification of powerless intellectuals with the deviants who were seen as more successful in controlling the events. In spite of its preoccupation with the trivia and politically irresponsible hipsterism,[32] the sceptical deviancy theorists helped to rid working class criminal behaviour of its pathology and invest it with some sort of respectability. Yet it was on the whole a fatalistic idealism, self defeating in underestimating the possibility of a radically different society where human values take precedence over property values.

The criticisms of the rehabilitative ideal by this philosophy would weigh heavily on the mystification and disguise of social injustice and the perpetration of the social control element. Because the values of individual privacy, autonomy, equality of treatment, individual dissent and cultural diversity cannot be contained in the present rehabilitative practices this school of criminology cannot support it. Added to this, the control agents are a necessary part of the rehabilitative process who contribute to the

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31. Alvin Gouldner, The Coming Crisis, op. cit., p. 121–122.

32. Anthony Platt, "Prospects for Radical Criminology in the USA" in Taylor, Walton and Young, Critical Criminology, op. cit., p. 98.

stigmatization and labelling and are therefore best left out. What is recommended is a minimalist criminal justice system which is noncoercive. I would place the romantic visions of Scandinavian criminologists such as Nils Christie and others such as Illich and Schaumacher who argue for the recreation of personal encounters and community responsiveness in the reperation of interpersonel conflicts as containing some elements of this philosophy.

Alongside this idealistic practice there should be lot less laws and especially those that discriminate against the working classes. Decriminalization is not of persons as in the rehabilitatlve ideal but of acts. The acts in question should not be blameworthy because the use of criminal law leads to greater blameworthiness. It campaigns to decriminalize drugs, homosexuality, suicide, abortion and many such actions of the less respectable, such as spuatters, football hooligans, pop festival fans, and others. The penal option is the last when other remedies are inadequate, If a givan pattern of behaviour can be conceptually normalized, there is a greater change of preventing blame allocation. Much of criminal activity can be transferred to civil courts with legal aid to enable victims to become plaintiffs etc. Victim support schemes, Criminal Injuries Compensation Boards and extension of the powers of courts for compensation and restibution gain momentum. Victim support schemes express solidarity with the victim recognizing his needs as legitimate and unmet.

RADICAL THEORY AND WORKING CLASS CRIMINALITY

Radical theory bigins with a proper examination of criminal statistics It reveals the class organized nature of crime and legal systems. In puttiing criminal statistics into analytic use one sees the emergence of the phenomenon of working class crime. In an inequitable society crime is generally about property and even those offences against the person are committed in the pursuit of property. Property crime therefore should be understood as a rational attempt to amass property than it is understood as innate wickedness or faulty socialization or inaccurate and spurious labelling. Both working class and upper class crimes ensue in this competitive struggle but for obvious reasons only workiug class crlmes are figured in statistics, For, Taylor, Walton and Young put it, a society which is predicated on an unequal right to the accumulation of property gives rise to legal and illegal desire to accumulate property as rapidly as possible.[33]

A radical approach to the examination of statistics is underpinned by a particular ontological concern about man and society which is a precursor to a proper analysis of working class crime in that perspective. A radical philosophy is one that goes into the fundamentals of our existence In doing so it assesses every actual and possible experience. It is a process of

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33. Critical Criminology, op. cit., p. 89.

demystification by which reality as given is exposed revealing its essential nature. In a critical philosophy truth is linked to the intention of the true and good life liberated from its oppressing forces. The liberating force of radical criticism aims to move out of mere revelation as in phenomenology to the developmcnt of a new consciousness and an active life in which we transcend the established forms of existence. Quinney says that a critical philosophy is in itself a form of life.

In demystifying our lives we are extricatlng ourselves from the current social and cultural life. It is to free one's existence from the present day arrangements of a bureaucratically organized system of production and distribution in which human freedom is sacrificed for an ideological social order which is not real. The repressive ideology hides even the freedom to know that the system is oppressive - a result of one dimensional thinking.[34] The negation of the present involves the questioning of its attendant paraphanelia of science and technology which legitimize the dominant order and the ruling class. Breaking the present order means a break with the ideology that justifies it. In radical thinking we can entertain the notion of an alternative reality - the image of the possible.

The concrete image of the possible is developed in the Marxist perspective- Current reality is judged in terms of the alternating effects. Process of realizing the new world is a collective activity consequent to a collective consciousness. The imagery is transcendental; to achieve it one has to rid one's present reality of its ideologies and structures. As Quinny remarks, "Marxism is the one philosophy of our time that takes as its focus the oppression produced by a capitalist society . . . A Marxist critique provides . . . a form of thought that allows us to transcend in thought and action that kind of existence".[35]

MARXIST INTERPRETATIONS

Marx was no different in explaining the criminality of the dangerous classes, but for entirely different reasons. The criminal classes were criminal because they were unproductive and parasitical because they did not contribute to the production of goods and commodities but lived on those produced by the labouring class. Marx's disdain for criminal activity is therefore bound up with his theoretical concern with the proletariat as the vanguard of the revolution. The comments made by Marx and Engels on the lumpenproletariat cannot be brushed off as mere "bourgeois morality" for they were conscious of the fact that the proletariat could fall victim to the ideological illusions of the parasitic element. As a parasitic class living off productive labour by theft and other vices, their class interests are diametrically opposed to those of the workers. They are open to the

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34. Herbert Marcuse, One Dimensional Man, London: Routledge and Kegel Paul, 1964.
35. Quinney op.cit., p. 191.

bribes and blandishments of the reactionary elements of the ruling classes and the state.[36] Furthermore, they are incapable of a militant socialist struggle and fall a prey to the worse deviations. Thus this harsh language of Marx and Engels with regard to the criminality of dangerous classes should be properly seen as stemming from a theoretical - political point of view. Nor should one be misconceived by the ironic comments made on the functionality of crime and criminal classes in maintaining the system of capitalist production.

About the individual who is driven to crime, we see him as a victim of the capitalist system. Engels says, "Under the brutal and brutalizing treatment of the bourgeoisie, the working man becomes precisely as much a thing without volition as water, and is subject to the laws of nature with precisely the same necessity; at a certain point freedom ceases".[37] Marx and Engels demonstrated that it was the capitalist system, the so called just and virtuous system that produced the criminal. However, this option of crime was not a political rebellion but a reactionary accommodation to it.

The proper explanation of working class criminality in Marxism would be concerned with the ways in which particular historical periods are characterized by particular sets of social relationships and means of production. These relations give rise to certain legal orders which are the creations of those who are in power. The defining agencies will have to be located not only in relation to the market structure but quite specifically in relation to the overweening structure of material production and division of labour. Man's location in a social structure of production and domination will be combined with the ontological assumptions about man (free from the one dimensional economic determinism of some commentators) and will lead to an understanding of criminality of some men as a combination of both an active and passive process. It might enable us to see the interpretation of working class crime as a political act rather than merely a result of a process of spurious labelling.

Viewed in this light it is easy to understand and provide an explanation to the new breed of criminals who are the victims of new laws against industrial dissent, political dissent, squatting control, tenant regulations and so on. It is clear from these that the vast bulk of new criminals in western countries are a sequel to a lack of property or working class or black. Yet they are of only incidental interest to orthodox Marxists as they are inadequate in themselves to transform conditions of production.

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36. Paul Q. Hirst in Critical Criminology, p. 216. J. Clarke and T. Jefferson, in Mungham and Pearson (eds) Working Class Youth Culture London. RKP, 1977 demonstrate the contemporary modes of winning over dangerous elements as part of the process of rule by consent of hegemony, as Gramsci calls it.

37. Engels, The Condition of the Working Class in England in 1844, reprinted in Carson & Wiles (eds), Crime and Delinquency in Britain.

The nature and content of crime cannot be grasped without a thorough-going analysis of its evolution historically and such an analysis will invariably reveal the primacy of material conditions as the determinants of crime and legal norms of any historical epoch. Legal relations are important precisely because they perpetuate a particular mode of production and thereby the whole life style and culture of society. The notions of property rights become intelligible only if viewed in terms of a particular mode of production. Changes in the nature of property lead to a development of a kind of private law favouring the non-workers. Property becomes not merely a title to dispose of material objects but also a title to power, a title to exploitation and domination. It is the function of a truly materialist criminology to demonstrate how the legal norms in question are productive of contradictions and to demystify the legal expression of true social conflict between contending classes.

As to the political activity of a radical philosophy such as Marxism, "the most important problem does not lie in understanding the laws of the objective world... but in applying the knowledge of the laws actively to change the world" (Mao Tse-Tung)[38]. The researcher will need to declare his partisan interest and take sides against the facts of a propertied society and against the correction or labelling of those criminals in a propertied society. The radical theorist needs to address his work to the constituencies that are appropriate and also at the proper time. The proper constituency may not necessarily be the proletariat as in orthodox Marxism but the oppressed classes seeking liberation.

The break with individual explanations has ended with the political economy as the primary determinant in the socialist interpretation of crime and law. In so far as crime in general and working class in particular are concerned, it is by altering the social formations that one could combat crime. This is not to discount the need for other controls on anti-social behaviour necessary in a socialist state. But in so far as crime is related to individious distinctions in property wealth and power, these forms of diversity will be free from the need to be criminalized and processed.

This is an area in which the theoretical debate is going on as passionately as ever. Any penal policy before the eventual coming of the good society will not be "the outcome of a rational and objective willing of the common good by all members of the communtiy alike; it is the price paid for those legal principles which secure the predominance of the owners of property".[39] It is difficult to contemplate the penal policy of Marxian thinkers except to repeat the arguments against the present criminal justice system as referred to by the American Friends Service Committee. They see the "impossibility of achiveing more than a superficial reformation of our criminal justice system

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38. Mao Tse-Tung, On Practice, cited in Anthony Platt, op. cit., p 105.
39. H. J. Lacki, The State in Theory and Practice, London: Allen and Unwin, 1934 p. 270

without a radical change in our values and a drastic restructuring of our social and economic institutions."[40] Since criminal justice is a derivative of social justice they add that "the quest for justice will necessarily be frustrated so long as we fail to recognize that criminal justice is dependant upon and largely derives from social justice".[41] They conclude "To the extent that equal justice is correlated with equality of status, influence and economic power, the construction of a just system of criminal justice in an unjust society is a contradiction in terms".[42]

CONCLUSIONS

The aim of the essay was to demonstrate the varying sociological interpretations of the phenomenon of criminality in the working class. More importantly it also demonstrated how our interpretations of the social behaviours affect, or ought to affect our living of it. It should become obvious therefore that contrary to the protestations of the so called value free theorist-no social theory is adequate unless it takes into account the political ramifications that go with the analysis.

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40. American Friends Service Committee, Struggle for Justice, New York:, Hill and Wang, 1971 p. 12.
41. Ibid, p. 13
42. Ibid, p. 16

Constituency Casework and Sri Lankan Legislators

ROBERT OBERST

A major justification for the adoption of proportional representation in Sri Lanka has been the impact it will have on the workload of the Members of Parliament. It has been argued that the change from single-member electoral constituencies to proportional representation will remove the heavy constituency case load that the MPs presently endure.[1] It is believed that with several MPs representing a district rather than one and the voters going to an ombudsman or other sources for help rather than inundating the MP, the MPs will have more time for other work. As things currently stand, most Members spend a great deal of time dealing with the personal problems of their constituents rather than with law-making and national issues. This paper will examine this justification by exploring the extent to which the Members of Parliament were burdened by constituency casework before the changes in the new Constitution.

The data for this study come from an open ended series of 102 interviews with current and former MPs taken in 1978, 1979 and 1980. The interviews averaged about one hour and asked the MPs about the number of constituents coming to see them, the reasons they came and the MPs' attitudes about their constituency casework.

The types of demands that constituents make on their legislators may be divided into two categories—generalized and particularized. Particularized demands are those whose primary consequences will affect an individual, small group of people or a single organization. Generalized demands are those which may affect the country's population in general. Generalized demands may be divided into sub-categories: (1) national demands which affect the nation as a whole or a significant region of it: and (2) local demands which are confined to the petitioner's district, municipality or electorate.

Demands may be made by individuals or groups. Groups may be local, based in a legislator's constituency, or they may be national with interests which are not limited to one constituency. The demand makers are capable of making any of the three types of demands. In addition, as Michael Mazey has pointed out, these demands may be directed at many structures in the political system, "such as the bureaucracy, interest groups, political parties, local govermental institutions and local elites."[2] The ability of other institutions to act on demands will affect the volume of demands that are directed toward the legislators.

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1. Personal interview with President J. R. Jayewardene on February 23, 1979.
2. Michael Mezey (1979) "Constituency Demands and Legislative Support: An Experiment" **Legislative Studies Quarterly** 1 (February): 104.

As can be seen in Table I, individuals coming to their legilsators in Sri Lanka come overwhelmingly with particularized demands. Only two Members who met with their constituents did not cite particularized demands as the main reason people came to them. The interesting point is that an overwhelming majority of the Members cited jobs or job related demands[3] as the main reason their constituents came to them. When the secondary reasons cited by the MPs are examined, the dominating influence of particularized benefits becomes even clearer. (see Table II)

TABLE I

MAIN REASONS WHY CONSTITUENTS COME TO MPS, AS CITED BY MPS

	Number	Percent
Particularized benefits	97	95.1
To Talk Politics or National Generalized Demands	2	2.0
Did Not Meet With Constituents	2	2.0
No Response	1	1.0
	102	100.1

Note: Totals in the percent column do not add up to one hundred percent due to rounding.

TABLE II

SECONDARY REASONS CITED BY MPS FOR CONSTITUENTS COMING TO THEM

	Number	Percent
Particularized	67	67.6
Generalized Local	19	19.2
National	1	1.0
No Second Reason Cited	35	35.4

Note: Totals exceed number in sample due to several Members providing more than one response.

3 Job related requests include requests for transfers and promotions Unless otherwise noted, reference to Job seekers includes those seeking transfers and promotions.

Most of the secondary reasons cited by the MPs dealt with such requests as land needs, disputes over boundaries, water or other problems connected with cultivation. The local generalized demands included requests for roads, electricity and transportation facilities. Surprisingly only one Member cited national problems. However, many of the local generalized demands involved requests that would result in community improvement but were primarily intended to benefit the petitioner such as a road to one's house or electrification of an area surrounding one's house.

The Members interviewed clearly believed that their constituents came to them for personal reasons. National and community oriented demands were not felt to be a serious part of the individual demands made on them. To further examine the types of individual demands that were made on the Members, meetings with two Ministers and two backbenchers were observed and the reasons that constituents came were noted. Of the petitioners whose reasons for coming could be ascertained,[4] over 79 percent came looking for help to find a job, transfer, or promotion. (see Table III) Only 2.8 percent came looking for something that could be described as community oriented and in each of these cases it involved a "community" development project that would directly benefit them. None came over national issues or legislation. Individual demands on the Members were overwhelmingly personal in nature.

TABLE III

CONSTITUENT REASONS FOR COMING TO MEET WITH MEMBERS IN OBSERVED MEETINGS

	Number	Percen
Jobs, Promotions, and Transfers	141	79.2
Government Benefits	8	4.5
Local Development	5	2.8
Other Reasons	24	13.5
Total	178	100.0

The number of constituents coming to meet with their MPs in Sri Lanka or particularized benefits is extremely high. The average number of constituents seen per week for those Members interviewed from the Eighth Parliament was just under 561 while in the Seventh Parliament it was over 448. Both of these figures are extremely high. In the Eighth Parliament this

4. The meeiings tend to be unruly with the petitioners crowding around the "member's table with several making their requests at the same time, while the MP or his staff are trying to process an earlier petitioner's request. As a result, It was not possible to ascertain the demands made by some petitioners.

represents an average of about 29, 214 constituents coming each year to meet with their Members of Parliament. At the time of the 1977 general elections, the average constituency had 37, 164 voters. Thus, the average Member of Parliament meets with close to the total number of voters in his or her electorate in one year. Several MPs from the Seventh Parliament estimated that they had met personally with over 99 percent of their constituents at some time during their term of office.

The general impression of the MPs who had served in earlier Parliaments was that the number of people coming to meet with them had increased sharply since they first entered Parliament. Evidence of this is found in the responses by the MPs to the question asking them how many people came in an average week. The number of MPs giving responses for Parliaments before the Seventh and Eighth Parliaments is somewhat limited, but even the scanty figures available give some impression of the increase. Table IV reports the average number of constiuents seen by each MP for several time periods. It indicates a very sharp increase in the numbsr of people coming to meet with the Members.

TABLE IV

AVERAGE NUMBER OF CONSTITUENTS MEETING WITH MPs PER WEEK

	PARLIAMENTS			
	Second & Third	Fifth & Sixth	Seventh	Eighth
Average	186.2	274.7	448.4	561.8
Number of Respondents	4	10	52	44

This increase in the number of constituents coming to meet with their Members is the result of three trends converging in the 1960s and acting to increase the number of damands made on the Members. The first of these trends has been the growth of government. As the size and scope of government grew, so did the number of benefits that it had at its disposal. The election of 1956 led to a more active role by the government in the economy of the country.

From 1958 to 1975 the number of state business enterprises nearly quadrupled in number, rising form twenty eight to 107.[5] The value of capital invested in the enterprises increased from 72 million rupees to over 1,300 millon rupees between 1956 and 1975. This increase in government

5, D. W. Subasinghe (1979) "The State Scctor in the Economy of Sri Lanka," In No Author. The Role of State Sector in Developing Countries (New Delhi: Pepcle's Publishing House) p. 52.

corporations and expanded role of the government led to an increased number of government jobs. At the same time, government welfare schemes were expanding. Expenditures on transfer payments increased from 621 million rupees in 1960 to almost 2,800 million rupees in 1975. As a percentage of total government expenditure, this was an increase from about 38 percent in 1960 to 51 percent in 1975.[6] Most of these increases have been in the area of education, health and food subsidies. In the area of education alone, the number of school teachers increased from just over thirty five thousand in 1949 [7] to more than one hundred and ten thousand in 1976 [8]. This growth in government not only increased the number of government jobs, but in addition, government intervention in the society increased the number of difficulties with bureaucratic red tape, and thus the populace had a greater need for help dealing with these problems.

The second factor was the growth of a competitive party system. The MPs felt that they must cater to the needs of the people in order to remain in office. Thus, after 1956 and the emergence of the SLFP as a competitive force in Sri Lanka politics, both parties felt an electoral need to cater to the demands of the people. Patronage became an important part of Sri Lankan politics.

The third factor was a general increase in the needs of the people. This was especially the case regarding employment. The educational system had grown and had been quite successful educating large numbers of young people while at the same time lifting their aspirations for white collar jobs. School enrollment rose from under one million in 1946 [9] to over two and one-half million in 1976 [10]. After 1946, the introduction of DDT in the fight against Malaria resulted in a very sudden and sharp decrease in the death rate on the

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6. Gratien Jayamaha (1976) "The Growth of Public Expenditures in Sri Lanka. 1960-1975" Staff Studies (Central Bank of Sri Lanka) 6 (Stember) '79, Another source, H. N. S. Karunatileke (1975) "The Impact of Welfare Services in Sri Lanka on the Economy, "Staff Studies (Central Bank of Sri Lanka) 5 April 201 - 232 lists total welfare expenditure in 1960/61 as 651 million rupees and the 1974, expenditures as 1, 644 million rupees In 1949/50 he lists the total expenditures as 174 million, In either case the increase has been quite large,

7. Government of Ceylon, Ministry of Finance (1951) Economic and Social Development of Ceylon 1926-50 (Colombo: Ministry of Finance) p. xxxi,

8, Government of Sri Lanka, Department of Census and Statistics (1979) Statistical Abstract of the Democratic Socialist Republic of Sri Lanka -1977 (Colombo : Government Publication Bureau) p. 423,

9. International Labour Office (1979) "Matching Employment Opportunities and Expectations : a Programme of Action for Ceylon (Geneva: International Labour Office) p. 9.

10. Government of Sri Lanka, Statistical Abstract p. 2 6.

island[11]. This drop in the death rate resulted in a rapid surge in population growth as the infant death rate declined and life expectancy increased. The drop in the infant death rate resulted in a baby boom which, coupled with the growth of the educational system, resulted in a sudden increase of educated young people entering the labour market beginning in the late 1960s. Between 1946 and 1971 the labour force increased by over 72 percent.[12]. Forty (40) percent of this increase occurred between 1963 and 1971 when the labour force grew by just over one million workers.

The economy was unable to increase the number of new jobs to match the number of youths joining the job market and very strong competition developed for the few jobs available. The consequences of this were soon felt by the MPs who were inundated by the seekers of particularized benefits. This increase in constituent demands has been, in large part, the result of this convergence of the shift of power from the colonial centers of authority in the society to the MPs and the growth of government coupled with a large surge in the number of youths entering the job market.

It was expected that the ability of a Member of Parliament to respond to particularized demands would affect the number of demands that are made on him[13]. Thus, the more able the Member is to satisfy demands the more likely people will come to him. In Sri Lanka, law making power resides in the hands of the Ministers. In addition, all government jobs originate in some ministry. The Minister in charge of that ministry is more likely to have jobs at his disposal than would a backbencher or opposition Member. Table V reports that Ministers averaged considerably more people coming to them than did other Members of Parliament. In the Eighth Parliament, the Ministers averaged almost 1,200 constituents a week coming to them or over twice as many as the backbenchers averaged. In the Seventh Parliament the differential between Ministers and backbenchers was less, but was still substantial. The difference between backbenchers and Deputy Ministers was small in the Eighth Parliament, however in the Seventh Parliament, the backbenchers averaged a few more people coming to see them each week. This may be a reflection of the equality of power between the Deputy Ministers and backbenchers. The Deputy Ministers may have status but they have few patronage jobs. Opposition Members saw considerably fewer people than did any of the government Members. Once again this may reflect the inability of the opposition Members to provide their constituents with patronage.

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11. A. N. A. Abesundere(1976) "Recent Trends in" malaria "morbidity and "mortality in Sri Lanka "In. Demographic Training and Researeh Unit of the University of Sri Lanka; **Population Problems of Sri Lanka** (Colombo: University of Sri Lanka) p. 51 – 52.

12. Government of Ceylon **Economic and Social Development of Ceylon**, p xlii and Government of Sri Lanka, Department of Statistics 1974) **The Population of Sri Lanka** (Colombo: Department of Census and Statistics) p 128.

13, Michail Mezey (1979) **Comparative Legislature** (Durham, North Caroline: Duke Univercity Press) pp, 150–151,

TABLE V

AVERAGE NUMBER OF CONSTITUENTS SEEN PER WEEK BY MPS

	PARLIAMENTS					
	Prior to Seventh		Seventh		Eighth	
	Average	no	Average	no	Average	no
Ministers	500.0	1	586.7	9	1192.9	7
Deputy Ministers	105.0	1	442·7	9	655.0	10
Backbenchers	233.0	5	463.8	26	539.6	13
Opposition	253.1	7	270.0	8	216.5	13
Average	253.0	14	448.4	52	561.8	43

Those Ministers who presented a large number of bills to Parliament or presided over ministries which had large numbers of patronage jobs at their disposal tended to have more people coming to them.[14] (see Tables VI and VII) In the Seventh Parliament, those Ministers who presided over ministries with few patronage jobs averaged about the same number of people coming to them as did the Deputy Ministers or backbenchers. In the Eighth Parliament, both categories of Ministers averaged considerable more meetings with constituents than did the backbenchers and Deputy Ministers.

TABLE VI

POLICY INFLUENCE OF MINISTRIES AND NUMBER OF CONSTITUENTS COMING

	Seventh Parliament		Eighth Parliament	
	Number	Average	Number	Average
High	5	652.0	2	1600
Low	4	512.5	5	1030

14. The ministers which presented the most bills to Parliament, and thus are the, most influential in policy taking are Finance, Public Administration, Defence, Planning, Employment and External Affairs.

TABLE VII

PATRONAGE POWER OF MINISTRY AND NUMBER OF CONSTITUENTS COMING

	Seventh Parliament		Eighth Parliament	
	Number	Average	Number	Average
Large Number of Patronage Jobs	4	767.5	2	1600
Few Jobs	5	442.0	5	1030

NOTE: The high patronage ministries are Food and Co-operatives, Power, Highways, Local Government, Industries and Buildings,

Those Members with the greatest amount of power in the government claimed the highest number of constituents coming to them with requests. Even among the Ministers there appeared to be a hierarchy of more and less powerful Members with the Ministers of the more important Ministries, both in policy making and in the number of patronage jobs available to them, receiving more constituents.

Although the evidence is based on limited data, the growth of the number of people coming to see the MPs can be seen in each of the three government Member categories. What is significant is the failure of the number of people coming to the opposition Members to increase. This again is a reflection of the linkage between power and demands. The ability of the opposition Members to assist their constituents is determined by the help they get from the government party, and thus they are not able to respond to an increased number of demands. The populace realizes this and does not come to them. Many Members who had left their parties for another party stated that as soon as they left the government party, the number of people coming to see them had declined while those who joined the government party stated that the number increased. One stated that "the people think that we can't help them and so they do not come to us"

Thus the number of constituents coming to see the MP's is related to their patronage power. In any case most members met with large numbers of constituents. The next section of this paper will examine the attitudes of the legislators toward this part of their job. Each member was asked whether they felt that meeting with their constituents was a burden. Almost one-half expressed varying degrees of dislike of the job. Only five members stated that they enjoyed or liked meeting with their constituents. (see Table VIII) Forty stated that they disliked it or expressed their negative feelings in more colourful terms such as "disgusting" "useless" or "you decome a glorified peon" In between these two extremes were a large number of MP's who either expressed neutral opinions or mixed emotions about the state of affairs. This latter group of sixteen members stated that it was a burden, hard and wasteful but that "it is the duty of the job. We must help."

TABLE VIII

LEGISLATORS ATTITUDES ABOUT MEETINGS WITH CONSTITUENTS

Responses	Seventh		Eighth		Total	
	no	percent	no	percent	no	percent
Positive	1	2.2	4	10.0	5	5.8
Neutral or Mixed	13	28.3	27	67.5	40	46.5
Negative	32	69.6	9	13.5	41	47.7

TABLE IX

LEGISLATORS ATTITUDES ABOUT MEETINGS WITH CONSTITUENTS AND FORMAL AUTHORITY

	SEVENTH PARLIAMENT			EIGHTH PARLIAMENT		
	Positive	Neutral or Mixed	Negative	Positive	Neutral or Mixed	Negative
Backbenchers	0	4	22	2	7	2
Deputy Ministers	1	2	5	2	3	3
Ministers	0	3	4	0	7	2
Opposition	0	4	1	0	10	1
Total	1	13	32	4	27	9

Note; The Chi square value for the Seventh Parliament is equal to 13.8 with 4 degrees of freedom, significant at the .01 level while for the Eighth Parliament it is equal to 8.7, significant at the .10 level.

Further analysis indicates that there are distinct differences between the levels of authority and legislator attitudes toward the job. (see Table IX) The opposition Members expressed very few negative feelings about their role in dispensing particularized benefits. What is surprising is that when the results for the two Parliaments are combined, the Ministers expressed the most positive and the backbenchers the most negative attitudes among the government party members. It had been expected that the Ministers would be the most negative bacause they have the most people coming to them. However when the number of constituents coming to the Members is examined, there appears to be no relationship between the number of constituents coming to the members and their attitudes about their role in answering their demands (see Table X) Even when the formal authority of the members was held constant, no relationship was found.

TABLE X

AVERAGE NUMBER OF CONSTITUENTS COMING TO MEET WITH MPs PER WEEK AND ATTITUDES ABOUT THEIR ROLE IN MEETING WITH THEM

	Numbers of MPs	Average
Positive	5	638.0
Neutral or Mixed	40	421.5
Negative	40	522.9

It does not appear that the number of constituents coming to meet with an MP affects his or her attitudes about the job. The Ministers meet with the most people and yet have the most positive attitudes of the government Members. The small percentage of negative attitudes expressed by the opposition Members, however, appears to be the result of the number of people coming to meet with them. They receive so few demands that they do not feel burdened by them. The government Members are so inundated by demands and the pressure that accompanies them, that the actual numbers coming does not necessarily affect their attitudes. Whether they are Ministers or backbencher, they receive too many demands for particularized benefits

The Ministers may find dealing with their constituents easier than the backbenchers do, because of the power and status attached to most of the Ministers. All Ministers have extensive staff help so that much of the paper work involved in particularized benefits is taken care of by staff members. Most of the backbenchers have to do part of the paper work themselves. In addition, most of the Ministers live outside of their electorates and only travel to their electorates on the weekends. Since most of the Ministers refuse to meet with constituents while in Colombo, it means that they only have to deal with particularized benefits two days a week. The backbenchers, on the other hand, find their constituents gathering at their house as soon as the sun begins to rise. Thus, the numbers of constituents coming s not e crucial fact but perhaps the environment that one has to work in and the conditions that one finds in that work, shapes the attitudes of the legislators. In the case of the Ministers, the conditions and environment are much more conducive to doing the job.

Another factor affecting the attitudes of the legislators toward their role in the granting of particularized benefits may have been the timing of the interviews. Most of the Members of the Seventh Parliament had suffered defeat in the general elections of 1977. This defeat, coming after seven years of trying to help their constituents in their personal needs, may have embittered them, Table IX reports a distinct difference between the two Parliaments in the attitudes of the members toward their role in granting particularized

benefits. The Seventh Parliament members are much more negative about their role. They had spent seven years finding jobs for the long lines of constituents coming to them and then had been rejected by the same constituents at the next general elections. A general attitude of bitterness pervaded their interviews. Most said that giving jobs was useless and damaging. " If you give one member of a family and fail to give the rest a job, they all vote against you " Another stated:

> " A man from a poor fishing family came to me looking for a job. I got him one as a cooperative rural bank clerk. Then he came to me and wanted to join the government clerical service. I fouud him a job. Later he came and wanted a transfer to Colombo. Then he wants a job for his wife. Then he hears there are six bank jobs. He wants one because it has higher pay. In the end he supported my opponent. "

The members of the Eighth Parliament had more positive or neutral feelings about their constituents. "They are so grateful for what we do" "There is no greater satisfaction than making them happy."

Some of this difference may be explained by the relative newness of the Eighth Parliament Members. At the time they were interviewed, most of the Eighth Parliament Members had been in power for less then two years and did not have the memories of seven years of drudgery endured by the Members of the Seventh Parliament· Most appeared to believe that their government would take care of the job problem and thus the numbers of youths coming to them for jobs would soon be declining.

The evidence presented in this study indicates that Sri Lankan MPs endure large numbers of constituents coming to them and that they tend to look at the constituency casework aspect of their job in very negative terms When one considers the numbers of constituents coming to see their MPs, proportional representation may alleviate the burden. However, the question of where these people will go for help still remains unanswered. It is unlikely that an ombudsman will be able to respond to such large numbers nor will an ombudsman have the patronage power necessary to satisfy the citizens coming to them.

Another consideration is the fewer negative feelings about case work expressed by the Ministers. It was argued that this is the result of their access to staff to assist them in their meetings with constituents. If this is the case, it may indicate a need for greater staff help for Sri Lankan Members of Parliament rather than a change in the structure of government.

National Perspectives on the Development of Demography

INDRA GAJANAYAKE

Introduction:

Demography or the study of population is aptly defined as "the study of the size, territorial distribution, and composition of population, changes therein, and the components of such changes, which may be identified as natality, mortality, territorial movement (migration) and social mobility (change of status)"(1). "Population" here refers explicitly to an aggregate of human beings.

The study of population may be conceived in a narrow sense as "demographic analysis", the study of population variations, change and their components. Demography may also be regarded in a broad sense as "Population Studies", which apart from demographic analysis also includes the study of relationships between population variations and change and other variables for example, social, economic and biological. Demographic analysis forms the core of the study of population which in the course of evolution takes on the interdisciplinary character of population studies.

This paper traces the past development of demography in Sri Lanka, sketches the impact of demography in relation to the present, and briefly outlines the perspectives on the development of demography as a science in the country.

Historical Development of Demography in Sri Lanka

In Sri Lanka. Demography made its beginnings as an area of empirical research in the nineteenth century when emphasis was laid on the collection, organization and publication of population statistics. Until then several population estimates had been made by the Dutch and the British rulers, with uncertain degrees of reliability (2).

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(1) P. M. Hauser and O. D. Duncan (eds.): (1959) **The study of Population** The University of Chicago Press,

(2) Population enumerations were carried out in 1789 by the Dutch rulers, and in 1814, 1821 and 1827 by the British.

The passing of the Census Ordinance (Ordinance number 5 of 1869) laid the foundation to the systematic and scientific study of population (3). The first census proper was taken in 1871, and since then, census taking became a regular operation at 10 year intervals until 1931. The last census of the colonial era was held in 1946.

The first census after independence was carried out in 1953. Subsequent censuses followed in 1963, 1971 and 1981. Information relating to basic demographic characteristics such as age, sex. principal occupation, religion and ethnicity was collected regularly in all these censuses(4). In order to obtain more reliable data a question on the date of birth was introduced in 1963. Information on marital status, literacy in any language and occupational status were collected in all the censuses after independence. While information on place of birth also figures in all the censuses, place of previous residence and duration of stay at usual residence were introduced only in 1971, from a sample of the households. Details collected on nuptiality and fertility have varied from census to census. Date of marriage in the census of 1953 was replaced by age at and duration of marriage in the censuses of 1971 and 1981. Questions on the number of children living and the date of the last live birth within the past five years were introduced in 1971. Questions on distance from usual residence to place of work or school, mode of travel, and physical disability replaced those on fertility in the 1981 census. Omission of questions on fertility may be justified on the grounds that detailed information on fertility levels and trends was collected in the fertility survey held in 1975.

Reliability of census data has improved considerably over the years. Digital preference has diminished and age accuracy has increased between 1953 and 1971. Coverage errors have also diminished during this period. For example, coverage in the enumeration of male children under five years has improved from 89% in 1953 to 94.5 in 1971(5). For the country as a whole, the extent of

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(3) A number of amendments have since been made to the Ordinance.

(4) The section on the development of census and vital registration system draws heavily from T. Nadarajah (1976): Sources of Demographic Data, **Population of Sri Lanka, Country Monograph Series No. 4,** ESCAP Bangkok, pp. 354-375.

(5) T. Nadarajah (1976). Evaluation of Quality of Demographic Data, **Population of Sri Lanka, Country Monograph Series No. 4,** ESCAP, Bangkok, pp. 376-389.

under-enumeration at the 1981 census is provisionally estimated as 0.9%(6). Census tabulations have grown in content and detail. For example in 1971 the population of ever-married females between ages 15 and 49 were tabulated for the first time by age and number of surviving children, and the population distribution by literacy, age and sex is now tabulated separately for urban, rural areas. Census reports are published regularly with increasing utility values for population analysts

Registration of vital events became a legal requirement when the Registrar General's Department was charged with the collection and compilation of vital statistics under the provisions of Ordinance No. 18 of 1867. The decision in 1887 to enforce legal compulsion on parents and guardians to register births followed by Ordinance No. 1 and Ordinance No. 2 of 1895 which came into force in 1897 resulted in a marked improvement in the extent of completeness and procedure of registration. Adoption of recommendations made at the seminar on Civil Registration and Vital Statistics for Asia and the Far East (1968) was a landmark in the development of the civil registration system.

All information recommended as basic by international standards is currently recorded on the original registration entry. However, not all this information appears in the statistical returns that are sent to the Registrar General for compilation and as a consequence tabulations are made on a subset of the recommended basic data. Births and deaths which were earlier tabulated by date of registration and not by date of occurence, and as such were of limited value to the population analyst, are currently being tabulated by the date of occurence. Coverage of civil registration has improved over the years in response to legislative compulsion and in 1967 the degree of completeness was estimated as 98.7% for births and 92.3% for deaths(7). The tabulated information was published in the **Annual Report of the Registrar-General on Vital Statistics** until 1967, after which its publication was suspended due to administrative difficulties. It is now proposed to resume yearly publication of the Report.

In order to supplement the information collected by civil registration and census taking several sample surveys have been carried out since independence. They fall into four categories:

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(6) Personal communication from the Department of Census and Statistics, Results of the latest post-enumeration survey are yet unpublished.

(7) Op. Cit. in footnote (5), pp. 378-379.

labour force surveys (1959/60, 1964, 1968-69, 1973) consumer finance surveys (1953, 1963, 1973), socio-economic surveys (1969/70, 1980) (8) and fertility, family planning surveys (1975, 1980, 1981). Though the first three categories of surveys were not intended primarily for the collection of demographic data they were instrumental in gathering valuable information on population characteristics.

In Sri Lanka, the contribution to demographic research during the first three decades of the twentieth century was largely confined to the description of population characteristics based on vital statistics and census data. In the years that followed until the middle of the century, there was a gradual shift of emphasis to mortality and immigration, prompted by the malaria epidemic and the large influx of Indian labour. In the 1950's, dynamics of population growth in the country became the focus of attention, and continues to attract the interest of many demographers. Principles of measurement and formal analysis of mortality and fertility began to be applied and demography, centered on vital statistics and census data, acquired greater breadth. During the last three decades family planning became increasingly important in the country's efforts to curtail population growth, and caused considerable research efforts to be diverted in this direction. Meanwhile, descriptive studies of the population based on data from censuses, civil registers and other sources became more comprehensive, specific and analytical.

Large variations in the population sizes and trends within and among other nations under different conditions has aroused recent interest in the relation of population trends to social and economic conditions in the country. Investigations are being carried out on the complex of interacting elements in population changes and their influences on other processes. The concept of "Population and Development" is now adding a new dimension to the scope of demography in the country.

Demography has begun to receive explicit recognition in the echelons of higher education. In 1973 the United Nations Fund for Population Activities, UNFPA, with the collaboration of the University of Colombo (formerly, University of Sri Lanka, Colombo Campus) set up a Demographic Training and Research Unit, within the University. This Unit conducts a training programme

(8) The survey held in 1980 was a combined labour and socio-economic survey.

in population studies leading to a postgraduate diploma, with the objective of producing a nucleus of competent personnel in and outside the University who would undertake demographic teaching and research. Courses on demography are incorporated also in the curricula of the Doctor of Medicine in Public Health, Master of Science in Town and Country Planning, and Diploma in Urban Development Programmes. At the undergraduate level demography is taught largely as a subsidiary topic in the universities of Colombo, Jaffna, Kelaniya, Peradeniya and Sri Jayawardenepura. In all these, one or more of the Departments of Sociology, Economics and Geography have introduced into their curricula aspects of demography that are relevant to the respective discipline.

Apart from the Demographic Training and Research Unit, the principal institutions currently engaged in population research are the Department of Census and Statistics the Economic Research Department, Central Bank and the Marga Institute. Together, the research institutions have made major contributions to the development of demography in the country(9).

Impact of Demography in Relation to the Present

At present the impact of population studies on Sri Lanka is perhaps most conspicuously manifested in the area of family planning. Information on the magnitude and direction of population growth has alerted the national policy makers to incorporate several strategies for effective arrest of the birth rate. The Government is committed to creating an awareness among the people of the population problem and to providing an extensive network of contraceptive services and supplies.

By 1971 two-thirds of the country's population were concentrated in the south western and central parts of the country which comprise only 23 percent of the total land area. Moreover, at that time three-fourths of the population were living in rural areas, with a steady flow of migrants from these to the urban area. There is evidence that there was also a steady stream of migrants to the rural hinter land of the country consequent to the sustained investment in peasant agriculture by the Government(10). Spatial planning is essential to disperse population

(9) K. A. P Siddhisena, (1981), **The Demography of Sri Lanka, Bibiliography**, University of Colombo.

(10) D. Abeysekera (1981), Regional Patterns of Intercensal and Lifetime Migration in Sri Lanka. **Papers of the East-West Population Institute.** No. 75.

concentrations regionally and between urban, rural areas in such a way as to facilitate the optimum use of resources. Recognition of this need by the Government is reflected in the various population re-distribution programmes implemented in the past and present. The most important current re-settlement programme is the Accelerated Mahaweli Development Scheme. It involves the re-settlement of about 140,000 families or about 7 percent of the population in the Mahaweli region. In the long run, development depends on the population factor, not only on its size, but also on the composition and growth. The young age structure of the new settlers and of the labour drawn into the area carries the potential for high fertility and has led the UNFPA to emphasize the need for a systematic study of the demographic implications of the Mahaweli Project (11).

Statistics on morbidity and mortality reveal that substantial differences continue to exist between geographical areas and between socio-economic groups of the population. The very low status of health in the estate sector led to the launching of the Estate Family Health Project in 1973. Probably as a consequence of improved access to health care and improvements in sanitation and water supply, the birth rate showed an upward trend from 2.85 in 1973 to 3.51 in 1977(12). A continuation of the upward trend could be counter-balanced with enhanced family planning information and services.

The main health problems facing the country continue to be environmental sanitation and communicable diseases. Cause specific infant and child morbidity and mortality statistics have pointed to the demand for better primary health care, clean water and adequate sanitation facilities. Programmes implemented to meet these needs have resulted and continue to result in a reduction of infant and child mortality.

The increasing trend in the exodus of Sri Lankan manpower is undoubtedly beneficial in terms of foreign exchange earnings and reduction of unemployment. Possibly as a consequence of enhanced economic standing and the provision of dowries the

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(11) UNFPA, **Report of Mission on Needs Assessment for Population Assistance** Report No. 36, p. 21.

(12) Department of Census and Statistics, (1979), **Bulletin of Vital Statistics**, p. 35.

number of marriages has tended to increase in recent years(13). Apart from creating a greater demand for housing and other utilities more marriages could retard or even reverse the downward trend in fertility which is attributed to continuing postponement of marriage. The short term and long term demographic impact of this outmigration and its consequences for national development efforts have already been identified as important areas of study by the UNFPA(14).

The foregoing is by no means an exhaustive presentation of the relevance and impact of population studies in relation to the present but constitutes a cross--sectional view of major issues worthy of consideration.

Perspectives of Future Developmen

Like any other scientific discipline in the course of development, demography should develop along several levels of exposition and interpretation: as valid observation, as substantive interpretation, as logical technical analysis, and as scientific theory. In the absence of a population register, demography in Sri Lanka is dependent for its data primarily on the census and the vital registration system. Interpersonal communication and techniques of data collection are very important in the generation of valid data in a census or survey. Regular review and development of these two factors is necessary to ensure the maintenance of high quality data with complete coverage. In order to improve predictability and explanation, it will be necessary also to widen the spectrum of information. Many gaps exist in both sources of natioal demographic data. A greater effort to identify and fill them and to communicate the demographer's needs to the data collecting authorities will lead to significant improvement in valid observation.

Any discipline dependent on observational data needs to evaluate the data, and at one time or another to adjust and estimate imperfect data. From the standpoint of evaluation, adjustment and estimation demography will gain credibility with the use of improved techniques for adjustment and estimation, with definitive evaluations of sampling and non-sampling error, and their inclusion in reports.

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(13) Department of Census and Statistics, 1979), **Bulletin of Vital Statistics**, p. 13.

(14) UNFPA: **Needs Assessment for Population Assistance** op. cit., p. 20.

Most demographic analyses in Sri Lanka hereto have been at the marco-level. Large-scale explanations by themselves provide inadequate explanations of changes in behaviour; they must be related to changes in individual motivation and attitudes. For example it is not simply mass communication and free availability of contraceptives, but the decision on the part of couples to use contraceptives which operates to limit the size of families. Micro-level studies are required to understand more fully many of the national population problems. A new level of interpretation and analysis of published and unpublished data is needed to uplift the status of demographic research in the country. From the perspective of a developing science, little is gained by repetitive exercises except when they lead to new analytical methods or afford some new insight into inter-relations between population and other related factors.

Although, ideally, population research should be integrated much more closely with the collection of data, the volume of data already available and being continuously collected is too large for the Departments of Census and Statistics and of Civil Registration to handle. Wider availability of data to research institutions, universities and organisations for analysis will be contributory to the development of demographic research. In the short run a comprehensive, annotated inventory of published and unpublished data prepared by the Department of Census and Statistics will be immensely useful to researchers, and in the long run cumulate into an updated bibiliography of national population data and sources.

The growth of demography as a discipline in Sri Lanka was slow largely because of a lack of academic leadership. Development of skilled demographers is an immediate national need. In our universities, demography has been supported within the Faculty of Arts, and at undergraduate level, particularly within the disciplines of sociology, geography and economics. The need for background mathematics and statistics is much less for these fields than for demography. A major problem of many students from these fields is that their knowledge of the English language and training in quantitative aspects are often insufficient to prepare them for graduate work in demography. While the introduction of compulsory basic mathematics and statistics courses to the conventionally non-quantitative curricula remains a controvercial matter, the provision of sound training in English is recognised as essential. Fluency in English would overcome a major handicap of the students of population because English is the most widely used language in demographic literature.

In the context of the development of demography as a discipline the Demographic Training and Research Unit, DTRU, University of Colombo is worthy of special mention. It is the only establishment affiliated to a University in the country to fulfill unmet needs in teaching and research in demography, and has a major role to play in the development of demography. Apart from its present involvement with undergraduate and post-graduate training the Unit could plan for the inclusion of demography as a specialised discipline within the Faculty of Arts. Moreover, it would also be possible for the DTRU to provide inputs on theoretical aspects of demography and statistical applications in population analysis for the students of statistics. When the Unit regains its full strength of well--trained demographers it would be possible for the Unit to be engaged in systematic studies of population problems which require consideration in policy formulation. Through fundamental and applied research, the Unit would be able to fill the many gaps that still exist in the knowledge of various aspects of population in the country and their relationship to socio-economic, biological and environmental conditions. In the near future the Demographic Training and Research Unit may also be in a position to supervise and provide expertise to current research projects and serve in an advisory capacity on population issues.

Demography as a discipline has wide scope to develop beyond the realm of formal demography. Biological, social and economic factors are relevant to the understanding of population changes and to be significant, demography should be interdisciplinary. Demographic research should not always be undertaken by demographers in isolation; in many instances the outcome of collaborative effort with researchers in other fields may prove more fruitful. In Sri Lanka, we are yet to achieve the co-operation or the organisational set up required to engage the interests of researchers from various disciplines in collaborative research into population problems. Recognition of the inter-disciplinary character of population studies will be a land mark in the development of demography as a discipline.

Isolation of scholars interested in population is a hindrance to the development of demography. Even at present it should be possible to form a professional organization of the students of population, which will add momentum to the progress of demography. Its advancement in the country will no doubt receive an impetus in the establishment of a conventional journal. Such a

journal will provide a common forum of discussion among the students of population who will be increasingly drawn from a variety of disciplines.

Allocation of resources to facilitate demographic study and creation of a demand for professional demographers in the job market are significant determinants of the pace at which demography will develop in the country. As a pre-requisite it is perhaps necessary to dispel misunderstanding of the nature of demography: far too many people still confuse the scientific study of population with the spread of propaganda for family planning.

The future of demography as a discipline depends to a large extent on the few professional demographers in the country. Apart from dissemination of knowledge, their primary function should be the objective analysis of population phenomena in the biological and socio-economic context which will serve not only to develop demography as a science, but also to find solutions to contemporary problems and formulate realistic public policies.

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Lifetime Migrants and Natives in the Rural Dry Zone and Urban Colombo*

DAYALAL ABEYSEKERA

Abstract

This paper compares the two dominant streams of lifetime migrants in the rural dry zone and urban Colombo along with their native counterparts using the 1971 sample census data of Sri Lanka.

Comparison of the two migrant streams reveal that Colombo attracted more males while the dry zone received relatively more females although both streams displayed a predominance of masculinity, more so in Colombo. Dependency was higher in the dry zone as was the level of selectivity of single males. Female migrants are more married than males in both streams. Sri Lanka Tamils are the only ethnic group selected positively to both destinations while the Kandyan Sinhalese are over-represented in the dry zone; Buddhists are attracted more to the latter while the Christians are selected to Colombo. Migrants to Colombo, as might be expected, are better educated when controlled for age but the more interesting observation is that the females are better educated than males in the 15-19 age group at both destinations, a drastic reversal of what prevailed 30 years ago. Male migrants are more employed and less unemployed in the dry zone but a greater proportion of the older males have to keep-on working while a larger proportion of them in Colombo enjoy formalized social security benefits; females are relatively less employed and a higher proportion in the dry zone are engaged in home duties.

When natives and migrants of each destination are contrasted, children are greatly under-represented among the migrants resulting in lower dependency ratios in both Colombo and the dry zone. Among both the males and females the migrants are consistently better educated than the natives in each destination when age is held constant. Male migrants were less employed in Colombo than the natives while the reverse is true of the dry zone. Within each age group, greater proportions of female natives are engaged in home duties than migrants at both destinations. The native females marry earlier and exhibit higher fertility at both destinations.

* The writer is most grateful to the Social Science Data Centre and the Department Sociology of Brown University, U. S A. for providing computer time in order to analyse the 10 percent sample census tapes from Sri Lanka,, the tables derived from which form the basis for this paper.

Introduction

The focus of this paper is to establish the basic differentials and similarities between two streams of lifetime migrants in Sri Lanka and their non-migrant (native) counterparts using the 1971 sample census tapes as its data base. The country offers a somewhat unique opportunity of observing two dominant streams of migrants, one to urban Colombo and the other to the rural dry zone consisting of eight districts which have been the selected locations for the government's investment in peasant agriculture.

Although district of birth and district of enumeration data were collected at the national censuses since the turn of the century, district-wise streams and volumes of migrants have only been available since 1946. However, until recently only a passing mention has been made of these two dominant streams in Sri Lanka (see, for instance, E.S.C.A.P., 1975; Abeysekera, 1979; 1981) as is revealed by a recent bibliography on the demographic literature on Sri Lanka (Siddhisena, 1981). This is partially a function of not going beyond a district-wise classification of migrant streams and exercising the researcher's judgement in a regional classification reflecting the historical conditions and the socio-economic development policies of the country. Partially responsible is also the non-availability of census data on magnetic tape until 1971. While it is readily granted that the interested researchers as well as many an enlightened layman were aware of migration to both urban Colombo and the rural dry zone, this paper attempts to go a step beyond merely documenting the prevalence of these two streams which has been done elsewhere (Abeysekera, 1981). It seeks to contrast them with respect to selected attributes of migrants as well as of natives in order to furnish the prelude towards understanding the determinants and consequences of migrating to these two destinations (i.e., urban Colombo and the rural dry zone).

Reaching beyond the mere fact of the prevalence of the two dominant streams of migrants in one country as providing legitimacy for the present analysis, this paper intends to demonstrate the rationale is grounded on more firmer theoretical footing as well as closely allied with the development options and strategies to be pursued in the developing nations. To this purpose will be devoted the next section of this paper. It is followed by a discussion on the data and methodology. The differentials among the two migrants streams and the natives are

pursued thereafter under the sub-headings of age and sex, marital status, ethnicity and religious affiliation, educational attainment, type of activity and fertility. The paper will conclude with a profile of lifetime migrants and natives in urban Colombo and the rural dry zone.

Background — Policy Related and Theoretical

Sri Lanka is no exception to the general pattern of rural to urban migration found in most developing countries. From the first time since place of birth and place of residence data were published there has been an unmistakable stream of lifetime migrants arriving in Colombo District.

There is, however, another rarer and therefore especially interesting aspect to population movement in Sri Lanka. Successive governments of independent Sri Lanka (and indeed legislatures before independence), having been sufficiently alerted as a consequence of severe disruptions during the two World Wars to the need to produce food domestically, consistently gave top priority to public investment in peasant agriculture. Stemming the growth of an agricultural proletariat was yet another important political consideration in the enterprise. As a result, massive irrigation schemes that had fallen into disrepair over the centuries were resuscitated and new land brought under cultivation (mainly rice). Thus, between 1952/53 and 1970/71, over 300,000 hectares of new land were brought under the plough and almost two thirds of this are concentrated in the districts of the dry zone. The newly developed land was to be colonized by the landless peasantry of the wet zone of the country which contained approximately 23 percent of land area and nearly 70 percent of the population. As a consequence, the sparsely populated dry zone districts had unprecedented rates of net in-migration far in excess of Colombo District which has been the only district in the wet zone to have positive net migration during the three intercensal periods between 1946-71 (E.S.C.A.P., 1975: 30-32). This constitutes the second dominant stream of migrants.

Apart from the inherent interest generated by the observation of a dominant rural to rural migration stream in the context of a less developed country, the study of this movement has a more pragmatic value within the international context when placed upon the canvas of urbanization. The level of urbanization in Sri Lanka has been low, a pattern which is somewhat

characteristic of the South Asian region in general; 11.6 percent in 1901, 15.4 percent in 1946 and 22.4 percent in 1971. The more interesting observation is the decline in the growth rate of the City of Colombo as well as of metropolitan Colombo over the last three intercensal periods. During 1946-53 the City of Colombo grew at 2.4 percent per annum but this dropped to 1.1 percent by 1963-71; a similar drop was observed in metropolitan Colombo (defined as the Colombo D.R.O.'s/A.G.A.'s Division) from 3.2 to 2.1 percent during the same periods (Department of Town and Country Planning, n.d.). Such observations in the context of burgeoning primacy and increasing metropolitanization in the majority of developing countries prods one to look to rural-rural migration, the government's continued investment in peasant agriculture and direct and indirect income transfer programmes from the urban to rural areas as having possible causal connection with the 'deviant' pattern of urbanization in Sri Lanka.

Somewhat contrary to what many researchers have highlighted (see, for example, Jones and Selvaratnam, 1970; Gunetilleke, 1973; Puvanarajan, 1976; Dias, 1977) in stating that the medium sized towns (population size between 20,000-50,000) have exhibited the most rapid growth, the writer has documented that while the lion's share of the national urban component was held within these medium sized towns it was the small towns (population size less than 10,000) that consistently depicted the highest rates of growth during the majority of the intercensal periods within this century (Abeysekera, 1980). This points to an emergent pattern of decentralized urbanization complemented by mitigated primacy and metropolitanization.

The link between urbanization and internal migration is not too difficult to establish in most of the developing world. As disconcerting as the massive increase in population in the less developed countries during the mid-twentieth century has been the precipitous growth of urban population in these countries. In comparison to the more developed countries, the population in the cities of the less developed countries has grown two and one half times as fast during 1920 to 1970 (Berry, 1973: 74). During the decade of the 1960s, the average annual rate of growth of the cities with over 20,000 people was 4.6 percent in the developing countries while their rural areas grew only by 1.8 percent (United Nations, 1970: 65-66). Although the growth of urban population is a joint function of natural increase and net migration, it has been estimated that nearly three quarters of the urban growth could result from rural to urban migration (World Bank, 1972).

This over-concern with urbanization is well reflected in the literature on internal migration where studies are mostly interested in urban-ward migration to the detriment of rural-ward streams of migration. This situation has been complemented by the existence of only a few scattered cases of intentional stimulation of rural-ward migrations. Some of these are reported from Indonesia (M. I. T.. 1955; Hameed. 1975; Jones, 1975), Malaysia (Dobby, 1952; Pryor, 1972), Philippines (Krinks, 1970; Simkins and Wernsted, 1971) India (Directorate of Economics and Statistics, 1968) and Brazil (Van Es et al., 1968; Wilkening, 1968). Sri Lanka is, perhaps, one of the very few cases where during the last three to four decades migrants were attracted to two major destinations characterized by very different vocational pursuits and life styles from one another; one to the rural hinterland and the other to the primate city and its suburbia.

As in most of the countries of the developing world Colombo is undoubtedly the primate city as well as being the capital. Some idea of its level of primacy can be had by noting that the city of Colombo as of 1971 was over three and one half times larger than the population carried within the next largest urban area in the country (viz., Dehiwela-Mt. Lavinia which is in reality a logical continuation of the metropolitan sprawl of Colombo towards the south) and more than five times as large as Jaffna, the third ranking urban concentration in the country (Abeysekera, 1980: Table 13). However, as Samarasinghe (1973) has observed, the socio economic activities in Colombo have peaked around 1953 and have since begun to decline. Similarly, the writer has also documented that the small towns with populations less than 10,000 have grown at a much faster pace than the large or the medium sized towns in Sri Lanka (Abeysekera, 1980). Both these observations have to be viewed within the context of the public investment in peasant agriculture in the dry zone, which, according to Samarasinghe (1977; 4) has grown to be almost a " 'counter-magnet' to the polarised development of Colombo".

Thus, placed within the international canvas of increasing urbanization (indeed 'over-urbanization' as referred to by many a researcher —see, for instance, Davis and Golden 1954; Sovani, 1964; Kamerschen, 1969; Hill, 1974) in the developing countries, Sri Lanka's case of a declining growth rate within the city of Colombo and to a lesser extent in its suburbia coupled with the emergence of a network of smaller towns exhibiting higher rates of growth existing concomitantly with a dominant stream of

rural-ward migration stimulated by the pursuit of the single most pervasive public policy of investment in peasant agriculture more than hints of an academic and pragmatic demand for further investigation of the determinants and consequences of such phenomena. This paper, however, will not attempt to be as ambitious but merely satisfy itself with laying part of the ground work for such an endeavour. It will simply seek to establish contrasting characteristics of migrants to urban Colombo and the rural dry zone (hereinafter abbreviated as UC and RDZ, respectively) and their native counterparts along selected attributes. The selection of these characteristics is dictated primarily by the pragmatics of data availability within the scope of a national census. The natives of both these locations are also brought into the picture so as to provide a broader perspective on the operant processes of migrant selection and change. Implicitly, though, the paper will not ignore the theoretical possibility that Sri Lanka's model of development may be yet another blue print for other developing countries to (modify and) follow given a hitherto undermined configuration of historical, cultural and politico-socioeconomic antecedents.

Data and Methodology

The interested reader is referred to Nadarajah (1976: 174-181) for a description of the sampling design of the 1971 Census of Sri Lanka.

It was in this 10 percent sample that the four items of information pertaining to migration and the questions on fertility were included. The information on migration included district of birth, district of usual residence, duration of stay at usual residence and district of previous residence for those who had not been living at their usual residence since birth. Using these four items of information the sample was divided into lifetime categories of non-migrants (natives), primary migrants, repeat migrants and return migrants by using a selection process shown in Appendix 1.

In addition to these migrant types, five more categories were evolved in the process of isolating these migrant types. They were the foreign-born, "illogical" cases, within-district migrants, "uncertain" migrants and the cases for whom data were missing so

that they were not classifiable into any of the above categories. For definitions of these categories the reader is referred to Abeysekera (1981: 22-23).

Table 1 presents the number and percentage distribution of the 1,237,087 cases contained in the 10 percent sample of the 1971 national census. Generalizations the 10 percent sample of the 1971 to arrive at because of a considerable number of 'missing' and "illogical' cases. One in every 11 cases (9.05 percent) of the sample is unidentifiable. Although it is possible to allocate these 'missing' cases randomly on a pro rata basis, this was not resorted to since the intent was more to ascertain whether or not there were any substantial differences between the definitely identifiable migrant types rather than to make a case for generalization. Thus, in interpreting these results one should avoid attaching too much weight in view of data deficiencies.

TABLE I

Number and percentage of migrant categories estimated from 10 percent sample census tape, Sri Lanka, 1971

Migrant category	Number	Percent
Repeat migrants	13,382	1.1
Return migrants	10,210	0.8
Primary migrants	125,320	10.1
Within-district migrants	121,494	9.8
"Uncertain" migrants	52,885	4.3
Cases with missing data	96,551	7.8
Foreign-born	15,667	1.3
"Illogical" cases	15,440	1.3
Non-migrants (natives)	786,138	63.6
Total 10 percent sample	1,237,087	100.0

In this paper, background characteristics will be examined among the migrants and natives of both urban Colombo (UC) and the rural dry zone (RDZ), controlling for sex. The migrants

are composed of all primary, repeat and 'uncertain' migrants; return migrants were not included since they are very much akin to natives in a district of birth by district of usual residence classification. Furthermore, they also consisted of a very minute proportion of the sample, i.e., less than one percent. The natives were first stratified by their district of usual residence and by rural/urban sector, i.e., into 44 strata and 15 percent from each stratum was selected randomly into a reduced sample. This was done in order to keep the data processing costs within limits. The results presented of the natives in this paper are based on this 15 per cent sub-sample of the 10 percent national sample while all primary, repeat and 'uncertain' migrants of the ten percent national sample are included in the analysis.

Urban Colombo as defined within the confines of this paper refer to the 26 locations defined as urban as of 1971 (Department of Census and Statistics, 1972). The rural dry zone consists of all rural areas as defined by the Department of Census and Statistics within the districts of Anuradhapura, Polonnaruwa, Trincomalee, Vavuniya, Mannar, Batticaloa, Amparai and Hambantota.

MIGRANT-NATIVE DIFFERENTIALS IN URBAN COLOMBO AND THE RURAL DRY ZONE

Age and Sex

Table 2 provides the age distribution of lifetime migrants and natives by sex in UC and RDZ. Among the total pool of migrant males who reached the four destination areas of UC, RDZ, 'other urban areas' and 'other rural areas' (the latter two consists of the spatially residual destinations within the country apart from the two dominant destinations of UC and RDZ), 4.6 per cent have missing data; 4.9 per cent of non-responses are recorded for females. The percentage distributions on table 2 are based on all cases with an acceptable response only.

TABLE 2

Percentage distribution of age among migrants and natives and 'standardized' selectivity by destination and sex, Sri Lanka, 1971.

Age	Urban Colombo						Rural Dry Zone					
	Migrants		Natives		'Standardized' Selectivity		Migrants		Natives		'Standardized' Selectivity	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0-4	2.0	2.7	15.9	16.9	-84.6	-79.7	3.3	4.6	20.9	21.0	-74.6	-65.4
5-9	3.0	4.7	14.9	14.9	-76.9	-64.9	4.9	6.9	19.9	19.8	-62.3	-48.5
10-14	6.0	7.9	14.6	14.6	-52.4	-38.3	6.9	8.1	15.6	15.9	-45.2	-36.7
15-19	10.3	9.5	11.2	11.4	1.6	-12.8	9.2	9.9	10.7	11.1	-12.4	- 9.2
20-24	16.8	12.6	9.9	10.0	71.4	23.5	13.8	13.9	6.9	7.4	40.8	36.3
25.29	14.2	11.8	7.4	6.8	94.5	53.2	12.3	13.0	4.1	4.6	68.5	68.8
30-34	10.6	9.5	4.7	4.5	82.8	66.7	9.8	9.4	3.7	4.1	69.0	64.9
35-39	8.7	9.7	3.8	4.1	55.4	67.2	9.2	9.3	4.1	3.5	64.3	60.3
40-44	7.6	7.4	3.8	3.8	58.3	68.2	7.5	6.5	3.2	3.1	56.3	47.7
45-49	6.2	6.2	2.9	3.1	40.9	51.2	6.9	6.3	3.4	2.9	56.8	53.7
50 54	4.7	4.9	2.7	3.1	34.3	58.1	4.8	3.6	2.2	2.0	37.1	16.1
55-59	3.4	3.9	2.9	2.1	17.2	50.0	4.1	3.4	1.4	1.2	41.4	30.8
60 +	6.5	9.2	5.2	4.8	12.1	55.9	7.3	5.1	3.8	3.4	25.9	-13.6
All ages	100.0	100.0	100.0	100.0	—	—	100.0	100.0	100.0	100.0	—	—
Dependency ratio	21	32	102	105	—	—	29	33	151	150	—	—

'Standardization' was achieved by subtracting the national age-sex specific proportion of population from the age-sex specific migrant population at each destination and dividing the difference by the proportion of the national population, expressed as a percentage. National age-sex proportions are given in ESCAP (1976: tables 66 & 67).

The familiar patterns of negative 'selectivity' of children and the high 'selectivity' of young adults among the migrants that have become a near-universalistic pattern is predominantly displayed in this table. The strength of 'selectivity' of the young adults (20-34 years) is lesser among the male migrants to the RDZ than to UC and conversely, the pattern is reversed among female migrants who are more strongly selected to the RDZ. The latter suggests that the migration to the RDZ was probably more of a familial one, as might be expected, in accordance with government policy considerations in the resettlement of the colonization schemes (Sri Lanka, 1958).

'Selectivity' here is used in the broadest possible sense since technically one cannot investigate it with lifetime data. Selectivity inevitably entails the qualification of 'the situation at the time of migration' that is not necessarily found among lifetime migrants. Thus, 'selectivity' in this paper is used in a special context; insofar as lifetime migration data encompass the characteristics at the time of migration and the capacity to retain the migrants within a spatial unit, to that extent both UC and RDZ could have manifested identical patterns in sex-specific age selectivity when 'standardized' upon the national sex-specific age distributions. Thus, the differentials observed in the strength of 'selectivity' in Table 2 are submitted as the prelude to the existence of differential selectivity at the time of migration and/or in the retention processes of migrants at the two destinations.

The higher levels of 'selectivity' of older female migrants in UC when compared to each of the other migrant groups (male or female) in both streams is partially the manifestation of longer life expectancy of women in relatively more developed areas of the country. Apart from this demographic consideration there may be yet another social utility factor operating for the disproportionate presence of older migrant women in UC. In the most urban area of the country where the chances of both spouses being employed outside the home is greatest, the necessity of an adult to look after the children would be fulfilled by a 'resident grand-mother'. This would, perhaps, be the most convenient 'arrangement' where all three generations would benefit from it in terms of security (young and old age), subscribing to social norms (by keeping the family together and looking after one's parents when they are old), and economic efficiency (rather than hiring outside domestic help to take care of the children).

The dependency ratios calculated by assuming that the 15-59 age group are economically active reveals that in both UC and RDZ the migrants have less dependency than the natives who have a ratio of more than 1:1 dependents to the economically active. Among the migrant stream, the UC stream has lower dependency, males more so than females.

Marital Status

The distributions of marital status among lifetime migrants and natives in UC and RDZ by sex are presented in Table 3. There is hardly any difference between the natives of each sex residing in UC and RDZ with respect to their proportions single and married. Within each destination, females, as expected are less single than males. This is due to the average seniority of males by approximately five years at the time of matrimony. There is hardly any difference among each of the destination-specific sex categories in terms of the legally separated and the divorced. A notable difference does appear among the widowed male migrants and natives in both areas but an appreciable difference does exist in the case of widowed females in UC. As was suggested earlier, the utility value associated with the 'resident grand-mother' in the migrant's home in UC would plausibly explain this differential along with the increased life expectancy of women in the more developed areas of the nation. While only 3.7 percent of natives are widowed, 6.6 percent migrant women are widowed. In the RDZ there appears to be reverse pattern operant with respect to the widowed women. It is possible that even though rural areas are steeped in tradition and taking care of one's parents during their old age is an operant norm with active sanctions attached, the act of migration and the ensuing physical distance in residential location between the two generations inhibit the operationalizing of the norm. Furthermore, with limited employment opportunities for the wife outside home, the presence of the 'resident grand-mother' may not be as beneficial to the young migrant family who would be burdened with an extra mouth to feed and extra medical expenses possibly without adequate reciprocation.

TABLE 3

Percentage distribution of marital status among migrants and natives by destination and sex, Sri Lanka, 1971

Marital Status	Sex	Urban Colombo Migrants	Urban Colombo Natives	Rural Dry Zone Migrants	Rural Dry Zone Natives
Single	M	56.0	73.9	47.1	73.4
		(44.1)	(39.9)	(30.1)	(19.1)
	F	40.4	67.7	32.7	67.4
		(29.8)	(39.7)	(16.2)	(24.7)
Married	M	42.8	25.1	51.4	25.3
	F	52.4	28.2	62.9	27.6
(Registered marriages)*	M	40.3	23.4	41.3	16.8
	F	48.2	26.4	50.3	18.4
(Customary marriages)*	M	2.5	1.7	10.1	8.6
	F	4.2	1.7	12.6	9.2
Widowed	M	1.0	0.9	1.3	1.0
	F	6.6	3.7	4.1	4.7
Legally separated	M	0.1	0.0	0.1	0.1
	F	0.2	0.2	0.2	0.2
Divorced	M	0.1	0.1	0.1	0.1
	F	0.3	0.2	0.1	0.1

* The sum of the registered and customary marriages is equal to the total married population.

Note: Percentages within parantheses refer to the single proportions when all males under 20 and all females under 15 years were removed from the distributions.

Within each destination-specific sex group, negative 'selectivity' of single persons among migrants is consistently depicted. The differential is largest among the females in the RDZ where 67.4 percent of natives are single and only 32.7 percent among migrants. The differential age structure among the migrant and natives is the most influential factor in enhancing the differential in marital status with the children, who are obviously not married, being under-represented among migrants. In view of this 'disturbance' some simple adjustments were carried out on the data. When all females under 15 and all males under 20 were removed from the single category the formidable differences that existed before were reduced and the direction of selectivity among the males was reversed. In UC the male migrants are

moderately 'selected' from among the unmarried (44.1 percent versus 39.9 percent) while in the case of the RDZ, the 'selectivity' of the single male is much greater. The pattern is the opposite in the case of females where the comparative proportions single in both destinations are lesser among the migrants than among natives; this denotes that the female migrants are selected disproportionately from among the married populations.

Another interesting, socially relevant phenomenon surfaces in the dichotomous breakdown of the currently married population (see Table 3). In the case of all four sex-specific migrant types resident in the RDZ there is an appreciable proportion of customarily married in comparison to those resident in UC. While both male and female natives of the RDZ who were customarily married consists of about one third of the total married population, the migrants in the RDZ show a lesser proportion of approximately one fifth of the total married. If one is to infer that the practise of customary marriage is linked with a lower level of education, residence in remoter locations and a lower level of association with 'modernity', then, the migrants in the RDZ are relatively better educated and more 'modern' than their native counterparts.

Since the colonization programme was geared to resettle families on crown land and the achievement of this goal should have been manifested in the 'selectivity' of married males and females than unmarried ones in the RDZ, the programme appears not to have achieved at least one of its goals in the establishment of colonies. However, the fact that there is a 'selectivity' of married females point to the possibility that single males may have been attracted disproportionately to RDZ outside of the government colonization programme, possibly as illicit encroachers or as migrant wage labourers.

Furthermore, a better test of the efficacy of the programme in relocating its 'preferred' colonists in terms of marital status should be pursued among land allottees and not among the entire migrant population; also, the issue should be probed with respect to marital status of colonists at the time of migration. With precipitously increasing rates of natural increase and postponement of marriage, the children of the colonists would be represented within the census sample so as to raise the proportions of unmarried persons in the sample who would be classified as migrants. These would be child migrants from the colonization programme's point of view, not a target group that could be used to evaluate the efficacy of the programme in terms of its capacity to attract married couples who were 'preferred' as colonists.

Ethnicity and Religious Affiliation

The national ethnic and religious distributions of 1971 are provided in Table 4 along with the distributions of the two migrant streams. To provide comparability, the migrant distributions have been 'standardized' by subtracting the national proportion from the proportion in each stream and the difference expressed as a percentage of the national proportion. This measure provides the strength of selectivity of ethnic and religious groups in each destination. Since ethnicity does not generally change over time, the levels of selectivity shown in Table 4 should not change even if data at the time of migration are pursued, unless, of course, the strength of selectivity has been changing over time.

TABLE 4

Percentage distribution of ethnicity and religious affiliation of migrants, 'standardized' selectivity by destination and national distribution, Sri Lanka 1971.

Ethnicity	Urban Colombo			Rural Dry Zone	
	Migrants	'Standardized'* Selectivity	Sri Lanka**	Migrants	'Standardized' Selectivity
Low country Sinhalese	56.8	32.7	42.8	30.8	-28.0
Kandyan Sinhalese	13.4	-54.1	29.2	48.4	65.8
Sri Lanka Tamils	17.6	57.1	11.2	12.5	11.6
Indian Tamils	3.9	-58.1	9.3	4.6	-50.5
Sri Lanka Moors	5.4	-16.9	6.5	3.2	-50.8
Indian Moors	0.1	-50.0	0.2	0.1	-50.0
Burghers/ Eurasians	1.4	250.0	0.4	0.2	-50.0
Malays	1.2	300.0	0.3	0.1	-66.7
'Others'	0.3	200.0	0.1	0.0	——
All ethnic groups	100.0	——	100.0	10.0	——
Religion					
Buddhist	64.1	- 4.8	67.3	76.9	14.3
Hindu	15.6	-11.4	17.6	15.1	-14.2
Muslim	6.7	-15.2	7.9	3.4	-57.0
Roman Catholic	10.1			4.1	
Other		88.7	7.1		-36.6
Christian	3.3			0.4	
'Others'	0.2	-50.0	0.1	0.0	——
All religions	100.0	——	100.0	100.0	——

* 'Standardization' effected in the same manner as in Table 2.

** From ESCAP (1976:100 & 105)

Malays and the Burghers/Eurasians (minority ethnic groups) are by far the most strongly selected to UC. Among the five major ethnic groups, the Sri Lanka Tamils are most selected to the urban areas of Colombo District. The above average level of English education of this community as well as the high urban-ward migration from Jaffna District was referred to elsewhere (Abeysekera, 1981). The only other positively selected major ethnic group to UC are the low country Sinhalese. The Indian Tamils are the most negatively selected in UC followed closely by the Kandyan Sinhalese.

In the RDZ, only the Kandyan Sinhalese and the Sri Lanka Tamils are selected positively. The higher selectivity of the former highlights the plight of the Kandyan peasantry who lost their traditional highlands to the plantations as a consequence of the enactment of the Crown Lands Encroachment Ordinance of 1840 (see, Sri Lanka, 1951; Farmer, 1957). The Sri Lanka Tamils are the only ethnic group who exhibit positive selectivity in both streams. There appears to have been two strata of Sri Lanka Tamils who were stimulated to leave their traditional homeland; the better educated in search of white collar jobs in the tertiary sector of UC and the landless peasantry who migrated to the surrounding districts of Jaffna. These two streams are well demarcated during the 1953-63 intercensal period (E.S.C.A,P., 1976:53) and also in the lifetime data of 1971 (Abeysekera, 1981: Table 12).

During the inter-censal period 24.8 per cent of all migrants from Jaffna reached Colombo District while 64.9 percent went to the surrounding dry zone districts of Mannar, Vavuniya, Trincomalee and Batticaloa. There was hardly any migration to other districts from Jaffna which reveals the ethnic segregation pattern of residence in terms of districts and the limited choice that is held out to the Sri Lanka Tamils in terms of geographic mobility. The lifetime data as of 1971 reveals a better record for Colombo in terms of attraction and retention of emigrants from Jaffna vis-a-vis the four dry zone districts over what prevailed during the intercensal period of 1953-63. Colombo District had attracted and retained 37.5 percent of all migrants from Jaffna while the four dry zone districts together had 42.1 percent. Jaffna's outmigration occurred amidst the establishment of several major colonization schemes which provided 6,430 alottees with agricultural land at an average of 4.5 acres per allottee as at the end of 1968-69 (Sri Lanka, 1975: Table G). The other dry zone districts of Vavuniya, Mannar, Batticaloa (excluding the Gal Oya Left Bank colonization scheme in Amparai District) and Trincomalee had 2532, 540, 3414 and 5904 allottees provided with land, respectively at very comparable ratios of land unit per allottee.

All these allotments were not necessarily alienated to Sri Lanka Tamils but the major proportion of it was; the proportion of Sri Lanka Tamil allottees in Trincomalee District would have been among the lowest since the Kantalai Colonization scheme (2,500 allottees) was mainly habited by the Sinhalese.

Religious affiliation as revealed in Table 4 is another dimension along which migrants are absorbed into the two destinations selectively. It is the Christians who are most attracted to UC. Although the Roman Catholic Church's influence over power position in the country has been reduced in the aftermath of political independence, the church was one of the most influential institutions that could provide extra-agricultural employment that was primarily concentrated within UC to its adherents.

Buddhists are the only religious denomination who are positively selected to the RDZ. This is due mostly to the preponderence of Kandyan Sinhalese in the stream, who, in comparison to the low country Sinhalese were much less proselytized into the religion of the western powers because they were the least exposed to the cultural after-effects of conquest. The low country Sinhalese had begun to adapt by the seventeenth century in terms of dress, vocation, name and religion; religious identity with the ruling elite was a strong variable which brought opportunities of self-advancement within reach of the indigenous in a positively selective manner.

EDUCATIONAL ATTAINMENT

The advances made in the realm of educational attainment in Sri Lanka are one of the important indicators of socio-economic development of the country. The main responsibility for the massive increase in education is due primarily to the activities of the Special Committee on Education of 1943 which recommended that "education should be free at all levels, that instruction should be through the medium of mother tongue and that education if it were at all to ensure equality of opportunity should be based on ability with greater participation by the state" E.S.C.A.P., 1976:209-210). Even before the 1943 recommendations, the British carried out educational reforms in Sri Lanka as early as 1833 (see, for instance, Sri Lanka, 1969: chapters 33 & 34). when they began ensuring the continuous production of a breed of bookkeepers that could effectively deal with the production and exports related economy at the clerical level. As of now the education system of the country is almost totally subsidized by the government to the tune of about five percent of the country's GNP, among one of the highest in Asia.

Table 5 reveals the educational attainment of both male and female lifetime migrants and natives in UC and RDZ. Since the education variable could change due to the relative emphasis placed on policy implementation spatially and with the passage of time, educational attainment is monitored by controlling for age among those 15 years and over. The summary statistic that is found in the table reveals how many persons had less than 10 years of education. Thus, the lesser the magnitude of this ratio, the higher is the level of education of the group concerned.

TABLE 5

Educational attainment* among migrants and natives by destination and sex, Sri Lanka, 1971.

Age group	Sex	Urban Colombo Migrants	Urban Colombo Natives	Rural Dry Zone Migrants	Rural Dry Zone Natives
15-19	M	4.2	4.4	9.0	11.7
	F	2.7	3.5	6.0	11.2
20-24	M	1.3	2.6	3.6	4.2
	F	1.1	1.8	3.5	6.5
25-34	M	1.3	2.5	3.8	6.7
	F	1.3	2.1	4.9	9.3
35-44	M	1.8	4.4	9.3	16.9
	F	2.3	4.3	10.9	141.9
45 and over	M	2.7	7.1	18.6	26.0
	F	4.5	9.3	46.6	(infin.)

* The number of persons with less than 10 years of education per person with an education of 10 years or more. (The lesser the magnitude of this ratio, the higher is the level of education of the group concerned).

A fair proportion of the cases are missing from the sample due to non-response. Males in general have a better response rate than the females. The non-response rate rises generally with age and is lower in UC than in the RDZ. In the majority of destination-specific age-sex groups the migrants have a lower rate of

non response than the natives. Although the Department of Census and Statistics (1974:table 3.21) assumed that all non-response cases did not possess any formal schooling, this assumption was not made in computing Table 5. The non-responding proportions were subtracted out of the total number of cases before the statistics were computed. As a result, the proportions without any schooling would be depressed systematically in comparison to the Census Department's estimates.

Among age-sex specific migrant streams, the migrants in the RDZ are consistently less educated. The differential is lowest in the 15-19 age group and with increasing age there is a rise in the education differential. Since formal education is generally completed by the mid-twenties of one's life, this increasing differential suggests that with the inauguration of the free education system, the relative gain in the level of education was greater for the migrant in the RDZ than in UC with the passage of time, as might be expected. That this was a national trend is documented by the natives of the two destinations exhibiting the same relationship as did the migrants. However, the differential is lowest among the 20-24 age group for males and among the 16-19 in the case of the females. This may suggest that the convergence on the part of the males at both destinations has been reached while it is still taking place among the females. It is difficult, however, to make this observation with any degree of certainty because the educational attainment process has not ceased when one has reached the 15-19 age group. The differential school attendance pattern among the sexes may be accountig for the educational differential observed above.

Perhaps the most interesting and important achievement in the expansion of educational opportunities in Sri Lanka is the massive advances that have been made by the females over that of the males. Among the oldest age group (who in all probability completed their education before the inception of free education) the education difference between the sexes is greatest. In this age group the smallest differential is observed among the natives of UC (i.e., 7.1 males versus 9.3 females) which suggest that continued residence or nativity in UC was more contributary

than being a migrant in the 1940s for a woman's educational attainment. With each successive younger age group the sex differential is gradually diminished. Native females are better educated than native males in UC among the 25-34 age group while among the migrants in UC, the females are on a par with the males. This signifies that even during the mid-1950s to the 1960s or so, nativity in UC was still more beneficial for the females' educational achievement than being a migrant in UC.

Among the 20-24 age group, both migrant and native women in UC are better educated than their male counterparts. Perhaps this is consequent of a more competitive selective process being operant in UC in comparison to the RDZ. In the meantime the sex differential in educational achievement in the RDZ has been erased in the 20-24 age group among migrants and the females are slightly better educated than the males. However, the male natives are better educated still than the female natives signifying that in the RDZ, nativity was a liability for the females vis-a-vis educational advancement which was the reverse situation that prevailed in UC. Among the 15-19 age group, however, irrespective of migration status, every female group is better educated than their male counterparts at both destinations. Thus, within the limitations of arbitraryness of the cut-off-points (10 years of formal education), during the span of 30 years or so the females who started with an enormous handicap in educational achievement have managed to out-strip the educational superiority of the males in both the most developed areas of the country (i.e.,, UC) and the least developed areas (viz., the RDZ). Speculation and further study on why the females managed to gain the advantage from the males in a veritable 'equal opportunity' situation (i.e., availability of free education) is best left to be pursued in another paper.

TYPE OF ACTIVITY

Percentage distributions of age-specific type of activity among migrants and natives of UC and the RDZ are presented in Table 6 by sex. The most interesting types of activities are the employed, unemployed, students, children not at school and not at work and those engaged in home duties.

TABLE 6

Percentage distribution of type of activity among migrants and natives by destination, sex and age, Sri Lanka, 1971

Type of Activity	Sex	Urban Colombo Migrants	Urban Colombo Natives	Rural Dry Zone Migrants	Rural Dry Zone Natives
		10—14 years			
Employed	M	22.5	1.1	11.6	9.4
	F	19.5	0.5	1.9	2.4
Unemployed	M	4.2	3.9	2.1	1.7
	F	2.0	2.5	1.0	1.1
Student	M	59.7	87.7	56.2	62.2
	F	63.1	82.1	59.6	52.9
Income Recepient	M	0.0	0.0	0.0	0.0
Pensioner	F	0.0	0.0	0.0	0.0
Engaged in	M	2.6	1.1	4.9	2.4
home duties	F	5.9	5.6	14.8	22.8
Too old or	M	0.0	0.0	0.0	0.0
unable to work	F	0.0	0.0	0.0	0.4
Child not attending	M	10.3	8.2	25.0	24.0
school & not at work	F	8.4	9.2	22.6	20.2
'Other'	M	0.7	0.1	0.3	0.2
	F	1.2	0.1	0.1	0.2
All Activities	M	100.0	100.0	100.0	100.0
	F	100.0	100.0	100.0	100.0
		15—29 years			
Employed	M	71.1	44.1	78.0	70.4
	F	25.2	8.2	18.0	12.4
Unemployed	M	13.1	27.5	10.4	8.1
	F	15.7	21.9	8.4	4.2
Student	M	10.7	21.6	4.9	12.1
	F	13.7	19.5	5.5	8.7
Income recipient	M	0.2	0.0	0.0	0.0
pensioner	F	0.1	0.0	0.1	0.1
Engaged in	M	0.8	0.7	2.5	2.5
home duties	F	41.7	44.6	64.9	70.2
Too old or	M	0.0	0.0	0.1	0.2
unable to work	F	0.2	0.0	0.2	0.1
Child not attending	M	1.3	5.2	3.2	6.1
School/not at work	F	2.6	5.1	2.8	4.2
'Other'	M	2.9	0.8	0.8	0.5
	F	0.9	0.5	0.1	0.1
All Activities	M	100.0	100.0	100.0	100.0
	F	100.0	100.0	100.0	100.0

Table 6 (continued) 30—54 years

Type of Activity	Sex	Urban Colombo Migrants	Urban Colombo Natives	Rural Dry Zone Migrants	Rural Dry Zone Natives
Employed	M	89.6	87.1	96.5	97.3
	F	25.0	13.2	29.9	17.9
Unemployed	M	5.4	8.8	1.4	0.7
	F	9.9	11.1	1.7	1.3
Student	M	0.2	0.0	0.0	0.0
	F	0.1	0.2	0.0	0.0
Income recipient/ pensioner	M	0.9	1.4	0.2	0.2
	F	0.5	0.8	5.0	0.8
Engaged in home duties	M	0.5	0.5	0.6	0.7
	F	62.6	72.0	66.2	78.4
Too old or unable to work	M	0.5	0.8	0.5	0.8
	F	1.2	2.0	1.8	1.4
Child not attending school & not at work	M	0.0	0.0	0.0	0.0
	F	0.1	0.2	0.2	0.1
'Other'	M	2.9	1.2	0.7	0.3
	F	0.6	0.5	0.1	0.3
All activities	M	100.0	100.0	100.0	100.0
	F	100.0	100.0	100.0	100.0
		55 years or more			
Employed	M	44.6	39.5	78.6	72.7
	F	10.9	4.3	14.4	9.7
Unemployed	M	5.3	6.5	0.7	0.0
	F	6.0	5.5	0.8	0.0
Student	M	0.2	0.0	0.1	0.0
	F	0.2	0.0	0.0	0.0
Income recipient/ pensioner	M	24.9	21.8	3.3	4.0
	F	6.0	5.2	1.7	3.4
Engaged in home duties	M	2.2	2.2	1.3	1.8
	F	37.6	41.5	43.3	40.3
Too old or unable to work	M	20.5	29.2	14.5	20.4
	F	38.1	42.9	39.1	44.1
Child not attending school & not at work	M	0.0	0.0	0.0	0.0
	F	0.0	0.0	0.0	0.0
'Other'	M	2.8	1.0	1.6	1.1
	F	1.1	0.6	0.7	2.5
All activities	M	100.0	100.0	100.0	100.0
	F	100.0	100.0	100.0	100.0

Among the native males there is consistently a higher proportion of employed in each age group at the RDZ than in UC: this pattern is also found among migrants except among the youngest age group of 10-14 where almost twice as many children are employed in UC. At the early stages of entry into labour force, i.e., in age groups 15-29, the native population show marked dissimilarities by area of residence. Those in UC are far below the proportions that are employed in the RDZ. Concomitantly, the relative proportions unemployed in these age groups are extremely high among the male natives of UC than in the RDZ. This signifies, perhaps, the high degree of structuredness of the labour market of UC and it also is. perhaps, reflective of the mentality and the capacity of the native to wait for a specific type of job rather than take up any opportunity that comes one's way. The latter becomes more apparent when unemployment among migrants are pursued in the same age group which is much less than the proportions among the natives. This is perhaps due to the migrants' inability to wait as long as the natives since they may be cusioned by a less viable supportive system.

In the case of the male natives and migrants in the RDZ, the reverse situation prevails. The natives are less unemployed in all age groups than migrants. It is possible that differential educational attainment is a major reason for the higher level of unemployment among the migrants. Since higher educational levels were observed among the migrants in the RDZ than among natives (see Table 5), this may be acting as a deterrant in taking up casual agricultural employment (or reporting such employment) as this would be considered somewhat demeaning to do so. Being in rural areas also adds to the capability of withstanding the pressure of being 'pushed' into seeking any employment since the economy, unlike in the city which is almost entirely money based, is still capable of sustaining an adult member of the family who is unemployed though at semi-subsistence levels.

Among the older ages, especially among those over 55 years, there is a marked decline in the proportions employed in UC among both male natives and migrants. Although there is a drop in the employed in the RDZ too, about three quarters of the male population are still at work while less than one half are at work in UC. The decline in the employed are compensated by the presence of almost one quarter of the old males in the category of pensioners and other income recipients reflecting the disproportionate prevelance of formalized social security benefits in the UC in comparison to the RDZ. The migrants within each area are more employed in the older ages than the natives depicting that either they are still achievement motivated and/or

(more likely) that they have to work longer to maintain themselves and their families.

The situation of the females is very much the same as that of the males with respect to employment, although, the magnitude is very much less. A notable deviation in the employment pattern of the female migrants is that among the young age group of 15--29 the migrants in the RDZ reveal lower levels of employment than their counterparts in UC. This is not because there is a higher level of unemployment (which is lower than that of the comparable female migrants in UC) but because the overwhelming majority of them are engaged in home duties. The differential between female migrants in UC and the RDZ in these age groups who are engaged in home duties is 23.2 percentage points. This perhaps reflects the relatively early age at marriage in the RDZ and the closer adherence to the traditional role of the woman as the homemaker. Perhaps it is also indicative of the relative scarcity of opportunities for the females to be engaged in gainful employment outside the home. A comparison of the female migrants and natives at each destination reveals that in both UC and the RDZ, native women are more engaged in home duties than the migrants within each age group. If the level of dissociation from home duties and being gainfully employed is a sign of 'progressiveness' among the females, then, in this limited sense the migrant females are more 'progressive' than the natives.

The student population among destination-specific age-sex groups show some element of variation. Among the 10-14 and 15-19 age groups (not in table) the native male population of both UC and the RDZ show a higher proportion of students than among the migrants. The same is true of the females in UC; but in the RDZ the migrants reveal a slightly greater proportion of students. Among both migrants and natives UC consistently reveals a higher preponderence of students in each age-sex category over the RDZ. Although these observations tend to suggest that in terms of current educational status the natives are more school-going than the migrants, the 20-24 age group (not in table) depicts that the migrants in UC are still engaged in studies in greater proportions than the natives. This is also true of the females in the dry zone but not so among the males.

FERTILITY

The reduction of fertility at the national level was of grave concern to the achievement of socio-economic development especially in the 1950s and 1960s when the conquest of malaria sent rates of natural increase soaring to the near-3 percent level.

The achievements that were gained through increased food production, redistribution of wealth to the rural areas and in general the welfare measures on education, public health and medical care were being negated by over-whelming population growth. The targets of self sufficiency in food production were pushed back, the redistributed resources in the rural areas became less significant at the per capita level and the state subsidies on food, education, medical services and transportation were strained beyond capacity. The net result was the general worsening of the living standard of the population at large due mainly to gains in natural increase.

The migrants in UC reveal the latest age at marriage within each educational category followed by the natives of UC, migrants of RDZ and lastly by the natives of the RDZ who marry earliest. The pattern is broken in the case of the most educated where the migrants in the RDZ have a slightly higher mean age at marriage (26.2 years) than the natives in UC (26 years). This is, however, the category which has the least number of cases and so entails a higher margin of probable error.

TABLE 7

Mean age at first marriage of female migrants and natives by destination and educational attainment and mean number of children ever born to ever-married females 15-49 years by destination and duration of marriage, Sri Lanka, 1971.

	Mean age at first marriage			
Educational Attainment	**Urban Migrant**	**Colombo Natives**	**Rural Dry Zone Migrants**	**Natives**
No schooling	19.7	18.3	19.1	16.7
1-5 years	20.8	18.9	19.8	17.0
6-9 years	21.7	19.9	20.8	18.2
G.C.E. (C.L.) & (A,L.)	24.1	22.4	23.4	21.3
Higher	26.9	26.2	26.0	24.9
Duration of marriage	**Mean number of children ever born**			
Less than 4 years	1.45	1.47	1.38	1.33
5-9 years	2.69	2.91	2.98	3.11
10-14 years	3.80	4.26	4.67	4.90
15-19 years	4.59	5.10	6.08	6.16
20-24 years	5.15	5.78	6.75	7.21
25 years or more	5.84	5.86	7.02	7.38
All durations	3.65	4.00	4.52	4.71

Within each group of natives or migrants in either UC or the RDZ there is a monotonic postponement in the age at marriage of the females with the graduation into higher levels of education. The proportionate difference is largest for the natives of the RDZ (49.1 percent in mean age at marriage) followed by the migrants of the RDZ (43.2 percent) when the best and the worst educated groups are compared. Since almost all births occur within wedlock and that the postponement of marriage is one of the powerful mechanisms to depress fertility, stimulation of the female population to higher levels or educational attainment may (in addition to fostering the skill levels of the population and thereby creating the pre-conditions for sustained economic development in terms of man/womanpower needs) in itself be an influential factor in achieving further reductions in fertility. If, for instance, the female natives of the RDZ can be induced to attain an education up to the 10th grade the average reduction in the exposure to childbearing would be in the region of four years, **ceteris paribus.**

A similar pattern of fertility implications is found in the lower panel of Table 7 where the mean number of children ever born to ever-married female natives and migrants in both UC and the RDZ are examined when controlled for duration of marriage. Except for the most recently married (less than five years)(all other duration-specific cohorts of women in UC, irrespective of migrant status, exhibit lower fertility than women in the RDZ All duration-specific migrant cohorts in both UC and the RDZ have lower mean fertility than their respective native counterparts, except in the case of the most recently married cohort in the RDZ who reveal a very slight reversal of the general pattern. Th fertility differential between migrants and natives is higher in UC than in the RDZ, about one third of a child on the average within the entire distribution in UC and one fifth of a child in the RDZ. The native fertility differential between the destinations is smaller (0.71 of a child on the average) than that among the migrants (0.87 of a child).

Of all ever-married women less than 50 years of age it was inquired whether or not they had a live birth within the last five years from the date of the census. Among those who answered in the affirmative, those women who had a live birth within the last 12 months were expressed as a proportion of those who had a birth during the course of the last five years. These proportions

which are closest to an age-specific fertility rate (but from within a population at 'risk' of actually having experienced a live birth within the last five years) are provided in Table 8 for migrant and native populations in UC and the RDZ. The equivalent of the 'general marital fertility rate' for females 15-49 years from this sample reveals that the migrants in UC had the lowest fertility during the year preceding the census followed by the natives of UC, the natives of the RDZ and lastly by the migrants of the RDZ.

TABLE 8

Age-specific 'marital fertility rates' of ever-married females 15-49 years by destination during 12 months preceding the census, Sri Lanka, 1971

Age group	Urban Colombo		Ruraln Dry Zone		Sri Lanka
	Migrants	Natives	Migrants	Natives	
15-19	.360	.321	.292	.247	.237
20-24	.288	.260	.326	.251	·272
25 -29	.207	.224	.263	.245	.238
30-34	.172	.150	.227	·193	.185
35-39	.087	.087	.158	.138	.134
40-44	.035	.029	.046	.060	·050
45-49	.011	·005	.010	.016	.010
All ages	.133	.141	.199	.185	.159
Age standardized for all ages	.150	.142	·187	.165	——

Since the age distribution within the ever-married female populations of destination-specific migrant types vary somewhat the age-specific fertility rates were standardized on the age distribution of the ever- married national female population as obtained from the sample (last column in Table 8). There was one noticeable change in the fertility rate when standardization was effected; the natives of UC now depicted lower fertility (0.142 versus 0.150) than the migrants. At both destinations natives now exhibited lower fertility than the migrants during the year preceding the census. This is a definite reversal of the hitherto observed pattern of fertility performance and is possibly due to the dependence on a cross-sectional measure spanning a mere year while the other measures, though cross-sectional, spanned approximately 15-20 years in arriving at their summary estimates of fertility. It is also possible that differential weightage in peak

marital duration and age-specific fertility periods in the distribution could be acting to bring about this 'different' pattern of fertility performance.

PROFILE OF MIGRANTS AND NATIVES IN URBAN COLOMBO AND THE RURAL DRY ZONE

When 'selectivity' is taken in its broader sense of the term the males were selected more strongly to UC while females were attracted more to the RDZ, although, in general, both streams displayed a predominance of masculinity, more so in UC, Dependency ratios were higher among migrants in the RDZ than in UC but in both cases it was over- whelmingly less than that of the native populations at each of the destinations.

Female migrants are more married than the male migrants in both streams due mainly to the average seniority of the males by approximately five years at the time of matrimony. Even when age 'adjusted' for the relative under-representation of children among migrants, the single males were still moderately selected to UC and more so among the migrants in the RDZ. Although the total proportions marrying above 20 years in UC among both the natives and migrants are less than in the RDZ, on a location-specific comparison the differential between the natives and migrants is much higher in the RDZ. It is plausible to surmise that the predominantly land-bound nature of livelihood of the population in the RDZ and the declining land/man ratios together with scarcity of extra-agricultural employment and most importantly, the protected tenure under which land was allenated to the colonist, disenfranchised a greater proportion of the RDZ migrant population from entry into matrimony as it undermines the possession of a sound economic base, a pre-requisite for embarking upon stable conjugal relations. The fact that the migrants in the RDZ are better educated and perhaps harbour greater levels of aspiration whose relative realization have been thwarted makes further inroads into depressing the proportions married among male migrants in the RDZ.

Among the five major ethnic groups in Sri Lanka, the Sri Lanka Tamils are the only group that is selected positively in both migrant streams, though, as was suggested, the selection in all probability was made from two strata. The greatest contrast in selectivity pattern is observed among the Kandyan Sinhalese who are over-represented in the RDZ stream but heavily under-represented inUC, a reflection of the effects of

greater deprivation inflicted upon this group during the colonial period and their minimal recovery in terms of possessing aggregate level socioeconomic development indicators. The Buddhists are attracted mostly to the RDZ while the Christians are highly selected to UC, once again a pattern that may well be mediated through ethnicity.

Migrants in the RDZ are less educated than their counterparts in UC. It appeared that with the activation of free education, the age-specific differentials in educational attainment declined over time by migrant status as well as by sex. The most interesting observation noted was the advancement of all age-specific female groups over their male counterparts from a position of great disadvantage to that of superiority in education within a matter of approximately 30 years. Some explanation of this phenomenon is advanced in terms of the operant social norms, the constriction of the economy and the adaptation to the changing environment on the part of the young females and their parents elsewhere.

Among males the levels of employment are higher in the RDZ than in UC while the proportions unemployed are greater in the latter. While migrants in UC were less employed than natives, the reverse was true in the case of the RDZ. Greater proportions were working in the older age groups in the RDZ but UC had a much reduced quantum with a substantial proportion enjoying formalized social security benefits during old age. Females, in general, were much less employed than males; the relative numbers engaged in home duties were much greater in the RDZ than in UC, natives more so than migrants.

When controlled for educational attainment, the mean age at first marriage of the females was highest among migrants in UC followed by the natives in UC, migrants and natives of the RDZ. The same rank ordering prevails when fertility levels are examined while controlling for duration of marriage. However, when age-specific marital fertility rates are examined for the one year preceding the census of 1971, standardized on the age distribution of the national ever-married female population, the natives of each destination show lower fertility than the migrants. This may, however, be due to the short-term nature of the period considered which may carry short run anomalies vis-a-vis the long term patterns.

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The Development of the Road System in Sri Lanka

P. C. H. RANASINGHE

Introduction

The transformation of the island of Sri Lanka from a series of disconnected settlements to a politically unified country with an import-export economy can be attributed to the impact of road and rail development which began with the British colonial rule. This development of road and rail was basically motivated by the desire to reach potential agricultural resources. Hence, transport development was more or less confined to the rich agricultural areas of the wet zone. The consequence was the emergence of a well-knit transport system in the wet zone, leaving the dry zone of the island on the other end of the development spectrum. These transport lines acted as a catalyst to general development and accelerated the rate of economic progress of the wet zone, thus creating an economic and social disparity between the wet zone and the dry zone.

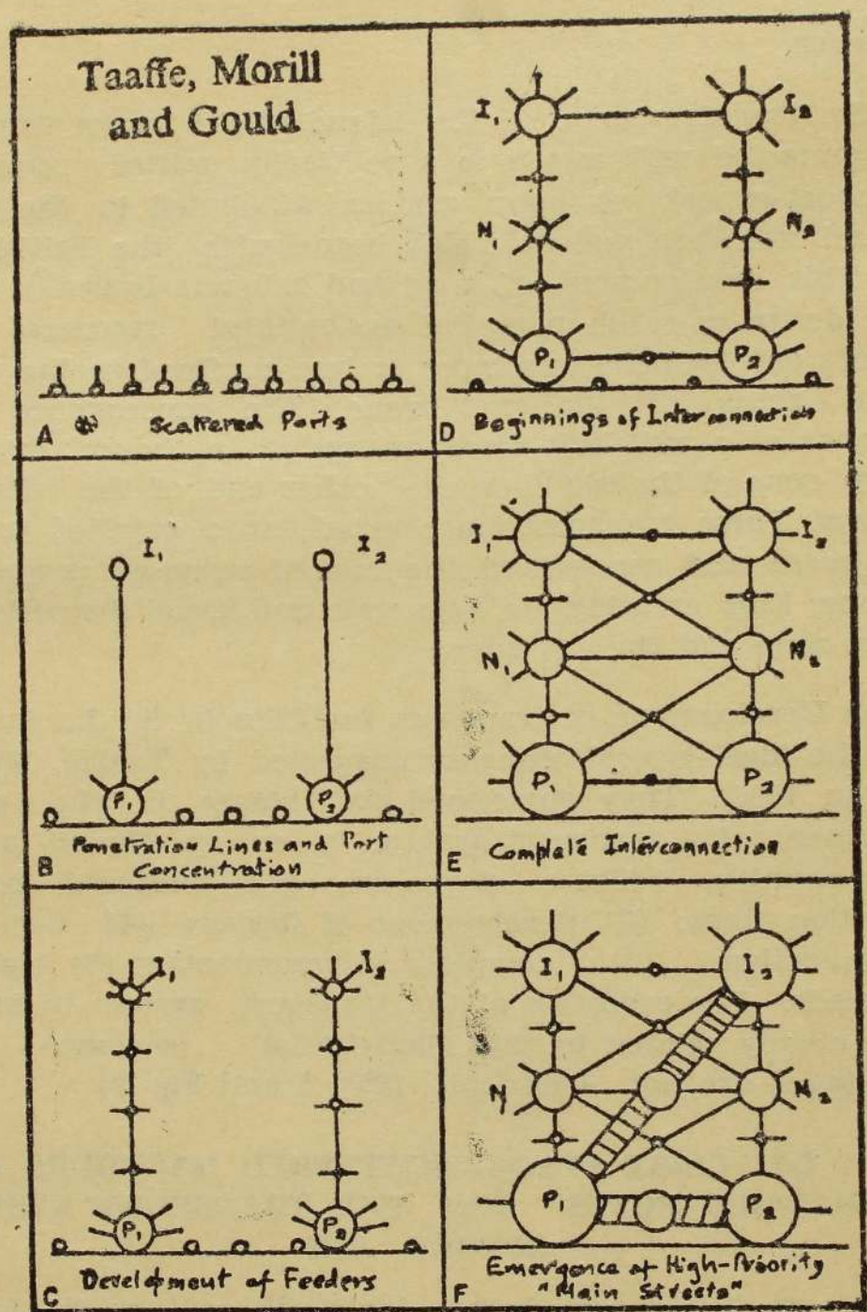
The Development of transport facilities in Sri Lanka approximates the ideal-typical sequence suggested by Taaffe, Morrill and Gould in 1963. They envisioned six stages in the sequential development of a transport system in an ex-colonial underdeveloped country. These stages are: (1) scattered ports; (2) penetration lines; (3) development of feeders (4) beginnings of interconnection (5) complete interconnection (6) high priority main roads. The evolution of the transport system in Sri Lanka can be closely related to this ideal-typical sequence although these stages are not identical. (Fig. 1 and Fig. 2)

THE FIRST STAGE—SCATTERED HARBOURS AND MILITARY POSTS AND THE TRANSPORT SYSTEM BEFORE 1820 ...

Until the beginning of the nineteenth century, Sri Lanka had a series of coastal trading harbours exporting indigenous products such as cinnamon, arecanut, coconut products, ivory, elephants, pearls and gems. The availability of these products was the only factor governing the location of these trading centres. Thus, Mannar and Point de Galle were the chief outports for ivory and elephants found in the Vanni in the north and Matara in

Figure I

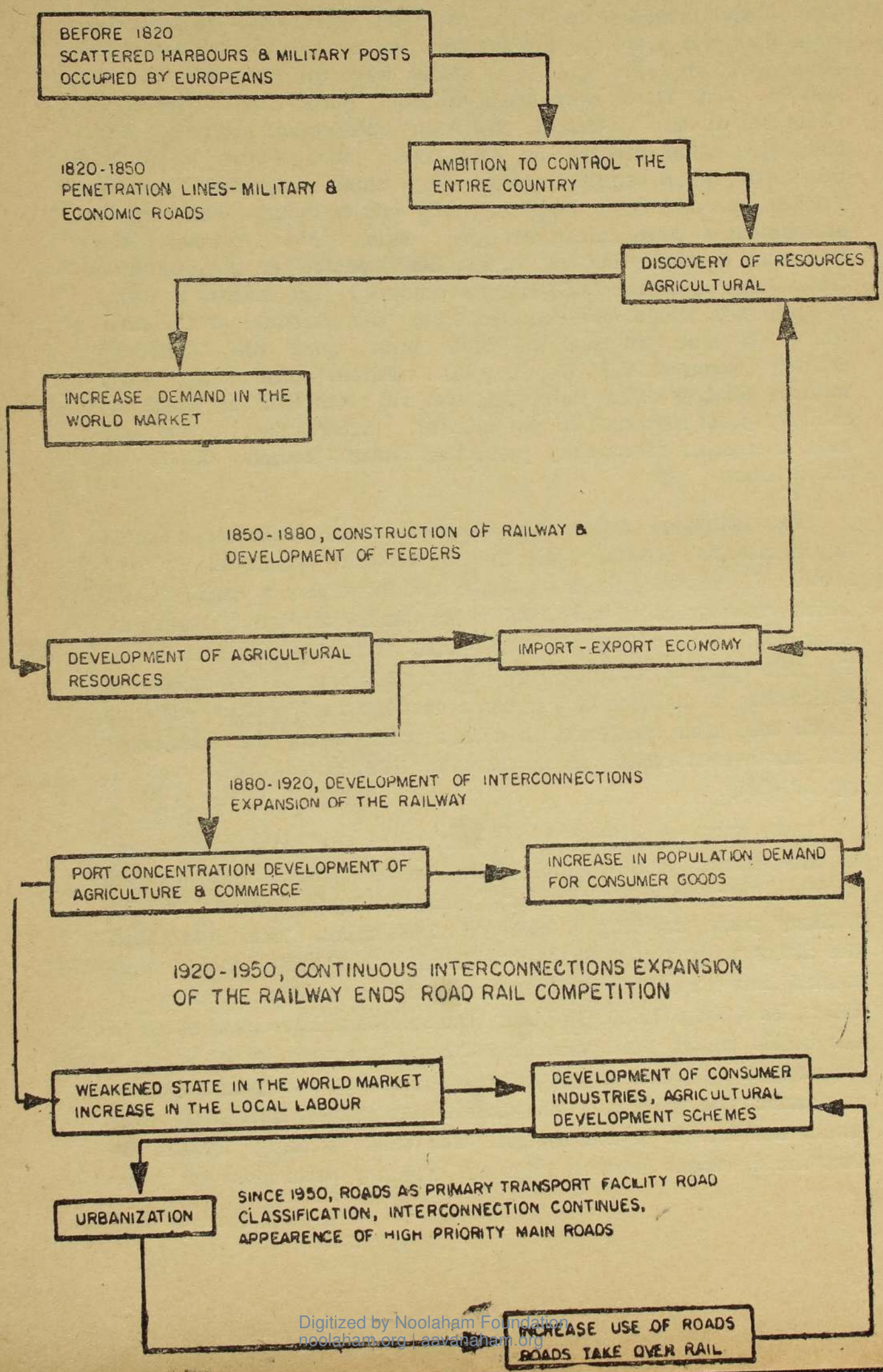
IDEAL-TYPICAL SEQUENCE OF TRANSPORT DEVELOPMENT



GEOGR. REV. OCT. 1963

FIGURE II :—

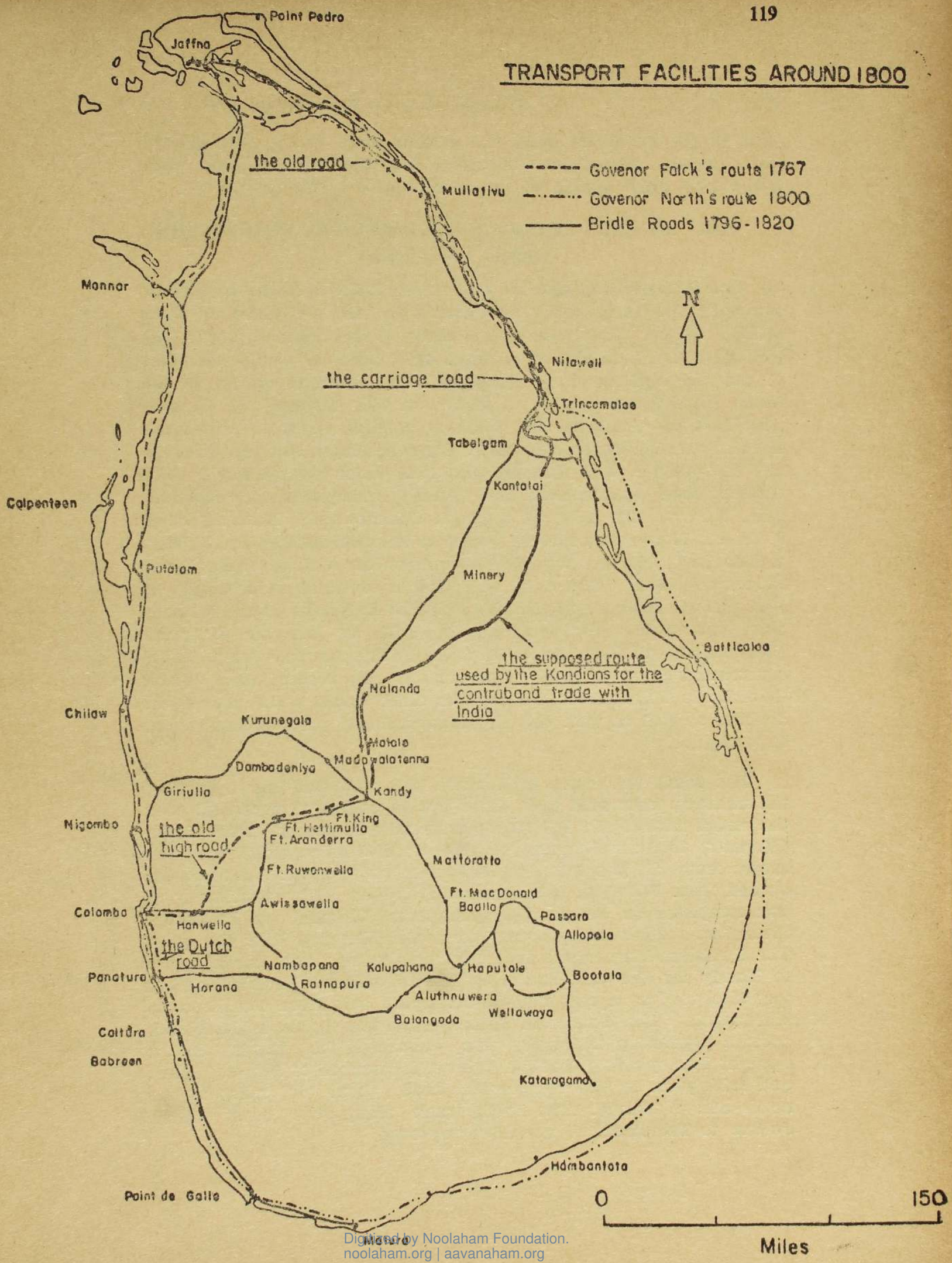
TRANSPORT NETWORK EVOLUTION IN SRI LANKA



the south respectively. Weligama and Kalutara (Caltura) were the chief harbours along the southwest coast, where coconut products, cinnamon and arecanut formed the main exports. Batticaloa (Batacolo), Mulativu and Trincomalee were the harbours in the eastern coast. There were other inferior ports too: Beruwela (Babreen) in the southwest; Negombo (Negumbo), Chilaw and Kalpitiya (Calpenteen) on the west; and Point Pedro on the north, which afforded shelter to small coasting vessels. Trincomalee and Galle were the only two harbours which could accommodate large ships (Percival, 1805, p.35). However, the European economic interest in Sri Lanka centred on the cinnamon trade. The hinterland of Colombo produced the largest quantity of cinnamon which was exported from the harbour at Colombo. Hence, Colombo had been the chief town since the sixteenth century (Tennent, 1895, Vol. 2, p.27). Furthermore, the early military strategy of the Europeans was to establish a chain of military posts scattered in the country. Accordingly, there had been a number of military posts and forts fortified chiefly in the interior.

The transport system had been formed by bridle tracks except in the narrow coastal strip in the western quadrant of the island. In the vicinity of Colombo and Negombo, a canal system which communicated with the rivers was the medium of transport. There had been a passable foot path from Colombo as far as Tangalle along the southwestern coast. Linking Trincomalee to Periaculam, a distance of 4 miles, a carriage road was in existence which had been continued as a foot path along the northeast and north-west coasts up to Colombo (Cordiner, 1807, vol. 1, pp. 283-284).

Until 1821 no records are found about the transport system in the interior of the island. The bridle path which existed between Colombo and Kandy had touched upon some of the military posts, covering a distance of 86 miles. This had been the direct route from Colombo to Kandy. The bridle track that existed between Kandy and Trincomalee, covered a distance of 128 miles (Davy, 1821). However, the reference have been made to the bridle tracks that connected the military posts in the interior. This suggests that the only tracks then existent were purpose-made to connect the military posts. There may possibly have been other tracks not known to the British. The most striking feature is that the distances between forts and military posts given are very



Source: Author's compilation from miscellaneous documents.

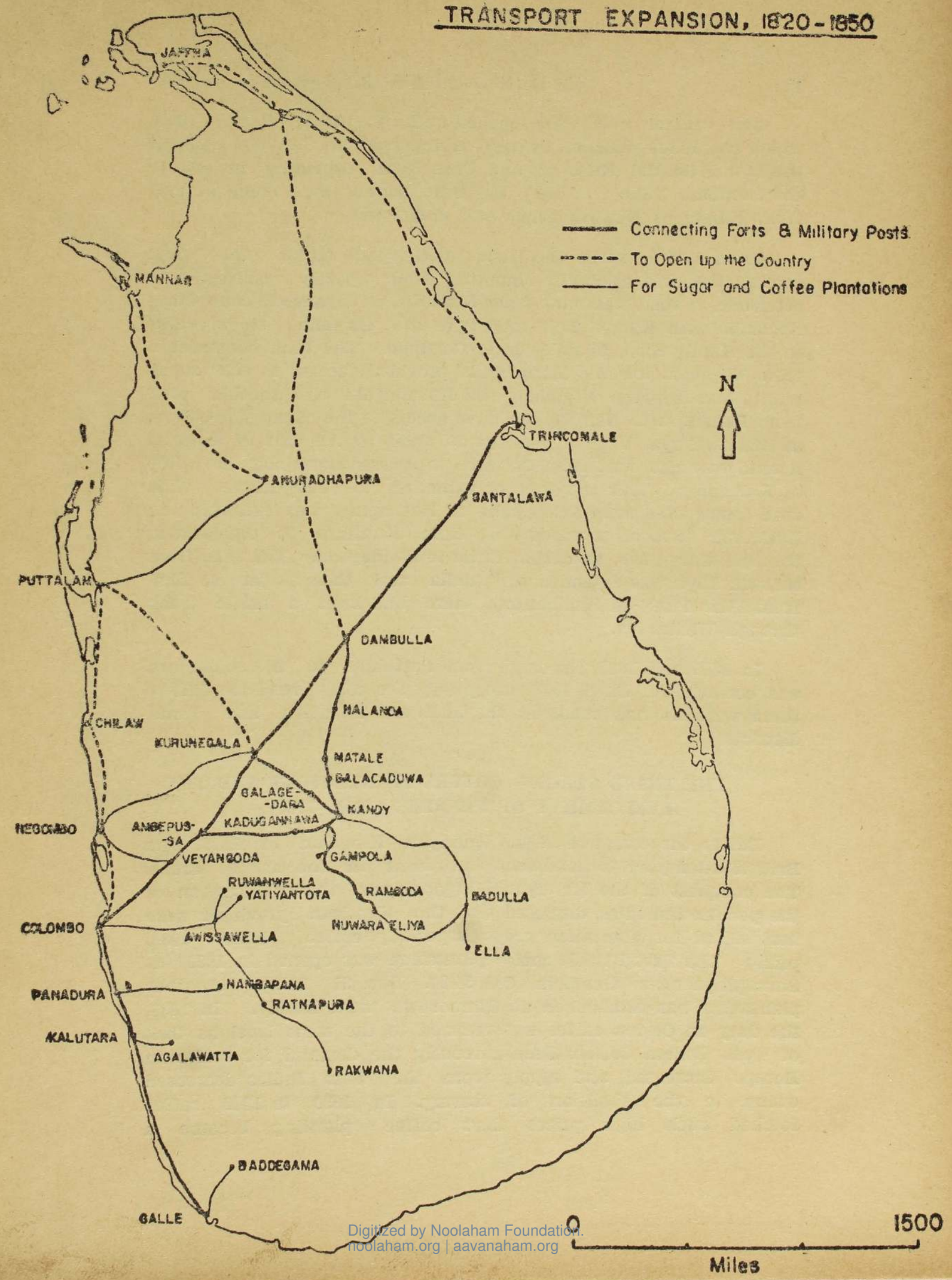
close to the distances along the present main roads between the same places. This clearly indicates that the existing main roads follow to a great extent the lines of original bridle tracks.

THE SECOND STAGE—DEVELOPMENT OF PENETRATION LINES (1820--1850)

The first military road in the island, from Colombo to Kandy, was begun in 1820, and completed with the exception of some bridges in 1825. This road took a more direct route through the Kadugannawa Pass with a distance of 72 miles as against 86 miles of the 'old high' road. Kurunegala, the principal station in the Seven Koreles, was joined to Kandy in 1821 through the Galagedera Pass to facilitate the military mobility between the Seven Korales and the Central Province. Communication between Colombo and Kurunegala was through this road which was 98 miles, until another road was built in 1825 joining Ambepussa with Kurunegala, reducing the distance between Colombo and Kurunegala to 56 miles. Kandy was further joined to interior centres like Matale, a distance of 15 miles, by the construction of a road through the Balacaduwa Pass. This road was further extended to Dambulla in 1832 through Nalanda to join the Colombo-Dambulla road. Further extensions of this road was made in 1833 as far as Kantalai (Gantalawa), the road from Kantalai to Trincomalee was probably constructed prior to 1833. This created a direct route from Colombo to Trincomalee, linking the chief town with the main harbour as well as with the important military posts of Kandy and Kurunegala.

The roads that were built since 1833, were not just to connect the military posts with each other but to gain a firm control over the entire island. In 1833, a direct road was traced from Aripo (Mannar) to Anuradhapura, a distance of 47 miles, which provided access from the coast to the Nuwarakalawiya district. A road was opened from Puttalam to Kurunegala and by 1833, another road was completed on the western coast from Colombo to Puttalam. These two roads simultaneously connected Kurunegala to the coast The Puttalam-Kurunegala road became the 'migrant coolie' route to Kandy for the coolies coming from Mannar to Puttalam and it was also used as a cart road to transport salt from Puttalam to Kurunegala. The district of Jaffna which was second in the island, both in population and trade, was connected to Kandy in a straight line, passing through the neighbourhood of Anuradhapura and falling on to the Trincomalee road about 50 miles to the north-east of Kandy. The bridle track along the coast from Jaffna to Trincomalee was also improved.

TRANSPORT EXPANSION, 1820-1850



The central hills were opened up by the Kandy-Badulla road, which was made passable through Haragama and Taldene across the Maha, Belihul, Kurundu and Uma Oyas, providing access to the Dumbara Valley. In 1937, the trace which was made in 1827 from Kandy to Nuwara Eliya, was completed.

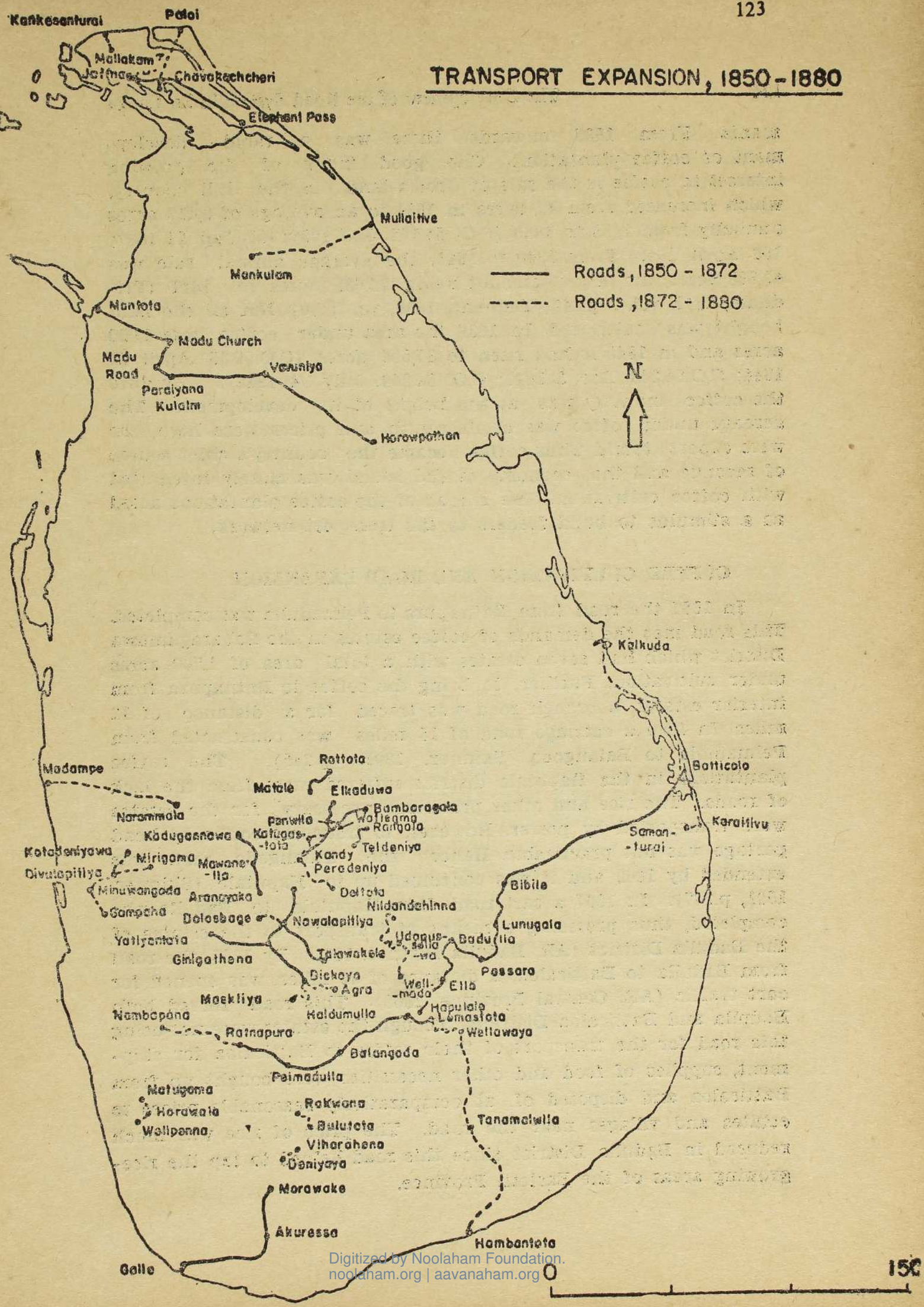
From 1836 onwards the basic motivating factor for road construction was gradually changing from purely political to economic. A road was built from Negombo to Veyangoda connecting Negombo with Kandy. This road gave the Negombo trade access to the Kandy road, 24 miles from Colombo. The road constructed from Negombo towards Kurunegala provided access to the sugar plantations between Negombo and Kurunegala and another road from Panadura to Nambapana gave access to the sugar plantations at Mahawakoya, which lay about 50 miles to the east of Horana. A road was also built from Colombo to Avissawella along the valley of Kaluganga. This was further extended to Yatiyantota. The road constructed from Avissawella to Ratnapura was extended to Rakwana. Two other roads were from Kalutara to Agalawatta through Matugama, and from Galle to Baddegama. The road from Nuwara Eliya was extended to Badulla and then as far as Ella, from Ella Pass to Hambantota there had been a bridle track through Wellawaya.

In 1846 and 1847, the road from Puttalam to Anuradhapura was constructed. Until 1848, excepting the coast road to Jaffna there were no new roads in the Mannar, Mulativu and Vanni districts.

THE THIRD STAGE— COFFEE PLANTATIONS AND THE DEVELOPMENT OF FEEDERS (1850—1880).

Before the conquest of the Kandyan Kingdom in 1815, the British attempted to establish plantations in the coastal areas. The conquest of the Kandyan Kingdom and the construction of the penetration lines, disclosed that the Kandyan provinces were best suited for plantation crops especially coffee (Mills, 1933, p.222). The first British coffee plantation was opened in 1823 at Sinnapitiya near Gampola (C.O. 54.84. Dec. 31 1823). Another plantation was established at Gannoruwa near Kandy. In 1833, the duty on Ceylon coffee was reduced to the same level as that of West Indian Coffee. Simultaneously the demand for coffee in Europe increased, and supply from the West Indies decreased owing to the abolition of slavery. In 1830 to 1840 coffee fetched such high prices that coffee planting became a

TRANSPORT EXPANSION, 1850-1880



mania. From 1835 onwards there was a rapid development of coffee plantations. One good index of the growing interest in coffee is the sale of Crown-land in the hill country, which increased from 49 acres in 1834 to an average of 6,412 acres annually from 1833 to 1838 (C.O. 54.153. Jan. 1937; 157. Jan. 21 1837; 196. April '1842). From 1840 to 1845, the average annual sale was 42,880 acres, the largest amount being 78,685 acres in 1841 (Pridham, 1840, vol. 2 p.849; Tennent, 1895, vol. p.30). Not all the land bought was cultivated. In 1836 the area under coffee was 4,000 acres and in 1845 it had risen to 37,596 acres (C.O.55.85. April 27 1844; C.O.54,240. Dec. 3 1847; C.O. 54.249. July 4 1848). By 1870 the coffee industry was at the height of its development. The acreage under coffee was at its zenith and prices were high, as were export totals. Thus coffee became the country's chief source of revenue and the economy of the island was closely integrated with coffee cultivation. The spread of the coffee plantations acted as a stimulus to build feeders to the transport network.

COFFEE CULTIVATION AND ROAD EXPANSION

In 1857 the road from Ratnapura to Pelmadulla was completed. This road met the demands of coffee estates in the Sabaragamuwa District which had seven estates with a total area of 1,700 acres under cultivation. Further, to bring the coffee to Ratnapura from interior estates, a branch road was traced for a distance of 12 miles. In 1860 a carriage road of 15 miles was constructed from Pelmadulla to Balangoda (Skinner, 1891, p.245). The coffee plantations in the Haputale district suffered most from the lack of roads. The rice and other provisions necessary for the estates were transported by porter. However, to transport coffee by head portage was not practicable. Hence the Balangoda road was extended by 1862 and it was continued up to Haputale (Skinner, 1891, p.247). In 1867 a cart road from Haputale to Badulla was completed, thus providing a means of transport to the estates of the Badulla District (AR, Badulla District, 1867). By 1868, the road from Badulla to Batticaloa, a distance of 70 miles, was opened for cart traffic (AR, Central Province, 1868). This road served both Badulla and Batticaloa Districts. Though the estates were not using this road for the transport of their coffee to Batticaloa for shipment, supplies of food and other necessities were bought up from Batticaloa and disposed of, at comparatively reasonable prices to estates and villages near the road. The price of rice was much reduced in Badulla District since this road helped to tap the rice-growing areas of the Eastern Province.

Among other coffee roads of the central hills were the roads joining Elkaduwa, Kabaragala and Bambaragala to Kandy, providing access to the Hunasgiriya and Knuckles coffee estates. Another road linking Rattota to Matale was built to cater for the needs of the coffee plantations in the Matale District, which had 44 estates with 7,933 acres under cultivation. The road from Teldeniya to Rangala provided transport to 1,915 acres of coffee estates in the Rangala District. The road from Mawenella to Aranayake, provided access to the Dolosbage coffee district, with cultivation of 10,900 acres. By 1868, this road was extended from Mawenella to Rambukkana railway station which brought the Dolosbage coffee estates within an average distance of 25 miles from the railway (AR, Kegalle District, 1868). The road from Gampola to Yatiyantota, through Ginigathena, was a very important link for coffee planters in the Central Province, as was the road from Ginigathena to Dickoya. A branch road was built from Lemastota to Haputale road in 1868, for the needs of Haputale planters.

The period between 1872 and 1879 was one of rapid expansion of branch roads. In the coffee districts, the construction of roads had been followed by the sale of Crownland and its cultivation and vice versa. The expenditure on construction of roads was shared by the planters attracted to the area. The revision of the Grant-in-Aid Ordinance (1866), and the consequent building-up of a network of estate roads were striking (C.O.55.429. June 23 1867; 530. May 7 1877). The new plantation districts of Sabaragamuwa were opened up by branch roads connecting with main roads. The road from Ratnapura to Nambapana was constructed linking the Sabaragamuwa Province with the Western Province and also acting as a feeder road to the Colombo-Kalutara railway. The road from Rakwana to Bulutota joined the Sabaragamuwa Province with the Southern Province, thus providing access to vast areas of virgin land. Roads were also constructed to provide access to Belihuloya, Nildandahinna and Uda Pussellawa, mainly to cater for planters' interests (C.O. 54.429. June 23 1873; 298. Sept. 8 1875; 453. Sept. 13 1876). The Badulla-Batticaloa road was extended to North Bay and provided transport facilities for the Uva planters.

Although the construction of roads was proportionately high in the plantation districts, roads were also built during this stage for the development of the Colony as a whole. The notable feature was the opening up of the southern and the northern districts of the island. The road from Vavuniya to Periaculam was opened in 1850 and Vavuniya was subsequently

linked to Horowpothana. These feeder roads helped the less-developed areas to communicate with the Kandy-Jaffna road, though it was only a jungle path. The great demand by coconut planters in the Jaffna District resulted in the construction of the road from Jaffna to Elephant Pass (Minutes and Speeches, 30 July 1856, p.39). The road which was originally traced in 1845 from Jaffna to Dambulla was completed in 1858 (C.O.54.316. March 14 1855). This road facilitated the transport of coconut to the oil mills at Colombo.

A road constructed from Lemastota through Wellawaya and Tanamalwila to Hambantota, provided easy access to the salt pans in the south from the Uva District (C.O.54.496. No. 62. March 2 1875). A road in Pasdun Korale, from Matugama to Welipenna, facilitated the cheap transport of plumbago to the coast road (Governors' Addresses 8 Sept. 1875 (405)). These roads mainly helped the development of the low country. Along the roads, markets and bazaars sprang up, and education and health facilities became available for the low country population. Trincomalee and Jaffna, the main settlements of the east and the north respectively, were connected to Kandy and Colombo (Governors' Addresses 8 Sept. 1875 (394); C.O.54.498. and 247. Sept. 8 1875). These roads facilitated the easy distribution of produce from the northern most section of the island to the southern areas. In the 1880s, in the northern districts, a number of roads were built joining the coast to the interior; for instance, Mankulam to Mullativu. Karavadi to Chavakachcheri, Vavuniya to Vilamkulam (Governors' Sept. 8 1875 (404) May 7, 1877 (503). These roads connecting towns with villages stimulated rural trade (C.O. 54.49. No. & 53 Feb. 15, 1884).

THE FOURTH STAGE—THE SPREAD OF NEW CROPS AND THE BEGINNING OF INTERCONNECTION TO THE NETWORK (1880-1920)

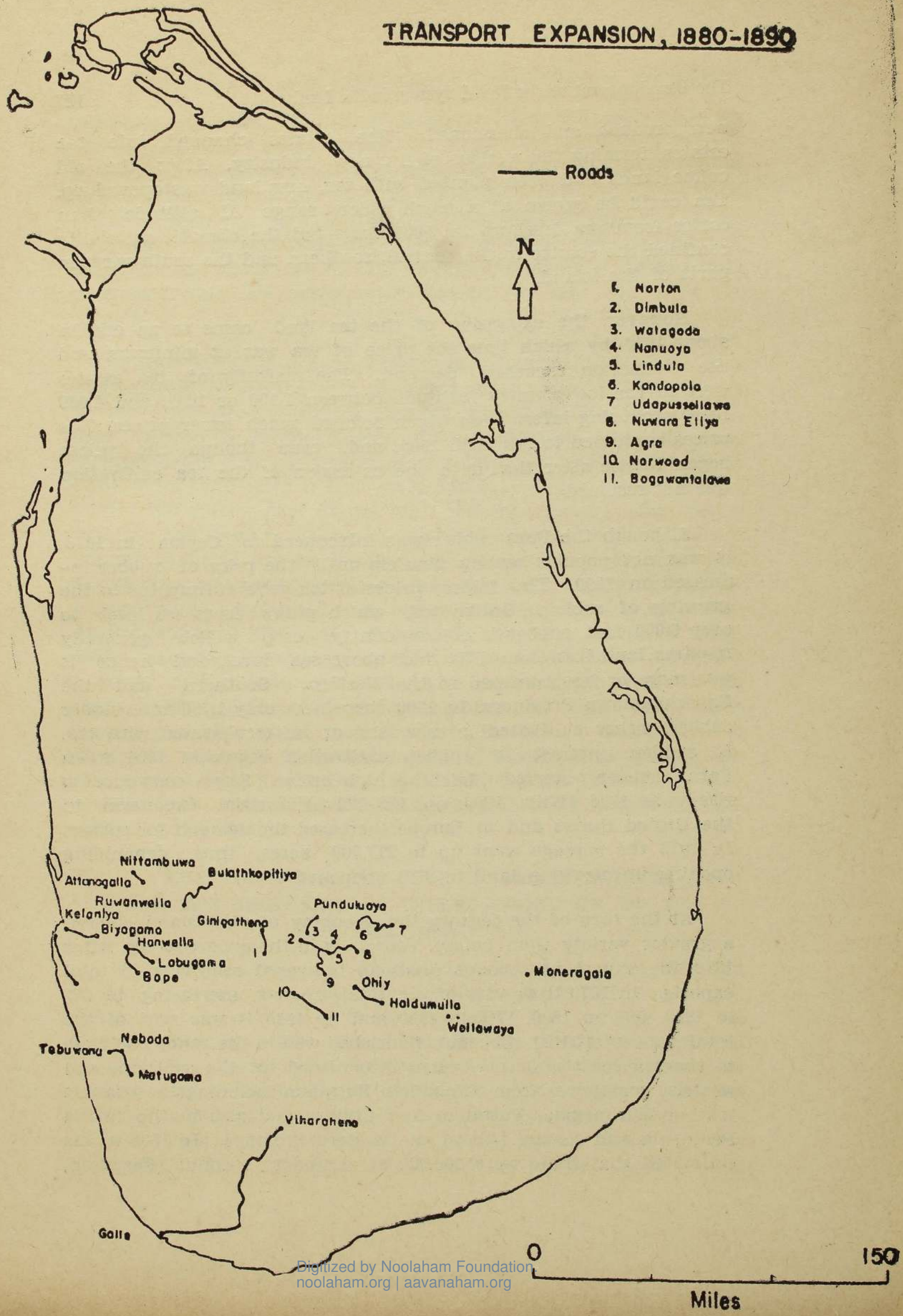
When the failure of coffee was definite and the imperfection of cinchona and cocoa as good substitutes for it had been shown, the interests were diverted to tea. By 1886 the acreage of tea exceeded that of coffee. Thereafter, the tea plantations expanded rapidly; every year some 20,000 acres were added to the plantation acreage until the beginning of the twentieth century, giving a tenfold increase in output. Tea was also a plantation crop, and hence it closely followed the pattern of the estate system already set up in Ceylon. The same land, labour and capital were used for the

new product. and abandoned coffee estates changed into tea estates, forming the nucleus of the new industry. After the old coffee lands had been planted with tea, new land was opened up. Tea could be grown at a much wider range of altitude than coffee-from sea level up to 7,000 feet—but the climatic suitability confined the estates to the central, southern and the south-western parts of the island.

However, the expansion of the tea land came to an end in about 1897, by which time the price of tea was at minimum and the production exceeded demand. The majority of tea estates were in the low-country (altitude between 1,000 or 1,200 and 4,000 feet) producing inferior tea which fetched much lower prices. The prices continued to fall until 1905, and, even though the prices began to rise after that date, the extension of the tea cultivation was not resumed.

Although the Para rubber was introduced to Ceylon in 1876, it was not popular among planters until the price of rubber increased in 1899. The falling prices of tea gave an impetus to the growing of rubber. Unlike tea, which grows from sea level to over 6,000 feet, rubber is a low-country crop which generally requires land less than 1,200 feet above sea level, and hence it was more or less confined to the Western, Southern and the Sabaragamuwa Provinces. In 1900 there were only 1,750 acres under rubber, either cultivated in new land or intercultivated with tea. A sudden interest in rubber cultivation began in 1904 when Para rubber started fetching high prices. Prices continued to rise until 1908 (Wills, 1909, pp. 123-129). Industrial expansion in the United States and in Europe increased the demand for rubber. In 1912 the acreage went up to 217,000 acres, thus. demanding opening up of virgin land in still unopened areas.

At the turn of the century the economy of the island showed a greater variety than before, especially in the export sector. After 1870 the export of coconut products increased relatively to total exports. In 1870 it was 4% of the total exports, increasing to 9% in 1880, 15% in 1890, 17% in 1900 and by 1910 it was 42% of the total exports (CBB). Coconut flourished well in the sandy soil close to the sea coast and it was mostly confined to the southern and western coastline, from Tangalleto Puttalam including the triangle joining Kurunegala, Puttalam and Chilaw, and also in the Jaffna Peninsula and coastal belt of the Eastern Province. In 1860 it was estimated that there were 200,000 acres under coconut (Ferguson,



Ceylon Directory, 1891-92, p.109-115). By 1900 the acreage had gone up to 600,000 acres of which only 10% were in the plantations while the rest were in the small-holdings. (Rajaratnam, 1961 CHJSS).

PLANTATIONS AND THE TRANSPORT NETWORK

A close relationship can be seen between the expansion of the plantation industry and the spread of the transport network. The period from 1890 till the beginning of the First World War can be considered as a period of rapid expansion of branch roads. Although the building of the branch roads was not confined to the plantation districts only, one can see a close relationship between the geographical distribution of the three major crops of tea, rubber and coconut, and the physical expansion of the transport network. Further, one can certainly deduce that the rate of expansion of the transport network was much higher in the plantation areas of the Western, Central, Southern and the Sabaragamuwa Provinces, than in the rest of the island. Moreover, the estate sector of Sri Lanka's economy, established an export-import trade, which demanded transport facilities not only in the plantation areas but in other areas as well. With the establishment of tea, rubber and coconut as the staple items in the export trade the revenue of the island increased giving room for more expenditure on welfare facilities. The spread of welfare facilities further demanded the opening up of remote areas by road and rail.

FEEDER ROADS TO THE ROAD NETWORK
TEA ROADS

During the coffee period the object of road building was mainly to get the produce of each coffee district to the port of shipment by the cheapest and the most direct routes. Roads were not planned as part of a general scheme for opening up the country. This was particularly true of the coffee roads in the Central Province. Although this feature was also visible in the roads constructed in the 1880s, they were mainly in the form of interconnections to the existing network,, demonstrating the intensive use of land in the plantation areas.

Between 1880 and 1890, Welimada was joined to Uda Pussellawa and this road was extended to Kandapola to provide access to the tea estates in the south-east section of the Nuwara Eliya District. The south-west section of the same district was provided

with a few more roads by joining Norton Bridge to Ginigathena road; extending the Dickoya road through Norwood to Bogawantalawa; joining the Dickoya road to Dimbula through Agra and Lindula; connecting Lindula with Dimbula and Nanuoya; and also linking Watagoda to Punduluoya.

Between 1890 to 1910, a greater number of roads were built in the south-eastern section of the hill country where new tea estates were opened up. The tea estates of the Badulla District were given access to the Badulla-Colombo road by feeder roads joining Taldena to Badulla; Madulsima through Passara, Namunukula and Ella to Badulla; Etampitiya to Bandarawela; Koslanda through Poonagala to Bandarawela; and Ohiya to Kalupahana. Other tea roads were the Rangala-Loolwatta road, and the Rikillagaskada-Padiyapellella Road.

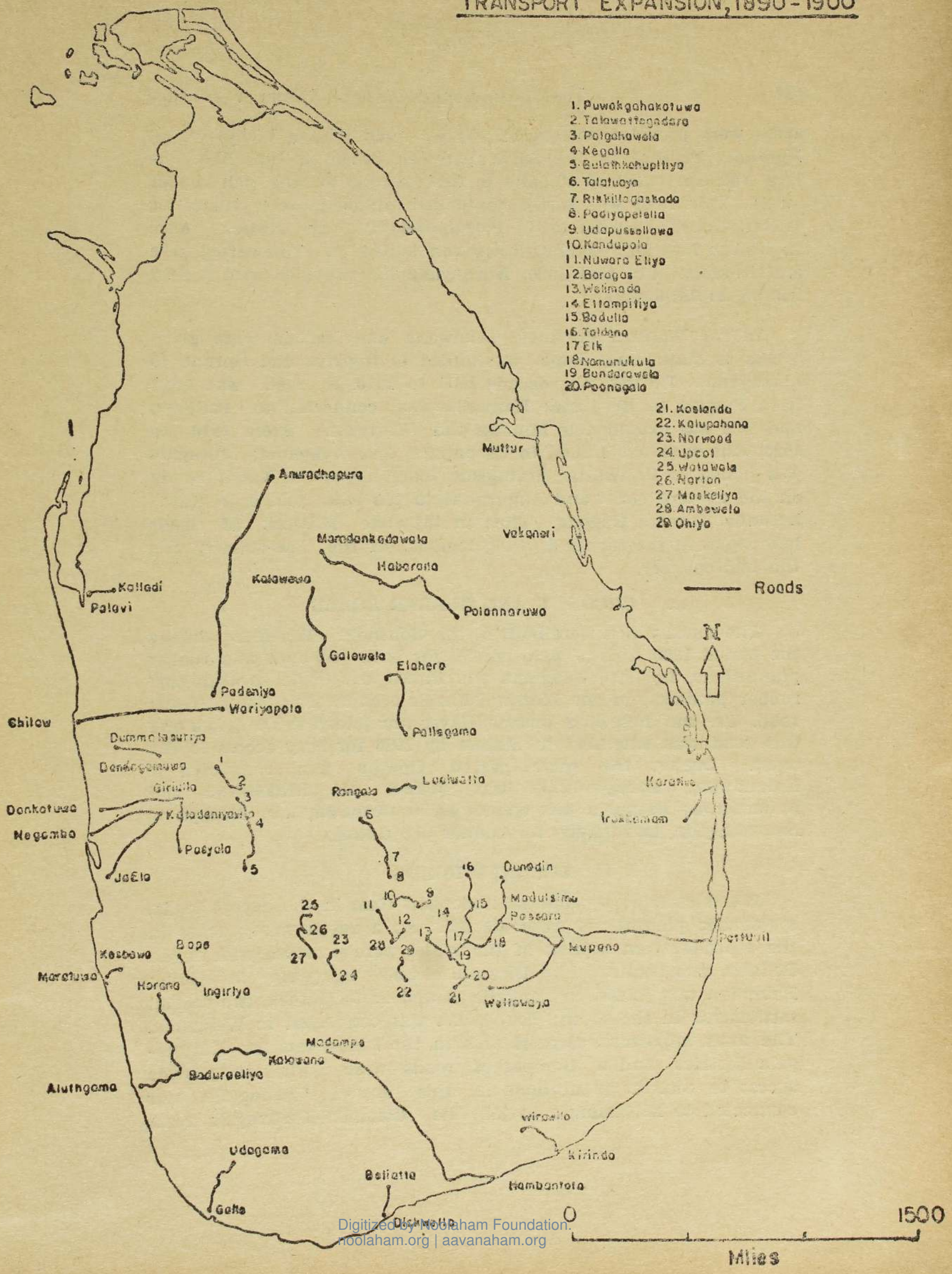
Many branch roads were built during 1900 to 1910 in the tea districts of the hill country. Remote places like Kandegedera and Dickwella were provided with roads; Dambetenna was linked to Nanuoya through Haputale, Diyatalawa and Pattipola; Brookside was jonied to Katumana; Agra to Lindula; Ramboda to Talawakele through Watagoda; Rikillagaskada to Deltota; Pupuressa to Ulapane; Gampola to Dolosbage and Madulkele to Katugastota.

Between 1910 and 1920, Balangoda was joined to Maskeliya through Pinnawela, Maratenna, Kotiyagala, Bogawantalawa and Norwood; Hatton was joined to Nawalapitiya through Kotmale; Talawakele was linked to Punduluoya through Watagoda; Pussellawa to Rangala; the Galaha road was linked to Kandy; Katumana to Mulhekele through Rangala; Rangala was also joined to Kandy through Teldeniya; Taltuoya to Galaha; and Ukuwela to Wattegama. These roads provided transport facilities for the 'high-grown' to the railway station.

RUBBER ROADS

The best physical factors for rubber cultivation were found in the Sabaragamuwa Province and in the Kalutara District where extensive land was brought under cultivation. Hence, a number of roads were built in these provinces. During the period 1880 to 1890, a few roads were constructed in the Western Province to link up the roads leading to Colombo. Biyagama and Attanagalle were joined to the Colombo-Kurunegala road; Kesbewa and Labugama to the Colombo-Ginigathena road; and Bulathkohupitiya was joined to Ruwanwella again giving access to the Colombo road. In the Western Province the Plumbago areas as well as rubber growing

TRANSPORT EXPANSION, 1890 - 1900



areas were provided with access by the road joining Welipenna to Horana. Further in the Sabaragamuwa Province, Bulathkohupitiya was connected to Kegalle to find access to the rich rubber lands. This road was further extended to Polgahawela, chiefly for the transport of rubber to the Polgahawela railway station. Also, in 1890 to 1900, Puwakgahakotuwa was joined to Talawattegedera and between 1910 and 1920, Aranayake was provided with a road leading to Rambukkana.

In the Western Province, Tebuwana and Neboda were given access to Matugama; Bope was linked to Ingiriya and Horana to Aluthgama. During the decade 1900 to 1910, a road was built from Pugoda to Kosgama; Hanwella was connected to Padukka and this was extended to Millewa and Kottawa. From 1910 to 1920, Kuruwita was linked to Ratnapura and Ayagama; Moragala was joined to Pelawatta; Matugama found access to Katukurunda on the western coast and Anguruwatota too was joined to Katukurunda through Nagoda. Thus an intricate network of roads had begun in the rubber growing regions of the low-country and the mid-country.

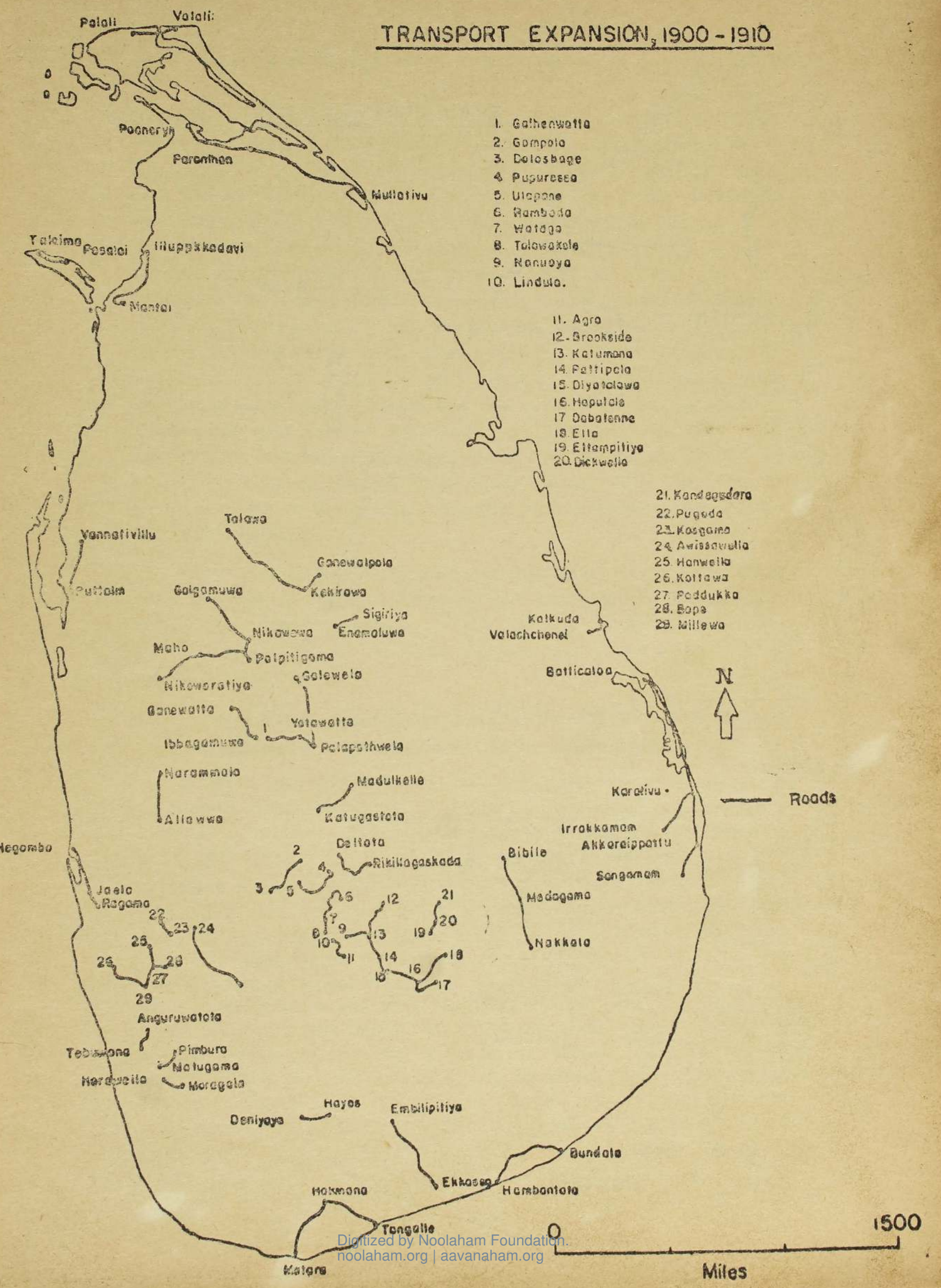
... COCONUT AND RUBBER ROADS

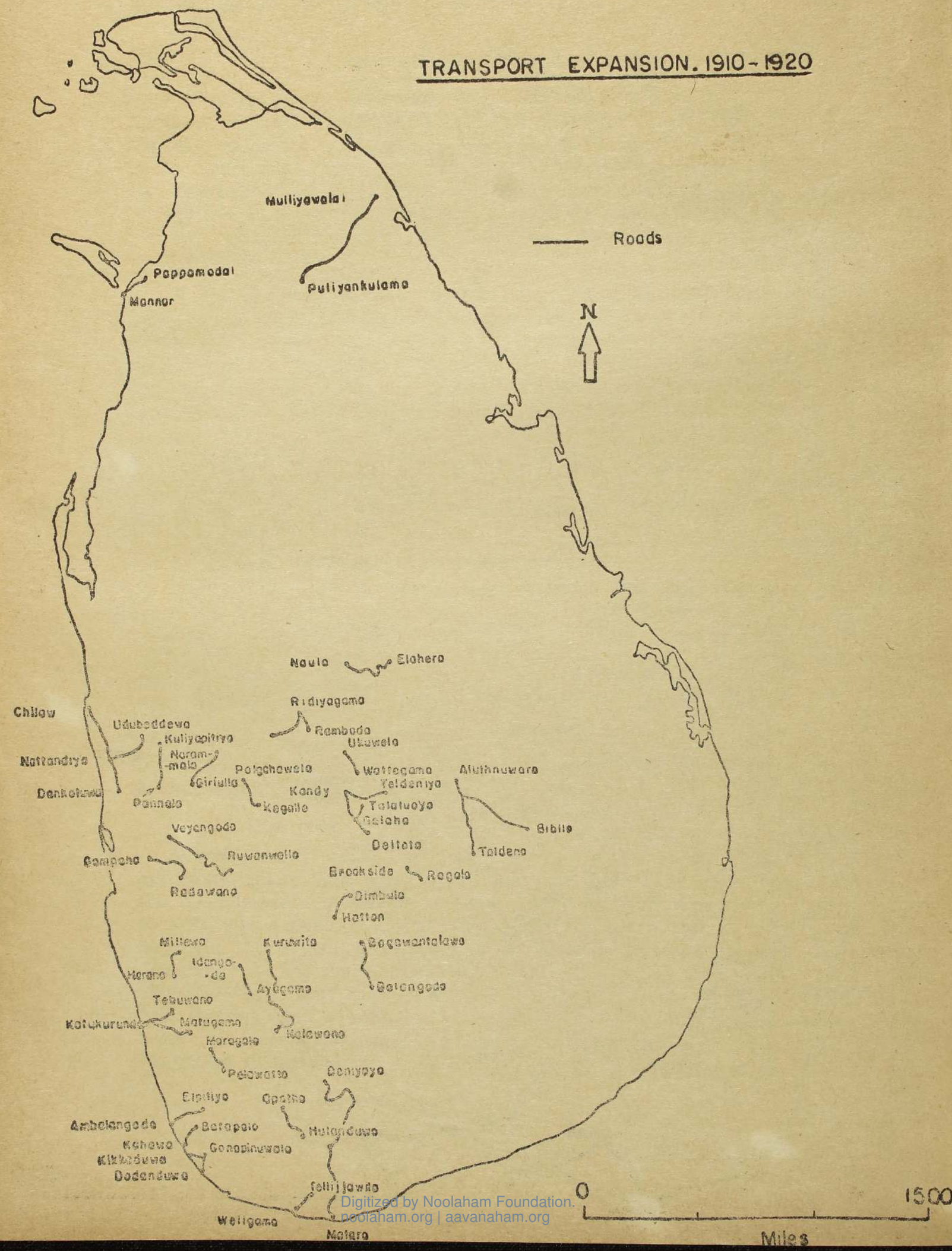
The roads which were built in the Southern Province during the period 1890 to 1920 were chiefly for both coconut and rubber plantations. In 1890, Udagama was linked to Galle to transport rubber produced in the Morawak Korale area to the Colombo-Galle road. In the following decade, Hayes was joined to Deniyaya and this road was extended to Matara by 1920 for easy access to the coast. During the same period Opatha was connected to Hulandawa; Gonapinuwala was joined to Hikkaduwa and Dodanduwa; Batapola was connected to Kahawa, and Elpitiya to Ambalangoda, exclusively for rubber plantations.

COCONUT ROADS

When coconut became an important item in the export trade, systematic plantations were started. As a result many areas in the south-western section of the island were provided with roads. Beliatta was connected to Dickwella and Udagama to Galle; Hakmana was joined to Tangalle as well as to Matara, two coastal settlements in the south; Tellijjawila was connected to Weligama. The most important coconut area in the island was the Kurunegala District and a number of roads were built to provide access to coconut plantations in this area. Attanagalle was connected to Nittambuwa to join the Colombo-Kurunegala road.

TRANSPORT EXPANSION, 1900 - 1910





Between 1890 and 1900, Pasyala was joined to Giriulla and Dankotuwa, while Ja-Ela was connected to Kotadeniyawa and Negombo. Two other roads were the Wariyapola-Chilaw road and the Kalladi-Palavi road. During 1900 to 1910, Puttalam was connected to Vannativillu and Illuppaikadavi to Mantai; and Mulativu was joined to Paranthan and Pooneryn chiefly to cater for the coconut growers. The decade 1910 to 1920 can be considered as a period in which an immense number of branch roads in the coconut regions were built. Galgamuwa was connected to Nikawewa and then to Maho and Nikeweretiya; Narammala was joined to Kuliyapitiya, Udubeddawa and Dummalasuriya; Udubeddawa was also connected to Nattandiya; Narammala was further connected to Giriulla, Pannala and Dankotuwa; and Kuliyapitiya was joined to Pannala. It can be reasonably believed that all these roads were built mainly to provide access to the coconut triangle joining Kurunegala, Puttalam and Negombo.

Another important feature during this time was the building of railway lines which necessitated the construction of approach roads and interconnections to the railway, showing the complementary growth of road and railway during this stage of road network development.

THE FIFTH STAGE—ECONOMY IN TRANSITION AND CONTINUOUS INTERCONNECTION (1920—1950)

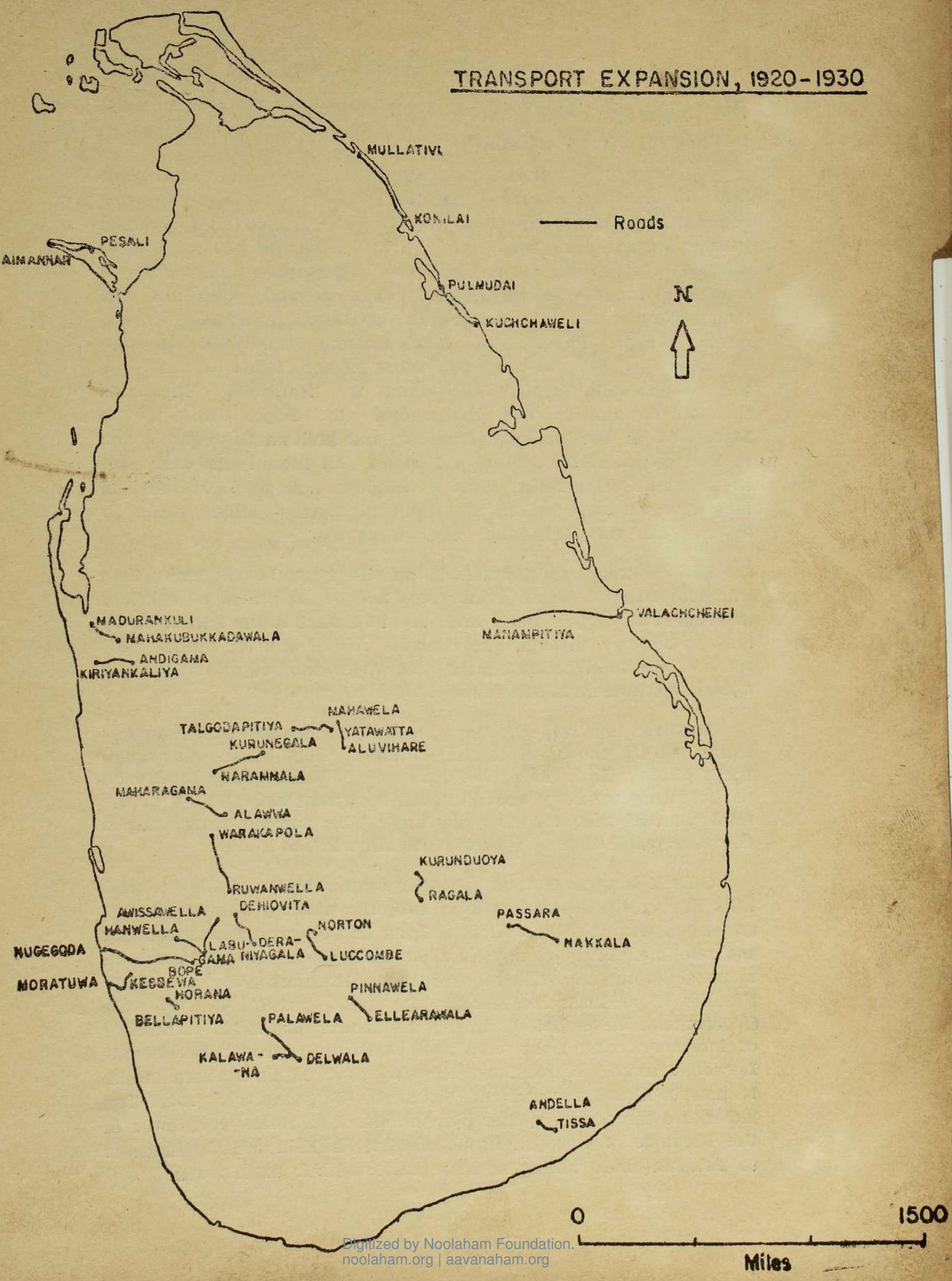
Between 1820 and 1920 each sector of the plantation industry flourished; consequently road building moved from one geographical locality to another. From the preceding anaysis it is clear that from 1820 to 1886 the coffee boom resulted in the opening up of extensive virgin land in the wet zone of the central hills. A visual comparison of the total figures of coffee exports (in hundred weights) and the sale of Crown land (in acre), between the years 1828 and 1886, suggests a certain degree of correlation. This was tested by simple linear regression. A correlation co-efficient $r = +0.63$ (significant at the 99% confidence level) with an explained variation of 40% was found. This test suggests that there is positive correlation between the sale of Crown land and coffee exports which in turn indicates that the coffee cultivation resulted in the development of virgin land, and the opening up of virgin land necessarily followed the increase in accessibility by road and rail.

From 1886 to 1913 tea growing flourished, necessitating further opening up of new lands in the central hills as well as in the mid-country by road and rail. The positive relationship between the extent of Crown land sold (in acres) and the tea acreage for the years between 1886 to 1923 is displayed by the correlation coefficient, $r = + 0.40$ (significant at the 99% confidence level). By this time since the main road network was already laid, only interconnecting links were necessary to provide accessibility to the new tea lands. Correlation of the tea acreages with the road mileages for the year between 1886 and 1923 reveals a high functional relationship through time with a correlation coefficient $r = + 0.93$ (significant at the 99% confidence level). This test gives positive evidence that road building during this time was induced by the tea plantations.

The First World War created a great demand for rubber, resulting in an upsurge in rubber planting. Hence between 1913 and 1929, a vast mileage of roads was built in the rubber growing areas of the Sabaragamuwa Province and the Kalutara District. mainly as interconnections to the existing network. After 1929 all sectors declined in response to the weakened state of the World market. The World Depression in the 1930s adversely affected the island's economy and thus the expansion of the transport system decreased in rate.

Before 1929 there were very few interrelations between the peasant sector and the plantation sector. By the 1920s the former model of the economic scene was gradually changing. The opening up of areas close to estates by road and rail helped to integrate these two sectors. The gap between the two was gradually becoming smaller, yet the spatial variation in the development of the country was still wide.

By the Second World War the entire wet zone low-country region around Colombo had been thoroughly commercialized; the traditional subsistence production had disappeared; the mobility of labour between estate and urban activities was greater, resulting in a third sector comprising industrial and urban enterprise, not directly related to the plantation agriculture (Snodgrass, 1966, p.57). Nevertheless, many parts of the dry zone were still virtually untouched.



DEVELOPMENT OF ROADS

The majority of the roads that were built during the decade 1920 to 1930 still resulted from the needs of the plantation community. During the First World War the demand for rubber in the world market was heavy. This paved the way for a large number of small-holders to enter the plantation industry. A number of roads were built in the rubber growing areas of the Sabaragamuwa Province; joining Dehiowita to Deraniyagala, Ratnapura through Palwela to Dewala, and Kalawana through Pinnawela to Ellearawala. The other rubber roads at this time were Awissawella through Labugama to Hanwella, Nugegoda through Pannipitiya and Homagama to Bope, Kesbewa to Moratuwa in the Colombo District; and Millewa through Horana to Bellapitiya in the Kalutara District. All these roads were built as interconnecting links, while a complete new road 38 miles in length was constructed in the Kalutara District joining Kalutara to Nagoda via Kalawana and Matugama.

In 1925, work was commenced on the 'High Level' road which was completed in March 1932. This new road provided a better arterial route above flood level from Colombo to the Kelani Valley and up-country through the coconut, rubber and tea lands. This route made road communication between the capital and the outside districts more satisfactory.

However, by 1934 the expansion of the rubber cultivation was controlled by the International Rubber Regulation Agreement April 7, 1934). Until the end of 1938 and between 1939 and 1940 each participating territory was allocated an extent equal to 5% of the total planted area for new planting. This automatically stopped the areal expansion of rubber cultivation in the island.

Only a limited number of roads were built in the central hills during the decade 1920 to 1930 the average annual acreage under tea was 453,000 acres and from 1933 onwards the area under tea remained fairly steady at around 550,000 acres. This was in response to the Tea Control Ordinance (Number 11 of 1933; Number 12 of 1938; Number 28 of 1949) enforced by the Government. Nevertheless, during the decade 1920 to 1930 a number of interconnecting links were built in the up-country: the Norton-Luccombe road, Kurunduoya-Ragala road, Naula-Elahera road, Mahawela-Aluvihare road and Yatawatta-Talgodapitiya road. The latter two served the rubber plantations. Two roads were built in the Province of Uva joining Passara to Nakkala and Aluthnuwere to Taldena(both acting as interconnections to main roads.

In the coconut region too a few roads were built during this decade, 1920 to 1930. These were constructed between Kurunegala and Madampe: Kiriyankali to Andigama, Madampe to Udubeddawa and Madurankuli to Mahakubukkadawela. This network further provided the accessibility to the coconut lands in the North-western Province.

The importance of the mineral sand caused the construction of roads joining Mullativu to Kokilai and Pulmodai to Kuchchaveli which provided access to the illmanite and monozite areas. Another important link in the Northern Province was between Pesali and Talaimannar providing road connection to the ferry to South India.

The road building from 1930 onwards clearly demonstrates the changing functions of the road network. Till 1930 a greater proportion of the roads were built in the wet zone of the island. In the 1930s the World Depression and the consequent falling of prices of the export crops diverted the attention from the plantation crops to the food crops. Hence land development and settlement schemes were taking shape. Thus road building was mainly to connect inaccessible food producing areas to the existing network.

In the Colombo District two roads were constructed linking Colombo to Ja-Ela and Hanwella. In the Southern Province Elpitiya was connected to Mattaka and Kotapola was linked to Mawrala through Urubokka. Two other roads were built in the Southern Province connecting very remote villages to the existing network: Tangalle to Middeniya and Yala to Palatupana.

In the Sabaragamuwa Province, Badureliya was joined to Kalawana while a road was constructed from Ratnapura to Uggakaltota passing through Gallela and Balangoda. In the transport network in the Uva District was provided with four connecting links: Bandarawela to Haliela, Kirklees to Boralanda, Nildandahinne to Uda Pussellawa and Aluthnuwera to Uraniya. All these roads were constructed to provide road accessibility to villages hitherto not provided by road, thus fulfilling an administrative necessity.

In the dry zone almost all the interconnecting links were built to provide access to the irrigation schemes. Thus, in the Matale District, Elahera was connected to Galkulama. Kurunegal-Hiripitiya

road, Mahakubbukkadawala- Andigama road, Uddappuwa-Bathuluoya road, Anuradhapura-Galkulma road, Mantota-Nanadan road anl Murukan-Silawatura road can be classed as land development roads. In the Jaffna Peninsula, Point Pedro was linked to Mulliyan and Jaffna was connected to the island of Kayts which was linked to Velani.

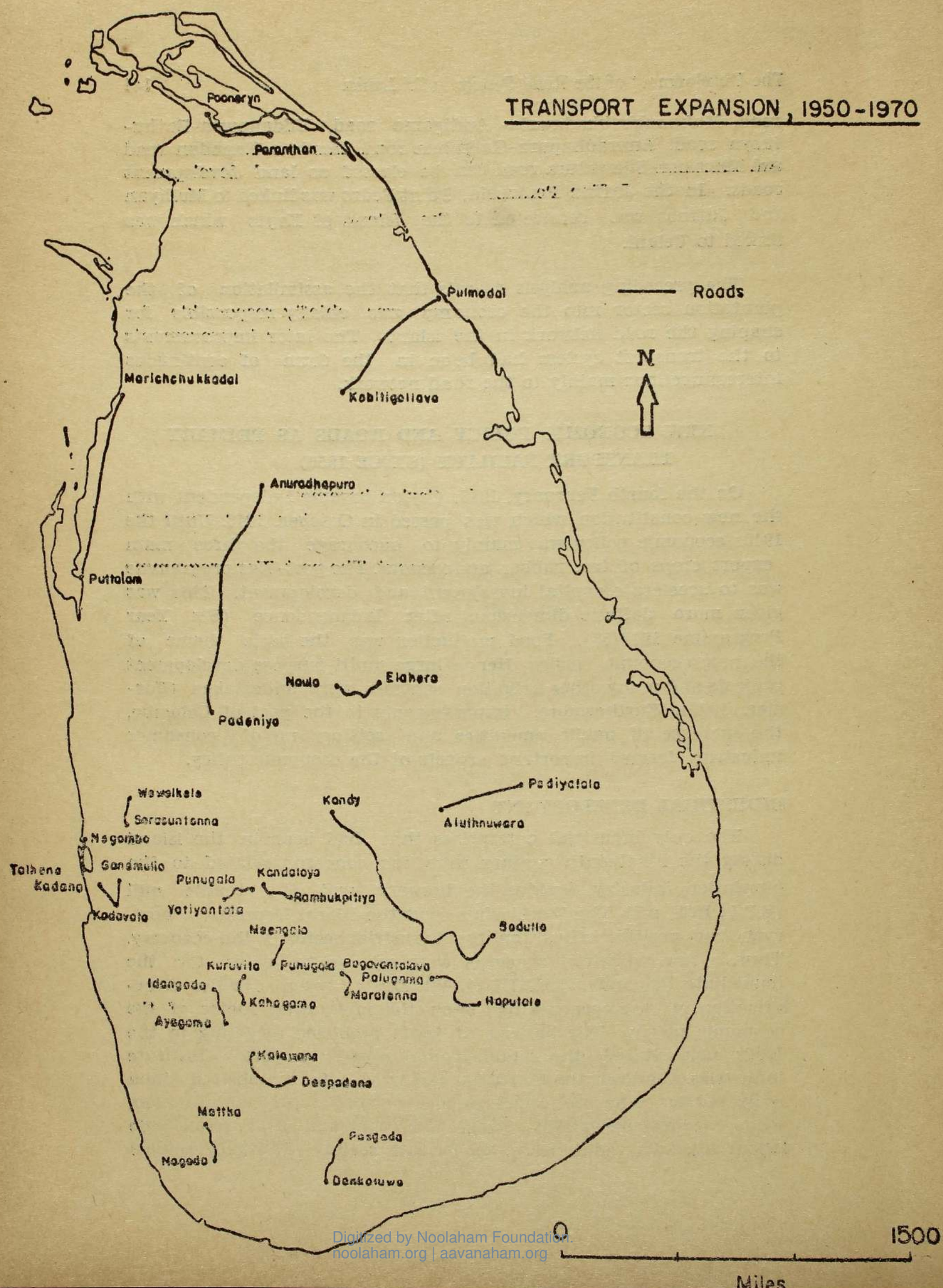
The preceding analysis reveals that the assimilation of the plantation sector into the economy was chiefly responsible for shaping the road network in the island. The later improvements to the transport system had been in the form of continuous interconnections mainly to the road network.

NEW ECONOMIC POLICY AND ROADS AS PRIMARY TRANSPORT FACILITY (SINCE 1950)

On the fourth February, 1948, Ceylon became Independent with the new constitution which was passed in October, 1948. Until the 1940s economic policy was mainly to encourage the three main export crops of tea, rubber and coconut. The post-War programme was to accelerate capital investment and development. This was given more definite dimensions after Independence (Six Year Programme 1947/53). Food production was the basic theme of the new economic policy. Hence large multi-purpose development projects and many other irrigation schemes were undertaken (Farmer, 1957). Furthermore, improvements to the port of Colombo, the increase of public amenities and setting up of consumer industries formed important aspects of the economic policy.

INDUSTRIAL DEVELOPMENT

The only industrial enterprises that had been in the island during the nineteenth century were the concerns related to the plantation industry, besides the brewery and the textile mill (S.P.I., 1922, p.7). The World Wars and the World Depression, however, had positive effects on the industrial sector of the economy. Thus, a few industrial concerns were set up to cater for the immediate demands (S.P.XIII, 1949). During recent decades diversification of the economy had been the motivating factor of the economic policy. The balance of trade problems recurring in the 1950s, necessitated the establishment of import substitute industries. However, the industrial policy was to establish medium scale public sector industries primarily for local consumption, while encouraging various cottage industries and other small-scale labour intensive industries in the private sector. The geographical



location of these industrial units shows that the establishment of these industries did not necessitate major additions to the existing network. For example 76% of the private sector industries and about 46% of the public sector industries were located in the Colombo District where both the road and rail accessibility were well provided. Hence transport was not a major concern in the location of industries.

ROAD CONSTIUCTION SINCE 1950

Road construction since 1950 did not have a particular pattern. But the most important force was political and especially parish-pump politics. Perhaps roads were built where the pressure was felt most from the local population, keeping up with the changing pattern in the road policy: (1) the construction of new roads to open up large tracks of undeveloped land for agricultural purposes, (2) the construction of roads to serve as inter-connections to minimize existing travelling distance and to fill gaps in the existing network.

In the Western Province during the twenty years, 1950 to 1970 only a very few roads were built. Bopitiya was connected to Ganemulla through Kadana. Another road was built to connect Talahena Palata to Negombo which was a fishery road. The other roads were the Wewelkele-Pannala-Serasuntenna road linking a series of villages to the existing network. The new road linking Puttalam to Marichchukkadi traversed the colonization and agricultural development schemes. With the building up of Katunayaka International airport an access road was built from Colombo-Negombo road. The building of the road skirting Oruwela iron and steel factory illustrates the changing pattern of the economic policy.

Between 1950 and 1970 in the Central Province a number of roads were built. Nagastenna--Kandaloya road was extended to Rambukpitiya and the Badulla-Nuwara Eliya road was linked to Colombo-Avissawella road. This connecting link traversed through Palugama, Boralanda and Haputale, providing access to a number of villages. Another road which was designated as 'Lower Badulla road' served as an access road to a large area in which irrigation and agricultural developments were taking place. This road was designed to form a short route from Kandy to Badulla. During the decade 1960 to 1970, Ohigantota Bogawantalawa road was built connecting Hatton to Aluthnuwera - Padiyatalawa road about 25 miles in length

providing a more expeditious route from Batticaloa to Kandy. In the Sabaragamuwa Province, a large number of roads were built to open up the virgin land; Karandana Bopekade road, Karandana-Wewila - Udagama - Bope road, Yatiparuwa-Karandana road, Kuruwita-Eratna (Kahagama) road, Ayagama-Idangoda (Kukul-korele) road, Kalawana-Deepedena road and Punugala-Meenagala road. This later road provided a connecting link between Gampola and Yatiyantota. The road built through Mawanella and Hemmathagama to Gampola connected the villages of Kegalle District with those of Kandy District, During the following decade Kegalle - Bulathkopitiya road and the access road to Polpitiya power station were built.

In the Southern Province three roads were built, namely Mattaka-Bamabrawana road, Pasgoda-Dankoluwa road and Platupana-Yala (Menikganga) road. These roads provided access to a large area which had been taken up for land development schemes. As an indication of the Government's attempt to increase the food supply a few fishery roads too were built. Chilaw-Ambakandawila is a case in point. The other roads which were built during this time were Anuradhapura-Padeniya road, Ella-Wellawaya road, Illupadichchanai road and Vettilaikerny-Trincomalee road. All these roads were to provide access to land development schemes. The reconstruction of the Paranthan Pooneryn road which connected the Kandy-Jaffna road with Jaffna-Pooneryn-Mannar road traversed rich agricultural land which hitherto had not been provided by roads.

EMERGENCE OF MAIN ROADS

The widening of roads leading from Colombo to Kandy, Galle and Negombo which started in 1921, was the first indication of the emergence of main roads. In 1927, main roads were recognized leading from Colombo to Negombo, Kandy, Awissawella and Galle. By 1935, there were about 17,000 miles of roads in the island, of which 4,509.9 miles were the responsibility of the Public Works Department (PWD). For the purpose of administration and control these 17,000 miles were classified under eight categories according to the construction and maintenance authority. In 1937, PWD roads were divided into 5 categories chiefly to guide the allocation of money for maintenance. However, this cost classification was serving only a purpose in the Government Annual Estimates and did nothing to define the functions of the roads. By 1952, a functional classification of the road system was introduced, which classified all PWD roads

into three main groups, each group being further sub-divided depending on the volumes and the nature of traffic which the roads are likely to carry. By 1955, some of the Trunk (A class) and Main (B class) roads were numbered and were referred to as 'posted' routes. There are 21 'A' class routes at present connecting all the Municipalities and major towns and 75 main roads numbered with the prefix 'B' linking additional towns to major places and to trunk routes. The minor roads are numbered by prefixes C, D, and E. However, only roads in the A and B classes can be considered as systems.

The mileage of A and B roads increased by about 21% from 1962 to 1967. This is a result of the urbanization, and the subsequent upgrading of some of the roads. However, the classification of roads suggests the increasing importance of road transport, and it also can be considered as a feature appearing in the 'take off' stage towards the maturity of a total transport system. This is noticeable when the roads have regained their former role as primary transport facility.

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ABBREVIATIONS

AR — Administration Report.

C.O. — Colonial office memoranda and drafts of dispatches from the Secretaries of State.

CBB — Ceylon Blue Book.

CGA — Ceylon Government Almanac.

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