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REPORT TO VOCA ON VISIT TO SRI LANKA
15 April - 26 April 1991
COMPETITIVE EXPORT PINEAPPLE FROM SRI LANKA
J. B. Smith, Ph. D.
AGPRO ASSOCIATES

REPORT PREPARED IN MAY 1991

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INTRODUCTION

This consultative visit arose from a request by Robert Flick of Agricultural Cooperative Development International (ACDI) of Colombo for a pineapple "guru" to assist in the further development of pineapple exports from Sri Lanka. My name came up on referral from Henry Winogrand, a former associate in the Dole companies.

Since I was to be in Hong Kong in connection with a Dole consultancy in China, I agreed to add ten days to my itinerary at no charge, on a one time basis. I was ably assisted in Sri Lanka by the staff of ACDI, to include Bob Flick, Mahinde Gunasekera, Mohamed Zuhyle and a very capable driver. I also benefitted from a very able presentation on pineapple production in Sri Lanka by Dr. Reginald St. John.

Both an itinerary and plan of work were prepared by ACDI and are included as Appendices I-II in this report. Some departures from these were necessary as time and developments required, to include for example, aerial surveillance on the morning of the 23rd and various meetings with exporters and processors. Two nights were spent "on the road" to include an overnight each in Kandy and Badulla.

A final presentation was made to government and industry parties on the 24th and a debriefing with USAID was held on the 25th. Some 150-200 were said to be in attendance at the seminar. The outline distributed at the seminar will be the guide for the remainder of this report to VOCA.

WORLD PRODUCTION AND MARKETING

PRODUCTION Only a very rough estimate of world production is possible because locally consumed pineapple, such as in Thailand, is undocumented. The best guess is that some 5 million MT (Metric Tons) will be produced in 1991 of which about 3 million will be processed. The remainder will be consumed fresh with about 200,000 MT exported. In addition Hawaii will ship some 100,000 tons internally in the USA from Hawaii to the US continent for fresh sales.

World production of canned (solid pack) pineapple for 1991 is roughly estimated at 720,000 MT of 24/2 case equivalents, mostly as rings, chunks, tidbits and crush. FCPJ (frozen concentrated pineapple juice) production for 1991 is estimated at 150,000 MT of 60 degree Brix.

MARKETS The primary markets for canned pineapple are Europe, USA and Japan. Consumption is declining in these countries, especially in the USA, and is only partially offset by demand in the newly developed countries such as Korea.

On the other hand, demand for pineapple juice, mostly as frozen concentrated pineapple juice (FCPJ), is strong with prices reaching as high as \$2500/MT for 60 degree Brix in 1990 and presently (5/15/91) at about \$2200. Reductions in sources, such as Hawaii, and rising demand in the pure juice consumer market in the USA and for second grade juice as a packing medium, are the factors behind these high prices. In my opinion we will not see less than \$1500/MT for FCPJ before 1996, if then.

The SRD group recently did an analysis of the fresh pineapple markets in Asia and Europe on behalf of the Mahaweli project and indicate some rising demand in those countries. However, it should be noted that Japan is easily served from the efficient operations in the Philippines and that Europe is marginal as to delivered quality from Sri Lanka.

SOURCES The two US companies, Dole and Del Monte, both of whom had their pineapple beginnings in Hawaii, control about 50 percent of world canned pineapple production and about 75 percent of fresh sales. Any market entry needs to be well aware of the reach of these companies, since their strategy is as global one of best source to best market. Niches not of significant interest to them represents th best opportunity for small sources such as Sri Lanka.

However, despite the dominance of these companies, independent processors in Thailand have made that country the world volume leader in canned pineapple. Thailand had the advantage of thousands of small growers already on land found unsuitable for rice culture and looking for an alternative.

EMERGING STRUCTURAL CHANGES IN PRODUCTION AND MARKETING

CANNING CAPACITY The Del Monte corporation discontinued pineapple canning in Hawaii a few years ago and Dole will close their cannery at the end of the 1992 season. Only one cannery will remain, that of a local family controlled company, Maui Pineapple. Non-competitive labor costs forced these closures.

The Philippines, now processing something over a million tons, has peaked owing to land limitations under more militant agrarian reform policies. Thailand, which exceeds Philippines slightly in tonnage, is now static or declining as a result of rising labor costs from competitive hiring into light manufacturing. Sumatra is an expanding new source, with low labor rates, but other problems may limit the expansion of canning in that country.

MARKETS Demand for canned pineapple in Europe, the USA and Japan is static or declining as a result of changing life style and a shift to convenience foods (read microwave) and fresh products on weekends. The significance of this change is that cannery capacity, which produced juice on an almost "free" by-product basis, has been reduced in response to the solids market, leading to lost capacity for juice.

Meantime demand has been rising for "pure" juices and blends, especially in the USA. In addition there is an increasing demand for second grade juice ("mill juice") to be used as a packing medium for sugar free canned fruits.

In response to market forces and declining supply the price for 60 degree FCPJ reached an unheard of high of \$2500/MT in 1990 and remains about \$2200 as of this writing.

NEW OPERATIONS Of the last four new plantations installed in the world, three have been for the fresh fruit/FCPJ combination (one each in Philippines, Dominican Republic and Costa Rica), and the fourth is being installed in Brazil as a juice only project in connection with orange processing.

LACK OF ORGANIZED EXPORT INDUSTRY IN SRI LANKA

WRONG VARIETY As a geneticist and former pineapple breeder the resolution of the variety question in Sri Lanka was of prime interest. From reports received ahead of time from UOCA I knew the major variety was called Mauritius for which purpose I traveled via Hawaii to reacquaint myself with that variety growing in the Dole variety garden. I remembered it as a one of the "Queen" group of varieties with spiny plants, slender fruit which are full yellow at maturity and excessive production of slips. This was more or less as I found it in Sri Lanka, with first sightings in fruit stalls.

The queen types are hardy and easily grown with minimum care. The fruit can be handled roughly in local trade and has low acidity, giving it a reputation for being "sweet". It has low fiber content and a very dry flesh, lending itself to table service either as salad or dessert. However, it is very poor for processing and juice yields are low. Local processors decline to process the fruit for either solids or juice. Juice yields on a weight basis were reported to be 32-34 percent, as opposed to 45-50 percent for Smooth Cayenne, the dominant variety in world trade (99 percent).

The other reported variety was "Kew", an unknown quantity in my personal world experience; however, upon encountering the first field, planted nearby by a processor (Pure Beverage, a Coca Cola bottler) I was astonished not only to recognize Smooth Cayenne but a superior clone known to us in Hawaii as Champaka, so called because of its introduction from a so named region of southern India. This clonal variety, specifically Champaka F-153, has been widely planted in Hawaii and several other countries (Dominican Republic, Philippines and Brazil).

Subsequent conversations with growers and processors indicated that the Kew variety has been grown in Sri Lanka since the early part of the century. It is my opinion that it was introduced more or less simultaneously in India and Sri Lanka about 1895, with the planting material coming from Kew Gardens in England. It is my guess that the name "Kew" was dropped in India in favor of Champaka but retained until now in Sri Lanka.

Failure to realize the full genetic potential of this variety probably resulted from the lack of a vertically integrated processing industry in Sri Lanka as has characterized most world production since the pioneering efforts of James Dole in Hawaii in the twenties.

CLIMATE Dr. Reginald St. John supplied to myself and the ACIDI office an excellent summary of the ecological aspects of present and potential pineapple production in Sri Lanka. Twenty four agro ecological zones are recognized as permutations of elevation, rainfall and soils (see map, Appendix III).

Smooth Cayenne pineapple is at its best with a diurnal flux of 18-20 degrees C. and 25-30 C., accompanied by 1000 to 1500 mm rainfall and about 2500 hours

of sunshine. One of the best growing areas in Hawaii is at Wahiawa on the island of Oahu; temperatures and rainfall are plotted against those for Katunayake (Gampaha district near airport), Kurunegala (Kurunegala district) and Badulla (Badulla district). (See Appendices IV-VI.)

In the order of acceptance the rankings would be as follows:

1. Badulla
2. Katunayake
3. Kurunegala

The high minimal temperatures at Kurunegala would result in (1) Low fruit acidity (2) excessive fruit disease (3) Poor ratoons. Katunayake would suffer less of these effects and Badulla would be almost perfect.

Whether the impact of these three regimes on Mauritius would be equivalent is not known to me but my guess is the consequences would be similar although perhaps of lesser magnitude.

SOILS Laterites (latosols) are the most popular soils in the world for Smooth Cayenne production, although not without exception (Dole grows on podzols in Thailand and Honduras, volcanic cinder in the Philippines and laterites in Hawaii). Such soils are very limited in Sri Lanka and confined to the Jaffna peninsula, currently the scene of civil unrest, and not seen by the writer. Otherwise the choice seems to be between red-brown podzols in the wetter areas and reddish-brown "earths" (clay loams) in the dry areas. Certain parts of Badulla appear to have young soils still forming from volcanic material.

None of these soils are outstanding for pineapple but appear in most instances to have adequate internal drainage, a must for pineapple, at least in the wetter zones. Most pH values seem to be in the 5.0 - 5.5 range, ideal for pineapple which prefers acidic soils, especially in reference to Phytophthora heart and root rot.

INFRASTRUCTURE The roads of Sri Lanka are deficient for transport of fresh fruit for export or raw product for processing, either by reason of design, maintenance or heavy volume. If nothing else both packing and processing facilities ought to be located within five miles of field production. Transport of boxed or processed fruit is much preferred to raw product. One of the reasons for growing Mauritius is just that; it transports with crude handling with little damage. As such it is well suited to present infrastructure and marketing techniques (roadside stands). So are coconuts.

PRESENT PRODUCTION In his report Dr. St. John includes a figure of some 3,268 hectares of pineapple in cultivation producing some 23,479 MT, about 81 percent of which is produced in Gampaha (56%) and Kurunegala (26%). Almost all this production is Mauritius intercropped with coconut. In Smooth Cayenne in Hawaii a standard measure of production is tons/acre/year (based on a 36 month cycle and two harvests); that value is presently about 23 MT for non-irrigated culture, equivalent to 57 MT per hectare.

On the same basis, for 3,268 hectares in cultivation in Sri Lanka, the tonnage would equal 186,276 or about eight times the present production; put another way, Sri Lanka has just over ten percent of the efficiency of Hawaii. Here are some of the reasons:

- (1) Farmers will seldom plant a "spiny" variety close together because of difficulties of harvesting; the penalty is on the order of 40 percent of stand in Hawaii
- (2) Intercropping with coconut reduces population by another 10-20 percent and results in inattention to pineapple production
- (3) Mauritius has only about 80% of the fruit size capacity
- (4) Mealy bugs are out of control, costing some 25% of yield
- (5) Fertilization is inadequate although recommendations are more than adequate; micronutrients (iron and zinc) are not applied for an estimated loss of 20 percent
- (6) Symphyllids may be costing another 10 percent
- (7) Nematodes may be costing still another 10 percent
- (8) Induction with carbide or NAA is only 75 percent effective as opposed to ethrel at 95 percent

Obviously all these factors are not additive, else there would be negative production! Of course limiting factor analysis is required but experience tells me that far and away the most significant is genetic (varietal); in fact I suspect that solving the other problems cannot be justified economically with Mauritius, which is the main reason the farmers are not doing it!

A nuclear farm of some 500 hectares, under private control, using modern but appropriate technology, could easily demonstrate the potential for Smooth Cayenne in Sri Lanka.

FRUIT COSTS Competitive fruit costs worldwide, in the third world, vary from \$50 to \$80 per metric ton; costs in Sri Lanka are on the order of three times this amount. In spite of this the high prices being received (\$170/MT) result in a grower return of only about \$100-150/acre year, not enough to encourage inputs of any kind. Likewise there is little incentive to expand processing or fresh fruit for export at this high cost of fruit; for that matter processors no longer wish to buy Mauritius because of its poor recovery of solids and juice.

Only a small local market, by now traditional, can support this high cost of fruit. Given a choice of Smooth Cayenne at one third the cost, I think there would be a significant shift to Smooth Cayenne.

POTENTIAL ADVANTAGES FOR SRI LANKA

Despite all the aforementioned problems, once shifted to Smooth Cayenne (Kew), Sri Lanka could well profit from the advantages listed below:

- (1) Good genetic material (Kew) is available in the country for expansion and field nursery techniques are adequate for expansion (not requiring tissue culture); at my suggestion ACDI is leading the collection of Kew crowns from processors for replanting at Mahaweli and multiplication by the "gouging technique. A multiple of 64 can

be achieved in three years, leading to some 20 million suckers for planting in 1994.

- (2) Chemicals and equipment for expansion are available in Sri Lanka or in nearby South Africa
- (3) Highly literate and able labor force is available at world competitive prices
- (4) Educated and trained agricultural managers are readily available, requiring no expatriates
- (5) An established fresh market exists in the Gulf states for Sri Lanka fruit
- (6) Processing capacity, including juice concentration, exists
- (7) Dry and reefer container service is available from two major carriers
- (8) There is good government and industry support for expansion

RECOMMENDATIONS

- (1) Encourage leadership in the private sector especially among fresh fruit shippers and processors
- (2) Encourage the combination model of fresh/FCPJ and discourage solids
- (3) Locate land for one or more nuclear farms of 500 hectare size, with gently sloping or rolling terrain, not otherwise in cultivation. Concentrate on the area of Monaragala, where promising land appears to adjoin suar plantings (pending soil analysis). This location, near main highways and close to Colombo is important for initial expansion of fresh fruit export and processing
- (4) Encourage closer, double row plantings of Mauritius, with better fertilization, mealy bug control and induction (ethrel), perhaps led by the Coconut Research Institute
- (5) Investigate dehydration of Mauritius reject fruit as substitution for wet processing; some industry efforts are already underway
- (6) Improve processing facilities for FCPJ and increase capacity as justified for Smooth Cayenne
- (7) Seek market expansion for fresh fruit in the Gulf states; prepare for Smooth Cayenne conversion on a price basis later; improve PH handling with oils and waxes to prevent endogenous brown spot
- (8) Have all government agencies enthusiastically support the new program based on Smooth Cayenne; make full use of outside funds available through ACDI and other USAID programs at Mahaweli and elsewhere

SCOPE OF WORK : DR. J.B.SMITH

Conduct a study and submit a report on the present status of the pineapple industry in Sri Lanka; potential for extensive cultivation, introduction of higher yielding varieties, quality control on production, possible improvement on the existing distribution systems etc.

1. Review the practices of the pineapple growing farmers in the coconut triangle with respect to planting density; application of fertilizer, hormones, carbides; inter-cropping with other fruits and vegetables such as banana, passion, manioc; harvesting methods, times and other cultural practices. Recommend improvements, new techniques as appropriate.
2. Recommended light intensity for viable pineapple plantation under coconut.
3. Provide information on several available options in processing of pineapple and the feasibility of such facilities to Sri Lankan conditions.
4. Review the post harvest practices such as collection, packaging, transportation from farms to the collecting centres and transportation from main collecting centres to the exporters, to the processors or to the local market. Recommend improvements, new techniques as appropriate.
5. Recommend techniques which may be adopted to obtain standard size pineapple.
6. Review the suitability of the presently grown varieties in Sri Lanka and comment on the introduction of new varieties with special reference to recommended propagation methods.
7. The present practices of packaging and transportation may damage and spoil the fruits. Review the existing methods and recommend improved methods of packaging and transportation to reduce spoilage.
8. Identify and recommend areas in Sri Lanka other than the coconut growing areas which may be suitable for pineapple production.
9. Present a comparative cost of production analysis of other pineapple producing countries with that of Sri Lanka. Recommend areas for improvement/reduction in Sri Lanka costs.
10. Export market opportunities, constraints/limitations for Sri Lankan pineapple.
11. Conduct a seminar/group discussion on April 24.

12. Provide names, addresses and contact numbers for persons, laboratories, research centers, equipment manufacturers, etc. with which ACDI and/or local pineapple industry people can establish contact.
13. Recommend additional technical studies and/or research that might be undertaken by ACDI related to pineapple production in Sri Lanka.
14. Submit a report with recommendations those could be followed by pineapple industry in general and ACDI in particular.

April 16, 1991

ITINERARY - 15TH - 26TH APRIL 1991

April 15, 1991	7.00 p.m.	Arrival at the Airport and travel to Hotel Taj Samudra
April 16, 1991	9.30 a.m.	Briefing ACDI
	2.00 p.m.	Review Reports - itinerary USAID
April 17, 1991		Field visit - Gampaha-Kaduwela, CTC Tissue Culture (Negombo).
April 18, 1991		Field visit - Makandura- Bingiriya, Kuliyaipitiya - spend a night in Negombo or proceed to Kandy.
April 19, 1991		Field visit - Kandy-(Girandurukotte)
April 20, 1991		MARD - System B
April 21, 1991		Return to Colombo
April 22, 1991		Colombo - EIED/Exporters etc. Processors
April 23, 1991		Preparation for - Colombo - Seminar - (Hotel - ACDI)
April 24, 1991		Seminar/ Group Discussion
	9.00-12.30p.m.	(Discussion - Technical)
	2.00-5.00p.m.	General
April 25, 1991		Report writing - Hotel/ACDI
April 26, 1991		Departure Thai International 1:25pm.

Agro-ecological Region Boundary

Regional Research Centre or Institute

Research Station

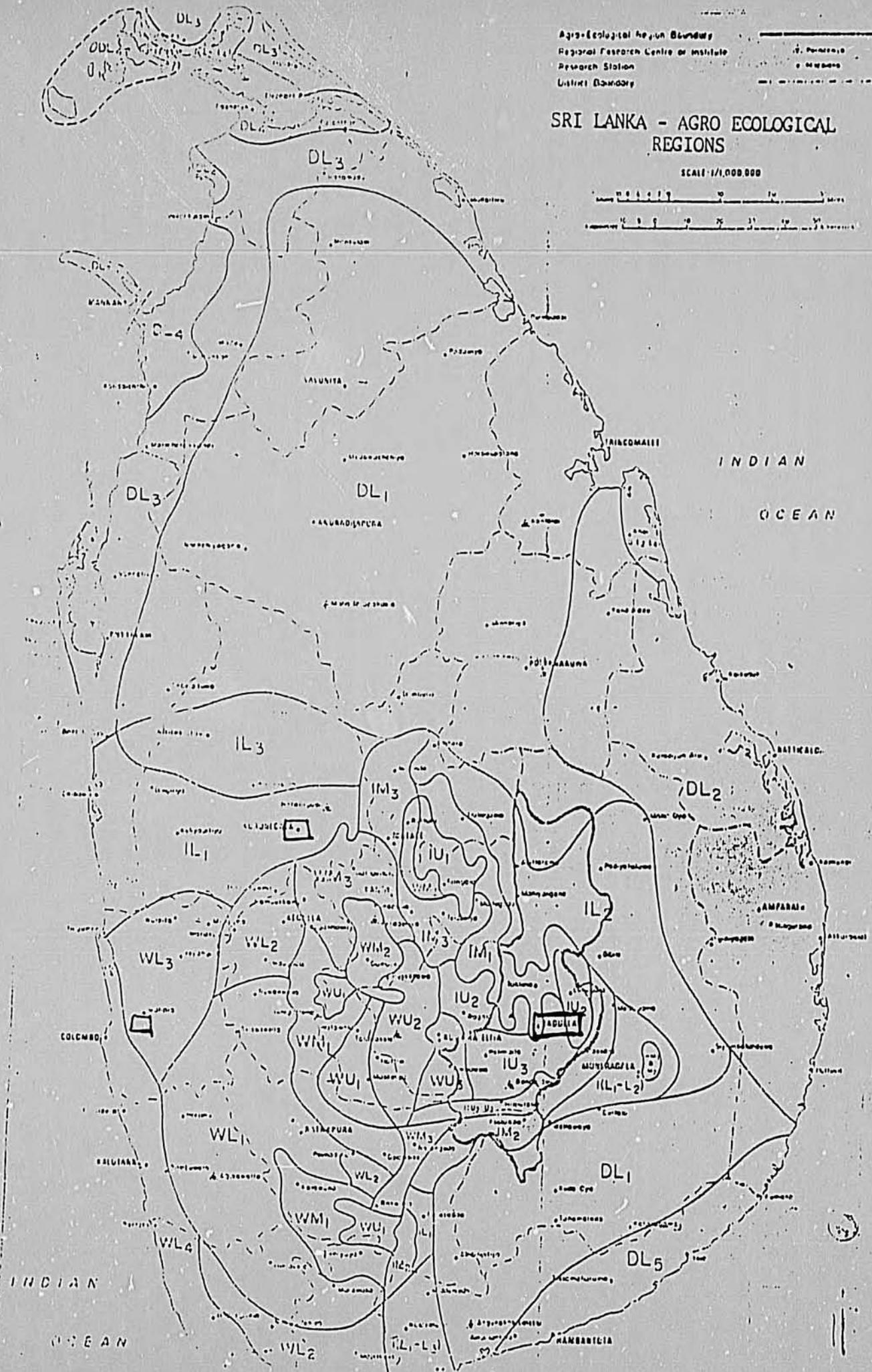
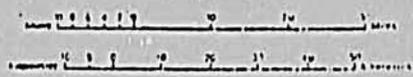
District Boundary

1. Peradeniya

2. Nuwara

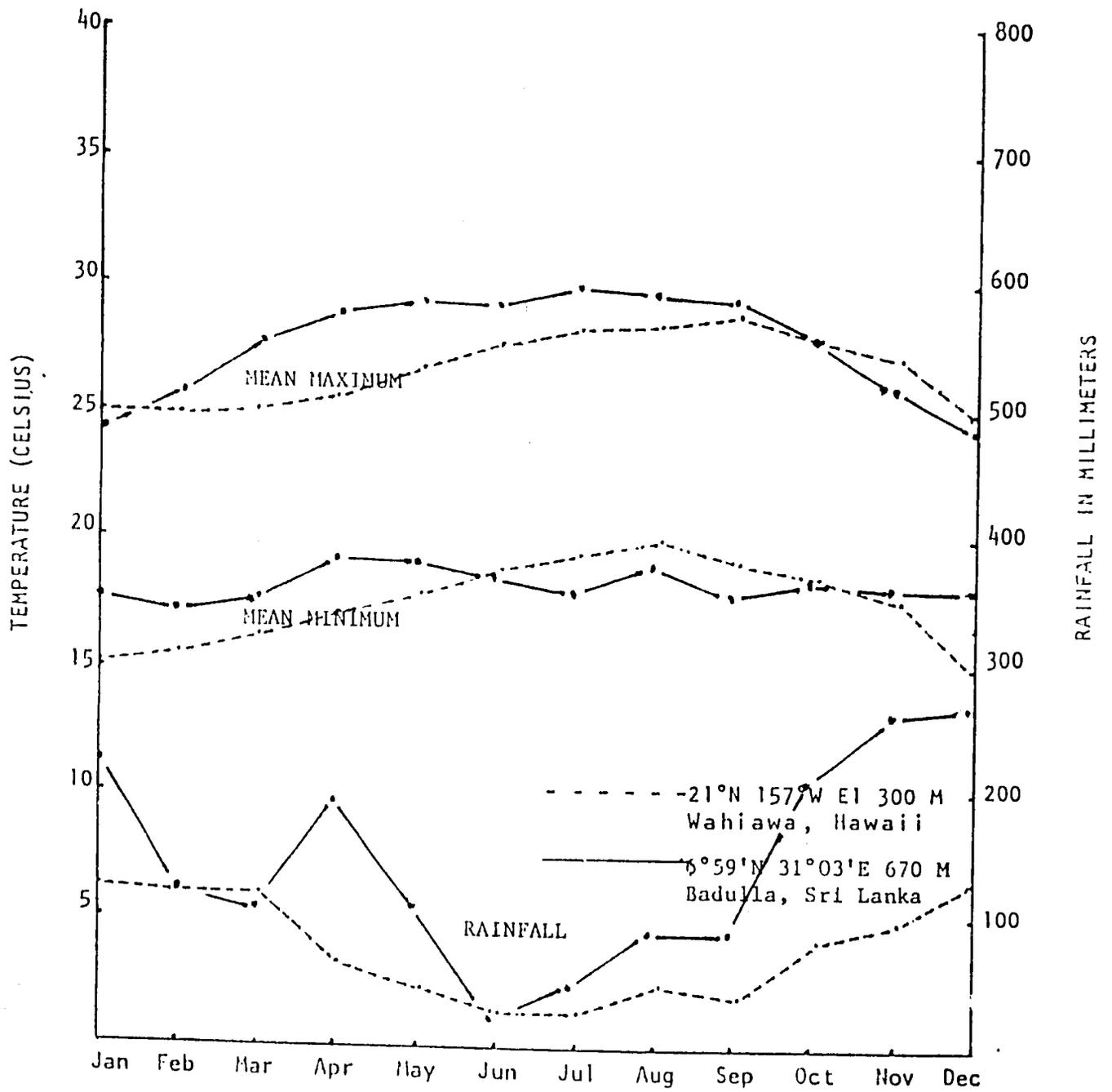
SRI LANKA - AGRO ECOLOGICAL REGIONS

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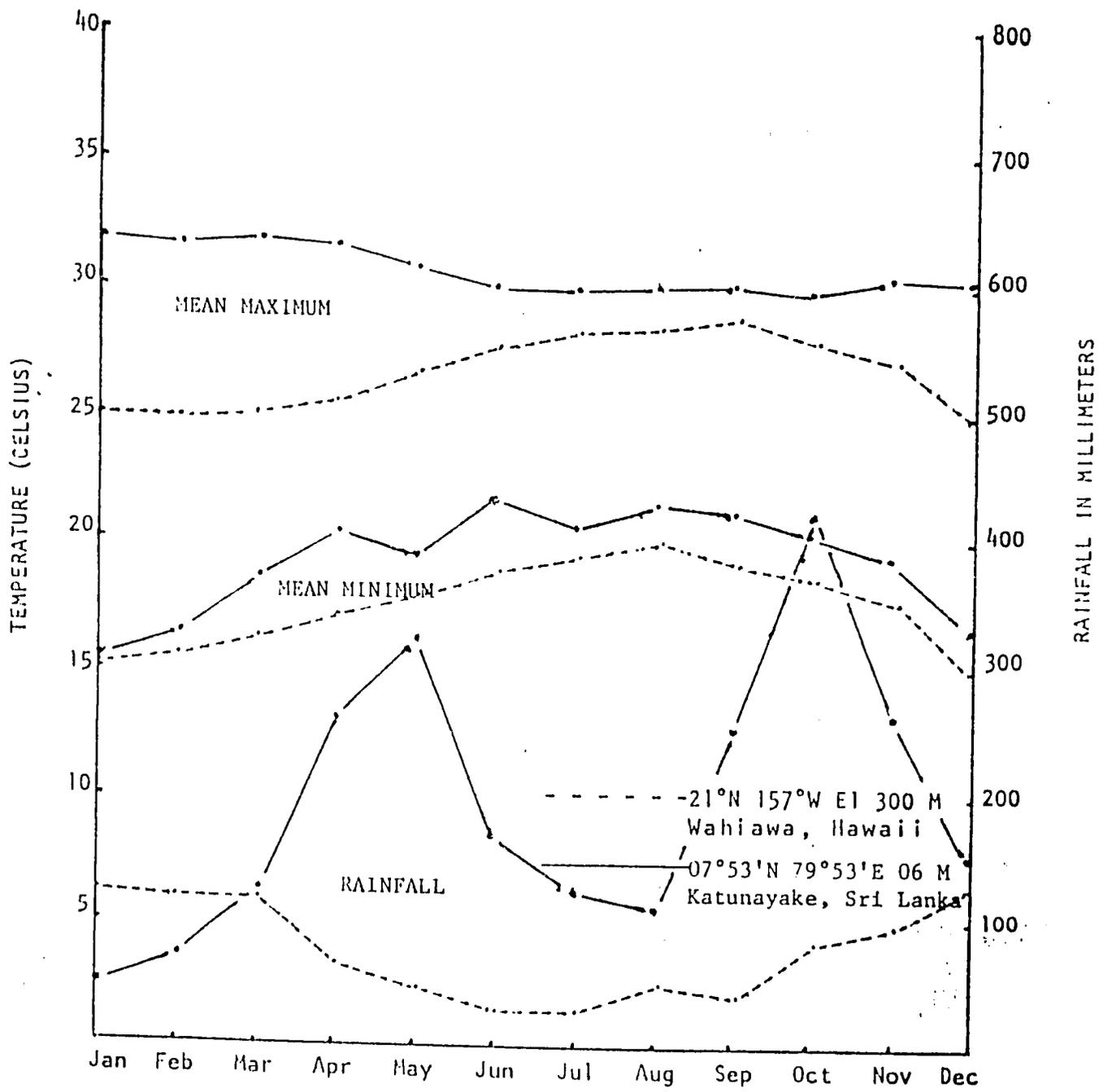
III

□ MET DATA



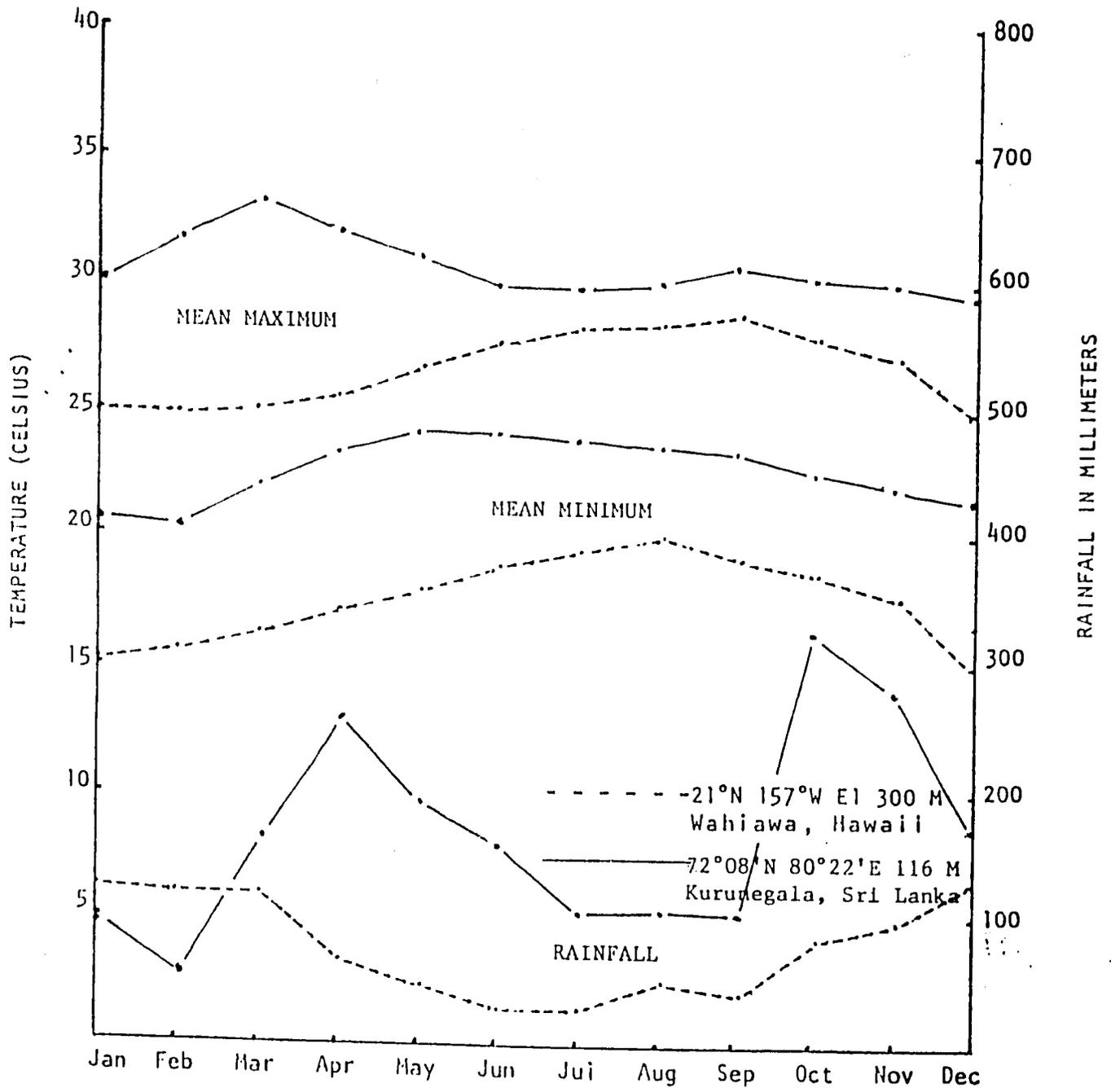
Comparative rainfall and temperatures, Wahiawa, Hawaii versus Badulla, Sri Lanka

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Comparative rainfall and temperatures, Wahiawa, Hawaii, versus Katunayake, Sri Lanka

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Comparative rainfall and temperatures, Wahiawa, Hawaii versus Kurunegala, Sr Lanka

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