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PROCESSING OF MEDICINAL PLANTS CULTIVATED
AND COLLECTED IN NEPAL

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NEPAL

Technical report: Conclusions and recommendations*

Prepared for the Government of Nepal
by the United Nations Industrial Development Organization,
*acting as executing agency for the United Nations Development Programme

Based on the work of Walter J. De Boeck, consultant in
cost-benefit analysis and market research

United Nations Industrial Development Organization
Vienna

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ABSTRACT

The report reflects the cost-benefit analysis undertaken by the consultant for the cultivation and collection of various medicinal and aromatic plants taken up in the production programme of the Herbs Production and Processing Company Ltd, a public company set up by the Nepalese government to commercially develop the country's potential in this field. Recommendations are provided to enhance the profitability of this venture.

In order to streamline the internal planning and management of the company, a practical management information system was developed.

Market research was undertaken in Nepal, Thailand and Western Europe, to investigate the market potential of the products taken up in the production programme, and to offer advice on how to approach potential customers.

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I. SUMMARY

After the completion of a three month assignment for the project in Nepal, which focussed primarily on cost-benefit analysis (1), it was decided useful to take a closer look at the market potential for herbal extracts, since it was in this field that the HPPCL encounters most difficulties in selling its products.

About 20 firms offering some scope for a market outlet were visited, in order to arrive at a general (although not comprehensive) picture of the market structure for herbal extracts in Western Europe. From this, we tried to derive some conclusions about the real market potential, and the ways to approach this market.

In addition, reaction of potential buyers is also given on a product-by-product basis.

(1) See report dated 25 April 1986

II. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

1. As opposed to essential oils, developing countries have not been able to penetrate the European market with herbal extracts, and this for several reasons:

i. The importance of botanicals in registered drugs is steadily declining in Europe, because of:

- the fact that the European legislation for accepting new drugs has become more and more strict over the years, and it is especially difficult to have new drugs registered that contain natural ingredients, mainly because of problems of standardization.
- the continuing search for finding synthetic alternatives for natural products, since the former often have clear advantages for the drug manufacturing companies in terms of standardization, reliability and cost of supply.

Since the market is not expanding, alternative sources of supply are seldom sought after.

ii. The European, and even the world market for herbal extracts has an oligopolistic nature: a few companies (one or two in each country) operate in this field, and moreover competition is restricted because of co-operation between some of these firms. It is difficult for a company from a third world country to obtain a place in this market.

iii. European extraction companies have not much interest in offering some room for herbal extracts from developing countries, because:

- it may result in under-utilization of their own production capacity.

- product specifications given by clients are such that the general information as found in pharmacopoeas is insufficient to manufacture an acceptable product. Frequent and close contact between manufacturer and client is often necessary, and this is impossible with a company in a developing country.
 - European legislation is also paying attention to standards for herbicide, pesticide and increasingly basic metal content in botanicals. Developing countries often do not have the required analytical set-up to deliver these data on a regular basis. Especially with products from India, manufacturers claimed that crude botanicals often contain unacceptable levels of pesticides and herbicides.
 - For most products, extraction companies have cheap sources of supply for the required raw materials. Nepal has an extra disadvantage because of its land-locked position, and therefore cumbersome and expensive transport of the raw material. It was found that CIF Hamburg prices of botanicals that could be supplied from Nepal, are often as low as the ex-factory price of the Herbs Production and Processing Company Ltd (HPPCL). This was the case for e.g. Valeriana Wallichii, Rauwolfia Serpentina and Atropa Belladonna.
2. Besides the use of botanicals and herbal extracts in registered drugs, there is an expanding demand for these products in cosmetics and so-called "alternative" products like herbal teas, capsules etc... that are sold in "health shops", reform and dietary food shops, and since a few years also in department stores. These products are governed by the food laws, that are less strict than the regulation for pharmaceuticals. Moreover, developments in this sector go so fast that governments are unable to closely scrutinize every new product entering the market. There may be a chance for Himalayan herbal products entering the market, if this is done in a proper manner (see recommendations).

B. RECOMMENDATIONS:

1. There appears to be only minimal scope for Nepalese producers to enter the market for extracts used in the pharmaceutical industry, for the reasons given above. Only a well-conceived and well-implemented programme to produce a variety of high quality extracts on a joint venture basis with user companies in Europe, would have a chance of succes.
2. Much more scope exists in developing a product-line based on Himalayan herbs, for the so-called alternative sector. Here also it is required to produce high quality products, It is deemed necessary that this is done in co-operation with a European firm that is well established in this sector, and that can take the responsibility for product-choice, packaging and marketing.
3. For some products (like Diosgenine, Xanthotoxin, Rauwolfia serpentine roots), there is a possibility for selling these products through European companies trading in these. Some of these companies are given in the Annex. In this case it is required that the HPPCL develops a regular competitive (both price and quality wise) production, and that a sales representative is appointed in Europe to find and maintain contact with customers.
4. Regional markets may offer greater possibilities for selling HPPCL herbal extracts, because they still rely more on drugs from botanical origin, and because herbal extracts are mostly imported from the west, rather than produced in the country itself.

III. PRODUCT - WISE CONCLUSIONS AND RECOMMENDATIONS:

A. Atropo Belladonna

The importance of this herb is becoming less in western medicine, since an increasing number of the drugs derived from it have been synthesized (1). Nevertheless, there is still a demand for the herb as such, as well for its extract. Dried belladonna herb of standard quality at present has a price of approximately 3 DM per kg, CIF Hamburg. The source of supply is Eastern Europe, and there is no scarcity of the product. It is very important that a supplier determines the alkaloid content of a particular lot, since this is the main element that will determine the price.

A Belgian company, CONFORMA NV, showed an interest in a 3% soft extract as produced by the HPPCL. Meanwhile however, Conforma informed that solubility of the soft extract was too low according to the European pharmacopoea, and as such unacceptable at present.

In Thailand, the "Government Pharmaceutical Organization", a public company requires about 1,900 litres of belladonna tincture (B.P.) per year, which is the equivalent of about 400 kg of soft extract, as produced by the HPPCL. At present, the Thai company utilizes an extract from William Ransom & Son Ltd (U.K.), a company that produces a highly concentrated extract.

B. Diosgenin

A visit was paid to Andard Mount, the company with which the HPPCL has a joint venture agreement for the production of diosgenin. It was clear from the discussion that, although the agreement has not materialized so far, Andard Mount is still very much interested in it, and is willing to assist in technology problems encountered by the HPPCL. It is therefore imperative that production is taken up as soon as possible.

Other companies that showed an interest in purchasing diosgenin are Globe Pharmaceuticals in Hamburg and Wynmouth Lehr in England.

(1) See ITC UNCTAD/GATT, Markets for selected medicinal plants and their derivatives, Geneva 1982, p. 86

C. Swertia Chirata

Recently an increased demand for Swertia Chirata herb has been noticed. Most probably, the product has been discovered by the beverage industry as an alternative bitter product.

This increased demand was confirmed by herb traders in Hamburg. One trade source informed that the prevailing CIF price for whole Swertia Chirata herb was 5 DM/kg. The product was sold on to extraction companies in ton lots.

Given the low price of the raw material and the obvious demand for the product, it could be very interesting to produce an extract as required by the beverage industry. Given the technical and marketing difficulties involved in this, it would be advisable to either work together with an extraction company (like Plantextrakt) or a company trading with the beverage industry (like Brenntag UK) for developing such a product. Both companies promised they would check out the potential for such a venture.

D. Rhubarb root:

None of the companies visited showed an interest in a total extract of Rhubarb.

As far as the root is concerned, the People's Republic of China seems to have a very strong position for this product, offering about 20 different qualities of Rhubarb root. The Government's "Pharmaceutical Organization" in Thailand buys Rhubarb root from China for manufacturing Rhubarb tincture.

E. Rauwolfia Serpentina:

This is another natural product that has decreased in importance due to the development of synthetic alternatives.

Only one company showed an interest in it: Boehringer Mannheim in the Federal Republic of Germany. The company however has no interest in purchasing a total extract, since they use Rauwolfia root powder in the preparation they manufacture. Rauwolfia from different sources is mixed to arrive at a product of standard quality, mainly for sale in the U.S. market. Yearly Boehringer Mannheim requires about 10 tons of Rauwolfia roots.

F. Valeriana wallichii and officinalis:

For pharmaceutical Valerian preparations in Europe, Valeriana officinalis, or European Valerian, is required in practically all cases. For export to third countries, Valeriana Wallichii is sometimes used, because it is clearly cheaper.

Recently however, the prospects for non-European Valerian for pharmaceutical use have even become more bleak, because of suspected carcinogenicity of valepotriates. Mexican Valerian has the highest contents of valepotriates, followed by Valeriana Wallichii. Valeriana officinalis only contains a small percentage of valepotriates (less than 0.5%), and these can be destroyed in the extraction process. At present it is required in Germany that it can be shown by analysis that Valerian extract does not contain valepotriates.

Valeriana wallichii roots only fetch a low price in Europe.

CIF Hamburg prices are only around 1 US-dollar per kg at present.

G. Xanthotoxin:

Globe Pharmaceuticals in Hamburg buys about 10 kg per year of this product from India. The product is then sold on to Mexico. There are some doubts however that Xanthotoxin might provoke health hazards, and as such the demand is less than what it used to be.

Globe informed that the price paid was around 800 US-dollars per kg., and that they were willing to switch to a new supplier if the price would be attractive and the quality acceptable.

H. Some essential oils:

In general, companies visited were much more open towards purchasing essential oils from developing countries than towards purchasing herbal extracts.

There was a special interest in promising new essential oils and oleoresins from Nepal. Some of the products that were discussed are:

* Zanthoxylum alatum essential oil:

A company in England (Albion Botanicals Ltd.) is interested in using this essential oil in the manufacturing of herbal toothpaste. Some toxicology studies are underway.

A few years ago Bush Boake had imported Zanthoxylum fruits, and made some 200 kg of essential oil. At 65£ per kg no demand was found for the oil however.

* Sugandha kokila essential oil:

Several of the companies visited showed an interest in this new essential oil, as well as in its concrete and absolute. Especially R. Sarant & Co. Ltd. had an interest in the concrete and absolute. The absolute however should be free from cinnamic acid, as stated by the company's chief perfumer.

* Ginger oil and oleoresin:

In these products Wymouth Lehr and R. Sarant & Co Ltd. were interested. The last company suggested to blend some 4% of the essential oil in the oleoresin.

* **Devano essential oil:**

R. Sarant & Co. Ltd. was also interested in good quality Devano oil, a product used in the soft drink industry. Present prices were quoted at around 85 £ per kg.

* **Acorus calamus essential oil:**

No company was interested in this oil. As a constituent of flavours, it is banned since several years, because of the suspected carcinogenicity of aserone. Since the product is considered unsafe, it is banned in perfumery as well.

ANNEX

List of companies visited:

West- Germany:

H. Ambrosius GmbH
Mittelweg 118
D-2000 Hamburg

Martin Bauer KG
Lüneburger Tor 9
D-2100 Hamburg 90

A. Golke GmbH
Postfach 1120
3363 Gittelde

Kali-Chemie AG
Hans Boehler Allee 20
3000 Hannover

Globe Chemicals GmbH
Bleichenbrücke 10
D-2000 Hamburg

Caesar & Loretz
Hilden

Boehringer Mannheim GmbH
Sendhoferstrasse 116
D-6800 Mannheim 31

Plantextrakt GmbH & Co. KG
Dutendorfer Str. 5 - 7
D-8531 Vestenbergsgreuth

Belgium:

Flore s.p.r.l.
Chaussée d'Ecaussinnes, 146
B 7490 Braine le Comte

Conforma NV
Dendermondse steenweg 345
Destelbergen

England:

Albion Botanicals Ltd.
84 High Street
Coton/cambridge

Ubichem Ltd
281 Hithermoor Rd
Staines - Middlesex

Steetley Chemicals Ltd
Berk House PO Box 56
Basing View Basingstoke
Hants RG21 2EG

Brenntag UK Ltd.
Brenntag House
45 High Street
Hampton Wick
Kingston upon Thames

Andard Mount Group
Ansvar House 24/26 London Rd.
Wembley - Middlesex

Wynmouth Lehr Ltd.
158 City Road
London, EC1V 2PA

R. Sorant & Co. Ltd.
Priestley Road
Basingstoke
Hants RG24 9PU