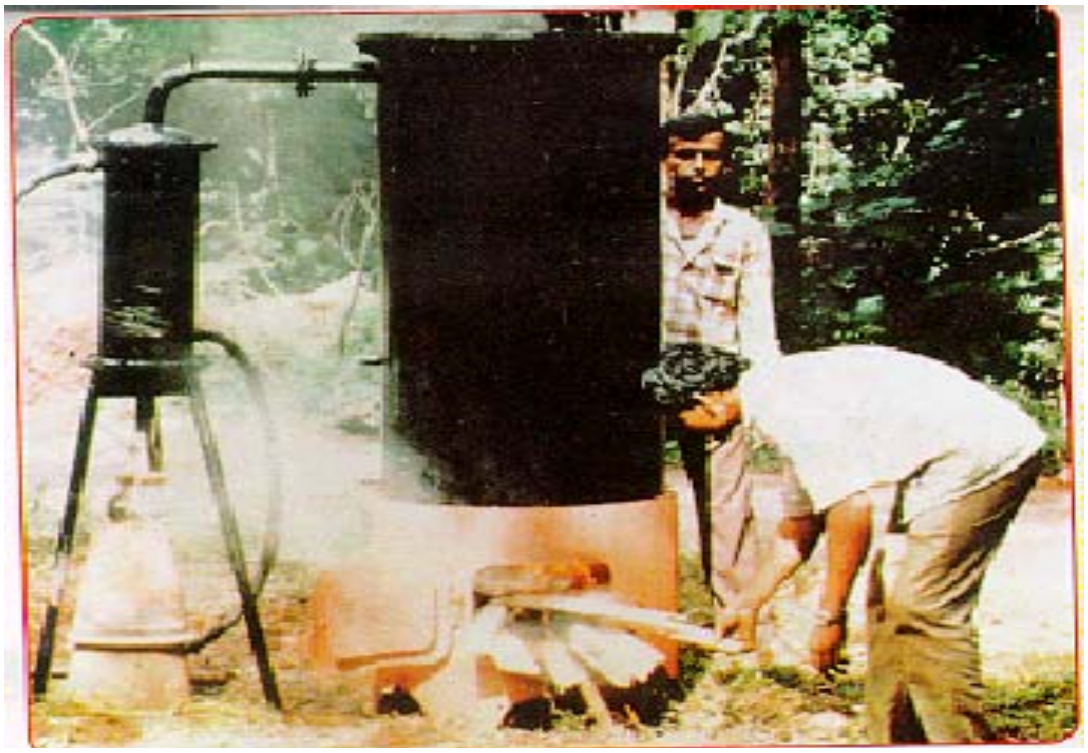
PORTABLE DISTILLATION UNIT FOR EXTRACTION OF ESSENTIAL OILS



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PORTABLE DISTILLATION UNIT

A. Nature of Technology

Design and development

B. Process in brief

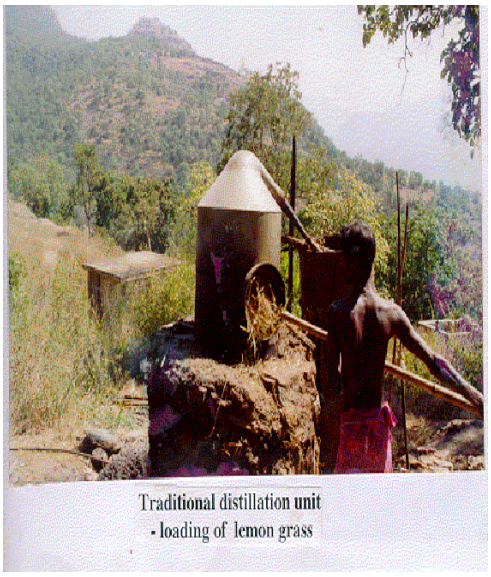
INTRODUCTION

Apart from timber, which are known as major forest produce, a wide variety of other products from forests are known as Non- Timber Forest Products (NTFPs). NTFPs are derived from over 3000 species and they cover a wide range of products from thatching materials to aromatic / medicinal plants. Essential oils are concentrated, fragrant, steam volatile plant essences obtained by steam/water distillation of the plant material.

Many industry people have already installed distillation units for distillation of essential oils. These conventional distillation units are mostly installed in places where water and fuel wood resources are easily available. But high cost of transportation of bulky raw material from field to industry and other constraints of local need have hindered installation of more distillation units. Keeping these things in mind and to meet the needs of farmers and small scale distillers, Chemistry of Forest Products (CFP) division of the Institute of Wood Science and Technology (IWST), Bangalore has developed a compact, portable distillation unit for oil distillation in the field. This unit has been designed and fabricated for distillation of oils from leaves and other aromatic plant material.

Traditional distillation units used by local people

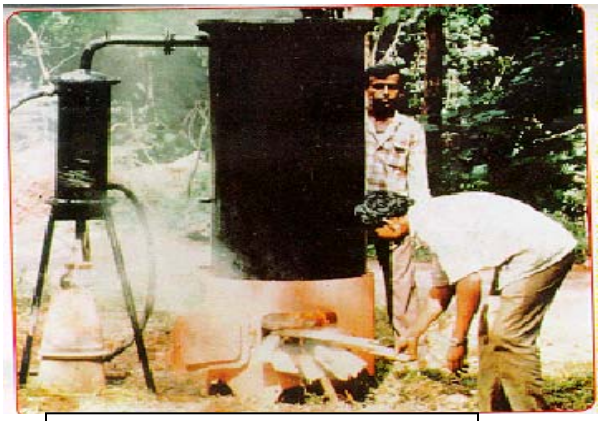
People living in rural area and tribal people living adjacent to forest areas are growing aromatic plants of commercial importance. Farmers grow these plants in their lands and tribal people in general depend on forestland for this purpose. They find problem of getting end product, because neither have they had distillation units with them nor they find problem of transporting raw material to the place of distillation. However some of the growers have developed their own traditional units for this purpose. One such traditional distillation unit used by tribal people living adjacent to Chinnar wildlife sanctuary, Chinnar, Munnar forest division in Kerala state.



Traditional distillation unit
- loading of lemon grass

Portable distillation unit developed by IWST, Bengaluru:

The portable field distillation unit (250-300 Lt. Capacity) designed and developed at Institute of Wood Science and Technology, Bengaluru is made of mild steel with detachable parts for easy transportation from place to place. This can be set up easily in field even where there is scarcity of water for use in condenser and other utility purposes. The unit comprises of a still with a lid on top and vapour outlet at the side. The material to be distilled is placed over the perforated place inside the still and is heated from a fire box (oven) fixed below, using locally available fuel wood.



Portable distillation unit

Close up of Condenser and receiver

The condenser has been modified to condense faster and more efficiently to yield 30% more oil. Portable distillation unit can reduce efforts and cost of transportation of bulky raw material to the stationary distillation site.

Aromatic crops, viz- Lemon grass, Citronella, *E*.hybrid and *E.citriodora* are in great demand in present days. Steam distillation of these crops produce valuable fragrant products called essential oils, which have got potential market value. Globalization system has brought many advantages for export of these products. Different essential oils find their own use in fragrance industry. Essential oils find use in manufacture of soap, perfumery, cosmetic, drugs etc.

C. Beneficiaries of the Technology

1. Prominent beneficiaries/user groups Forest departments, Tribal people, small farmers who are engaged in cultivation of aromatic plants.
2. The technology has been transferred/ sold to five clients.
3. The unit has a good potential to be used by small scale operators in the field and can be given wide publicity

D. Economic significance

1. *Potential to address Livelihood issues and generate additional income.* People living in rural area and tribal people living adjacent to forest areas are growing aromatic plants of commercial importance. Farmers grow these plants in their lands and tribal people in general depend on forestland for this purpose. They find problem of getting end product, because neither have they had distillation units with them nor they find problem of transporting raw material to the place of distillation. The developed portable distillation unit has potential to address livelihood and generate additional income.

Approximate expected net income per year from distillation of different essential oils by portable distillation unit

S.No	Aromatic Plant	Avg yield of oil / Ha (in Kg)	Avg Net income / Ha /Year (In `)
1	Citronella	200	20,000 – 30,000
2	Lemon Grass	200 - 300	30,000 –35,000
3.	Eucalyptus globules (blue gum)	40 –45	4000-6000
4.	Eucalyptus citriodora oil	40 - 50	4000-6000

2. *Productivity enhancement and economic benefits over replaced technology* 30 % more production of oil, this is because of use of modified condenser system. Here instead of one coil, 5 parallel coil pipes are used. This ensures 100 % condensation of vapours without loss, thus more yield

3. *Impact of the Technology* Manufacturing cost is less and can be affordable by small scale industries or even by group of small farmers on cooperative basis. Approximate cost to fabricate one unit is Rs. 45,000/-

Technology Transfer:

The technology can be transferred to any industry or individual. The institute is having a policy to transfer the technology to different stakeholders. For detailed terms and conditions and negotiation of cost of technology, the interested parties may contact Marketing Cell of IWST. Email Id: groupco_iwst@icfre.org

Phone: 080-23340115 Office Hours- 9.00 AM to 5.30 P.M.

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