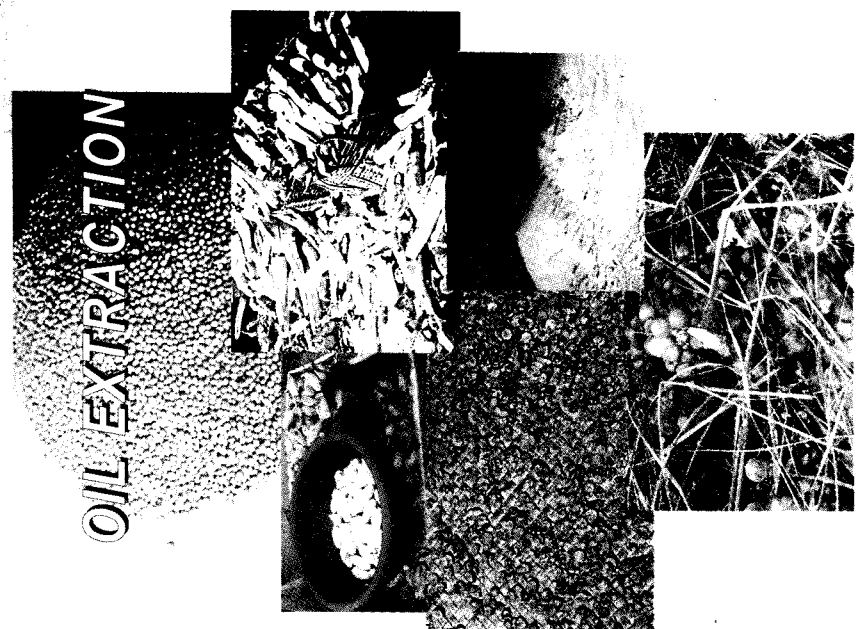


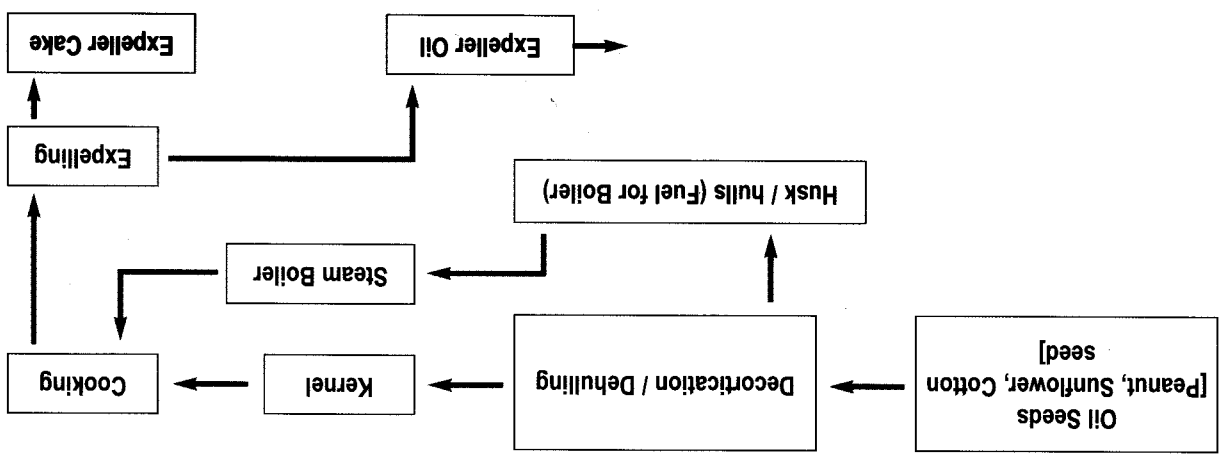


**OUTLINES OF SMALL SCALE PROJECTS**  
For  
**AGRO-BASED FOOD PRODUCTS**



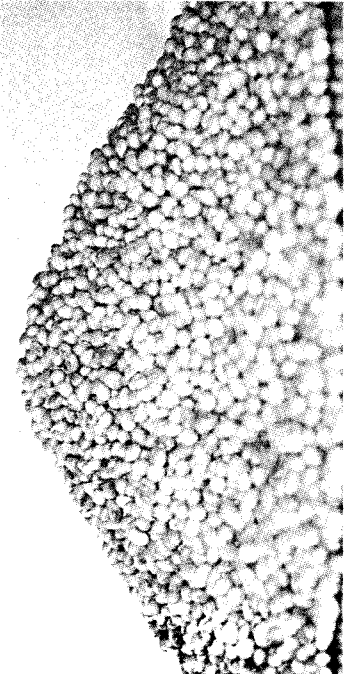
**OIL EXTRACTION**

**Flow Diagram for Vegetable Oil extraction (Expeller)**

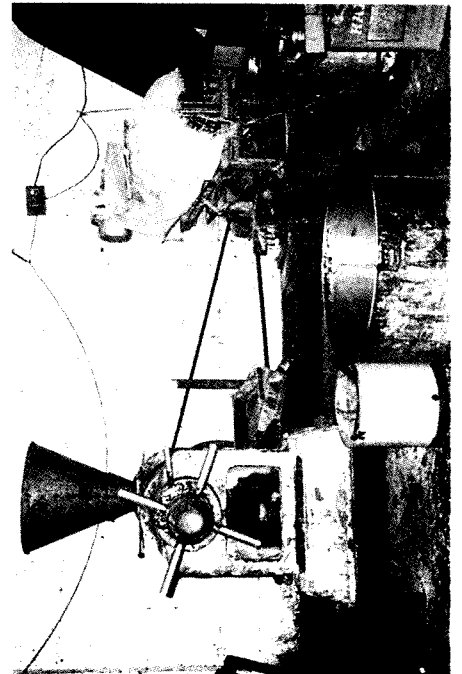


**Typical oil extraction from 100 kg. of best oil seeds**

PALM KERNEL	36 kg	SOYBEAN	14 kg
SESAME	50 kg	PALM FRUIT	20 kg
RAPESEED	37 kg	GROUNDNUT KERNEL	42 kg
MUSTARD	35 kg	CASTOR SEED	36 kg
LIN SEED	42 kg	SUNFLOWER	32 kg
COTTON SEED	13 kg	COPRA	62 kg



100 Kg Soybean typically produces 14 Kg Oil and 86 Kg of cake in an expeller mill. Cake is conditioned by adding moisture and thus 100 Kg of cake would be available instead of 86 Kg.



PUBLISHED BY  
THE DEPARTMENT OF AGRO-INDUSTRIES  
MINISTRY OF AGRICULTURE, FORESTRY AND FISHERIES  
IN COLLABORATION WITH THE FOOD AND AGRICULTURE  
ORGANIZATION OF THE UNITED NATIONS

**Activity: Oil Extraction  
Capacity: 140 liters/ day**

Equipment	Unit	Rate Riel	Cost Riel
1 Balance, 0-100 kgs scale	1	100000	100000
2 Diesel oil engine, 3 HP	1	1000000	1000000
3 Oil expeller one set,	1	12800000	12800000
4 Plastic bottle, 25 L	10	12000	120000
5 Plastic basin, 50 L	5	8000	40000
6 Plastic funnel	5	2000	10000
7 Boiled kettle, 300 L, local made	1	160000	160000
8 Oven, local made	1	15000	15000
<b>Total</b>			<b>14245000</b>

Raw materials	Quantity /day ( Kg)	Rate Riel	Cost Riel
Ingredient	Percent		
1 Soybean	7-14	970	970000
<b>Total</b>			

Packaging	Quantity /day	Rate Riel	Cost Riel
1 Plastic bottle with cap 0.75 l	186	190	35340
2 Labeling	186	35	6510
<b>Total</b>			<b>41850</b>

Utilities	Quantity /day	Rate Riel	Cost Riel
1 Diesel oil	L 12	1450	17400
2 Charcoal	Kg 10	350	3500
3 Water	m <sup>3</sup> 1	750	750
<b>Total</b>			<b>21650</b>

1 Unskilled and 1 semiskilled worker needed

Oil expeller includes : Boiler, Filter press, Pump and Oil tank.  
Source of technology: Tiny Tech Plants, Tagore Road, Jacoot, 360 002, India  
[www.tinytechindia.com](http://www.tinytechindia.com)

**Profitability Estimate**

Requirements	Unit
Equipment - see list	14245 000 Riel
Unskilled workers	2 No
Semi-skilled workers	1 No

Production Capacity	Unit
Per day	140 litres
Per year of 250 days	35000 litres
% utilisation assumed	100 % /yr

Costs per year	Unit
Rent	1800 000 Riel
Semiskilled	2555 000 Riel
Unskilled workers	2920 000 Riel
Electricity	0 000 Riel
Other utilities	5413 000 Riel
Transport	0 000 Riel
Repair and maintenance	1425 000 Riel
Others	0 000 Riel
Distribution	27064 000 Riel
<b>TOTAL A</b>	<b>41176 000 Riel</b>

Raw materials - see list	Unit
Packing	242500 000 Riel
<b>TOTAL B</b>	<b>252963 000 Riel</b>

Revenue and Profit	Unit
Market Unit Price Riels	6200 Riel/unit
Revenue Oil	217000 000 Riels
Revenue - oil cake@0.185\$ for 860kg/dayx 250x4000	159100
Total Revenue	376100

Cash Profit per year -	Unit
Revenue minus A and B	81962 000 Riels
<b>Cash Profit per month</b>	<b>6830 000 Riels</b>

**Basic Hygiene - Precautions for Food Processing**

- The presence of rodents, insects, and other animals in the facility should not be allowed because they are sources for the contamination of food with foreign material, filth, bacteria, etc.
- The facility and grounds should be free of uncut weeds, brush or tall grass.
- Improper storage of unused equipment or materials, presence of litter, waste refuse and stagnant water should be avoided.
- Unhygienic conditions in and around the shop floor can allow contamination to enter the food processing plant air borne, adherence to personnel clothing and other means
- All persons, in food preparation and handling should wear clean outer garments, and conform to hygienic practices
- Persons affected by disease in a communicable form, or while affected with boils, sores, infected wounds, or other sources of microbiological contamination, should not work in the food factory.

Process water must be of high quality as it becomes a part of or affects the quality of the product

**NOTE**

1. The estimates are based on standardized values for several cost items such as wages, rental for space, utilities, input-output ratios, sale price etc. and as such may not be accurate with reference to a given production circumstance and location
2. The outlines are meant to give an idea of available avenues of profitable investment and the likely profitability. Those interested in pursuing any selected activity are advised to make accurate estimates of cost and revenue with reference to their local circumstances, using this guide if necessary, to assess likely returns before embarking on investment.
3. Those interested in starting any activity could approach DAI at the following address for assistance.



No.242, Preah Norodom Blvd, Sangkat Tonle Basac, Khan Cham Karmon, Phnom Penh.  
E-mail: dai-maff@camnet.com.kh  
Phon/Fax: (855) 23 213 145