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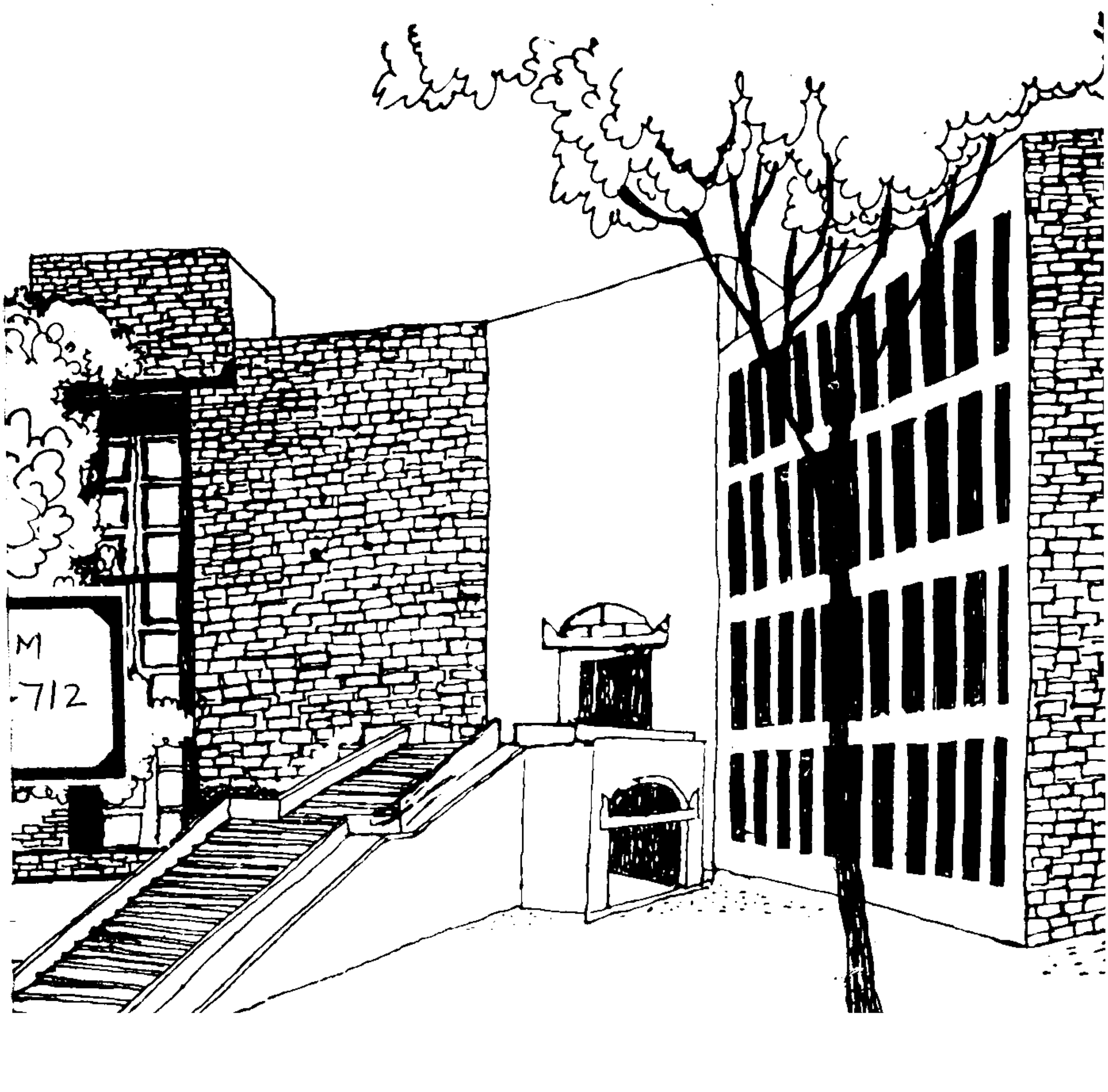

OPPORTUNITIES AND CONSTRAINTS IN THE GROWTH OF PRODUCTION OF OILSEEDS AND EDIBLE OILS IN A SYSTEMS FRAMEWORK

By

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OPPORTUNITIES AND CONSTRAINTS IN THE GROWTH OF PRODUCTION OF OILSEEDS AND EDIBLE OILS IN A SYSTEMS FRAMEWORK@

*U. K. SRIVASTAVA**

In recent years there has been an alarming gap between demand supply of edible oils. This has necessitated an import of edible oils worth about Rs.1000 crores per annum. The present edible oil demand-supply gap is expected to widen substantially by the year 2000 A.D. (Table-1 showing various estimates of demand-supply gap). This realisation has led to oilseeds production being included in the 20 point programme and also setting up of a technology mission for the same. The major objective of all the interventions and government policy supports is to achieve self sufficiency in edible oil production in the near future.

This paper is designed to delineate opportunities and major constraints in the achievements of self-sufficiency objective and key areas of policy action. The analysis is presented in a systems framework.

I. OPPORTUNITIES AND CONSTRAINTS IN A SYSTEMS FRAMEWORK

The entire oilseed and edible oil production and distribution system may be divided into four sub-systems (See Figure 1) :

@ This paper was presented at the Seminar on 'Achieving Self Sufficiency in Oilseeds Production' organised by Economic Research and Training Foundation of Indian Merchants' Chamber at IMC Building, Bombay on 22nd August 1987.

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TABLE - 1

ESTIMATES OF DEMAND AND SUPPLY OF EDIBLE OILS

(In lakh tonnes)

YEAR	N C E A R			STUDY GROUP			TATA CONSULTANCY			O T A		
	Maximum demand	Supply	Maximum gap	Demand	Supply	Gap	Maximum demand	Gap with NCEAR supply data	Gap with study group supply data	Demand @ 3.5% growth in National income	Supply	Gap
1985-86	42.3	28.9	13.4	47.0	38.4	8.6	44.0	15.1	5.6	44.45	30.2	14.2
1990-91	53.1	32.9	20.2	57.8	46.9	10.9	59.8	26.9	12.9	55.7	33.4	22.3
1995-96	66.7	37.9	28.8	71.3	58.1	13.2	81.2	48.3	23.1	69.8	36.1	33.7
2000 AD	-	-	-	-	-	-	-	-	-	87.5	51.5	36.0

Source: *U.K. Srivastava and Abhay Shah, "Marketing of Oilseeds and Oils in India: Present and Future", in H.C. Srivastava et.al. (eds.), Oilseed Production: Constraints and Opportunities, Oxford & IBH, New Delhi, 1985.*

FIGURE - 1

SYSTEM CHART OF OILSEED AND EDIBLE OIL

PRODUCTION & INPUT SUB-SYSTEM

Production

Crop Origin

1. Groundnut
2. Rapeseed and Mustard
3. Sesum
4. Linseed
5. Castor
6. Sunflower
7. Soyabean
8. Safflower
9. Niger Seed

Tree Origin

- Coconut
- Minor oilseed of tree oriented

Others

Input

Crop Origin

- Seed
- Fertilizer
- Pesticides
- Irrigation
- Credit

Tree Origin

- Fertilizer
- Pesticides
- Planting Material

Others

g and
g facilities

→

TRADE IN SEED

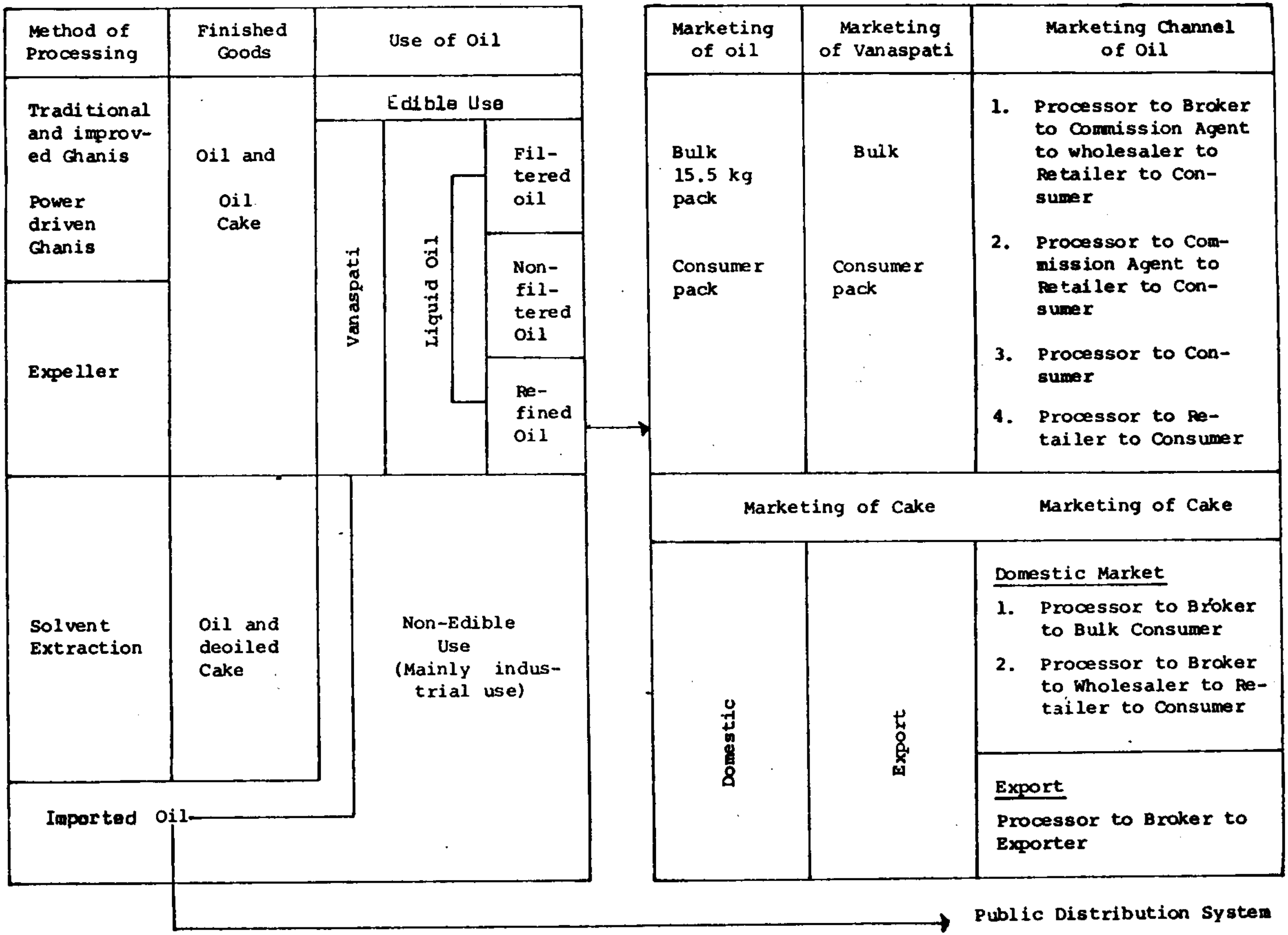
Marketing Channel

1. Producer to village trader who in turn sells either directly to processor or indirectly through wholesaler or commission agents.
2. Producer to commission agents to processor either directly or through wholesaler.
3. Producer to broker who sells to processor directly or sometimes through wholesaler.
4. Producer to processor directly.
5. Producer to cooperative society to processor (cooperative oil mills).

Fig. 1 Contd..

PROCESSING SUB-SYSTEM

MARKETING SUB-SYSTEM



1. Input and production sub-system
2. Oilseed Trade sub-system
3. Processing sub-system
4. Marketing sub-system

Input and Production Sub-system

Oilseeds are divided into three types: a) crop origin, b) tree origin, and c) others, which are derived from processing of main products (e.g. cottonseed and ricebran). In case of the oilseeds from crop origin, it is known that 90% of the area is under rainfed conditions and only 10% is under irrigated conditions. Also 80% of the total area under oilseeds is located in only seven states: Gujarat, Andhra Pradesh, Maharashtra, Karnataka, Uttar Pradesh, Rajasthan and Tamil Nadu. Among the oilseeds, groundnut and rapeseed-mustard account for about 75% of the area in the country.

In recent years substantial achievements have been made in the oilseed research in terms of plant breeding and genetics and plant protection technology. But in terms of the overall status of the production system, following observations can be made :

1. Since bulk of the area is under rainfed conditions there have been major fluctuations in yields and production over the years and in general yields have been much lower than those observed based on the results from the research institutions[1]. An idea of this gap can be

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1. *Integrated Approach to Edible Vegetable Oils Problem*, NCEAR New Delhi, 1983; *Indian Oilseeds Economy: An Overview*, Tata Economic Consultancy Services, Bombay.

TABLE - 2

YIELD OF VARIOUS OILSEEDS

CROP	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86
Groundnut	737	972	731	940	897	759
Castorseed	400	554	603	645	701	469
Seasum	182	227	248	255	245	223
Rapeseed and Mustard	560	542	577	674	769	695
Linseed	251	264	264	295	281	264
Nigerseed	250	279	240	300	254	302
Safflower	458	568	513	602	565	372
Sunflower	583	571	500	429	530	435
Soyabean	721	729	636	726	774	754
TOTAL :	532	639	563	679	685	591

Source: *Directorate of Economics & Statistics, Ministry of Agriculture, Government of India.*

TABLE - 3

IDENTIFIED VARIETIES OF DIFFERENT HIGH YIELDING OIL SEED CROPS

Name of the Crop	Class	No. of Varie-ties	Range of Maturity	Oil Content	Average Yield range Kg /ha
1. Groundnut	Bunch	26	95-135	47-53	830-2700
	Semi-spreading	17	110-150	45-54	950-2100
	Spreading	20	110-150	47-51	1000-2750
2. Rapeseed and Mustard	Toria	10	75-120	40-46	800-2000
	Brown Sarson	8	85-145	38-47	890-2600
	Yellow Sarson	9	90-150	42-47	1000-1800
	Rai	13	100-155	37-44	1200-2000
	Taramira	2	150	32-35	600-1000
3. Seasum	Early	10	70-85	40-52	300-900
	Medium	25	86-145	35-54	165-950
4. Safflower	-	19	108-176	30-33	670-2550
5. Niger Seed	-	10	80-145	37-43	200-420
6. Sunflower	-	9	75-115	31-49	900-2500
7. Linseed	-	29	110-170	40-50	350-1500
8. Castor	Hybrids	11	140-270	48-56	280-3000
	Others	29	110-275	42-56	300-3000

Source: Directorate of Oilseed Research, Hyderabad formed by comparing the data on observed yields in Table-2 with data in Table-3. On the face of it, if all the present area can be saturated with recommended varieties the production can be raised to 2 to 3 times of the present level even with the already available varieties. The claims made by the research institutions about higher yields for new varieties have a major fallacy because they ignore the risk and uncertainty faced by the farmers in incurring higher cost and indebtedness in switching over the high yielding varieties. This point is illustrated with the help of cost of cultivation data of groundnut from Andhra Pradesh and Tamil Nadu (collected by Directorate of Economics and Statistics, Ministry of Agriculture - See Annexure-1). To elaborate the argument, suppose we take a six year period and compare the net present value of groundnut cultivation in Andhra Pradesh, Tamil Nadu under the following assumptions :

a) Linear cost and revenues at presently observed level.

b) Crop losses to the extent of 70% in A.P. (taken as proxy for traditional varieties) and 90% in T.N. (taken as proxy for high yielding varieties) in every alternative year.

Based on these assumptions, a comparative picture is presented in Table-4. It can be seen from the table that the Net Return after taking higher magnitude of risk in Tamil Nadu are only marginally higher than that of A.P., where the crop loan requirements and the risk of failure of crops are substantially less.

2. The net incomes from most of the oilseed crops (if one takes all costs including depreciation on fixed assets

TABLE - 4

ILLUSTRATION OF THE IMPACT OF RISK AND UNCERTAINTY IN RETURNS FROM TRADITIONAL AND HIGH YIELDING VARIETIES (GROUNDNUT)

TRADITIONAL VARIETY				HIGH YIELDING VARIETY			
Cost*	Revenue	Net Return	Net Present Value[1]	Cost*	Revenue	Net Return	Net Present Value[1]
1747	2502	755	686	2286	4181	1895	1723
1747	1001	- 746	- 617	2286	418	- 1868	- 1544
1747	2502	755	567	2286	4181	1989	1424
1747	1001	- 746	- 510	2286	418	1868	- 1276
1747	2502	755	469	2286	4181	1895	1177
1749	1001	- 746	- 421	2286	418	- 1868	- 1054
		27	174			81	450

1 @ 10% discount rate

* Total cost excludes depreciation on fixed asset and interest on the fixed asset (as these costs are common to both the varieties).

also into account) are very small. This point is clear from the data in annex-1 for groundnut. Similarly data for all major oilseed crops are readily available from the Directorate of Economics and Statistics, Government of India.

3. One of the other major bottlenecks in saturating the area with high yielding varieties is the multiplication, storage and supply of seeds to the farmers. The process of multiplication of commercial seed from breeders seed stage seems to be analogous to that of delineation of petroleum oil fields and start of production from the same. It used to take about 10 years for the process to be completed for the oil fields. In recent years, however, the introduction of early production systems has considerably reduced the time lag to a year or even less. In case of seed production for oilseed crops, the bulk of the infrastructure is in the government system which has its own time lag. Besides the production, the storage and distribution of quality seed to oilseed farmer is very deficient. As we know even in case of fertilizers, the density of outlets and consumption in rainfed areas is very low, and similar system operates in case of seed storage and distribution as well.

4. Since oilseed crops are prone to very large risk due to year to year fluctuations in yield and production, its farmers are not considered credit worthy by the financial institutions. The constraints of non-availability of credit can be illustrated by the fact that while the entire cost of purchased inputs remains tied for 3 to 6 months (varying between the oilseeds) for the farmers, the processing units and the trade is able to turn around their working capital very fast. Moreover, the

working capital requirements of processing units and trade in seed and oil are very small as compared to the requirement of the farmer when compared to per kg. of materials. For example, in case of groundnut the working capital required in different stages viz. production, trade in seed, processing and marketing of oil is given in Table-5.

TABLE - 5

WORKING CAPITAL REQUIREMENT PER KG. OF OILSEED IN DIFFERENT STAGES OF OPERATION

Operation Stage		Working Capital Requirement (Rs.per kg)
1. Production		1.35
2. Seed in Trade		0.02
3. Processing	- Ghanis	0.03
	- Expellers	0.21
	- Solvent Extraction units (per kg. of oil cake)	0.10
4. Trade in Oil		0.01

Source: *U.K. Srivastava and Abhay Shah, "Marketing of Oilseeds and Oils in India: Present and Future", in H.C. Srivastava et al (eds) Oilseed Production: Constraints and Opportunities; Oxford & IBH, New Delhi, 1985.*

5. Due to the constraints of lack of adequate credit facility, and high risk, oilseed farmers are putting much less fertilizers than the national and regional averages per hectare. Similarly their consumption of pesticide is nominal as compared to recommended doses by the research institutions.

6. The oilseeds from the tree origin in India are mainly two types: coconuts and minor oilseeds. In case of coconuts the constraint has been the planting material which is free from diseases. In case of coconuts such planting material is now available with the tissue culture but so far it has not make much impact on the new planting and replacements. In case of minor oilseeds from tree origin at best only one tenth of the potential has been exploited (see Table 6). In case of these sources of oilseed, major problem is in organizing a collection system. Other specific constraints are illustrated in Table 7.

TABLE - 6

POTENTIAL FROM OILSEED OF TREE ORIGIN

Tree Origin	Potential in '000 Tonnes	Availability in '000 tonnes		
		80-81	81-82	82-83
Mahua	171.0	52.6	64.0	56.5
Neem	836.0	38.5	34.0	29.0
Kusum	30.0	5.0	4.0	5.0
Karany	30.0	7.0	7.0	8.0
Sal	688.0	5.5	19.0	12.6
Rubber seed	5.6	3.7	3.7	3.5
Mango kernal	48.0	0.5	2.5	0.50
Kokum	5.0)			
Dhupa	5.1)			
Vindi	11.2)			
Marotti	4.2)	2.8	3.8	3.14
Pisa	5.8)			
Nahor	2.3)			
Khakan	15.4)			
Total	1105.2	117.0	138.0	118.24

Source: Directorate of oilseeds development, Hyderabad

TABLE - 7

SOME CONSTRAINTS IN PRODUCTION OF MINOR OILSEED OF TREE ORIGIN

Name of the oilseeds	Constraints
Sal fat and Mohua	Forest Oilseeds Collection should be intensified as their potential is as high as 15 M tonnes
Dhupa, Kusum, Kokum-oilseeds	All these seeds have oil content and one being used for medicinal purpose and cosmetics. Hence, the production should be increased to the extent possible. Collection of seed poses problem.
Palash, Pilu, Pisa	The oils derived from these seeds are excellent for soap making, the collection of these seeds should be done to the maximum extent.

Source: *U.K. Srivastava and Abhay Shah, "Marketing of Oilseeds and oils in India: Present and Future" in H.C. Srivastava, et al. (Eds.), Oil Seed Production: Constraints and Opportunities, Oxford & IBH, New Delhi 1985.*

7. In case of other oilseeds like rice bran and cotton seed the problems are basically to get all the possible raw material for processing. In case of cotton seed a substantial portion is used for direct cattle feed. It is only mass campaign and education indicating the disadvantages of feeding the cotton seed to buffaloes which can reduce the wastage. In case of rice-bran the problem are as follows: The quality of bran largely depends on the nature of the milling applied. In India, rice producing system in vogue are either huller mills, shelter mills or modern mills. Huller mills yield a bran having lowest oil content as it contains an appreciable quality of husk and broken rice mixed in it. The quality of bran coming out of shellers and modern mills are far

better in this respect. The quality of rice bran from various type of rice mill is given below :

Type	Grade	Oil Content
Huller	Raw, Par-boiled	4-6%
Sheller	Raw Par-boiled	12-15% 15-20%
Modern	Raw Par-boiled	15-20% 25-30%

In India about 40% of the total milling capacity is of the obsolete huller type. Thus, a substantial quantity of bran coming out of these huller mills goes as waste in regard to oil extraction. Another major reason for deterioration of the quality of bran is the presence of a lipase enzyme which gets activated after milling and splits the oil present in the bran so that the resultant oil becomes high in FFA. This problem could be minimized after by extraction of the fresh bran quickly or by stabilisation of the same. Another factor responsible for the deterioration of bran quality is the inadequate system of drying paddy.

Apart from the above constraints, till today a substantial quantity of bran is used directly as cattle feed or fuel. Measures also be taken to stop this loss.

Oilseed Trade Sub-system

The trade performs the functions of assembly, transportation, broking, and rarely storage, in moving the produce to the Mills. Though marketing channels in the oilseed trade differs from state to state, by and large the following channels are in operation:

i) Producer to village trader who in turn sells either directly to processor or indirectly through wholesalers or commission agents.

ii) Producer to commission agents to processor either directly or through wholesalers.

iii) Producer to broker who sells to processor directly or through wholesalers.

iv) Producer to processor directly.

v) Producer to co-operative society to co-operative oil mill.

Sale through co-operatives is yet to become popular marketing. Direct sales to processor also account for just 13 percent. More than 75% of the total produce moves only through private intermediaries segment of the market.[2]

i) The intermediaries deal not only oilseed but also other grains.

ii) Most of the intermediaries perform multiple functions from assembling, transportation and other services to broking and wholesaling functions. It was observed that often a miller and/or a commission agent is also a large farmer, handling not only his produce but buying the produce of the other farmers. They are compensated for the number of functions they perform.

iii) Intermediaries as well as even co-operative mills do not perform the storage functions. The storage operations were undertaken by the farmer or by

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2. *U.K. Srivastava, Finance of Trade in Groundnut, Groundnut Processing Units and Distribution of Finished Products, Oxford and IBH (under printing), New Delhi, 1987.*

others at the cost and risk of the farmers (as in Janghad system in Gujarat for Groundnuts). If intermediaries provided any finance to producer they are compensated for this function also.

The oilseed trade links, the production with the processing sub-system. The processing sub-system expected to work for about 300 days, while the market arrivals are concentrated immediately after the harvest. In case of the most of the major oil seeds it has been observed that the function of inventories is performed by the farmers themselves, and the farmers are compensated only partly for performing this function. For example, a study by Narappanavar and Bharadwaj[3] estimated the relationship between wholesale price of oil and farm harvest prices using the data for 1962-63 to 1980-81 (price index based on 1970-71 = 100). The estimated is as follows:

$$P_f = 37.2451 + \underset{(5.8657)}{0.5505}\ P_w \qquad R^2 = 0.680$$

Where

Figures in bracket is 't' value

P_f = Farm harvest price

P_w = Wholesale oil price index.

The equation explains about 68 percent of the variation in the farm harvest price index as a result of the changes in the wholesale price index at one percent level of significance. The equation further explains that the increase of one point in wholesale price

3. *S.R. Narappanavar and V.P. Bharadwaj, "Farmer's and Intermediaries Share: A Study of Groundnut during 1962-63 to 1980-81", Indian Journal of Agricultural Economics, Vol.28, No.2, April-June 1983.*

index causes a less than proportionate change in the farm harvest price (.55 point).

The above finding has two implications. The processing subsystem stands to gain without any storage cost. Therefore, it has no incentive to block the working capital by buying the raw material and keeping a large inventory. Farmers also stand to benefit from the increased prices at the later stage, therefore they have incentive for performing the storage function.

Processing Sub-system

Oil is extracted from oilseeds through traditional ghanis, improved and power driven ghanis, expeller mills and solvent extraction plants. Traditional ghanis are bullock driven and they are inefficient because they are labour time consuming and their capacity is hardly more than a quintal per day. Even now there are 1,32,000 such ghanis in rural areas (Table 8). Attempts have been made by KVIC to upgrade the traditional bullock driven ghanis with a view to improve its capacity and efficiency. The bullock were replaced by 2 HP motors with suitable drive mechanism. The power driven ghanis take 30 to 40% less time than traditional or improved ghanis and these are mostly involved in crushing groundnut, sesamam and mustard seeds. The ghanis, however, at best account for only 3% of the vegetable oil production in the country. The oil cake from ghanis contains around 12 percent of oil.

Bulk of the vegetable oil is produced by the expellers. While there were 8,175 oil mills in 1956, as per latest data the number had gone to 15,685. The crushing capacity of these expeller mills ranges between 4 to 5 tonnes of oilseeds per day to as much as 75 to 80 tonnes in a day. Bulk of these oil mills are in small and unorganized sector. Several studies have indicated that most of the units have an average capacity use of around 50%. Even during the peak marketing season the capacity utilization did not exceed 70%. Despite this most of the oil mills survive because they have very low breakeven percentage.

Although the solvent extraction industry begun in India way back in 1904, the rapid growth begun since 1950. There were 93 solvant extraction plants in 1968, 158 in 1975 and 305 as per recent data. These plants mainly process soyabean, rice bran, and oil cake from various oilseeds crushed by expellers.

TABLE - 8

STATEMENT SHOWING NUMBER OF PROCESSING UNITS IN INDIA

Processing Units	Number	Capacity
Traditional Ghanis	132,000*	390 ('000 MT)**
Improved Ghanis	30,000*	288 ('000 MT)**
Power driven Ghanis	10,419*	281 ('000 MT)**
Oil Mills***	15,685	14180 ('000 MT)
Solvent Extraction Units	305	9675 ('000 MT)@

* Data related to 1977
** Data related to 1983-84
*** Data related to 1982-83
**** Data related to 1985
@ which includes 4217 thousand MT capacity of ricebran also.

Source: India oilseeds Economy: An Overview (Draft Report), Tata Economic Consultancy Services, Bombay.

Oil refinery is one of the essential down-stream activity, generally associated with either an oil mill or a solvent extraction plant with a primary objective of eliminating the free fatty acids in the oil. In India, bulk of edible oils are consumed in unrefined form (filtered or double filtered only).

Edible oils are also used in the manufacture of 'Vanaspati' or hydrogenated vegetable oil. As a result of Government policy, Vanaspati Industry has played a vital role during last two decades in developing the production of new and non traditional oils like cottonseed oil, soyabean oil, rice bran oil, and more recently, even niger seed oil, mahuva oil and sal seed oil. In 1971, the licenced capacity of the Vanaspati industry was around 590,000 tonnes a year in terms of output, and this has increased to 909,000 tonnes (as per recent data) and the overall capacity utilization of the industry averaged around 62 percent. One of the major constraints in capacity utilization of vanaspati units is the shortage and high cost of raw material (washed oils). In recent years government of India has allocated the ported oils to the extent of 60 to 70% of the requirement. Besides Vanaspati, the Vanaspati manufacturing units also produce refined edible oil, hardened industrial oil and a small quantity of margarine.

In terms of the self sufficiency objective the processing subsystem can contribute marginally in terms of enhanced processing of all rice bran and cotton seed supplies. Also if the practice of feeding oil cake from ghanis and expeller mills to cattle can be gradually stopped and oil the oil cake are put through the solvent extraction process, the total supply of oil can be enhanced by the processing sub-system. In case of rice bran, theoretical potential of rice bran available for oil extraction and rice bran oil is 4.5 million tonnes and 6.5 lac tonnes respectively. But the present level of production is only 2.5 lac tonnes leaving an unrealised potential of 4.0 lac tonnes. Out of the present available rice bran oil of 2.5 lakh tonnes hardly 40,000 tonnes is of edible quality. This can be increased manifold by improving the quality of rice bran by suitable treatment.[4]

Marketing Sub System

Bulk of the oil produced (about 60%) is sold as loose oil (un-branded) in drums, and only a small percentage (about 10%) which is sold in family size packing of 1 to 5 kg. and remaining is sold in 15.5 kg. tin. Oil is marketed through the usual marketing channels (See Figure 1) and most of the transactions are on cash basis and no one keeps a large inventory.

The marketing sub-system can lend its contribution in augmenting edible oil supplies for newer source of oil. For example, even if the technology is made widely available for the production of edible grade rice bran oil and other constraints are overcome, it will need considerable marketing promotional backup to make it acceptable to consumers as direct cooking medium. It is noted

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4. *Handbook on Rice Bran: Processing and Utilisation of Products*, The Solvent Extractor's Association of India, Bombay 1987; Abhay Shah and U.K. Srivastava, *Rice Bran Oil Industry: An Insight into Technology and Commercial Aspects*, Concept Publishing Co., New Delhi, 1985.

that several new brand gaining popularity and rice bran oil is gradually being used as a direct cooking medium.

In case of soyabean substantial effort are required to produce and market value added products. Approximately 80% of the defatted meal in India is being exported as cattlefeed, whereas it can be processed into various high priced product such as soya protein concentrates, isolates, soya milk and texturised vegetable products (like nutrela and others). This product mix will not only serve as a potential source of protein but also enable the processors of soyabean to get better net returns which in turn can be passed on to the farmers. Once again the industry is making attempts in this direction and several new products have been introduced in the market.

Further, there is a role for generating the market demand for non-traditional oils. For example, export market demand confectionary fats at remunerative prices led to successful research to make sal fat as cocoa butter substitute. Similar market support for Neem, Kusum oil can also strengthen the collection system and enhance produ

II. AREAS FOR POLICY ACTION

The above discussion of the edible oil production, trade, processing and marketing sub systems indicates the following points

1. The major problem in achieving in self sufficiency objective of edible oils in the country lies in the production

sub-system. Although technology is available in the form of high yielding seeds and packages of practices including the plant protection measures, a challenge lies in rapidly transfering this technology for improvement in yield and production.

2. The improvements in processing and marketing sub-systems are desirable and should be pursued. But this will at best bring about only marginal addition to the edible grade oil supplies. In view of the acute shortage of edible oils, market mechanism are already underway to exploit the opportunities in the processing and marketing sub-system to promote additional supplies either for direct consumption or supplies to Vanaspati manufacturers. Price incentive has also helped to break the consumer resistance against new and non-traditional oils for direct cooking medium and their acceptance is in gaining ground. Most recent examples are from edible grade rice bran oil being sold as direct cooking medium in branded consumer pack.

3. The major problem is a lack of adequate raw material for processing and this has resulted in underutilised capacity of all types of processing units referred above. Therefore following key areas of action are suggested to enhance the production of oilseeds of all types (crop origin, tree origin and other derived oils):

   a) There is a need to make the seed production system commercial as far as possible and cut down the time lag between the breeder's seed production and commercial supply of the same.

   b) Since seed supplies are crucial constraint in saturating the area under HYV, there is a need for a thorough review and monitoring of the activities of the seed production facilities in the government sector and seed production storage and marketing facilities in the private sector.

c) Conscious effort has to be made on the part of funding institutions in providing working capital (crop loans) to the oilseed farmers. It has to be consciously recognised that crop is risk prone and the loans may have to be re-scheduled in case of oilseed crop failure due to weather, pest and disease attack.

d) There is a need to further intensify the policy effort to enhance the outlet density for fertiliser and pesticide supplies by major companies in the oilseed producing areas. These are traditionally rainfed areas and therefore, they have not evoked favourable response on the part of fertiliser and pesticides producers in past.

e) In terms of extension efforts, differential needs of the drought prone areas need to be taken into account. It is known that the population density in oilseed producing regions is much less than the traditionally cereal producing areas.

f) The price support for major oilseeds is a step in right direction but in the times of acute shortage, the support price are best only notional. There is a need to further improve the farmers share in consumer rupee for various oilseeds. We may need even the infrastructure support in the form of storage and warehousing which can enhance the gains of farmers for performing the storage function (which they have been observed to carry out). In this context the NDDB's project for restructuring the edible oilseed production and marketing is significant step. The project has been designed to help cultivators to adopt production techniques which will decrease the vulnerability of their oil-seed crops to climatic variations and offer year-to-year price stability to induce farmers to increase the production.

This is to be achieved through integration of production, procurement, processing and marketing of oilseeds by two tier cooperative. It consists of oilseed growers cooperative federations at state level and primary cooperatives. Now there are several such state level federations have been operating for the last five years, one would raise the following two questions :

i) What is the impact of the cooperatives and their activities on the yield and production of oilseeds by the members ?

ii) What is the extent of increase in income due to more efficient processing and marketing of oil and other by-products on behalf of the members (by eliminating the middle-man) ?

Preliminary evidence on the first question seems to be somewhat positive but doubtful for question two. This emphasises the need for more rigorous review, monitoring and evaluation of these federations and their activities under the NDDB project.