PALAWIJA NEWS

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Soybean Utilization, Processing and Production Policy in Indonesia[1]

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Soybean Utilization

Soybean is one of the important secondary food crops (palawija) grown in Indonesia. In the form of processed food - *tahu*, *tempe*, *oncom*, *kecap* or *taucho* - it is part of the daily diet of most Indonesian families. More than 80% of households in Java consume soybean. The next highest consumption rate is in North Sumatra where 55% of the households eat soybean regularly (Rosegrant, et al., 1987). In Java, annual soybean consumption per capita varies from 11 to 16 kilograms compared with one to six kilograms in other areas of Indonesia. Java, which produces 47% of Indonesia's soybean, is also its greatest consumer.

Average soybean consumption for the whole of Indonesia increased from 3.42 kg/cap/year in 1969 to 5.78 kg/cap/year in 1985 (CGPRT No. 10, p.32, Table 3).

Consumption per capita of processed soybean is higher in urban areas than in rural areas (Table 1), and the average expenditure per capita for soybean is greater in urban than in rural areas* [SUSENAS 1981, quoted by Rosegrant et al. (1987)].

The total demand for processed soybean in 1987 has been estimated at 1.46 million tones of *tahu/tempe* and 48.2 million litres of kecap. The related demand for soybean grain has been estimated for the same year at 928,100 tonnes (Table 2), corresponding more or less to the national yearly production.

The Indonesian "poultry revolution" (World Bank, 1984) has given rise to the modern animal feed-mill industry, which provides most of Indonesia's commercial feed. As soybean meal is regarded by animal nutritionists and poultry breeders as an ideal source of protein, the continuing development of poultry farming (both broiler and egg production) has sustained the demand for chicken feed and consequently for soybean meal. As Indonesia did not have a crushing industry until 1988, the meal had to be imported to regulate the national demand and to sustain the development of the "poultry revolution".

IN THIS ISSUE

[1] This presentation was given at the International Conference on Soybean Processing and Utilization in Gongshuling, People's Republic of China, 24 -29 June 1990.

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* Annual expenditure per capita for soybean consumption was Rp 127,644 for the rural population, while that of urban population was Rp 222,954.

Table 1. Weekly consumption per capita of processed soybean in Indonesia.

Type of product	Unit	Rural			Urban			Rural + Urban		
		1981	1984	1987	1981	1984	1987	1981	1984	1987
1. *Tahu*	kg	0.055	0.055	0.065	0.139	0.119	0.129	0.074	0.066	0.082
2. *Tempe*	kg	0.065	0.067	0.076	0.129	0.103	0.115	0.095	0.075	0.086
3. *Oncom*	kg	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.004
4. *Kecap*	m*	1.877	1.057	3.660	5.37	2.492	10.740	2.673	1.363	5.530

Source: CBS (Central Bureau of Statistics)

Note: * in 1984 the unit = once

Population in 1987	Urban	44,276,004
	Rural	123,338,823
	Total	167,614,827

Table 2. Estimated yearly consumption of *tahu/tempe*, *kecap* and related demand for soybean in 1987 in Indonesia.

Type of product	Consumption (1000)	Related demand for soybean (1000)	(%)
Tahu	714.7 t	476.5 t	51
Tempe	749.6 t	440.9 t	47
Kecap	48,200,00 l	10.17 t	2

Conversion rate:

1 kg soybean = 1.7 kg *tempe* (Hayami *et al*., 1987)

= 1.5 kg *tahu* (Hayami *et al*., 1987)

= 4.5 litres *kecap* (CBS Statistics Industry 1987)

Source: Survey data, SYGAP, 1988-1989.

It was still necessary to import more than 460,000 tonnes of soybeans and 72,000 tonnes of soybean cake in 1988, absorbing over one hundred and fifty million U.S. dollars of foreign currency (Table 3).

Rosegrant *et al*. (1987) showed that the national annual human consumption of soybean was projected to grow at a rate of 3.5% per year, with animal consumption growing at 5.2% per year. Consequently, imports will continue to increase, at a rate of 5% per year, to a projected 1.5 million tones in the year 2000.

Concerned at this situation, the Indonesian government has implemented programmes to boost soybean production, the effects of which will be discussed later.

Soybean Processing

National statistics show that in 1987, large- and medium-scale processing units (employing more than 20 persons) processed more than 16,000 tonnes of soybean. They produced almost 16 million litres of kecap (soy sauce) and 16,400 tonnes of tahu and tempe (Table 4), the equivalent of 1% of the estimated demand for tahu/tempe and 33% of the estimated demand for *kecap*.

This means that in 1987, Indonesia small-scale soybean processing plants (or non-registered, large- and medium-sized ones) produced 99% of the *tahu/tempe* and 67% of the *kecap* consumed. As *tahu* and *tempe* cannot be stored for more than a day without refrigeration, and because they must always be available in small quantities for the consumer, processing has to be carried out near the consumer, to avoid deterioration during transportation and storage. Thus *tahu/tempe* processing industries have to be small and scattered throughout the country.

In co-operation with the Socio-Economic Department of the Bogor Research Institute for Food Crops (BORIF), SYGAP carried out a short survey on soybean processing in March 1989, in the districts of Karawang (West Java), Wonogiri (Central Java) and Jombang (East Java). A total of 1,284 small processing units, producing about 22,200 tonnes of *tahu/tempe* annually, were identified. Counting 300 working days per year, the average daily production capacity was estimated to be 57 kg per unit. Irawan and Purwoto (1989), showed that the small-scale ones processed an average of 90.6 kg daily.

According to the SYGAP survey, the 181 units studied in the Karawang District provided employment for 1,164 people, composed of 75% family labour and 25% paid workers (Table 5). Sixty percent of the units studied employed between two and five family members and 83% employed fewer than two paid workers (Table 6).

Table 3. Exports and imports of soybean and soybean cake in Indonesia, 1963-1987.

Year	Soybean [a]				Soybean cake [b]			
	Exports [1]		Imports [2]		Exports [1]		Imports [2]	
	Quantity (mt)	Value ('000 US$)	Quantity (mt)	Value ('000 US$)	Quantity (mt)	Value ('000 US$)	Quantity (mt)	Value ('000 US$)
1963	311	26	19	2	-	-	-	-
1964	-	-	-	-	-	-	-	-
1965	290	10	-	-	-	-	-	-
1966	27,446	996	-	-	-	-	-	-
1967	6,860	193	2	0	-	-	-	-
1968	8,316	247	0	0	-	-	-	-
1969	749	13	1	0	-	-	-	-
1970	3,953	57	0	0	-	-	-	-
1971	732	13	277	6	-	-	-	-
1972	3,955	44	183	8	-	-	-	-
1973	36,001	851	101	12	-	-	-	-
1974	4,148	176	15,013	-	-	-	-	-
1975	30	4	17,802	953	1250	80	1,197	69
1976	554	7	171,746	20,329	-	-	8,117	609
1977	10	3	89,101	22,170	1000	115	9,733	1,148
1978	-	-	130,499	37,143	-	-	20,672	2,234
1979	2	1	176,620	55,789	-	-	28,357	3,142
1980	-	-	100,878	3,128	-	-	26,640	6,994
1981	60	28	1,414	676	-	-	169,776	41,847
1982	10	13	1,257	452	-	-	71,769	18,828
1983	16	10	221,515	62,098	-	-	103,569	26,855
1984	-	-	401,024	129,581	-	-	206,077	52,567
1985	-	-	301,957	79,664	-	-	175,223	30,751
1986	-	-	359,270	83,454	-	-	306,716	63,685
1987	-	-	286,705	63,146	-	-	257,000	51,885
1988	38	13	465,839	138,045	30	10	72,323	18,036

Note: [a] Soybean includes: No. stat. 1260 (export) or 1820 (import) BTN 12.01.30, CCCN 12.01.410 (yellow), CCCN 12.01.420 (black), CCCN 12.01.430 (green), CCCN 12.01.440 12.01.440 (brown), CCCN 12.01.490 (mixture)

[b] Soybean cake includes: CCCN 23.04.200

Source: [1] BPS, Ekspor Menurut Jenis Barang, Negeri Tujuan dan Pelabuhan Ekspor (fpor 1963-1983 data), time series data, and Ekspor: Statistik Perdagangan Luar Negeri Indonesia (for 1984-1988 data), time series data.

[2] BPS, Impor Menurut Jenis Barang dan Negara Asal (for 1963-1988 data), time series data and Impor: Statistik Perdagangan Luar Negeri Indonesia (for 1984-1988 data), time series data; as cited in CGPRT Working Paper no. 4 (1990).

Table 4. Consumption of soybean by large-and medium-scale manufacturing companies which produced *tahu/tempe/kecap* in Indonesia in 1987.

Type of product	Number of unit	Production (ton's)	Soybean consumption
Kecap	72	15 896 000 l	3 472
Tahu/tempe	48	16 388 t	13 000
Chicken feed	59	13981 000 t	112 0431

[1] Soybean cake

Source: CBS (Central Bureau of Statistics, 1987).

Table 5. Labour in *tahu/tempe* processing units in Karawang.

Type of product	Number of unit	Family	Paid workers	Total
Cikampek	71	331	110	441
Ranas Dengklok	51	245	90	335
Cilamaya/Jatisari	18	74	23	97
Karawang	41	210	81	291
T o t a l	181	860	304	1164

Source: Survey data, SYGAP 1988-1989.

Table 6. Number of employees in small-scale soybean industries in Kabupaten Karawang.

Industry	Numberof unit						
	Family labour			Total	Paid workers		
	< 2	2<x< 5	> 5		< 2	2<x< 5	> 5
Tahu	5	40	22	67	46	20	1
Tempe	16	64	24	104	97	7	0
Tahu/tempe	0	5	5	10	8	2	0
T o t a l	21	109	51	181	151	29	1

Source: Survey data (*SYGAP II annual report 1988-1989*).

Tahu, also called *tofu*, or soybean curd, is the most important non-fermented soybean food. It is made by grinding soybean by hand or machine to produce a soybean meal. This meal is mixed with calcium sulphate to form a soft curd and poured into clean, muslin-lined wooden frames. It is then covered and left to drain like a cheese. The curd is air-dried on pallets before being cut up to be sold by small traders. It can be further processed by the addition of turmeric, or fried and eaten as a high protein snack which is usually sold by street vendors. Fried *tahu*, containing 55% protein, is especially nutritious.

Tempe is extremely popular in Indonesia. It too, is high in protein and quick to cook - possibly the first fast food ever! The whole bean is used to make tempe in a traditional fermentation process. The beans are boiled, hulled, steamed in a basket over a copper chimney, mixed with *Rhixopus olicosporus* mould from a previous batch, wrapped in small teak and banana leaf packages and left for 25 hours to ferment, producing a firm white cake which is fried before it is eaten.

Hayami (1988) evaluated the production structure of *tempe* and *tahu* manufacturing (Table 7). The conversion rates for one kilogram of *tahu* are similar. The labour requirement for processing one kilogram of soybean into *tempe* is, however, twice as high as for tahu, reflecting the more labour-intensive production process of the former (Table 7).

Since the raw material input of soybean is dominants in both *tempe* and *tahu* production, a similar conversion factor corresponds to a similar level of added value per kilogram. In both cases the value added ratio is less than 15%, reflecting a low degree of processing.

To meet the daily requirements of the cottage *tahu*/*tempe* industry, the Indonesian private sector, together with the National Food Logistic Board (BULOG) and the co-operative of *tahu* and *tempe* processors (KOPTI), developed an efficient marketing system (Hayami, 1988).

Table 6. Production structure of the soybean processing industry.

	Tempe	*Tahu*
Output, input and price		
1. Output (kg/day)	17	150
2. Raw material input (kg/day)	10	100
3. Labour input (hour/day)	8	40
4. Conversion factor (1)/(2)	1.7	1.5
5. Labour coefficient (3)/(2)	0.8	0.4
6. Product price (Rp/kg)	440	500
7. Wage rate (Rp/kg)	100[a]	150[b]
Income and profit		
(Rp/kg of soybean processed)		
8. Soybean input	-590[c]	585
9. Other current input	60	60
10. Product : (4) x (6)	748	750
11. Value added (10)-(8)-(9)	98	105
(value added ratio, %), (11/(10)	(13)	(14)
12. Labour income (5) x (7)	80	60
(labour's share %), (12)/(11)	(82)	(57)

[a] Female wage rate

[b] Average of male and female wage rate

[c] High quality soybean for tempe, which costs about Rp 10/kg more than ordinary soybean in the villages.

Source: Hayami *et al*., (1988).

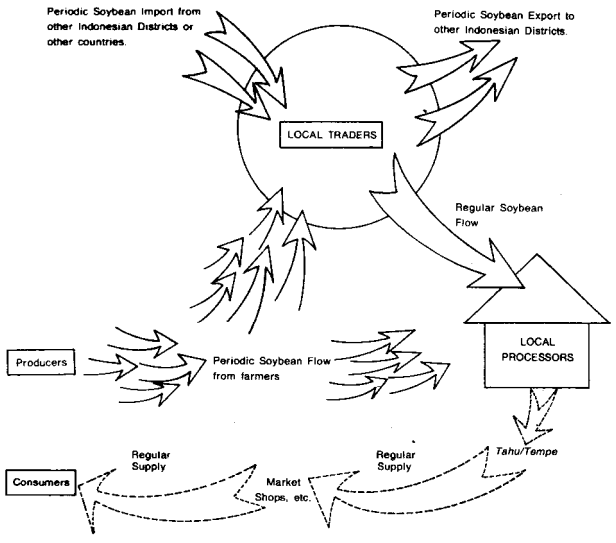


Diagram 1. Diagram of Soybean Flow in Indonesia From Producers to Consumers

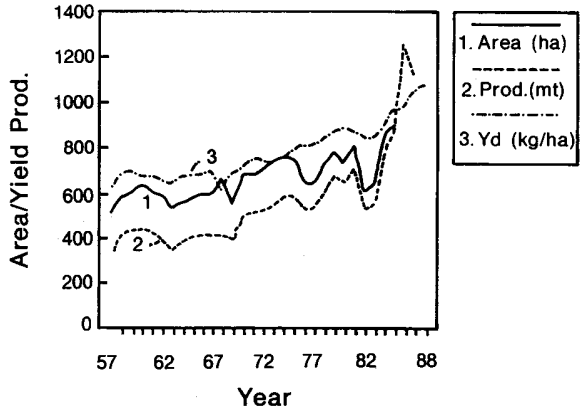
The soybean harvest takes place once or twice yearly while the demand for soybean is daily and regular throughout the year. The soybean supply to the processor has therefore to be regulated. Village traders, who export the excess soybean at harvest time and import soybean when it is no longer available from the farmers, perform this function (Diagram 1).

Production Policy

In view of the growing demand for soybean and the consequent increase in imports, the Indonesian government has acted to stimulate domestic soybean production through four principal programmes: crop intensification, crop diversification, agricultural extension and land rehabilitation. These programmes aim to achieve the targeted level of production using available technology.

The soybean crop intensification programme began in 1979 and was augmented in 1985 by a special programme (OPSUS) in transmigration areas. Supporting policies such as guaranteed price, farm input subsidies, rhizobium inoculant subsidies, liming subsidies, reinforcement of extension programmes and introduction of research and development projects, were also formulated (Sebayang and Sihombing, 1987). The campaign included study and research conducted by the FAO in East Java (Smis, 1987 and Hseu, 1987).

Since 1984, growth of the harvested area, production and yield has been rapid (Graph 1). In 1988 the harvested area increased by about 37%, production by 35% and yield by 20%.



Graph 1. Area, Production, and Yield of Soybean in Indonesia, 1957 - 1988
Source: CBS (Central Bureau of Statistics)

Most of the new soybean areas, however, have displaced cassava and maize. Such a shift will cause a loss in economic efficiency, since soybean production with available technology has a substantially higher domestic resource cost than either maize or cassava. This situation has evolved as a result of price protection through BULOG which controls soybean imports.

Simulation study results reported by Heyten (1990) concluded that efforts to increase soybean production through price incentives may cause rice self-sufficiency to deteriorate. The most feasible way to increase soybean production while safeguarding rice self-sufficiency in Indonesia is to improve production technology.

Rosegrant *et al.* (1987) concluded that one of the major constraints to the development of soybean production in Indonesia is the lack of quality seed that can respond to prevailing agro-climatic conditions, as Indonesia has not yet developed the technical capacity to produce and disseminate suitable high quality seed.

Although such high yielding varieties as Orba, Galunggung, Wilis, Dempo, Kerinci, Raung, Merbabu and Tidar have been developed by BORIF, soybean yields under farmer management remain uncertain (SYGAP II Annual Report 1988-1989). Some of these seed varieties are unsuited to local conditions (Hseu, 1987) or do not always match local requirements.

Farming techniques exist to increase soybean yields (Sumarno, 1987; Smis, 1987; Hseu, 1987) but their application is an intensification process requiring more labour, adequate inputs and precise application. This implies an increase in production costs which cannot be passed on to the soybean price. Intensification of the soybean cropping system is possible only if increases in production cost can be offset by increased yields which reduce the production cost per kilogram. Recommended production techniques, therefore, must be reliable and adapted to each agro-system.

The inevitable increase in production cost caused by intensification should be met by the farmers themselves, or by farmers assisted by financial institutions which are able to provide adequate, efficient credit (Kredit Usaha Tani = K.U.T.).

The small size and limited financial capacity of individual *tahu/tempe* processing units restricts their ability to influence soybean production through the provision of inputs (seed, fertilizer, pesticide) or credit to farmers. Although medium- and large-scale soybean traders have this financial capacity, their intermediate position between

millions of small soybean producers and millions of small *tahu/tempe* processors, gives them no control over production and prices. The economic links between processing and production are weak, even where soybean farmers are also soybean producers.

To speed up the development of soybean production in Indonesia, the requirements of the soybean processors, large and small, should be carefully investigated. Research and extension programmes must take into account the needs of the processors and the market as well as the requirements of the soybean grower.

Workshop on Integrated Pest Management and Insecticide Resistance Management in Asian Grain Legume Crops[1]

19-22 March 1991

Some 40 delegates, representing the major legume growing countries of Asia, the agro-chemical industry, and international research and policy organizations,[2] met in Chiang Mai, Thailand, to discuss the integrated management of grain legume pests in Asia and the related topic of insecticide resistance management. The meeting was sponsored by IDRC, Ciba Geigy (Thailand) Ltd., and ICRISAT, as an activity of the Asian Grain Legumes Network (AGLN).

The workshop was divided into two, two-day meetings: the first meeting dealt with Integrated Pest Management (IPM) per se, the second with Insecticide Resistance Management (IRM), recognizing that IRM is a facet of IPM.

The **Objectives** of the workshop were to:

– determine the need and the strength of support for network activity among legume entomologists in Asia, and if the need was demonstrated to:
– highlight priority areas (research topics and key insect pests).
– examine the feasibility of increasing the interaction between public sector researchers and the agro-chemical industry.
– determine the extent and intensity of insecticide resistance in the farming systems that include grain legumes, and
– discuss policies that would prevent insecticide resistance in legume crops reaching the grave levels found in other commodities.

Brief review of the Proceedings

Day 1. Country delegates presented an overview of the major insect problems which beset grain legume crops in their respective countries. A Ciba-Geigy representative outlined the new policy of his company towards IPM, and indicated the kind of information the private sector would like to receive from public sector scientists.

Day 2. The morning was devoted firstly to reviewing the policy milieu in Asia as it might influence the implementation of IPM in farmers' fields. Discussion was free and wide and touched on such matters as open and hidden subsidies, rational behaviour, and the economic importance of insects. Even though IPM researchers depend upon pest damage to justify their continuing employment, it was agreed that they were doing their profession a disservice by overstating the losses caused by insects and other pests.

Delegates then discussed the technology transfer 'loop' in their countries. The loop starts with the transmission of the message from the farmers about what they really need and want to know, to the sources or providers of new or existing information, which should then be transferred to the farmer.

In the afternoon, the major problem areas were distinguished and separated into topics that could be handled by discrete working groups. A ballot was taken to determine the relative importance of the potential working groups across Asia. A set of recommendations for action by NARS and the international research sector was then drawn up (below).

Day 3. Country representatives outlined the insecticide resistance problems in their countries. The discussion centred on legume crops, but was extended to cover the problems of the relevant farming systems, especially where they contain crops that are susceptible to polyphagous insects which are likely to become resistant to insecticides. Cotton and Helicoverpa was the combination most frequently reffered to.

The Ciba-Geigy representatives gave an account of how the industry, via the Insecticide

[1] Sponsored by CIBA-Geigy Ltd., IDRC and ICRISAT

[2] Bangladesh, People Republic of China, India, Indonesia, Pakistan, The Philippines, Viet Nam, CIBA-Geigy Ltd., AVRDC, FAO, ICRISAT, University of Goettingen/Asian Institute of Technology.

Resistance Action Committee (IRAC) and a US Government backed international consortium of representatives of industry, academia and the public sector International Organization on Pesticide Resistance Management (IOPERM) = International Resistant Pest Management (IRPM), are working towards the implementation of pesticide management schemes. There is a strong commodity bias in these organizations. Grain legume crops are included in a loosely defined sector called 'field crops'.

Day 4. The final day was devoted to discussing approaches for dealing with insecticide resistance problems. Guidelines drawn up in Australia - following their experience in managing pyrethroid resistance - formed a basis for this discussion. The need to detect insecticide resistance before it manifested itself in the form of pesticide failures was stressed. A set of recommendations that indicates how the delegates perceived the need for, and direction of future action, was drawn up (below).

Recommendations Leading to the Formation of a Sub-Network Dedicated to the Integrated Control of Insect Pests of Grain Legumes in Asia

1. It was recommended that a network should be formed under the aegis of AVRDC, FAO and ICRISAT (AGLN)[*] to promote:
   a) the exchange of information on grain legumes pests[**]. Specific mention was made of the need to communicate information on the results of pest surveys carried out by members of national programmes;
   b) the exchange of natural control agents, including pathogens, germplasm and breeders material with insect resistance in its profile;
   c) human resource development by the interchange of trainess and organization of specialist training courses;
   d) the development and application of biotechnological techniques specifically orientated to the needs of IPM schemes;
   e) rational insecticide management; and
   f) taxonomic support for the identification of insect pests and their natural enemies, ideally through a Regional Centre.

2. It was recommended that attention be focused on specific problems through the medium of working groups, consisting of specialists from the National Programme, the private sector, and where accessible, from international institutes in the region and from institutes on other continents:

The Working Groups highlighted in discussion, are arranged below in priority order of topics (notes 2.1-7):

Pesticide management	(1)
Agromyzid flies	(2 =)
Storage pests	(2 =)
Insecticide application	(4)
Helicoverpa	(5)
Maruca	(6)
Virus vectors	(7)
Soil insects	(8 =)
Pod borers	(8 =)
Defoliators	(10)
Thrips	(11)
Heteroptera	(12)

Insect pathogens (see note 2)

Note 2.1 The ranking was determined by ballot and indicates the importance of the areas of potential working groups, in terms of constraint intensity. It was acknowledged that the priority order would be different (almost reversed) in terms of the need to gather and collate information about specific pests.

Note 2.2 The exploitation of insect pathogens was noted by researchers to be of highest priority, but the ranking of this topic was depressed because it is currently of lesser importance to the private sector, although research is ongoing.

Note 2.3 The anticipated needs of Myanmar, Nepal and Sri Lanka, were indicated by ICRISAT representative, as delegated from these countries were unable to attend.

[*] A co-ordinating body within this structure is necessary, to accommodate all the relevant grain legume crops in Asia and the needs of the relevant countries.

[**] The term "pest" normally includes all biotic constraints. The possibility of linking with other legume constraint networks or, of extending the proposed network to include fungal pathogens, vertebrate pest, and weeds in the future, was accepted a s a natural progression.

Note 2.4 Industry and the extension sector indicated that researchers should provide them with information about the life cycles, phenology, population dynamics, natural enemies and damage - yield loss relationships of key pests. This is in-cluded in the information required about specific pests or pests or pest group together with indications of potential IPM strategies.

Note 2.5 Species included under 'pod borers' = *Etiela,* plume moth, blue butterflies, and *Eucosma*; 'defoliators; = *Spodoptera litura,* groundnut leaf miner, hairy caterpillars, semi-loopers and defoliating beetles; 'soil insects' = white grubs (of highest priority for groundnut in India, Viet Nam, China, Myanmar and the Philippines, and of high priority in Thailand), termites, doryline ants, and *Agrotis*; 'Heteroptera' = pentatomids (*Nezara*, *Oiezodorus*), corieds (e.g. *Riptortus, Clavigralla*) and mirids (e.g. *Camplyloma*); 'storage pests' refers specially to bruchids.

Note 2.6 A 'thrips network' has already been iniatiated by AVRDC and the needs of legume entomologists can be accommodated therein.

Note 2.7 It was agreed that studies of the natural enemies of specific insects or insect groups would be included in the activeties of the relevant working groups.

3. The need to monitor the effectiveness of IPM in economic and socio-economic terms was stressed, and the following specific recommendations were made:

   a) to hold a workshop in the near future, in order to compile all available baseline data on the relationships between pest density and yield loss for grain legume crops;
   b) to initiate studies on the effectiveness and farmer perceptions of IPM in grain legume crops;
   c) to analyse the impact of the policy environment in the furtherance of IPM.

4. Technology exchange and information transfer should be facilitated by:

   a) newsletters(s)
   b) working group meetings
   c) construction of an IPM database
   d) investigating the possibility of organizing an International Grain Legumes Workshop to be staged in 2993/1994 by ICRISAT in India
   e) procuring support for inter-country study tours.

5. The widening of the membership of the network should be sought to increase the pool of experience available within the network and to attract donor support. Specific mention was made of:

   ADB
   AIDAB/ACIAR
   CGIAR - (CIAT, IITA, IRRI, ICARDA)
   CP-CRSP
   FAO (Rome, Bangkok, Manila)
   GIFAP/IRAC
   GTX/BMZ
   ICIPE
   IDRC
   IDOAM
   IOCU
   The anticipated 'IPM-CRSP'
   IRPM (IOPERM)
   JICA
   NRI
   PAN
   P-CRSP
   TARC
   UNDP
   WWF

6. Attempts should be made to link with other network sharing common interests.

7. A Steering Committee, based and administered by AGLN at the ICRISAT Centre, should be formed to promote the activities of this subnetwork. It should be chaired by an ICRISAT Legumes Entomologist and composed of AGLN country representatives or their nominees if the representative is not a plant protection specialist. The private sector, AVRDC, FAO and NGOs, should be represented on this steering committee.

Insecticide Resistance Management in Asian Grain Legumes

Recommendations

1. The group recognizes the importance of Insecticide Resistance Management (IRM) as a component of the integrated management of legume pests. It wishes to link IRM with the IPM Network proposed above, through the pesticide management working group. It also

recognizes that insect pests of legumes live on other crops and stresses the importance of the co-ordination of IRM active-ties by insect species and across farming systems (as opposed to the existing emphasis on crops and commodities).

2. The group emphasized the need for accumulating baseline data about key or high risk pests with respect to their resistance to different classes of insecticides. Where-ever possible, this should take place before resistance was detected or suspected. Initial research projects should focus on:

   Maruca
   Spodoptera
   Helicoverpa
   Aphids, jassids and white flies
   and insect pests of local relevance

3. There is a need to increase the number and quality of test laboratories and training courses to obtain the required baseline data. Training should be imported by resource people from the private and public sector.

4. Monitoring techniques should be identified, standardized, and developed or refined where necessary.

5. IRM/IPM strategies should be formulated on the basis of site specific, baseline susceptibility and resistance data, as well as on the results of resistance.

6. There is a need for the continuous evaluation of IRM strategies.

7. Every effort should be made to ensure the full participation of policy makers, researchers, industry and farmers, to guarantee the success of IPM/IRM programmes.

8. The Asian Grain Legumes IRM Network should establish linkages with the donor community IOPERM, IRAC, FAO and other international bodies to sustain the work of IRM.

It is anticipated that a summary of proceedings will be available from September 1991. Delegated will automatically receive a copy.

Communicated by:

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Workshop on Methods and Procedures in Comparative Advantage

5-8 November 1991

From 5-8 November 1991 a workshop on Comparative Advantage measurement tool place at the CGPRT Centre which was attended by 24 participants from 12 countries. The workshop signifies a long term involvement of the Centre in disseminating and promoting appropriate methods and procedures in measuring comparative advantage, and was sponsored by the European Community.

It has become widely recognized that trade negotiations are becoming increasingly important to the developing economies in the region and that important issues concerning farm income and public investment are directly connected to the comparative advantage of agricultural commodities. The CGPR Centre was among the first institutes in the region to apply comparative advantage on food commodities, which are important to an estimated 700 milion people conducting agriculture on some hundred and thirty million ha in the region.

During the workshop a number of researchers from Chiang Mai University, Thailand and CASER, Bogor, Indonesia presented research results. It was found, that although yields in Chiang Mai are high at 1.8 ton/ha, the increased cost of labour had severely affected the domestic resource cost ration of soybean in Northern Thailand. It was found that soybean which increasingly replaced second rice in Chiang Mai province in the last decade, is in turn being replaced by onions and horticultural crops, which have a substantially higher private profitability. In Indonesia two locations were researched in East Java on limestone based marginal soils, the district of Blitar, and in irrigated area, the district of Jember. It was found that soybean, which yields 1.7 ton/ha in the Jember district has a DRC of 0.435 under an import scenario whereas in the Blitar district which yields 0.4 ton/ha, the DRC is substantially higher than one. Regarding Indonesia it was concluded that the present policy of insulating the domestic soybean market from the international market underscores differences in local resource endowment. It also found that, applying standard methodology, the Jember district is a more efficient producer of Soybean than Chiang Mai, Thailand, which basically re-

flects the different cost of labour.

A Number of the other resource papers were presented from which some tentative results are given in figure 1 and 2. It can be seen that substantive variation exists in soybean production by agro-ecologival zone. Similar variations can be observed regarding maize. Research results match these tentative results very well, which would strengthen the observation that the analysis according to agro-ecological zone is of essential importance in analyzing impact of policy and policy transfers.

Two days of the workshop were devoted to handling computer software which would make zonal and statistical analysis easy. Substantive discussions centred around the pre-condition for applying the Policy Analysis Matrix (PAM). It was stipulated that market formation and integration as well as competition at specified market level between competing produce from different areas or from overseas are of basic importance. Several participants, noticeable from the Union of Myanmar, Papua New Guinea noted that even for major commodities in their countries, these conditions might not be met.

Moreover, basic questions regarding social cost were discussed. A number of interesting historical consequences of sufficiency policy were delineated, which in India in some areas resulted in over-intensive land use and subsequent desertification and land degradation. It was pointed out with emphasis that the PAM would not accommodate in its present analytical form the inclusion of these connected and important issues in the social and private balance.

It was concluded that the PAM is a useful tool for policy analysis but that its static comparative nature necessitates analysis of time series data pertaining to technology, productivity and competetive advantage. It was acknowledged by the participants that the PAM permits the inclusion of technology level in a wider policy context which was felt to be an important contribution toward establishing appropriate agricultural policy. A number of participants submitted suggestion for further research which would be followed-up in due course.

On the final day the Minister of Agriculture and Marketing of Sri Lanka, H.E. the Hon. Mr. Wijeratne Band and the Permanent Secretary General Mr. W.P.R.B. Rajakaruna attended the session and engaged in discussion.

CGPRT Centre News and Activities

The Centre distributes "Economic Plants of Indonesia: A Latin, Indonesian, French and English Dictionary of 728 Species"

There are two ways of going about the study of the Indonesian flora. The first and most accurate one is to become acquainted with botanical terms. The other way, much less reliable but a lot more pleasant and above all faster is to depend on the wonderful botanical knowledge of the Indonesian farmer. If you decide on the latter, this handbook may prove precious to you. This booklet deals with 728 numbered species, divided into 139 families and introduced in alphabetical order. The usage of this book is guided with good indexes: a scientific index, an Indonesian index which includes the local names (Javanese and Sundanese), and a French index.

This book is co-published by ORSTOM and SEAMEO BIOTROP, and the Centre distributed on request to the interest customer in **Indonesia only.** For overseas purchase, please contact: SEAMEO BIOTROP, P.O. Bx 17, Bogor, Indonesia.

Patrice Levang, and Hubert de Foresta. ORSTOM and SEAMEO BIOTROP, Bogor, 1991. 180 p. Rp. 11.000 (including postage cost).

New Publication

Asian Agriculture: A Sourcebook

Compiled by Soeripto, Sri Wahyuni, and Green Judy. 1991. 118 p. ISBN 979-8059-34-4.
Price US$ 12.50. US$ 9.00 (developing countries). Rp 11.000.

This sourcebook draws on a wide range of newly available information sources and systems. It is a guide to secondary information in Asia. It has been designed to help agricultural researchers and economist make easy and rapid use of this information, through providing access

to bibliographies, organizations, software, on-line service, databases, journals, etc. The book should helpd to meet the growing need for comprehensive and integrated information.

Marketing Innovation for Vegetables: Conditions of Diversification in Upland Farming

Yujiro, Hayami, Toshihiko Kawagoe, Shigeki Yokoyama, Al Sri Bagyo, and Amar Kadar Zakaria. 1991. 87 p. ISBN 979-8059-42-5.
Price US$ 10.50. US$ 7.50 (developing countries).
Rp 9.000.

The study investigates the marketing system for perishable commodities such as vegetable, which have been recently introduced into cropping systems in upland farms. The study analyzed the market structure and examines the benefits which accrue to farmers. It also examines policy implications and the role of rural women in vegetable marketing.

Forthcoming Publications

Rural Employment and Small-scale Rural Food Processing in Asia

Aida R. Librero, and Charles E. van Santen. 1991. 177 p. ISBN 979-8059-46-8
Price US$ 17.50 US$ 1350 (developing countries).
Rp 16.500,-

A major challenge for the future throughout Asia is to generate sufficient employment in rural areas, absorbing surplus labour from the agricultural sector, and reducing urbanization. This theme has been of importance in economic policy since the Second World Was and continues to be a concern to policy makers throughout the region. The volume presents country overviews regarding rural employment and rural industrialization, with specific attention to employment generation in processing of non-rice crops. Although no firm conclusions can be drawn, it is clear that secondary crops provides significant opportunity and potential for employment generation in rural areas. The volume contains revealing insights into major agricultural-based economies in the region.

Announcement

NRI TRAINING IN POSTHARVEST FRUIT, VEGETABLE AANF ROOT CROP TECHNOLOGY

The Natural Resources Institute (NRI) invites applications for its 13-week training course in Postharvest Fruit, Vegetable and Root Crop Technoloy beginning in September 1992. The course provides in-depth training for people from developing countries who have some involvement in the handling of perishable produce. Special attention is given to tropical crops.

Key topics in the programme include:

* optimal crop harvesting for storage
* postharvest physiology of fruits, vegetables and root crops
* principles of marketing perishable crops, product quality and its control
* handling crops
* [ackaging
* packing station design, equipment and operation
* principles f storage
* cold store design and operation
* postharvest diseases and their control
* postharvest physiological disorders and their control
* pest control: fumigation, pesticide residues
* transport; road, rail, sea and air
* instrumentation: basic laboratory and commercial systems
* legislation and grading, including quality requirements for the European market
* fuit ripening
* small-scale crop conservation through processing and improved product utilization
* specific commodity studies: workhops on major commodities of particular interest to the group

The course is organized as a series of lecture modules, seminars and practical. The trainees also carry out a library based research project on a relevant topic of their own choice. In addition to the time spent in NRI, visits are arranged to research establishments, commercial organizations and markets elsewhere in the UK.

The NRI (previously ODNRI) is the scientific arm of Britain's Overseas Development Administration. The Institute is an internationally recognized centre of expertise on the renewable natural resources sector in developing countries, with a staff of around 500. For further information contact: Training Contracts Officer, Natural Resources Institute, Central Avenue, Chatham Maritime, Kent ME4 4TB, UK. Tel. 0634 880088, telex 263907/8 LDN G.

CGPRT Centre

The Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific (CGPRT Centre) was established in 1981 as a subsidiary body of UN/ESCAP.

Objectives

In co-operation with ESCAP member countries, the Centre will initiate and promote research, training and dissemination of information on socio-economic and related aspects of CGPRT crops in Asia and the Pacific. In its activities, the Centre aims to serve the needs of institutions concerned with planning, research, extension and development in relation to CGPRT crop production, marketing and use.

Programmes

In pursuit of its objectives, the Centre has three programmes which are mutually supportive:

1. Research, which entails the preparation and implementation of studies covering production, utilization and trade of CGPRT crops in the countries of Asia and the South Pacific;
2. Training of national research and extension workers;
3. Information and documentation which encompasses the collection, processing and dissemination of relevant information for use by researchers, policy makers, and extension workers.

Palawija News

Contributors are invited to submit concise summaries of significant social research related to CGPRT crops for publication. Submissions should be limited to two to four double-spaced typewritten text. Two figures (graphs or tables) may accompany the article. Include only references cited. All articles are subject to editing to meet space limitations.

Please send all queries relating to articles in *Palawija News* to Head Publications Section, CGPRT Centre, Jalan Merdeka 145, Bogor 16111, Indonesia.

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