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STAFF SUMMARY REPORT: WORKSHOP ON FOOD AND NUTRITION POLICY IN INDONESIA

Held in Bogor, Indonesia
July 10 - 14, 1978

Sponsored by

Indonesian Institute of Sciences (LIPI)
with participation of Resource Individuals from
Board on Science and Technology for International Development
Commission on International Relations
National Academy of Sciences - National Research Council
United States of America

NATIONAL ACADEMY OF SCIENCES
Washington, D.C.
1978

The report is a staff-prepared summary of the Workshop on Food and Nutrition Policy in Indonesia. The workshop was held in Bogor, Indonesia, July 10-14, 1978, under the sponsorship of the Indonesian Institute of Sciences (LIPI) with participation of U.S. resource persons by the Board on Science and Technology for International Development of the U.S. National Academy of Sciences. Participation by the National Academy of Sciences was made possible through funds provided by the USAID Mission/ Indonesia, Agency for International Development, under contract No. AID
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I

Indroduction and Background

In 1968, the Indonesian Institute of Science (LIPI) and the U.S. National Academy of Sciences (NAS) cooperated in a joint workshop on food and nutrition. The objective of the meeting was to devise practical recommendations about food problems in Indonesia that could be used as guidelines in the formulation of national food policy and the development of food programs for Indonesia's first five-year development plan (Replita I, for 1969-1974). The 1968 workshop was designed to explore approaches to immediate and long range food and nutrition problems and was considered very successful by the Indonesian organizers. Many of its recommendations were integrated into the first and the second five-year development plans (Replitas I and II).

A decade later, LIPI asked the NAS to join with it and with the Indonesian Association of Food and Nutrition in a 1978 National Workshop on Food and Nutrition Policy. The major goal of this second workshop was to review the status of selected food and nutrition policies and programs during the interim ten-year period and to help formulate policies and programs for possible inclusion in the third five-year development program (Replita III, for 1979-1984).

A preparatory meeting was held in Jakarta on June 13, 1978. A summary of the recommendations that emerged from this meeting are included as Appendix C.

II

Organization and Highlights of the Workshop

The workshop was formally opened by President Suharto and LIPI Chairman Bachtiar Rifai, with comments by Dr. Vernon Ruttan, Chairman of the U.S. panel, at the Presidential Palace in Bogor. The first and the last days of the workshop were full plenary sessions. In the interim, the participants were assigned to working groups which considered the following themes.

Group 1:	Food Sufficiency and Nutrition.
Group 2:	The Role of Soil, Water, Climate and Production Technologies in the Food Supply.
Group 3:	Biological Studies to Support the Development of Technologies for Agricultural Resources.
Group 4:	Agricultural Policy to Stimulate Production.
Group 5:	Postharvest Technologies and Marketing and Utilization of Food.
Sub-Plenary 6: (two sessions)	Institutional Systems for the Planning, Execution, and Evaluation of the Food and Nutrition Program.

The national workshop was attended by approximately 180 Indonesian participants, 11 resource persons from the U.S. National Academy of Sciences and representatives from the FAO, World Bank, UNICEF, Ford Foundation, International Agricultural Development Service, the Agricultural Development Council, and other pertinent organizations resident in Indonesia.

The NAS played a major role in assisting the Indonesians with the agenda and the arrangements for the 1968 workshop, which was conducted in English. In 1978 the Indonesians made all arrangements, including the formulation of the agenda, without assistance from the NAS. The panelists provided by the NAS served solely as resource persons. Most

of the 1978 sessions were held in the Indonesian language with individual translators assigned to each NAS participant.

This staff summary is largely a translation of the documents presented at the final plenary session, which was accepted by the participants with minor corrections. It includes a statement on problems and potentials, plus a report from each working group.

The main conclusions and recommendations, as perceived by the U.S. group, were:

A. A national food and nutrition coordinating committee should be created, headed by the Ministers of Agriculture, Health, and Social Welfare, which would report directly to the President. This recommendation resulted from awareness of the need for interaction on these topics, as well as the concern of the professional communities in health, agriculture, and related sciences with vital food and nutrition issues.

B. Because of the pervasive nature of Indonesia's nutritional problems, solutions will come from provision of more and better food, rather than pharmaceutical interventions.

C. A more balanced food production strategy should be stressed, with emphasis on neglected alternatives to rice, particularly sorghum, maize, cassava and fish.

D. The increasing food supply problem should be solved domestically through agricultural developement, with dependence on food imports avoided.

E. There is reasonable optimism that Indonesia's resource base and technological capacity can sustain a 4 percent per year increase in food production (including a 3 percent increase in rice) if institutional problems and constraints can be overcome. Steps toward achieving this growth rate include increasing the efficiency of marketing institutions, gaining public support for resource development, and providing incentives.

F. Technology needs include improved postharvest conservation of foods, particularly cereals and fish, and diversification of food production and use. Training programs will be necessary to implement technical changes and improve institution performance.

The support and cooperation of the Indonesian organizers and hosts were excellent. LIPI provided lunch each day of the workshop, an event that not only was pleasant but that also enabled a helpful, informal exchange among the participants. LIPI officials also arranged many evening functions that offered additional opportunities for informal discussions.

III

Workshop Proceedings**

Summary of Problems and Potentials

The Problem of Nutrition

The main problems of nutrition in Indonesia are: (1) calorie and protein deficiency, (2) vitamin A deficiency, (3) endemic goitre, and (4) nutritional anemia.

- KKP (Kurang Kalori-Protein = calorie-protein deficiency) affects 9 million preschool children, 5 million pregnant women, and 2 million breast-feeding women.
- Vitamin A deficiency is mainly prevalent among preschool children causing eye damage and blindness among 100,000 children each year.
- Iodine deficiency occurs on various islands in Indonesia, causing endemic goitre in 12 million people.
- Widespread iron deficiency causes anemia in 12.5 million preschool children, 9 million school children, 14 million women, and 5.5 million low-income workers.

From this, it can be concluded that nutritional levels in Indonesia are still far from satisfactory and can result in impaired physical and mental health among the population, lowering the national resiliance and delaying development.

The Food Problem

According to the Food Balance Sheet, since 1973 the per capita calorie supply of the Indonesian people has exceeded, on the average, an energy level of 2100 cal/day.

** Chapter III consists largely of a translation of the documents presented at the final plenary session, which were accepted by the participants with minor corrections.

However, the protein supply reaches only 43-45 grams cap/day. The Indonesian diet still shows a heavy dependency on rice. Of the available calories, 55 percent come from rice, 11 percent from maize, and 9.8 percent from ubi-ubian/edible tubers. In the supply of protein, rice contributes at least 50 percent, maize 14.3 percent, and ubi-ubian 4.2 percent.

This picture of the food supply is at the national level and does not depict the consumption levels of the various separate societal groups. Although on a national level it seems that the food supply is adequate in terms of calories and proteins, in fact, part of the population does not get enough food, as explained above. Further, the per capita increase of rice consumption has created a problem that needs serious attention. From various data sources it can be concluded that--with a few exceptions--food production during Replita I and Replita II has shown an increase. However, this increase is not enough to bring Indonesia to the point of self-sufficiency. In order to make the food supply adequate, the Government imports rice and other staples such as flour, sugar, maize, and soybeans.

In 1970 rice importation was approximately 960,000 tons; this rose to 1,960,000 tons in 1977. Further, imports of flour and soybeans show an increase. In 1970 a flour import of approximately 0.5 million tons was reported. This rose to 1 million tons in 1977. In 1971 the import of soybeans was 3,000 tons, rising to 172,000 tons in 1977. Importation of maize has been fluctuating. In 1973 it was around 142,000 tons, decreasing in 1975 to 24,000 tons, and in 1976 rising again to 96,000 tons. In 1977 maize importation again deminished to approximately 14,000 tons. Meanwhile, consumption of rice has shown an increase; during the period 1970-1976, this increase averaged approximately 4.1 percent a year, while in the same period consumption of maize decreased by 6.2 percent a year. The intake of edible roots during this period shows an increase of more than 9 percent a year, much higher than the increase in the consumption of rice.

The slow increase of food production in comparison with the increase of its consumption is the main food problem that Indonesia is facing at present. This situation is caused by various factors. With regard to consumption, these include rapid polution growth and rising per capita income. With reference to production, setbacks have been caused by droughts and pests. Moreover, there are still socio-economic obstacles that inhibit peasants from stepping up food production, whether of rice, maize, cassava, or other crops.

The lack of effectiveness of the policy for stimulating food production is largely due to the fact that it does not rest on price incentive. With regard to establishing the maximum price for rice, it is feared that market developments have forced the rice to a relatively low level compared with the prices of other food commodities, excessively stimulating its consumption. The maximum rice price varies according to the demand in each section of the country, making it difficult

to set a high floor price as a means of stimulating the substitution of other crops in the diet.

However, not only will announcing one fixed price valid for all territories be ineffecient, it can destroy other price relations and weaken the production stimulation policy it means to support. With regard to the stimulation policy, in certain cases subsidizing production will be better, particularly in light of its beneficial influence on the rate of inflation and the leveling of incomes.

In the execution of the food production stimulation policy, the main problems concern a floor price. There are still public misconceptions about this floor price and its function, especially among the field workers. They confuse the concept of a floor price with the cost price, while the function of the floor price is also often linked with the domestic paddy purchase program, without being associated with the stimulation to produce. Because of these misconceptions, the correctness of the level of the floor price is often measured against the success of the purchase instead of by its effectiveness in stimulating production.

In addition, the floor price set for quality and a certain level of moisture cannot always be easily used by the peasants to calculate the price they should receive for the paddy/unhulled rice, which further reduces the effectiveness of the floor price in stimulating production. Also, the existing market system, particularly at the rural level, is inefficient, and stimulation caused by the floor price cannot be channelled satisfactorily to the peasants.

Damage and loss of agricultural produce largely occur in the postharvest period. Attention to this problem is still slight, and of little importance compared with the attention given to production technologies. In the drive to increase the supply of food, the postharvest problem of the agricultural food crops needs greater effort. It is estimated that in Indonesia 20-45 percent of the perishables and 10-40 percent of the legumes produced are damaged or lost following harvest.

Potential

Land Use

The present agricultural area in Indonesia can be extended to meet the goal of self-sufficiency in food production. According to estimates, within 5 years an irrigation network of 650,000 hectares can be put into use. The "padi gogo" (dry field paddy) area can be raised from 1.1

million hectares to 1.8 million hectares in the next 10 years. This projection includes lands with slopes of 0 to 15 percent, and of the adaptability classes IV to VI, which still have possibilities for cultivation of agricultural food crops, farming, and fishery on a mainland area of 28.7 million hectares and a swampy area of 39.5 million hectares in Sumatra, Kalimantan, Sulawesi, and Irian Java. The land surface for brackish water ponds is 180,000 hectares and the area for fresh water ponds can be increased from 60,000 hectares to 1 million hectares.

As a cattle-breeding area, the cogongrass (Imperata cylindrica) plains have a potential of 4.1.12 million hectares. Integration efforts between coconut and rubber estates and forestry and farming also have development potential.

The main problem in utilizing these lands is the fact that the soil has suffered stresses that have decreased its quality and capacity. This is because the soil has not been used according to the principles of soil conservation, resulting in the decrease of its productivity.

The inventory of land potential shows that an estimated 5 million hectares can be developed into irrigated wet rice fields and another 1 million hectares can become quick-yielding fields by simple development. Wet land with potential for extension includes valleys, swamps, and ebb and flood areas amounting to 39.474 million hectares. Potential dry land amounts to 32 million hectares (only 18 million hectares in Sumatra and 14 million hectares in Kalimantan).

Only cogongrass and brushwood, in large part, indicate that man has ever planted crops in these areas, and these are the results of shifting cultivation. The area of cogongrass plains with a slope of less than 8 percent scattered over Sumatra, Kalimantan, Sulawesi, and Irian Java covers 4.1-12 million hectares.

Rural territories, particularly, suffer soil damage because people destroy forest for firewood. Meanwhile, residential yards, which form approximately 20 percent of the agricultural lands, are not sufficiently utilized.

Climate and Water

In some territories, the prospect of irrigation (with the use of pumps) is still open. The allocation and arrangement of irrigation can be further improved to extend the planting area.

The country's rainfall is only utilized in small part; in all of Indonesia an average of only 1/16 of the total rainwater is used (Java and Madura 29 percent; Sumatra and Kalimantan 16 percent; Sulawesi 20 percent; Bali, Nusatenggara almost 5 percent; Maluku and Bali only a small percentage). In Java, the utilization of rainwater, mainly as surface run-off, is done rather extensively. It is estimated that by the year 2000 a number of territories, including Jakarta, Surabaya, and

Semarang will suffer a shortage of water. To meet their agricultural needs, these areas will have to obtain water from distant places through an "inter-basin development" project.

Rainfall data are often obtained from observation stations situated far from the agricultural areas. This is a problem, as data about the weather are needed in agricultural efforts, particularly in areas dependent on rain to establish timing patterns for planting and fertilization.

Flora

We may still expect that in the future new varieties of paddy will emerge with higher crop potential, as the IR varieties cannot yet equal the crop yields of the Japonica in Japan and Korea. Similar expectations exist for other foodstuffs such as maize, soybeans, cassava, sweet potatoes, high-carotene vegetables containing iron, and fruits with a large content of fats and calories.

Losses caused by pests and disease in the field vary between 19-24 percent. If the loss due to pests can be decreased to 10 percent, a production increase of approximately 1.7 tonnes of rice per hectare can be expected. If this is done gradually over 5 years, an increase of 350,000 tonnes of rice per year can be expected.

With reference to the carbohydrate supply, many opportunities remain to increase the production of maize, edible tubers, and cassava. In addition, a number of other commodities constitute a potential supply of natural carbohydrate sources, e.g., sorghum (Sorghum bicolor), sweet potatoes (Ipomcea batatas), taro (Colocasia esculenta), sagu (Mextroxylon sago), and sugar palm (Arenga pinnata).

Among approximately 350 kinds of beans important to the economy of Indonesia, only about 30 have been utilized as sources of food, especially protein, including soybeans (Glycine max), peanuts (Arachis hypogea), and green beans (Vigna radiata). There are also other beans that do not need special attention, such as rice bean (Vigna umbellata), winged bean (Psophocarpus tetragonolobus), string beans (Vigna unguiculata), sword bean (Canavalis ensiformis), lima bean (Phaseolus lunatus), common bean (Phaseolus vulgaris), lablab (Lablab purpureus), horse bean (Vicia faba), and pigeon pea (Cajanus cajan).

Cattle, Animals, and Fish

During Replita II, the average production of foodstuffs from farm products has been: (1) meat produce, 449,354 tons in a carcass equivalent comprising meat from cows, water buffaloes, goats and sheep, poultry, pigs, and other farm animals; (2) egg production, 108,078 tons (equal to 2.16 billion eggs) produced by village hens, purebreds, and ducks; (3) milk production, 55,297 tons, all coming from Holstein-Fresian milk cows and their crosses. The problem in utilizing animal resources lies in the lack of knowledge about developing them. Information is needed regarding various biological aspects of the groups constituting

this food source. Moreover, increasing the utilization of animals is impeded by the problem of providing their food.

Sea fishing is an area with potential for development. Since Indonesia is an archipelago, the role of fishery is expected to increase considerably. The production from waterborne natural resources in Indonesia at present is approximately 1.4 million tons per year. Since Peplita I, the increase has averaged 3-5 percent a year. The continuous production potential from the sea is about 7.2 million tons a year; from fresh water 6.0 million tons; from brackish water ponds 0.72 million tons; and from fresh water ponds and wet fields (sawahs) 0.3 million tons. At the end of Replita II, 20-30 percent came from the sea sector, 46.2 percent from fresh water, and 9.3 percent from brackish water ponds.

Technology

The potential of many technologies has not yet been developed to the maximum, i.e., production technologies (applying fertilizer, cropping, and crop protection) and postharvest technologies (handling storage, processing and diversifying.

Agricultural technologies used in areas such as valleys, swamps, and ebb and flood regions open the possibility of developing these lands into productive rice cultivation fields.

Development of overall drainage and irrigation systems includes the construction of irrigation/drainage networks and irrigation buildings, as well as the shaping of the wet rice fields, which should be done as soon as the irrigation network is completed.

Although the raw agricultural surfaces of irrigated fields as well as fields dependent on rain do not change, the cultivation of "palawiji" (food crops other than rice cultivated in the fields, such as soybeans and cassava edible tubers, etc.) on these areas can be extended through development of a planting program in accordance with the principle of an integrated mixed-cultivation approach.

The conclusion can be drawn that, in fact, Indonesia possesses a very large potential for increasing its food supply and improving nutrition if certain problems can be eliminated.

Policy

Documentation presented to the participants stated that the objectives of Peplita III are:

1. To raise the people's standard of living, capacity and welfare, making these more equal and fair.

2. To build a strong foundation for the next development stage.

In the sector of agricultural development the GBHN states the importance of increasing food stuff production such as rice and food crops originating from market gardens, plantations, farming and fishery, for the purpose of meeting food needs and reaching self-sufficiency, while at the same time improving the food value by increasing the protein supply from vegetables and animals. Stepping up the production of foodstuff is also aimed at raising the peasants' living standard, extending labor facilities, and providing food for the society at a reasonable price for peasants and producers as well as consumers.

With respect to health, the GBHN states: "In order to raise the level of health and the people's capacity the health service should be upgraded and the nutritional value be improved, especially for the low-income society in the villages and in the cities."

To achieve these objectives it is necessary, among other things, to provide sufficient and varied food and to distribute it evenly, keeping it within the purchasing capacity of most people, so that the nutritional need of the various population groups is met according to the standard of nutrition sufficiency established by the 1978 National Workshop on Food and Nutrition.

In addition, efforts should be made to handle properly the nutrition sector, including dissemination of knowledge to the public about nutrition and health in general, improving the nutritional value of food, and improving the information system to be used as guidance by a region suffering food scarcity. For a food production improvement program to be successful, the participatory role of the people must be developed as intensively as possible.

In efforts to supply sufficient food, steps should be taken to discover and utilize potential human and natural resources. Further, it is necessary to handle postharvest stages more efficiently and to activate the role of the "lumbung desa" (village rice barn), especially in regions poor in food production.

Efforts to increase and equalize the food supply and improve nutrition are closely linked with rural development. Therefore, in the rural development strategy, plans to increase food production need to be emphasized.

The status of nutrition must become a major measure of success in overall development, so that improvement of the food and nutrition sector will be a measure of the degree of social justice.

Because an integrated strategy of food and nutrition is basically part of Indonesia's overall development strategy, effective, stable

coordination arrangements are necessary among the various levels included in planning, execution, evaluation, and research.

Finally, a sound food and nutiriton policy should be incorporated into legislation.

Program

Nutrition

In the framework of the national and regional food supply and provision, the sufficiency figures given in Table 1 (page 22) for calories and proteins are used as guidelines. The development of the food production pattern in each territory/region is adapted to the food consumption in these areas.

The efforts to take in hand the problem of "Kurang Kalori Protein" (KKP--Calorie-Protein Deficiency) are aimed in the first instance at preschool children (below 5 years), pregnant and breastfeeding women, the low-income group, and inhabitants of regions with food shortages, including territories suffering from natural disasters. The measures taken are distribution of additional food, advice about nutrition and about the importance of breastfeeding infants, baby food after weaning, and the distribution of food to families according to their nutrional needs. The periodic check-up on body weight on the "Kartu Menuju Sehat" (KMS--Toward Better Health Cards) is used as an indicator in monitoring the health of these target groups.

Efforts to remedy vitamin A deficiency are particularly aimed toward preschool children and include fortification of flour, sugar, and salt, periodically distributing high-dosage vitamin A capsules via the Puskesmas (Public Health Centres) and people's cadres, and giving advide on the importance of green vegetables in their diet in order to increase their use. As a monitoring indicator, the prevalance of night blindness is measured periodically in certain regions.

Efforts to eliminate nutritional anemia are aimed at preshcool children (below 5 years), pregnant women and low-income employees, and consist of providing an iron supplement or reinforcing salt with iron. As a monitoring indicator, Hemaglobin is measured at the Public Health Centres using the standardized Sahli method.

Efforts to meet iodine deficiency are aimed at people of all ages in regions where the deficiency is endemic, by giving iodine injections and/or fortifying table salt with iodine. As a monitoring indicator, palpation is done on the thyroid glands of schoolchildren in the endemic regions.

The surveillance system of food and nutrition is handled mainly by the Dinas Pertanian dan Kesehatan (Agriculture and Health Office), in particular in the handling of notes and reports concerning the shortage of food and nutrition shortages in the poorer regions.

Efforts are made to develop the consciousness of individual families in the various social groups about the need to make good nutrition a major goal. These efforts include the following activities:

- Giving advice to the people via mass, group, and individual communication;

- Providing orientation regarding nutrition to the executors of the food and nutirtion program to enable the setting up of an integrated program; and

- Integrating knowledge about nutrition into the curriculum of educational institutions (the material should be tailored to local conditions).

The nutrition extension (UPGK) program will be upgraded and extended, with preschool children (below 5 years), pregnant women, and other vulnerable groups as its target. The work system, personnel, and substance of the UPGK program should be upgraded so that the results will be in accordance with planning.

Food

In order to increase and upgrade Indonesia's food supply, a program should be undertaken that includes the steps discussed below:

- The food marketing system should be extended and made more efficient, especially if the incentive policy is extended to include paddy, maize, cassava, soybeans and other crops.

- Research should be aimed at determining the criteria for judging the progress of efforts to increase production, marketing and food consumption. Operational formulas and completion of the policy to stimulate production require an understanding of the relationship between production and consumption and the price changes of various food commodities.

- Research should be undertaken on the efficiency of food marketing in connection with incentives, especially since it varies from one region of procution to another. The research should also include the variation in regional food policies.

- The factors underlying the decrease in maize consumption and the increase in cassava consumption should be studied.

- Investment should be made in tertiary irrigation canals, to shift the function of production to the right so that the function of supply can also be pushed to the right.

- The population of rural villages should be enlisted for the extermination of mice and rats.

- The present land-management system, which may be impeding the technological implementation, should be changed as follows: 1) "tanah bengkok" (Fields given to Government-appointed Village Heads in lieu of a salary) should be replaced by a salary for the village heads. They should also be given authority over land (lahan bengkok), which would be worked together in shifts by groups of peasant laborers who do not possess their own fields; 2) the regulation concerning produce-sharing (Bagi Hasil) (1960) should be strictly enforced. The policy of handing out rice-in-kind to Government employees and soldiers should be reviewed in the context of cutting back the very heavy dependence on rice.

Resource Utilization

The land should be assessed continuously and the records kept up to date so that whenever new demands arise a number of alternatives are available. Criteria of the lands adaptability for various purposes should be developed and tested constantly. In this way, failure to properly utilize land resources can be minimized.

Intensification of land-use efforts, including increased irrigation for optimum productivity should be based on local characteristics and distinction, determined by reliable standard diagnostic measures. Continuity of land and water resources can be assured by using certain planting patterns and setting up fisheries and farms in keeping with sound conservation practices, along with continual improvement efforts using mechanical, biological, or chemical means.

Rainfall data collection, including the patterns of the rainfall as well as its quantity, should be used by the agricultural regions to obtain a more exact weather forecast and assure greater success in food-crop production.

To achieve better control and utilization of water, experiments should be conducted with man-made rain (cloud-seeding) particularly in connection with water deficit forecasts at times when water is vital for the growth of the crop.

The program for more efficient and effective use of water should be intensified, with emphases placed on three aspects of it:

1. Identifying continuously unexploited water resources;

2. Minimizing waste in the use of water; and

3. Managing and developing groundwater resources.

To increase the use of land and water in a number of strategy alternatives, the following steps should be taken:

1. Intensifying the use of existing drainage and irrigation projects by

- rehabilitation of nonfunctioning irrigation networks;
- extension of networks up to the tertiary and quarterly network divisions
- encouraging local participation in using the water resources as profitably as possible.

2. Extending the irrigation network to the regions still lacking irrigation.

3. Genetically and agronomically improving the biological resources of land already in use, including the following efforts:

- Studying the agronomy and the dissemination of biological resources that have not yet been developed;
- Studying the possible cultivation of wild but often-used biological resource groups;
- Taking stock, evaluating, and determining the potential of wild biological resources that are less used but that may have value as food crops.
- Isolating and identifying bacteria that cause fermentation of food crops and their life cycles;
- Isolating and identifying bacteria that cause fermentation of household and agricultural wastes; and
- Collecting, identifying, preserving, distributing, and exchanging non-pathogenic bacteria of economic value.

4. Making fuller use of land already farmed or inhabited including the following measures:

- Evaluating and taking stock of soil damage and carrying out rehabilitation and conservation measures;
- Selecting lots to increase production of food and to be used as living space;

- Utilizing residential yards to meet food shortages and to diversify food and nutrition (by using them to grow beans, vegetables, fruit, small animals, and fish); and

- Recycling of waste material refuse.

Development of Technological Potential

The agricultural intensification program can achieve a still higher production level through completion of the production technology stressed in the BIMAS/INMAS intensification program, especially: 1) extensive introduction to the pest control program, particularly in territories suffering an explosion of pests; 2) monitoring as early as possible to detect potassium, sulphur, zinc, nitrogen, and other elements; and 3) adaptation of planting patterns to the methods of cultivation.

The following further technological developments should also be stressed:

- Overall efforts in the sector of postharvest technology including both methods and equipment.

- Methods for processing and storing foodstuff in the rural regions.

- Developing the sector of cooperative activities including the pre- and postharvest systems, and the marketing of food crops.

- Upgrading of the system of educating food-handlers and increasing their numbers and efficiency.

- Drawing up a map of the food consumption pattern in Indonesia.

- New technologies for cereals other than rice, including maize, sorghum, cassava, and sago, to be based on a study of the processing, marketing and use of these crops, and to emphasize greater utilization of sago.

- More extensive use of fish by further developing methods of preservation during transportation and storage, developing of processing technologies, and utilizing trash fish.

- Wide distribution of information about postharvest technologies, food processing, and food preparation.

- A system for disseminating advice to small producers and to consumers about the need for standardization and for consumer protection.

- Legal support for technological improvement of the food system, including taking stock of the regulations regarding standardization and drafting regulations for execution of the 1961 Act No. 10 concerning goods, particularly with regard to standardization, standard control, labels and advertisements and packing.

Institutional Arrangements

As the food and nutrition strategy is integral to the overall development of Indonesia, it is suggested that the following actions be undertaken to provide a strong governmental support base:

- The coordinating institution specified in Presidential Instruction INPRES 14/1974 should be improved and brought into harmony with the structure of the Kabinet Pembangunan III and with the development of the food and nutrition program policy in Replita III.

- The effort to improve the coordinating institution, should include the following:

  a) Special meetings should be held on food and nutrition on the MENKO and ministerial level, headed by the President or the Vice President, as well as the MENKO KESRA Coordination Meetings specified in Presidential Decree KEPPRES No. 12/19/78.

  b) The necessary INPRES/KEPPRES should be issued to enable the organizing of MENKO KESRA Coordination Meetings among Ministers, Directors General, Directors, or other leaders of the same level, in order to study the implementation of the food and nutrition policy. The Coordination Meeting stay under the authority of the MENKO KESRA.

  c) When the coordinating mechanism has been thus defined and strengthened, the results of the National Workshop on Improving the Peoples' food menu, held from 18-23 January 1978 on the topic of "Organization and Coordination Management of Improving the National Nutrition," should be reviewed and combined with the results of the 1978 National Workshop on Food and Nutrition (See Table 4).

d. To make the suggested coordination institution effective, efforts are needed to:

- Strengthen the National Institute for Nutrition, which is currently part of the Department of Health.

- Institutionalize the nutrition unit of the Department of Agriculture.

- Enable the appointment of permanent officials/workers for each sector/sub-sector that participates in the food and nutrition program. More attention must be given to providing and developing expertise and working skills at various levels in the sector of food and nutrition, from the central up to the regional level and to workers in the villages.

Structure and Operation of the Coordinating Institution

- The Food and Nutrition Coordination Meeting (Sidang Kordinasi Pangan dan Gizi = SIKOR), basic to the operation of the coordinating institution, is a meeting between members of MENKO and certain Ministers, headed by the President/Vice President.

- Periodic coordinating meetings on the ministerial level (Rapat Kordinasi Periodik Tingkat Menteri = RAKORDIK) are meetings between MENKO KESRA, as established in KEPPRES 12/78, with the addition of certain Ministers appointed by the President and headed by the MENKO KESRA or by the Ministers of Health and Agriculture and the Under Minister on Food Production Matters acting in the name of MENKO.

- Daily coordination meetings (Repat Kordinasi Harian = RAKORHAR) are meetings of Directors General and Officials of the same level from departments and non-departmental institutions sitting in the RAKORDIK and are headed by the Ministers of Health and Agriculture. RAKORHAR holds its meetings according to the definitions stated in the KEPPRES/INPRES and is responsible to the MENKO KESRA.

- The Team of Experts (TEAM AHLI) is a team comprising a number of experts having expertise in different fields, appointed by the MENKO KESRA to give their advice and views concerning various questions in the framework of the food and nutrition program requested or volunteered from a scientific-technical aspect.

- The Pakorhar Secretariat is a permanent secretariat that functions within a department qualified to manage in the field of food and nutrition, the Directorate of Nutrition (DEPKES under the Department of Health) or the Nutritional Unit, (DEPTAN,

in the Department of Agriculture) headed by a Permanent Secretary *ex officio*.

- Staff Coordination Meetings (RAPAT KOORDINASI STAF = RAKORTAF) are routine meetings of the Directorate, The Bureau leaders, and the Staff, from the Department/Non-departmental Institutions sitting in the RAKORDIK, headed by the RAKORHAR Secretary.

- The Task Force is a temporary work team formed by the RAKORHAR to execute special tasks within a certain period. The Task Force is responsible to the RAKORHAR Secretary.

- The body for improvement of nutrition in the regions (BADAN PEREAIDAN GIZI DAERAY = Province and Regency) is a coordinating forum in the regions according to the definitions set forth by the RAKERPMMR/UPGK of January 1978.

- BAPPENAS (Ministry of Planning) in this case with a consultation function.

Table 1. Standard for nutrition recommended for Indonesia.

Age Group (Year)	Body (Kg.)	Energy[1,2] (Kcal)	Protein[3] (g)	Calcium[4] (g)	Iron[3] (mg)	Vitamin A Activity, I.U.[6,7]	Thiamine[6] (mg)	Riboflavin[6] (mg)	Niacin[6] (mg)	Vit.C[5] (mg)
6 - 12 months	8,0	900	20	0,6	10	1200	0,4	0,5	5,9	20
1 - 3	11,5	1160	22	0,5	10	1500	0,5	0,6	7,7	20
4 - 6	16,5	1450	27	0,5	10	1800	0,6	0,8	9,6	20
7 - 9	23,0	1790	33	0,5	10	2400	0,7	1,0	11,8	20
Males:										
10 - 12	30,0	2130	39	0,7	10	3450	0,9	1,2	14,1	30
13 - 15	40,0	2280	46	0,7	18	4000	0,9	1,3	15,0	30
16,- 19	53,0	2600	51	0,6	15	4000	1,0	1,4	17,2	30
20 - 39	55,0	2530	51	0,5	9	4000	1,0	1,4	16,7	30
40 - 59	55,0	2470	51	0,5	9	4000	1,0	1,4	16,3	30
>> 60	55,0	2020	51	0,5	9	4000	0,9	1,2	14,2	30
Females:										
10 - 12	32,0	1980	39	0,7	12	3450	0,8	1,1	13,1	30
13 - 15	42,0	2100	43	0,7	24	3500	0,8	1,2	13,7	30
16 - 19	45,0	1940	40	0,6	24	3500	0,8	1,1	12,8	30
20 - 39	47,0	1880	40	0,5	28	3500	0,8	1,3	12,4	30
40 - 59	47,0	1740	40	0,5	12	3500	0,7	1,0	11,4	30
>> 60	47,0	1500	40	0,5	8	3500	0,6	0,9	10,6	30
Addition for:										
Pregnant women		+ 300	+ 8	0,6	+ 2	+ 500	+0,2	+0,2	+ 2	+ 20
Lactating women		+ 470	+ 23	0,6	+ 4	+2500	+0,3	+0,3	+ 3	+ 20

1. Requirement figures are based on the average weight of Indonesians considered healthy. These requirements are not valid for individuals whose weight deviates from the standard.
2. Expert Committee FAO/WHO 1973
3. The recommended allowance of protein is based on the quality of the protein in the Indonesian diet which has an amino acid score of 62. Adjustment is needed when the quality of protein in the food differs significantly from this standard.
4. FAO 1962.
5. Expert Groups FAO/WHO 1970.
6. Expert Group FAO/WHO 1967.
7. The allowance of Vitamin A is based on the assumption that 100 percent of the intake is in the form of Carotene. For the age group 6 - 12 months, 10 percent of the Vitamin A is derived from animal food or mother's milk.

Table 2. National Per Capita Requirements for Energy for Replita III.

	A Age Groups (Year)	B Body Weight (kg.)	C Required per person per day (kcal)	D Proportion of Population* %	Weighted Required per 100 Population (C x D) kcal.
	1**	8.0	1100	3.6	3960
	1 - 3	11.5	1160	9.9	11484
	4 - 6	16.5	1450	8.8	12760
	7 - 9	23.0	1790	8.2	14678
Males	10 - 12	30.0	2130	4.0	8520
	13 - 15	40.0	2280	3.7	8346
	16 - 19	53.0	2600	4.4	11440
	20 - 39	55.0	2530	12.6	31878
	40 - 59	55.0	2470	7.0	17290
	60	55.0	2020	2.0	4040
Females**	10 - 12	32.0	1980	3.9	7722
	13 - 15	42.0	2100	3.6	7560
	16 - 19	45.0	1940	4.3	8342
	20 - 39	47.0	1880	13.8	25944
	40 - 59	47.0	1740	7.8	13572
	60	47.0	1500	2.3	3450
TOTAL				100.0	190988
Approximate energy requirement per person per day					1910
Supply level (10%) added for wastage, etc. based on real consumption data.					2100

*) B.P.S. 1973 Demographic projection 1971 - 1981. To calculate the energy requirements at regional level, the age and sex composition must be adjusted to regional data.

**) Addition for pregamant and breastfeeding women is included in the calculation for infants. See FAO/WHO, 1973).

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Table 3. National Per Capita Requirements for Dietary Protein (Score 62) per day for Replita III.

	A Age Group (Year)	B Weight (kg.)	C Requirements per person per day (g)	D Inhabitants (percentage) *)	C x D
	- 1	8.0	20	5.6	-
	1 - 3	11.5	22	9.9	217.8
	4 - 6	16:5	27	8.8	237.6
	7 - 9	23.0	33	8.2	270.6
Males	10 - 12	30.0	39	4.0	156.0
	13 - 15	40.0	46	3.7	170.2
	16 - 19	55.0	51	4.4	224.4
	Adults	55.0	51	21.6	1101.6
Females	10 - 12	32.0	39	3.9	152.1
	13 - 15	42.0	43	3.6	154.8
	16 - 19	45.0	40	4.3	172.0
	Adults	47.0	39	23.9	932.1
Addition for pregnant women			8	4.0	32.0
Addition for lactating women			23	4.5	103.5
Total				100.0	3923.9
Approximate requirement for protein per person per day					39.24
Adjustment for differences in the quality of protein between regions (2 x SE) or (+ 6.5 percent)				41.8	
Supply level:	+10 percent			45.93	

*) B.P.S. (1973). Inhabitant projection in Indonesia 1971 - 1981.

To calculate the requirements for protein for a region, it is necessary to conform to the inhabitant composition according to their age and sex and the quality of the protein in the food of the region, if it differs significantly from an amino acid score of 62 (See FAO/WHO, 1973).

TABLE 1. Adequate nutrition levels recommended for Indonesia.

	Group/Age (years)	Weight a) (kg)	Energy b) (Kcal)	Proteins b) (g)	Calcium e) (g)	Ferram c) (mg)	Vit A d) IU. Vit A/ug Carotene	Thiamine d) (mg)	Ribo-flavin d) (mg)	Niacine d) (mg)	Vit C c) (mg)
	6 - 12 Mnths	8,0	900	20	0,6	10	1200	0,4	0,5	5,9	20
	1 - 3	11,5	1160	22	0,5	10	1500	0,5	0,6	7,7	20
	4 - 6	16,5	1450	27	0,5	10	1800	0,6	0,8	9,6	20
	7 - 9	23,0	1790	33	0,5	10	2400	0,7	1,0	11,8	20
Male	10 - 12	30,0	2130	39	0,7	10	3450	0,9	1,2	14,1	30
	13 - 15	40,0	2280	46	0,7	18	4000	0,9	1,3	15,0	30
	16 - 19	53,0	2600	51	0,6	15	4000	1,0	1,4	17,2	30
	20 - 39	55,0	2530	51	0,5	9	4000	1,0	1,4	16,7	30
	40 - 59	55,0	2470	51	0,5	9	4000	1,0	1,4	16,3	30
	>60	55,0	2020	51	0,5	9	4000	0,9	1,2	14,2	30
Female	10 - 12	32,0	1980	39	0,7	12	3450	0,8	1,1	13,1	30
	13 - 15	42,0	2100	43	0,7	24	3500	0,8	1,2	13,7	30
	16 - 19	45,0	1940	40	0,6	24	3500	0,8	1,1	12,8	30
	20 - 39	47,0	1880	40	0,5	28	3500	0,8	1,3	12,4	30
	40 - 59	47,0	1740	40	0,5	12	3500	0,7	1,0	11,4	30
	>60	47,0	1500	40	0,5	8	3500	0,6	0,9	10,6	30
Addition for :											
Pregnant women			+ 300	+ 8	0,6	+ 2	+ 500	+ 0,2	+ 0,2	+ 2	+ 20
Nursing women			+ 470	+ 23	0,6	+ 4	+ 2500	+0,3	+ 0,3	+ 3	+ 20

a) Weight for Indonesians considered healthy, with formulations of sufficiency based on the following:
b) Committee of FAO/WHO Experts 1973
c) Group of Experts from FAO/WHO
d) Group of FAO/WHO Experts 1967
e) FAO 1962

Footnote - Refer to subtheme 1, p. 7

TABLE 2. Standard of average energy sufficiency (calories) per person per day for REPELITA III[a)]

	A Group/Age (years)	B Body Weight (Kg)	C Adequate calories per person per day	D Population in percentage b)	Column C x D
	(including calculation for pregnant and nursing women)	8.0	1100	3.6	3960
	1 - 3	11.5	1160	9.9	11484
	4 - 6	16.5	1450	8.8	12766
	7 - 9	23.0	1790	8.2	14678
Male	10 - 12	30.0	2130	4.0	8520
	13 - 15	40.0	2280	3.7	8346
	16 - 19	53.0	2600	4.4	11440
	20 - 39	55.0	2530	12.6	31878
	40 - 59	55.0	2470	7.0	17290
	60	55.0	2020	2.0	4040
Female	10 - 12	32.0	1980	3.9	7722
	13 - 15	42.0	2100	3.6	7560
	16 - 19	45.0	1940	4.3	8342
	20 - 39	47.0	1880	13.8	25944
	40 - 59	47.0	1740	7.8	13572
	60	47.0	1500	2.3	3450
	TOTAL AMOUNT			100.0	190988
	Adequate energy per person per day				1910

Level of Supply (± 10 percent)
(Based on actual consumption data between 85-90 percent of balance figures re foodstuff).

a) To calculate the energy adequacy on regional levels the composition of inhabitants according to age and sex should be adjusted to the local data.

b) Source: BPS (1973). Projection of Population 1971 - 1981.

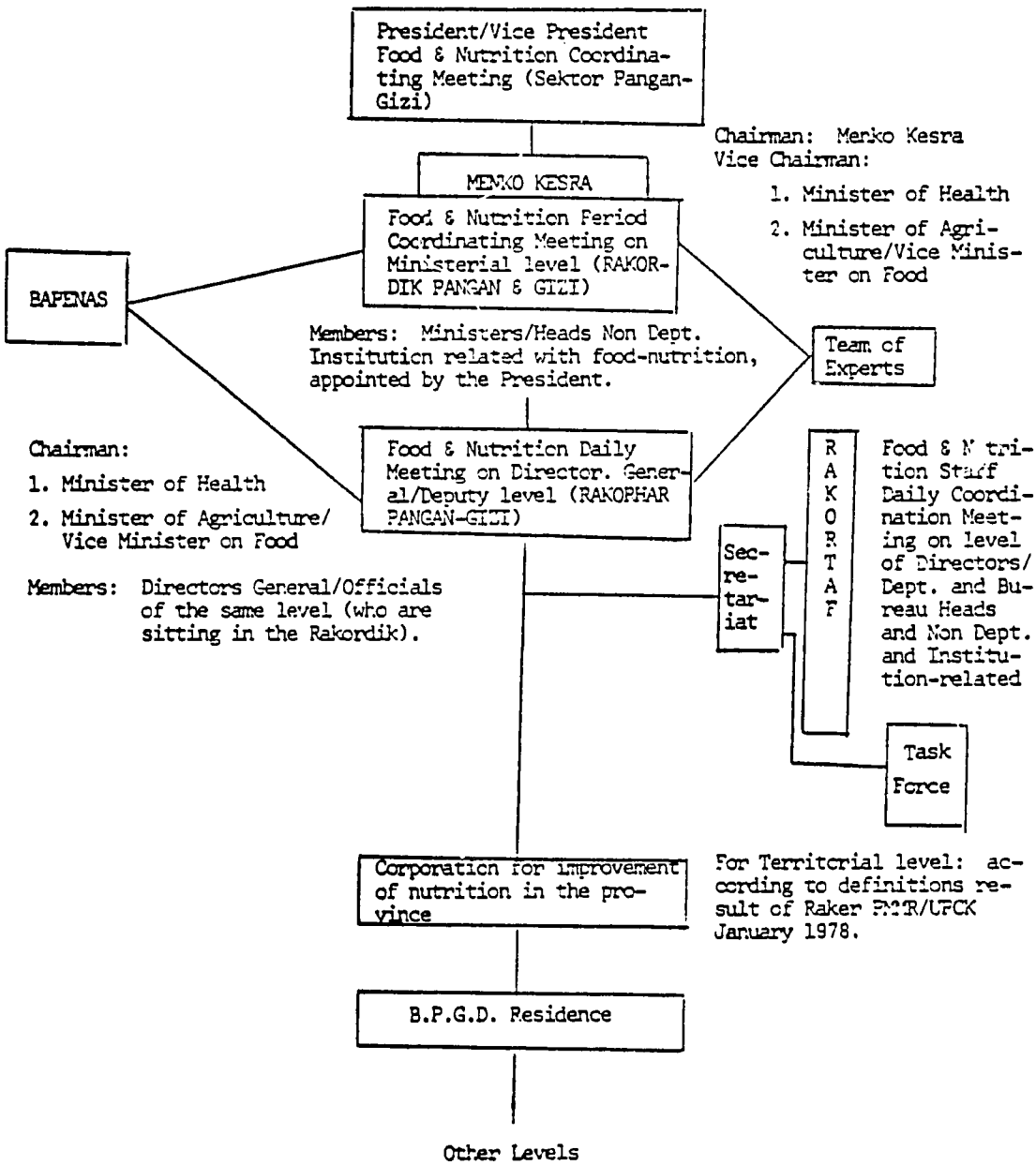
TABLE 3. Standard of average protein sufficiency per person per day for REPLITA III[a)]

	Group/Age (years)	Body Weight (kg)	Adequacy per person per day (grams)	Population in percentage b)	Column III x IV
	I	II	III	IV	V
	1	8.0	20	3.6	-
	1 - 3	11.5	22	9.9	217.8
	4 - 6	16.5	27	8.8	237.6
	7 - 9	23.0	33	8.2	270.6
Male	10 - 12	30.0	39	4.0	156.0
	13 - 15	40.0	46	3.7	170.2
	16 - 19	55.0	51	4.4	224.4
	Adult	55.0	51	21.6	1101.6
Female	10 - 12	32.0	39	3.9	152.1
	13 - 15	42.0	43	3.6	154.8
	16 - 19	45.0	40	4.3	172.0
	Adult	47.0	39	23.9	932.1
Including Calculation for pregnant and nursing women			8	4.0	32.0
			23	4.5	103.5
	TOTAL AMOUNT			100.0	3923.9
	Average protein per person per day				39.24
	Additional adequacy of protein quality differences among regions (2xSF)(+6,5 percent)			41.8	
	Level of Supply (± 10 percent)			45.93	

a) To calculate the energy adequacy on regional levels, the composition of inhabitants according to age and sex should be adjusted to the local data.

b) Source: BPS (1973). Projection of Population 1971 - 1981.

TABLE 4. SUGGESTED SCHEME OF THE FOOD AND NUTRITION COORDINATION ORGANIZATION



V

Group I

Food and Nutrition Sufficiency

Julie Sulianti Saroso, Chairman
Ig. Tarwotjo, Secretary

The Problem

From the data and results of surveys made within these last 10 years, the nutrition problems in Indonesia have become more and more apparent.

This nutrition problem has mainly been caused by the consumption of food that failed to fulfill nutritional needs on the one hand, and by poor health on the other.

The inadequacy of food consumption may be caused by insufficient food production and supply. At the core of this inadequacy is the agricultural system, including the characteristics and productivity of each production area and influenced by the systems of distribution and marketing. In addition, the low family income does not make it easy to buy nutritious food in sufficient quantity. Often a low-income family in a village already knows how to select its staple food wisely in accordance with the production system in their area, but the quantity of good food is not enough to fulfill the need of each member of the family.

Further, the sociocultural attitudes of the community, with the set customs and rigid attitudes that may exist in connection with food, is often a hindrance in the effort to meet nutritional needs.

The main types of staple foods in Indonesia are: First, some type of rice-food where the rice is dominant, as in West Java, where

approximately 50 percent of the population of Indonesia lives; second, some mix of rice-cassava-corn, where the dominance of rice is less, typical for the villages in Central and East Java, where 36 percent of the population lives; and third, a mix of rice-corn-ubi-roots, which is consumed by 13 percent of the population. There are still other staples like sago, whose consumption rate is not yet known. The dominance of rice is increasingly to be found in the diet of inhabitants of cities. This trend is also present in communities where the diet originally consisted of different kinds of food. It is happening because the distribution of rice for the cities in Indonesia has become better with the years. For the greater part of the Indonesian population, rice and corn are important as the main sources of calories and protein. Moreover, rice is also highly valued socially, so that any effort to lessen its consumption in favor of another kind of food must be carefully considered.

Supplying food that meets nutritional needs will become more and more difficult as the population growth rate, which is still 2 percent per year, increases. It is also complicated by distribution problems, since the greatest part of the population lives on the isle of Java.

In addition, where the sanitary conditions of the community are bad and the rate of infectious diseases high, absorption of nutritious food by the body is slowed down, which further weakens the resistance of the body to diseases.

The results of the latest surveys done over a great part of Indonesia show that the most important nutrition problems are:

1. Calorie-protein deficiency, existing in 30 percent (9 million) of children aged 0-6; 7 percent (0.5 million) of pregnant women; and 3 percent (0.2 million) of breastfeeding women. Severe shortages of calories and protein can manifest themselves as hunger-edema. This hunger-edema often occurs among the population in infertile regions who suffer from chronic malnutrition; at times of flood, in long dry seasons, and when crops are destroyed by pests and other causes.

2. Vitamin A deficiency, which occurs mostly among children aged 0-6 years, with about 100,000 children suffering from eye diseases each year that cause blindness.

3. Iodine deficiency on several islands in Indonesia causes endemic Goitre in 12 million people, with about 0.5 million people having cretinoid characteristics and 100,000 people suffering from cretinism.

4. Iron deficiency causes anemia in 12.5 million children aged 0-6 years, 9 million children aged 7-14 years, 14 million women, and 5.5 million workers of the low-income group.

Undernourishment (manifesting itself when the approximate consumption rate falls under 1,700 calories per person per day) is found in 23 percent of the inhabitants of Indonesia, for the greatest part in Central and East Java. In the villages on the isle of Java, the undernourished family spends less than Rp. 200/person/month (at the 1976 price rate or about the same as 20 kg rice/person/month), while in the cities it is Rp. 4,000/person/month.

The various nutrition problems mentioned above are the cause of the high rate of disease and death among children, a matter that obstructs the birth control movement because it weakens the parents' motives to raise small families. For the young, undernourishment can be an obstacle to studying well and to creativity, while in adults it can lessen their working capacity.

Food and Nutrition Policy

The core of the planning for food and nutrition problems is a base for the multisectoral activities aimed at fulfilling the need for food and at combating ill-health; activities to promote a better nutritional state for the people, beginning with the undernourished. For that purpose, a policy for food and nutrition is needed that will be integrated and allencompassing.

In accordance with the "Trilogy of Development Foundamentals," this means that:

1. The equal benefit for all from the development and its results as a social-rights goal should include a rise in income for the low-income group to enable the fulfillment of food needs and to achieve a normal state of health.

2. The maximum agricultural potential in each region in Indonesia should be realized, with the economic development that this will foster. This means the development of the many facets of the food-production plan, following as closely as possible the food plan of each area, so that it guarantees sufficient food for the low-income group and fulfills the requirements for healthy living. Food production planning does not preclude a region's specializing in the production of surplus food for distribution to other regions.

3. A food distribution policy that will consider the trend of consumption in each region should be formulated to combat the rising consumption of rice.

4. Intensified exploitation of gardens should be encouraged to provide "living food storage" and a source of food for family consumption.

5. In the villages, the stores for the different kinds of food must be improved to prevent decay, decrease, and loss. Better storage is urgently needed in undernourished regions, especially when a bad harvest is expected.

6. The improvement of regulations to upgrade the quality and safekeeping of food should be given priority consideration by the government.

7. A surveillance system for food and nutrition is needed in order to handle the primary problem mentioned above to quickly alleviate calorie-protein deficiency and nutrition problems caused by natural disasters. This should permit direct as well as indirect intervention in nutrition cases (including action by the regions themselves), in addition to providing monitoring and advice.

8. Work on food and nutrition problems must be done through the coordination and mobilization of the existing government apparatus, with intensified advice and cooperation from the people, to guarantee the achievement of good results.

9. The state of nourishment of the people must become one of the most important standards of successful development, because it shows increasing equalization of incomes.

10. Education and advice about nutrition for the different levels of the community must be developed as fully as possible so that knowledge about nutrition will be used in everyday life.

11. Research in the field of food and nutrition must continually be improved so as to find the best technologies for the food-improvement program. In keeping with this, the training for those who work on the food and nutrition program must be improved to meet rising demands.

12. As a standard in evaluating food consumption in the monitoring and surveillance of nutrition, planning and evaluation of the national or regional food supply and in executing nutrition programs in Indonesia, figures for nutritional sufficiency must be used as a base. These figures are shown in Tables 1, 2, and 3.

These figures for nutritional requirements must be reexamined after a period of 5 years to bring them into line with new scientific developments.

Program

1. Calculating the food supply for the nation, figures for the requirements for calories and protein are stated in the preceding tables. For the needs of the regions, an explanation is given in the footnotes of these tables.

The development of the plan to increase food production in each region is first of all concerned with the quality and planning for staplefood consumption set for these regions, and is based on local food crop potential.

2. The commitment to work on the cases of calorie-protein deficiency is, in the first place, aimed towards pre-school children (under 5 years of age), pregnant and nursing women, the low-income group, and the inhabitants of undernourished regions, including the regions suffering from natural catastrophes. The steps taken are distribution of additional food, advice about nutrition, including the use of different kinds of available food in a region, and the importance of ASI and food for children weaned from breastfeeding and the distribution of food to families according to their individual nutritional needs. In monitoring progress, the periodic weight measure using the Towards Better Health (KMS) charts is used as an indicator.

3. The effort to combat the shortage of vitamin A is first of all aimed towards nursery-school children through fortification of food distributing high dosage vitamin A capsules periodically via Public Health Centers and community organizations, and by disseminating information about nutrition to increase the consumption of vegetables and fruits.

As a monitoring indicator, surveys on the prevalence of night-blindness and Bitot spots are done periodically in certain areas.

4. The efforts to combat undernourishment are aimed towards pregnant women, nursing women, pre-school children and the working class, in the first place, the low-income group, through supplies of iron, taking into consideration diseases that interfere with nutrition, and/or fortification with iron, together with advice, which can be done through the birth-control services. As a monitoring indicator, Hemoglobin measurements are taken at Public Health Services using the standardized Sahli method.

5. The effort to combat the shortage of iodine is aimed in the first place towards people of all ages in regions where it is endemic by giving injections with solutions of iodine oil and/or salt fortified with iodine and by giving advice on the problem.

As a monitoring indicator, swollen thyroid glands in schoolchildren are investigated in regions where iodine deficiency is endemic.

6. The surveillance system of food and nutrition is executed by the various levels of government apparatus, collaborating on data and reports on the different aspects of food and nutrition, especially in undernourished regions. To deal with regions suffering from natural disasters, the work must be coordinated and a program set up with the aim and line of action based on the results of surveillances already done, clearly stated.

7. To instill and develop in individuals, families, and communities the consciousness of the need for good nutrition, the following steps should be taken:

- Advice given to communities, groups, and individuals via mass communication systems;
- Standardized orientation about nutrition for those who work on the food and nutrition programs to make possible the drawing up of a coordinated program; and
- The integration of the science and nutrition into the curriculum of educational institutions, especially at the elementary level. The material given must be according to the needs and conditions of the region.

8. The UPGK program must be improved and expanded and aimed at the target groups--pre-school children, pregnant women, and other groups of the traditionally undernourished. The organization, the personnel, and substance of the UPGK program must be upgraded so as to achieve the results stipulated during planning.

9. Some efforts important to the outcome of Sub-theme I, which possibly are also mentioned in other sub-theme reports, include the following:

- Research on nutrition must be stepped up simultaneously with the effort to set up food regulations so that these studies and regulations support each other.
- The exploitation of yards should in the first place be at fulfilling the need for an adequate and more diversified diet (nuts, vegetables, and fruit).
- The village good stores must be improved and maintained in accordance with local circumstanced, and their use encouraged, especially in undernourished regions.
- An "Institution of Feeding" is needed to develop the means and expertise for the nutrition improvement programs for the people of Indonesia.

VI

Group II

The Role of Soil, Water, and Production Technologies in the Supply of Food

Sadikin Sumintawikarta, Chairman
Surjatna Effendi S., Secretary

Introduction

In the coming years, agricultural development must be intensified to meet the goals of food and nutrition sufficiency. As the quantity and variety of food improves, so will the diet, with increased protein, vitamins and minerals from animals, fruit, and vegetables.

An integrated food and nutrition program including village development, is part of our overall development strategy since food production is usually carried out in the rural regions. Therefore, the food program should be treated seriously. Taking into consideration the average population growth of 2 percent a year (with the planned parenthood program) and the need for an adequate nutrition level, we can estimate that consumption will increase by 4-5 percent a year, which can only be met if the supply of food is increased. An increase in the consumption pattern, showing a dependency on rice, will strain rice-supplying efforts, and it is therefore imperative to step up the production of other foodstuffs. The possibilities for doing this through wider and more intensive cultivation are excellent.

Although production of farm products such as meat, milk, and eggs shows an increase, it is felt that the deficit in the target for nutrition sufficiency of 15 grams per capita per day (LIPI-NAS 1968 Workshop on Food) is still very large, and production will only reach 36 percent of

this goal in 1985. Obviously, we are facing a challenge in supplying farm animal protein, as food and nutrition needs cannot be fulfulled by fruits and vegetables alone.

With regard to meat production, the cattle population in Java is showing an alarming decline. This also affects the supply of cattle for ploughing the fields.

Policy

In order to achieve food self-sufficiency in Indonesia, policy measures are particularly needed in the areas discussed below.

1. Arable land and fishing areas. The inventory of land that can still be developed into rice fields comprises an area of 5 million hectares for sawahs (wet rice fields) and more than 1 million hectares that can be developed in a simpler way (for instance, into quick-yielding fields). To make the new sawah development program successful, with good drainage and irrigation systems, attention should be paid not only to the drainage and irrigation network, but also to the shaping of sawahs. An arrangement is necessary so that the sawahs can be set up immediately and can start producing. Land is available for extension of the total padigogo (dry field paddy), and over the next 10 years the present area of 1.1 million hectares can be increased to at least 1.9 million hectares.

Extension of the total agricultural area is projected through pressing into use land with slopes of 1-15 percent in the suitability classes IV to VI, which offers possibilities for foodcrops, farming, and fishery. This surface includes 28.7 million hectares of inland soil and 39.5 million hectares of ebb and flood swamps in Sumatra, Kalimantan, Sulawesi, and Irian Java.

The present fishing area of 240,000 hectares (180,000 hectares of brackish water and 60,000 hectares of fresh water) can be enlarged to a total of 1.0 million hectares. Extension of cattle breeding farms to imperata grass (alang-alang) plains is a way of making this available land (12 million hectares) useful. Integration between coconut estates and rubber and forests with farms also offers potential for increased production and should be encouraged immediately.

2. Meteorological data. Reliable rainfall data for various regions, over a reasonable time period, are not yet available. Rainfall data are often obtained from weather stations situated far from the

agricultural areas, although these data are vital to establishing the planting pattern, the time of planting, and the schedule for using fertilizer.

It is necessary to extend weather monitoring to regions that are planned for agricultural use or for transmigration settlements.

3. Water sufficiency. Use of rainwater in the form of surface runoff and groundwater is already rather extensive on Java. In fact, it is estimated that by the year 2000 a number of regions, including Jakarta, Surabaya, and Semarang will suffer from water shortages, so that it will become necessary to bring in water from distant places through an inter-basin development project to obtain enough for agriculture. The needs of cities, industries, and other units should be planned for each river territory or for several river territories combined, to ensure optimal development of the area.

4. Agricultural technology. Possibilities exist for increasing food production by using available technologies, as in the following examples.

- In Indonesia the average paddy harvest per hectare is 3.06 tons of dry unhulled rice, while production on trial estates and trial runs on peasants' fields has reached an average of 7.2 tons of dry unhulled rice per hectare. It is therefore evident that the production of wet field rice can still be increased.

- Padigogo (dry field paddy) production in Indonesia is 1.3 tons dry unhulled rice per hectare; with the use of technology, this can be raised to 3.0 tons.

- The maize crop in Indonesia is 1.0 tons of dry kernels per hectare. This can be raised to 3.0 tons by using "bulai" disease-resistant and high-production varieties, such as, for instance, maize variety H-6.

- Soybean production in Indonesia averages 0.76 tons of dry beans per hectare, while experimental production has produced a harvest of 1.5-2.0 tons of dry beans per hectare.

- Cassava production in Indonesia averages 9.2 tons freshweight tubers, but by using the presently available technology the potential of the production is 30.0 tons per hectare.

- The average sweet potato (ubi jalar) crop in Indonesia is 8.1 tons freshweight tubers; this can be raised to 20 tons by using correct methods of cultivation and the most suitable varieties.

The production and quality of vegetables and fruit can be improved by using better varieties.

5. Fish production. Since Indonesia is an archipelago, we can expect sea fishery to play a larger part in the supply of food. Inland sea fishery has almost reached its maximum, and therefore only the offshore and ocean fishing industries need to be built up. On the other hand, brackish water fishing with a production of 0.3 tons per hectare can be stepped up to 1.5 tons and pond fishing, with 1.5 tons, can be stepped up to 5.0 tons per hectare.

Considering the fact that many people live in rural regions far from sea fishing centers and have low incomes, increased fish consumption can only be made possible to the inland village population if the production from inland fishing and free water fishing (in lakes, rivers and swamps) can be increased twofold.

6. Poultry, dairy, and meat production. The production potential for eggs and chicken is sufficiently high, but their consumption is limited by the low purchasing capacity of consumers. The fact that our import laws still permit eggs and meat reflects the need for a government policy on import regulations on the one hand, and the rearrangement of the domestic production system on the other. This also applies to milk, which has great difficulty in competing with the cheaper imported milk.

In fact, if the farm production system can be taken in hand, the prices and increase in demand for meat will be high enough. The low incentive for producing meat on Java results largely from the difficulty in providing cattle with cheap feed, either as forage or in concentrated form. It seems that we are able to export cattle feed such as dry cassava, whereas domestic supplies have failed to develop as anticipated.

The potential for meat production from ruminant cattle with advanced and traditional technologies is high, particularly in connection with using cogon grass plains and integrating estates with forests.

7. Miscellaneous measures. There is also great potential in the reuse of agricultural foodcrops and the use of residential yard areas for raising farm animals.

The integration of farming with the transmigration program can further both food and nutrition and transmigration goals.

Programs

The programs discussed below should be considered and undertaken, where feasible.

1. Farming demonstrations. The available production technologies for paddy as well as palawija (i.e., second crop, planted after rice, such as beans, tubers, etc.) no longer need research testing on peasants' fields but can directly be demonstrated in rural areas under the supervision of agricultural advisors from production centers on lands with still low productivity rates. Farming technologies can also be implemented whenever the means are available.

2. Pest control. Every year losses due to pests and diseases amount to 19-24 percent. With the available technologies, however, this loss can be reduced to 10 percent so that an increase in rice production of approximately 1.7 million tons can be expected. If this can be done step-by-step over 5 years, an increase of 359,000 tons of rice can be expected per year.

At present, various effective means of pest control are available, for instance, by flooding the root area of crops to eliminate such major pests as "ganjur" and "penggereck batang." It is hoped that the pest control program, linked with the monitoring system, will become more effective.

Preventive measures will be effective if pest- and disease-resistant crop varieties are used to cover 60-75 percent of the paddy field or the area is planted in a "polygenic" way. Losses due to parasites and cattle diseases are fairly large, and programs for pest control should be continuously and intensively carried out.

3. Planting patterns. At this time, there are 3.94 million hectares of land under irrigation. On these lands, wet rice paddy can usually be planted twice a year. On land with less than 9 months' irrigation water a year, however, the second crop is often scant for want of water, especially when paddy varieties used are more than 120 days old. For these regions, the potential for the planting method "paddy-paddy-beans" is good.

The best cultivation patterns on dry lands are the arrangement called "tumpang-sari" and "sisipan," meaning that padigogo is planted simultaneously with maize and cassava after the paddy and the maize is harvested.

This technology is demonstrated directly on the farmer's own soil, especially in transmigration settlements on dry land, former imperata plains in the territory of South Sumatra. Utilization of

imperata plains in the territory of South Sumatra. Utilization of imperata plains for cows, water buffalos, or sheep and goats can be started immediately.

4. Highland development. The region of agricultural land higher than 500 meters above sea level covers an area of 500,000 hectares of sawahs; within a short time, a paddy variety will be produced that will be resistant to the "wereng" pest. This high region shows promise for the breeding of milk-cows.

5. Land records. Stocktaking of land resources should be carried out continuously, so that each time land is needed, there are a number of clear alternatives to choose from. The critieria for land suitability for various needs should be consistantly developed and tested so that the possibility of failure in utilizing a piece of land can be minimized.

6. Local research and adaptation. Efforts for expanding land and intensifying production should be based on local characteristics and distinctions. To achieve this, various diagnostic measures both in the field and in the laboratory are necessary. Continuity of land and water resources and cattle can be ensured by correct planting patterns and fertilizing efforts, as well as by introducing mechanical, biological, and chemical improvements.

7. Meteorological efforts. Data showing rainfall patterns or quantities are urgently needed in agricultural regions to increase success in the production of food.

The control of the water supply by inducing artifical rain should get serious attention and its methods developed, particularly in connection with water deficit forecasts when water is needed for crop growth.

8. Water sufficiency. According to calculations, no major changes will take place in the total amount of rainwater in Indonesia from the present till the year 2000. In particular, the need for water for home use, agriculture, and industry will keep rising, and therefore a program should be undertaken for more efficient and effective use of water. Three aspects of this program should be emphasized:

- To identify, on a continuing basis, water resources that have not yet been exploited;
- To minimize waste in the uses of water; and
- To process and develop groundwater resources.

9. Land and water use. A number of strategic alternatives increasing the use of lands and water in Indonesia include:

- Intensifying the uses of the existing irrigation and drainage projects by:

a. Rehabilitation of the irrigation network;

b. Extension of network facilities up to the tertiary divisions;

c. Upgrading the system of operation and processing; and

d. Intensifying the people's participation in using the water resources as effectively as possible.

- Extending the irrigation network to areas that are not yet irrigated, thereby widening the distribution and sharing the benefits of the country's water resources.

Institutional Arrangements

The administrative and organizational needs of the food and nutrition program should be provided for, as follows:

1. The institution for stocktaking, up-grading of data sources, and evaluating data should be put into operation.

2. Land use planning efforts should be coordinated and the institution responsible for them should be strengthened.

3. Development of agricultural territories should begin with sound basic plans, with the exploitation and uses of the land coordinated by the Department of Agriculture, and the execution of the plans can be shared by the Department of Agruculture, the Department of Public Works, and the Department of Transmigration and Labor.

4. The institutions for early warning systems for climatic changes, food storages, pests and disease should be confirmed and established.

5. Advice about food production technology should be accompanied by advice about nutrition.

VII

Group III

Biological Research in Support of Technologies for the Development of Agricultural Resources (Flora, Fauna, and Soil)

Setijati Sastrapradja, Chairman
Scenartono Adisoemarto, Secretary

Situation and Problems

Indonesia's subsistence is largely based on rice. There is a consensus that we need to vary the source of our staple food in order to reduce the dependency.

In connection with these efforts, we are aware that the many different kinds of biological resources have not yet been fully utilized. These resources can be exploited to produce higher quantities of carbohydrates, protein, fats, vitamins, and minerals. Crops under present cultivation are limited only to a few species. The products from this group can tide the country over for the next 5 years. However, for the future it will be necessary to develop other biological resources that are available in large quantities and that have wide adaptive potential. Although we may enjoy the results of this development only after 10-20 years, the development effort must be started immediately.

Although these available biological resources hold immense potential for development and diversification, there still remains the need for more explicit knowledge about this potential, elementary as well as advanced.

In the meantime, the soil--the habitat of these valuable resources--suffers from pressures that decrease its quality and capacity. These

pressures result from the use of the land in a way not in keeping with the principle of soil conservation, and they result in a decrease in soil productivity. Rehabilitation of the soil requires, first of all, the knowledge about the magnitude of these damages.

It has been recently realized that the food and nutrition problem is particularly acute among rural low-income groups where people earn their living as small landholders or peasant workers. This group is a potential element in soil and environmental damage.

Damages to the environment also result from inefficient use of residential yard areas, which take up 20 percent of the agricultural territory. In addition, the need for energy (fuel) also causes man to inflict damages on the environment. Energy needs should be met by introducing a waste recycling process for the production of biogas, which will require the development of related technologies.

Policy

In light of the continuing population growth and the goals for improving the national welfare, rehabilitation and greater use of the country's resources becomes our hope for the future. To more fully utilize these resources, an integrated strategy is needed for development of biological resources and soil productivity, with its thrust centered in the rural sectors. The development of this strategy should take into account the conservation of the living environment for future generations of Indonesia.

MICRO ORGANIC RESOURCES

STUDY FIELD PRIORITY	PROGRAM	PROJECT	EFFECT	ORGANISATION/ EXECUTIONER	NOTES
- N_2 combination biological	- Isolation, indentification, selection of micro-organism, their cultivation for practice	- 1.study N_2 combination, symbiotic, by bean variations 2.study N_2 combination, simbiotic, by non-bean variations 3.study N_2 combination, by free living micro-organism	- 5 years, in data and methods to increase efficiency of fertilizer use, increase of bean production and increase of soil fertility	- LBN-LIPI, LP3, LP soils Agriculture faculties, LPP, BPP, LP Horticulture BATAN	- further developable in industrial programs
- Fermentation of agricultural products for food	as above	1.study traditional fermentation products. 2.study non-traditional fermentation products	5 years, in data and methods for assisting quality increase of traditional and supply of new fermentation products.	LBN-LIPI, LKN-LIPI, Agric. Technol. Faculties, LPIP, BP3G, LPP, [illegible], LPPH, LP Hort, BATAN, BIOTEK-ITB Puslitbang Farmacy & Nutrition FK2	as above
- Fermentation agricultural & household wastes	as above	1.study fermentation agricultural & household wastes as organic fertilizer. 2.study fermentation agric. & household wastes, as animal food. 3.study fermentation agric. & household wastes as sources of energy	5 years, in data and methods to increase the economic value of agriculture & household wastes	LBN-LIPI, LKN-LIPI, Agric. Technol. Faculties, LPIP, BP3G, LPP, PKH, LPPH, LP Hort, BATAN, BIOTEK-ITB Puslitbang Farmacy & Nutrition FK2	as above

MICRO ORGANIC RESOURCES

STUDY FIELD PRIORITY	PROGRAM	PROJECT	EFFECT	ORGANISATION/ EXECUTIONER	NOTES
- Collection of non patogenic micro organism with economic value	- Collection, indentification, preservation, distribution, exchange	- Forming collections of non-patogenic micro-organism with economic value	5 years in collections of micro-organism cultivations useful for increasing production activities in agriculture & agricultural industries	LBN-LIPI, LKN-LIPI, Agric. Technol, Faculties, LPTP BP3G, LPP, PKH, LPPH, LP Hort, BATAN, BIOTEK-ITB, Puslithang Farmacy & Nutrition, FK2.	Further developable in industrial programs

SOIL RESOURCES

PROGRAM	PROJECT	EFFECT	ORGANISATIONS
I. Taking stock and evaluating of soil damage	1. Study soil damage criteria 2. Taking stock of damaged soil by mapping of areas	- 2-3 years, use of soil management - 5 years, specification of uses for food crop, pasturing.	- LPT, LP3, LPP, LPH/DITJEN Kehutanan, LP Hort., LPTI. - Fakultas Pertanian, Kehutanan, Peternakan/Kedokteran Hewan.
II. Rehabilitation efforts for damaged soil	- Rehabilitation by biological mechanical and chemical methods	- 5 years, increase of productivity	- LPT, BAKOSURTANAL, LBN-LIPI, Perguruan Tinggi sejenis (Fak. Kehutanan, Fak. Peternakan).
III. Efforts for prevention of soil damage	- Restructuring existing regulations (soil management, customary laws, education, etc.)	- first 5 years decreasing the spreading rate of damages.	- Departement Dalam Negeri : Agraria/Tataguna Tanah. P & K, Penerangan, Ditjen. Kehutanan.
IV. Soil selection for increasing food production and for living space (this is probably already included in sub theme 2)	- Survey and soil mapping in certain areas with potential for opening up new settlement areas.	- first 5 years, correct selection of settlement space according to territory development	- LPT, FAK. Pertanian, BAKOSURTANAL, LAPAN, Transmigrasi, PU/PIPT (Dit. Penyiapan Tanah Pemukiman Transmigrasi).

ENVIRONMENT RESOURCES

PROGRAM	PROJECT	EFFECT	ORGANISATIONS
- Utilization of yards	1. survey of yard areas in accompanying projects. 2. selection and multiplication of choice plants varieties seasonal or for daily picking.	- first 5 years, able to plan the use of yards and seed supply.	- BPS, Agraria, Tata Guna Tanah, PU. - LP Hort., LPTI, LBN-LIPI - Dinas Pertanian
	3. study and breeding of cattle and and fish.	- first 5 years : 1. increase of production. 2. healthy environment. 3. increase of family welfare. 4. food alternatives.	- LP Perikanan Darat. - Dinas Perikanan. - Fak. Perikanan.
	4. Preservation and processing of yard products.	- first 5 years : 1. improvement of family economy. 2. food alternatives	- Fak. Teknology Pertanian (ITB, IPB) - LKN-LIPI - LP Hort., Gizi-Puslitbang
	5. Further study of fauna and flora to develop industry.	- first 5 years : - improvement of plant seed and and farm animals.	- LP Peternakan - LP Perikanan Darat - LP Hort., LBN-LIPI - FKH, LP Penyakit Hewan. - Dinas-dinas Lembaga Perasito-logi, UNPAD.
- Repeating cycle refuse/waste	1. study/development of waste material manufacture into compost, and its distribution. 2. study/development, utilizing/manu-facturing of soil or human refuse into organic fertilizers. 3. study/development, manufacturing of waste/refuse into animal food.	- first 5 years : 1. making environment healthy. 2. increasing economic value of material. 3. increasing energy resources. 4. increasing soil productivity and usefulness of synthetic fertilizers.	- PU - Litbang Kesehatan - Puslitekol kes. - P4K - Fak. Peternakan, Fak. Perikanan - LP Peternakan - LP Perikanan Darat - BATAN - PPMPL - LBN-LIPI - Fak. Teknik Penyehatan.

FAUNA RESOURCES

STUDY FIELD PRIORITY	PROGRAM	PROJECT	EFFECT	ORGANISATION/ EXECUTOR
I. Animal groups already farmed but not yet improved a. four-footed : 1. ongol cows 2. madura cows 3. water buffaloes 4. bali cows 5. sheep and goats 6. pigs 7. rabbits b. two-footed : 1. village chicken 2. ducks 3. manilla ducks 4. goose c. fish : 1. ikan mas 2. ikan gurameh 3. ikan tawes 4. ikan mujair 5. ikan nila 6. ikan bandeng d. other : honey bees	- development of improvement efforts	1. study of necessary material for improving (establishment of wild or original population) and the varieties of the population which have been cultivated. 2. study of genetic gestation with potentials in the efforts for improvement. 3. study of mating behaviour and off-spring, and adaptation of mother and off-spring to certain environments. 4. study of animal disease aspects and food for cattle and fish.	increase of production by using prime seed	- LBN-LIPI; LP Peternakan - PPA - Perguruan tinggi yang sebidang - LP Perikanan - FKH - Puslitekol kesehatan - LON - LIPI
II. Animal groups already kept but not yet utilized : 1. ayam hutan 2. doves 3. burung puter(pigeons)	- increasing of farming and improvement efforts. - increasing of utilization.	1. study in the aspect of multiplying (behaviour& conditions necessary for breeding) 2. study in aspects of off-spring and adaptation (incl. resistance to diseases) 3. study in aspects of improvement possibilities or crossings.	- 5-10 years. control over breeding methods and utilization of this group as farm animals	- LBN - LIPI LP Peternakan; - LP Penyakit Hewan - Perguruan tinggi yang sebidang.

VIII

Group IV

Agricultural Policy for Production Stimulation

Sjarifuddin Baharsjah, Chairman
R. Sinaga, Secretary

Introduction

In its discussions, the group has been aware of the limitations in the integrity of the data needed to formulate the stimulation policy alternatives. The data is also needed for considering the strong and weak points of each alternative from various aspects, such as the effect on equalizing of incomes and employment possibilities, and their impact on the rate of inflation. Therefore, the group has not aimed its discussions towards the formulation of an operational policy, but has limited itself to:

1. Considering the problem of production stimulation policy;

2. Suggesting the direction that should be followed by the production stimulation policy in the framework of food and nutrition sufficiency; and

3. Indentifying the aspects that the institution and the overall plan must incorporate to effect the actions arrived at in the discussion of point "2."

The group has centered its main attention on the price stimulation policy. However, a number of non-price stimulation policies have also been discussed, for the group is aware that, in the long run, the effectiveness of the price policy will be greatly influenced by the success of other non-price stimulation policies.

Situation and Problem

From various data it can be concluded that, with a few exceptions, production during Replita I and Replita II has shown an increase. However, this increase is not large enough to bring the country to the point of self-sufficiency. In order to achieve an adequate food supply, the government imports rice and other foodstuff such as flour, sugar, maize, and soybeans. Various data sources show that in 1970, the rice import was approximately 960,000 tons and that it rose to 1.96 million tons in 1977. Further, imports of flour and soybeans also show an increase. Various data sources also show a flour import of approximately 0.5 million tons in 1970, rising to 1 million tons in 1977. Soybean imports amounted to 3,000 tons in 1971 and rose to 172,000 tons in 1976. The import of maize has been fluctuating. In 1973 it was approximately 142,000 tons, decreasing to 24,000 in 1975, and rising again to approximately 69,000 tons in 1976. In 1977, the import of maize decreased again to appromately 14,000 tons. Meanwhile, the rice consumption has steadily risen; in the period 1970-1976, its growth rate reached an average of 4.1 percent a year, while in the same period the consumption of maize decreased by 6.2 percent a year. In this period, the consumption of ubi-ubian (edible tubers) also showed an increase of more than 9 percent a year, much higher than the increase of rice consumption.

The slow increase of food production in comparison with the increase of its consumption, which is leaning more and more toward rice, is the main food problem Indonesia is facing at present. This situation is caused by various factors. In the field of consumption, by the fact that both the population and the income per capita are rising rapidly. In the field of production, setbacks have occurred, caused by drought and pests. Thus, the group is of the opinion that the production stimulation policy now in force has not yet succeeded in promoting the production of food. whether it be by increasing rice production to meet the demand or by stimulating the use of resources that will increase production of maize, cassava, and other foodstuff.

The lack of effectiveness in the stimulation policy can, according to evaluations, be ascribed to three causes: 1) the problems concerning the policy itself; 2) the problems concerning tis execution; and 3) the problems connected with the non-price components of stimulation policy.

From the viewpoint of establishing the maximum rice price, it apprears that price developments have occurred that place this price on a relatively low level in comparison with the prices of other foods, thus excessively stimulating rice consumption. It is also obvious that although the maximum rice price is fixed differently for each territory, according to the local needs, it does not yet take into account the different reactions at various consumer levels within each locale and so fails to stimulate the substitution of other foods for rice.

The problem of policy in relation to the floor price lies in the setting of a floor price valid for the whole nation. The basic price established on the "Rumus Tani" (Peasants' Formula) and the "B/C Ratio" calculation of 2.0, as used in some rice-producing territories, also has drawbacks. It is not considered high enough to stimulate production. Further, establishing one fixed price for all territories not only will be inefficient, but can destroy other price relations, and in this way weaken the stimulation policy it is meant to support. With regard to setting the floor price in the context of the stimulation policy, the group draws attention to the fact that in certain cases a subsidy for production will be better, particularly with respect to its influence on the rate of inflation and the leveling of incomes.

In the execution of the stimulation policy, then, the main problem concerns the floor price. Another facet of the problem, the group feels, is that wrong conception still exist about this floor price among the field workers. Some field workers confuse the concept of the floor price with that of the cost price, linking it with the domestic paddy purchase program without connecting it with a stimulation to produce. Because of these misconceptions, the correctness of the floor price level is often measured in terms of its purchasing power, rather than its ability to stimulate production.

The formula for the floor price, and a certain level of quality and dryness, cannot always be utilized by peasants to calculate the amount they should receive for their paddy/unhulled rice. This, too, makes the floor price ineffective as a stimulus to production. Further, the existing trade system, in particular on the rural level, is estimated to be inefficient and to inhibit any stimulating effects of the floor price from being channeled satisfactorily to the peasants.

Proposed Policy

In its discussions concerning the completion of the production stimulation policy, the group has viewed the stimulation policy as part of the overall food policy. Thus, its evaluation of a production stimulation policy cannot be separated from its evaluation of the overall package of policies, which are integral to the food policy. The group's evaluation of various food policies has taken into consideration their influence on: 1) the food-consuming society, comprising various groups according to income level or origin (region, city, or rural territory); 2) the food producing society, also comprising a number of production groups in various regions; 3) the rupiah expenses necessary for food-policy execution; 4) its effect on the country's foreign exchange budget; and 5) its effect on employment opportunities and its other sociopolitical impacts.

The group is of the opinion that the import of foodstuff, as a component of the food policy, in particular of staple food, should in the long run be decreased as much as possible. For instance, the flour import at present amounts to 1 million tons per year and is estimated to be increasing rapidly. The group proposes the prevention of further increases of flour imports in order for the country to withdraw from dependency on the international food market, especially for the articles that cannot be replaced by domestic production. The group feels that the high flour import points to the presence of an encouraging flexibility in Indonesia's staple food pattern. By making use of this flexibility, it should be possible to replace, step by step, the use of wheat flour by other kinds of flour that can be domestically produced.

If the import of foodstuff is to be kept down, the food policy must emphasize the need for increasing domestic production. In this connection, the production stimulation policy should be improved by incorporating the following recommended points.:

1. The production stimulation policy should be expanded to include not only paddy (and maize), but also other food crops; thus, while it is hoped that paddy production can be increased, the peasants should also be stimulated to use their other available resources for the production of maize, cassava, soybeans, etc.;

2. The new stimulation policy should contain a higher maximum and basic paddy/rice price so that a too rapid increase in rice consumption can be prevented and at the same time substitution of rice by other food can be stimulated;

3. Although the differences in the pattern of staple food consumption, resources, and production designs, as well as market-integrating levels, provide the opportunity to set up regional stimulation policies (by price stimulation as well as non-price stimulation), the drafting of a stimulation policy detrimental to an integrated national food policy must be prevented; and

4. To prevent unwanted results from the increase of the paddy/rice price, in particular for the low-income people, this increase should be introduced by degrees, while taking into consideration the group consumer target; when the change has been fully implemented, food subsidies can be given to the low-income group.

Programs Proposed in the Framework of Upgrading and Completion of Stimuation Policy

In this connection, the group recommends:

1. The establishment of a food trade system. The effectiveness of the production stimulation policy, in particular price stimulation, is largely dependent on the food trade system in force. The group is of the opinion that a program aimed at the establishment and greater efficiency of the food trade policy is necessary. This is especially necessary if the stimulation policy is expanded to include paddy, maize, cassava, soybeans. and other crops.

2. Research aimed at disclosing parameters for the behavior typical in production, marketing, and consumption of food. For an operational formula, and to improve the production stimulation policy, it is necessary to possess knowledge about social factors in food production, as well as about the reaction of consumers towards relatively small price changes in various food commodities. Research is also necessary for assessing the efficiency of food marketing systems. Further research is needed to determine the factors that cause such changes as the decrease in the consumption of maize and the increase in the consumption of cassava.

Institution

In order to perfect and carry out the policy proposed, the group considers that the institute for administering the existing policy still needs the following improvements: 1) more effective utilization of the interdepartmental working groups consisting of those from the Department of Agriculture, the Department of Trade/Cooperation, BULOG, the Department of Public Works, and other institutes concerned with the food question; 2) better coordination in the execution of policy, especially at the lower levels; 3) increased capability and expanded scope of the BUUD/KUD cooperation in carrying out the policy regarding the basic price; and 4) an improved food production forecasting system and better monitoring of food prices.

Other Suggestions

The group also recommends:

- Investments in tertiary irrigation works to alter and improve the function of production and supply.

- Organizing the rural society to cooperate in the extermination of mice and rats.

- Reorganizing the structure of the system to control and exploit land (as it seems that the present structure forms an obstacle to the implementation of technologies), including these changes: 1) Tanah Bengkok (pieces of land given to village heads in place of salary) should be substituted by a salary, with the Tanah Bengkok still to be set aside, but worked in groups or cooperatively by field laborers who do not possess land; and 2) the U.U. Bagi Hasil (regulation regarding production sharing, 1960) should be strictly executed.

- The practice of distributing rice "in natura" to civil servants and members of the armed forces should be reviewed as part of pursuing a moderate rice consumption policy.

IX

Group V

Technologies for the Postharvest Processing, Marketing, and Utilizing of Food

Permadi, Chairman
Hermana, Secretary

Introduction

To cope successfully with the food and nutrition problem in Indonesia, it is necessary to stop up both the efficiency of the postharvest system and the use of food by the consumer.

To attain self-sufficiency in food, the nation will need not only to increase the available food, but to diversity it.

These efforts, the protection of the consumer, should be given full consideration.

Situation and Problems

During Replita I and II, though there was an increse in the production of food, it fell short of the goals for quality as well as quantity. One reason for this is that crops other than rice do not yet get enough attention.

Moreover, various problems related to technology, marketing and distribution, sociocultural patterns, consumer protection, and institutional mechanisms have resulted in unequal distribution of food, with nutritional sufficiency varying by income group.

Technology

The postharvest technologies for processing, storing, and preserving and not yet satisfactory; damage and shrinkage rates for both seeds and horticultural crops reach 20-40 percent.

In general, food processing technologies are not yet efficient and have not made much contribution toward the diversification of food.

Adoption of new technologies is still limited and often the local situation is not taken into consideration, so that the innovation often may be detrimental to the local environment.

Marketing and Distribution

No marketing system has yet been proposed that seemed guaranteed to stimulate production and distribution.

The distribution system is not yet satisfactory, as scarcity of transportation has resulted in a high-cost system that upsets the balance between the producing and the consuming regions, in particular between Java and the other territoties.

The cooperative movements do not yet include marketing activities.

Socioculture

The tendency exists for people to feel reluctant about using foods that may suggest a decline in their social status.

Protection of Consumers

The question of consumer protection does not yet receive sufficient attention.

Policy

The diversification of food should be done on a national scale and spread over all levels of society, step by step, without force, and should not be projected as an effort to decrease the consumption of rice.

The uses of new foods must be increased and available food should be utilized more efficiently.

Postharvest technologies should be developed that will limit damage, shrinkage, and decreasing quality of foodstuff.

Food-processing technologies should be adapted to the nutritional needs of the income group using the related products.

New technologies should be adapted to the living environment of the local people, their level of technology, and inexpensive materials that may be available locally.

Marketing and Distribution

Both infra- and superstructure of the distribution network should be improved.

Sociocultural Factors

People should be made aware of the uses and values of various foodstuff.

Consumer Protection

The public should also be made more aware of the importance of consumer protection.

Program

A sound food and nutrition improvement program should include the following goals:

- To diversity the food supply;
- To step up efforts to improve postharvest technologies with procurement of the necessary equipment;
- To disseminate tested, appropriate technologies;
- To establish processing facilities for a number of foods that may have potential on a small scale in some producing regions, keeping in mind their economic feasibility;
- To improve the food distribution network;
- To develop cooperative activities to include pre- and post-harvest phases and marketing;
- To conduct intensive studies of marketing technologies and outlets for processed food products;
- To complete Act No. 10 of 1961 concerning "Goods" and drafting the regulations for its execution;
- To review existing regulations and the developing standardization activities;
- To advise the public about the need for standardization and the protection of consumers;
- To distribute food information to the target population;
- To increase the number of food workers and to upgrade their capacity, with the improvement of the food worker educational system as a long-term program;
- To produce a map of food-consumption patterns.

Institutional Arrangements

A mechanism is needed to facilitate cooperation between sectors and to enable regional and inter-regional cooperation.

An institutional effort is needed to raise the national capacity in the field of science and technology by using domestic and foreign agencies;

For the handling of the overall food situation with activities relating to postharvest technologies, diversification of foodstuff, adoption of technologies, improvement of the nutritional qualities of food, and dealing with famine; and

For coordinating standardization activities on a national basis.

The function of consumer organizations should be developed (including others besides the Yayasan Lembaha Konsumen).

X

Group VI
Sub Pleno A

Planning of Evaluation and Execution
of the Food and Nutrition Program

Harjono Sujono, Chairman
Soekirman, Secretary

1. Alternative II is approved, with a few improvements and conditions as follows:

a. The leadership of the RAKORTAF, RAKORHAR and RAKORDIK should be raised to their next echelons in order to give more authority to the RAKORS;

b. Full-time staff members are needed, especially on the Secretariat and the MENKO staff;

c. Permanent memberships are necessary for success of the RAKORTAF meetings;

d. The qualifications of the members of the Team Ahli (Team of Experts) should be studied in order to procure those experts who are able to tackle the food and nutrition problem;

e. The possibility of incorporating certain organizations and the role of Under Minister of Women's Affairs into the structure of Alternative II should be considered;

f. To enable the Secretariat to function effectively and to become the coordinating mechanism, the existing functional institutions (in the Department of Health) should be reinforced and the ones not yet operating (in the Department of Agriculture) should be instituted.

2. To make the coordination effective, it will be necessary to link the macro food programs with the nutrition programs. From these combined programs, a harmonious working system can be arranged between sectors and subsectors participating in the coordination.

3. To enable the coordinated programs to function on various levels, the employment of skilled workers at the level of provinces, regencies, and districts should be considered.

4. In the execution of food and nutrition programs at the village level, the community institutions in the villages should be utilized as they are in the Planned Parenthood Program (Keluarga Berencana).

5. Prior to drawing up the program and setting up the new structure of the coordinating institution as recommended in the Widya Karya, it will be necessary to codify the norms and standards of nutritional sufficiency as the legal basis of judging food sufficiency for the various groups of people in Indonesia.

XI

Group VI
Sub Pleno B

Planning of Evaluation and Execution of the Food and Nutrition Program

Soepardan Soerjohoedojo, Chairman
Ig. Suharto, Secretary

1. Subgroup VI-B has concluded that it is necessary to perfect the coordination of the food and nutrition improvement activities by: 2) adapting the food program to the government's regulations and the structure and working mechanism of the Kabinet Pembangunan III; and b) reinforcing the institutions for coordination in the central government and in the regions with a Team Ahli (Team of Experts), consisting of top people from universities, departments, and nondepartmental institutions.

2. Within the framework of plans for increasing the activities for the improvement of food and nutrition, it is necessary to expand the role of the universities in Indonesia.

3. The sectoral transition programs concerned with the improvement of food and nutrition should be simplified into operational projects, which can then be carried out through community approaches to further promote community participation.

4. To make programs for the improvement of food and nutrition more successful, special attention should be paid to the promotion of education and training of administrative personnel. Interlinkages of the roles of the three kinds of institutions--the educational institutions as producers, the institutions for labor exchange as distributors, and the labor-using institutions--should be promoted with regard to the food and nutrition improvement activities.

5. To successfully execute the food and nutirtion improvement activities, a new personnel system should be designed to attract and hold capable workers, for instance by establishing a career scale and instituting a system of employment benefits.

6. In studying the National Standardization coordination, Subgroup VI-B was reminded of the existence of a memorandum from LIPI to the government, which has already been extensively discussed in seminars in the Government Centre as well as in the regions. In this memorandum, the MENKO-EKUIN sector is proposed as standardization coordinator, with participation requested from other departments and institutions outside the sector who are involved with the problem.

7. Subgroup VI-B is of the opinion that the implementation of the food and nutrition improvement programs should use the existing infrastructure and facilities and should be carried out through already-functioning channels in accordance with their relevant competences and potentials.

8. Because of the importance of the Department of Agriculture in the execution of the food and nutrition improvement activities, it is recommended that a Food and Nutrition Unit be formed in the department.

APPENDIX A

Workshop on Food and Nutrition
in Indonesia

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Dr. M. G. C. McDonald Dow
Deputy Director/BOSTID
National Academy of Sciences
Washington, D.C. 20418

Mrs. Rose Bannigan
Assistant to the Director
BOSTID
National Academy of Sciences
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Group I: Food and Nutrition Sufficiency

Chairperson: Julie Sulianti Saroso

Secretary : Ig. Tarwotjo

Papers presented by :
1. Darwin Karyadi
2. Sajoguo
3. Soeharso

Resource persons :
1. Doris Calloway
2. James Dinning
3. Sunawang
4. Rachmat Qureshi

Other participants :
1. Djumadias Abunain
2. Muh. Arief
3. Subiyakto Atmosiswojo
4. M. Amin Azis
5. John A. Dixon
6. Wiratmo Haryoko
7. Sayuti Hasibuan
8. Lukas Hendrata
9. Husaini
10. Melati P. Joenoes
11. Kamarsjah
12. Sri Kardijati
13. Muhamad Khumaedi
14. Dradjat Prawiranegara
15. Soemilah Sastroamidjojo
16. Lasam Soeroso
17. Lie Goan Hong
18. S. Malasan
19. I. B. Mantra
20. Sukartijah Martoatmodjo
21. Muhilal
22. Saadillah Mursjid
23. Burhan Napitupulu
24. Suaspendi Notodihardjo
25. Soeharto Prawirokusumo
26. Uton Muchtar Rafei
27. Brata Ranuh
28. Samsudin
29. A. Djaeni Sediaoetama
30. Bambang Sotiadi
31. Hananto Sigit
32. M. B. Sirait
33. H. H. Sitompul
34. Poorwo Soedarmo
35. Soegito
36. Soekirman
37. Soepardan Soerjohudejo
38. Suhardjo
39. Suharto
40. Sam Suharto
41. Suhartono
42. Haryono Suyono
43. Arifin Tasrif
44. H. A. R. Talaar
45. Bambang Wikantadi
46. Kartono Wirosuhardjo

Group II: The Role of Soil, Water, and Production Technologies in the Supply of Food.

Chairperson: Sadikin Sumintawikarta

Secretary : Surjatna Effendi S.

Papers presented by :
1. Guswono Supardi
2. Rusli Hakim

Resource persons :
1. Colin McClung
2. Donald C. Taylor

Other participants :
1. Boesono Boedidarmo
2. Zaenuddin Harahap
3. Sri Setyati Harjadi
4. Paransih Isbagio
5. Surahmat Kusumo
6. Amris Makmur
7. Harimurti Martojo
8. Soetedjo Moeljodihardjo
9. Hansani Pekerti
10. M. Qazuini
11. Sjamsoe'oed Sadjat
12. Sumardi Sastrakusumah
13. A. M. Satari
14. D. T. H. Sihombing
15. Saroso Sindhoesarojo
16. Suwadi Sindoeredjo
17. M. Soepraptohardjo
18. Soeyono Soeropati
19. Subijanto
20. I. G. M. Tantra
21. Alie Purnomo Tirtoredjo
22. Gombong Tjitrosoepomo
23. Triharso
24. Andreas Warkidi
25. Suhaedi Wiraatmadja
26. Samino Wirjosuhardjo

Group III: Biological Research in Support of Technologies for the Development of Agricultural Resources (Flora, Fauna and Soil).

Chairperson: Setijati Sastrapradja

Secretary : Soenartono Adisoomarto

Papers presented by :
1. Didin S. Sastrapradja
2. O. Koswara
3. Johan Silas

Resource persons :
1. James Moomaw
2. Hugh Popenoe

Other participants :
1. Wanda S. Atmadja
2. Didi Atmadilaga
3. L. A. Gunawan
4. G. Ban Gong
5. Komaruddin Ma'sum
6. Sayuti Murad
7. Jotty Nurhajati
8. Oey Kam Nio
9. P. M. Pajow
10. Soetjipto Partohardjono
11. Roestamsjah
12. Susono Saono
13. Muchtar Effendi Sirogar
14. B. H. Siwi
15. Justina Sri Adiningsih Soejitno
16. Aprilani Soegiarto
17. Roberto Soenarjo
18. Martono Soeronegoro
19. Hendro Sunarjono
20. Suryo
21. Sri Suwasti Susanto
22. Mehammed Hasroel Thajib
23. Mozes Toelihare

Group IV: Agricultural Policy for Production Stimulation.

Chairperson: Sjarifuddin Baharsjah

Secretary : R. Sinaga

Papers presented by :
1. I. Gusti Bagus Teken
2. Affendi Anwar

Resource Persons :
1. M. L. Barnett
2. Richard Goldman
3. Altaf M. Hussain
4. Vernon Ruttan

Other participants :

1.	Nadir Abdulkadir	15.	Montgomery
2.	Anwar Abidin	16.	Mubyarto
3.	E. Rukasah Adiratma	17.	B. S. Muljono
4.	Saleh Afiff	18.	Hidayat Nataatmadja
5.	Sri Suwito Idris Atmodjo	19.	Andung A. Nitimihardja
6.	A. T. Birowo	20.	Nyberg
7.	William L. Collier	21.	Dibyo Prabowo
8.	Soehartojo Hardjopranyoto	22.	A. M. Saefuddin
9.	Harsojo	23.	M. Arifin Salatang
10.	Erfansjah Hasan	24.	Sapuan
11.	Ibrahim Hasan	25.	Kabul Santoso
12.	D. Hedley	26.	Soekartawi
13.	Mon. Mohfoedi	27.	Rusman Sudjana
14.	Wahjudi Sugijanto	28.	Baskoro Winarno

Group V: Technologies for the Postharvest Processing, Marketing, and Utilizing of Food.

Chairperson: Permadi

Secretary : Hermana

Papers presented by :
1. Soewarno T. Soekarto
2. Muhammadi Siswo Soedarmo

Resource persons :
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2. Michael Dow
3. E. R. Pariser

Other participants :
1. Purwo Arbianto
2. Hardiman
3. Suhadi Hardjo
4. Nasruddin Iljar
5. Sofyan Ilyas
6. Siti Isnijah S. P.
7. S. B. Joedono
8. Kamarjani
9. Musrefinah Mahlan
10. Suwarto Martosudirdjo
11. Diah Maulida
12. Sidik Moeljono
13. Sjahmian Muhyi
14. Muslimin Nasution
15. M. Anwar Nur
16. Nuryadi
17. Redyowati
18. Atjeng Muchlis Syarief
19. Soedito
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21. Dardjo Somaatmadja
22. Ig. Suharto
23. Ismu Sukarto Suwelo
24. Susarsono Wijandi
25. F. G. Winarno
26. Winoto.

Group VI, Sub Pleno A: Planning of the Evaluation and Execution of the Food and Nutrition Program

Chairman : Soepardan Soerjohoedojo

Secretary : Ig. Suharto

Resource Persons :

1. James Moomaw
2. E. R. Pariser
3. Hugh Popenoe
4. Vernon Ruttan
5. Sunawang
6. Rachmat Qureshi
7. Donald C. Taylor

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1. Sutjipto Partohardjono
2. Permadi
3. Hansani Pekerti
4. Dibyo Prabowo
5. Suharto Prawirokusumo
6. M. Qazuini
7. Uton Muchtar Rafei
8. Brata Panuh
9. Redyowat
10. Rustamsjah
11. Sjamsoe'oed Sadjat
12. A. M. Saefuddin
13. Sajogyo
14. M. Arifin Salantang
15. Susono Saono
16. Samsudin
17. Kabul Santoso
18. Sapuan
19. Julie Sulianti Saroso
20. Didin S. Sastrapradja
21. Setijati Sastrapradja
22. Sumardi Sastrakusumah
23. A. M. Satari
24. A. Djaeni Sediaoetama
25. Bambang Setiadi
26. Hananto Sigit
27. D. T. H. Sihombing
28. Johan Silas
29. R. Sinaga
30. Sjafar B. Sinambela
31. Saroso Sindhoesarojo
32. Suwadi Sindooredjo
33. M. B. Sirait
34. Muchtar Effendi Sirogar
35. H. H. Sitompul
36. B. H. Siwi
37. Poorwo Soedarmo
38. Muhammadi Siswo Soedarmo
39. Soedito
40. Soeharso
41. Justina Sri Adiningsih Soejitno
42. Aprilani Soegiarto
43. Soegito
44. Soekartawi
45. Soewarno T. Soekarto
46. Roberto Soenarjo
47. M. Soepraptohardjo
48. Soeyono Soeropati
49. Martonon Socronegoro
50. Dardjo Somaatmadja
51. Subijanto
52. Rusman Sudjana
53. Wahjudi Sugijanto
54. Suhardjo

55. Suharto
56. Sam Suharto
57. Suhartono
58. Guswono Supardi
59. Haryono Suyono
60. Hendro Sunarjono
61. Suryo
62. Sadikin Sumintawikarta
63. Sri Suwasti Susanto
64. Ismu Sukanto Suwolo
65. Atjong Muchlis Syarief
66. I. G. M. Tantra
67. Ig. Tarwotjo
68. Arifin Tasrif
69. I. G. B. Teden.
70. Mohamad Hasroel Thajib
71. H. A. R. Tilaar
72. Alie Purnomo Tirtoredjo
73. Gembong Tjitroscepomo
74. Mozes Toelihare
75. Triharso
76. Susarsono Wijandi
77. Andreas Warkidi
78. Bambang Wikantadi
79. Suhaedi Wiraatmadja
80. Samino Wirjosuhardjo
81. Baskoro Winarno
82. F. G. Winarno
83. Winoto

Group VI, Sub Pleno B: Planning of the Evaluation and Execution of the Food and Nutrition Program.

Chairperson : Saadillah Mursjid

Secretary : Sukirman

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Other participants:

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12. Sri Suwito Idris Atmedjo
13. Subiyakto Atmosiswojo
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18. William C. Collier
19. John A. Dixon
20. Rusli Hakim
21. Go Ban Hong
22. L. A. Gunawan
23. Zaenuddin Harahap
24. Hardiman
25. Suhadi Hardjo
26. Suhartojo Hardjopranjoto
27. Sri Setyati Harjadi
28. Wiratmo Haryoko
29. Harsojo
30. Erfansah Hasan
31. Ibrahim Hasan
32. D. Hedley
33. Sayuti Hasibuan
34. Lukas Hendrata
35. Hermana
36. Husaini
37. Nasrudin Iljas
38. Sofyan Ilyas
39. Paransih Ishagio
40. Siti Isniah S.P.
41. S. B. Joedono
42. Melati P. Joenoes
43. Kamarjani
44. Kamarsjah
45. Darwin Karyadi
46. Sri Kardjati
47. Muhamad Khumaedi
48. Surachmat Kusumo
49. Dradjat Prawiranegara
50. H. Tb. Bachtiar Rifai
51. Soemilah Sastroamidjojo
52. Lasam Sceroso
53. Lie Goan Hong
54. O. Kuswara

55. Moh. Mahfoedi
56. Musrefinah Mahlan
57. Amris Mahlan
58. Komaruddin Ma'sum
59. S. Malasam
60. I. B. Mantra
61. Sukartijah Martoatmodjo
62. Harimurti Martojo
63. Suwarto Martosudirdjo
64. Diah Maulida
65. Sidik Muljono
66. Soetedjo Moeljodiharjo
67. Montgomery
68. Mubyarto
69. Muhilal
70. Sjahmian Muhyi
71. B. S. Muljono
72. Sayuti Murad
73. Burhan Napitupulu
74. Muslimin Nasution
75. Hidayat Nataatmadja
76. Andung A. Nitimihardja
77. Suaspendi Notodiharjo
78. M. Anwar Nur
79. Yetty Nurhajati
80. N ryadi
81. Nyberg
82. Oey Kam Nio
83. P. M. Pajaw

Appendix B

Perspectives on Indonesian Food Policy*

Vernon W. Ruttan**

Since the 1968 LIPI-NAS Workshop on Food, Indonesia has made impressive progress along the many dimensions of its effort to mobilize resources to enhance development processes.

1. In 1968 Indonesia's limited industrial capacity remained under utilized as a result of the disruption and the stagnation that accompanied the economic policies pursued under the Sukarno Government were not yet fully realized. Since 1968 the growth of industrial capacity and production has been very impressive.

2. Between 1968 and the mid 1970s rice production experienced a relatively rapid rate of growth. Many of us who participated in the 1963 conference were sceptical that growth at the rate that appears to have been achieved at least until the mid 1970s would be possible--even with the adoption of modern rice varieties higher levels of fertilization and appropriate price policies.

3. Since 1968 a population program has been implemented that had, by the mid-1970s begun to exert a reasonable impact on the rate of population growth. The need for a major emphasis on population programs had been clearly recognized by the 1968 workshop. Few of the participants actually believed, however, that a program could be evolved that would achieve a level of effectiveness that is apparent in some parts of Indonesia.

The extraordinary accomplishments of the last decade also serve to reinforce the seriousness of the opportunities that were lost and the problems that remain.

1. In spite of rapid growth in production, rice imports have increased to over 2.0 million tons and wheat imports to approximately 1.0 million tons. At least twice during the last decade farmers' efforts

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* Address to the Workshop on Food and Nutrition, Bogor 10-14 July 1978.

**Professor, Department of Agriculture and Applied Economics, Department of Economics, University of Minnesota.

tionships and counter productive procurement efforts. Rice production has also been lost as a result of lack of capacity to respond to insect and disease attacks. During the next decade it seems likely that, even with appropriate market policies and increased technical capacity, increases in rice production will be more difficult to come by than during the last decade.

2. In spite of the progress that has been made there have been substantial increases, in both urban and rural areas, in the number of families who are unable to meet basic subsistance - including nutrition - requirements. There is evidence in many villages that the number of landless workers has risen. There is also evidence that the number of kilograms of rice that can be purchased with the wages from a days work has declined. And there is at least a hint of evidence that the number of days of work available to many landless or near landless workers has declined. More productive employment remains as least as important a door to the solution of Indonesia's agricultural and food problems today as a decade ago. And the key to unlock this door has, in my judgement, not yet been found in spite of much fine rhetoric about "integrated" rural development programs and 'basic needs' approaches to development.

There are also a number of important questions that must be resolved as Indonesia moves into the next decade of its efforts to improve its food, nutrition and poverty problems. Let me indicate a few of the questions that I hope this Workshop will help to resolve.

1. <u>What will be the source of growth in food production over the next decade?</u>

Historically, one can identify five sources of growth in output:

- the productive capacity of a nation's agricultural resources

- the capacity to provide agriculture with more efficient sources of energy - embodied in labor substitutes such as machinery or land substitutes such as fertilizer.

- the capity of its scientific establishments - to produce the new rice varieties that make for more efficient use of land, water, and fertilizer, for example.

- the capacity of its farm people - to adapt and use new materials, new technology, and new products.

- the capacity of its institutions - to transmit knowledge and technology to rural people, and to provide the incentive and logistical supports needed for efficient operation of markets.

Until very recently Indonesia has depended primarily on the capacity of its abundant and productive natural resources as its primary source of agricultural growth. This phase of development has already been left behind for Java. Before the end of the century it will be essentially completed even on the outer islands. In the future it seems apparent that Indonesia will have to shift from a resource based to a science based agriculture.

2. A second question has to do with the commodity composition of agricultural production.

It seems clear that this Workshop must give even more attention to the alternatives to rice than the 1968 workshop. This does not imply a reduction in the effort to expand rice production. It does suggest the possibility of a more balanced approach to meeting food demand and nutrition requirements. My own view is that it will be necessary, over the next decade to build adequate research capacity to enhance and protect the productivity of each commodity of economic significance in each agro-climatic or ecological zone in which it is produced if the foundations for a science-based agriculture are to be established. I would hope that this workshop can provide the planners with some of the hard empirical evidence needed to judge which commodities and in which area sufficient knowledge and sufficient technology already exist to serve as a base for expanded production in the next decade. I would think that it would require a further exercise to determine the relative priorities in building the research capacity that will be needed by the end of this decade to support expansion of production capacity in the following decade.

3. A third set of questions centres around the institutional capacity to support agricultural production.

Both the logistical support-transportation, storage and processing facilities--and the institutional infrastructure necessary to relate consumer demand to producers remains weak. It is indeed a serious contradiction that the food problem at the national level often appears to be manifest in terms of inadequate supply. While at the farm level--the producer level--where the decisions to produce are made, the problem often appears to be of lack of demand--or more correctly prices that provide little incentive to produce. The problem continues to exist even in the most highly developed market sector--that of rice. BULOG has developed an admirable capacity to maintain ceiling price for rice. It has yet to demonstrate the same capacity to effectively supporting producer prices --the prices that serve as an incentive (or disincentives) to produce.

4. A fourth question centres around the institutional innovations needed to support more equiptable participation in production and consumption.

How are the gains from agricultural production to be distributed among producers, the marketing system and consumers? And how are they

to be distributed within the producing and consuming population. It is my impression that Indonesia has not yet been able to wean itself from the illusion of the efficiency of large scale in agricultural commodity production. Yet a careful review of commodity production patterns around the world indicates that there are few so-called plantation crops that can not be efficiently produced by small holders when supported on efficient institutional infrastructure. This conference will give considerably more attention to the problems of nutrition than the 1968 conference. I hope that attention can be given to the institutional innovations that will be needed to support effective efforts at nutrition improvement. Until this can be discussion of nutritional deficiencies will remain little more than statistical exercises and empty rhetoric.

Finally, I would like to impose on you one of my concerns about the limitations that my own profession, economics, has not yet been able to resolve in providing analitical support for national planning efforts. It is no secret that economics has great difficulty in linking micro-level analysis with macro-level analysis--that is in the relating of its understanding of the economic behavior of the individual producer and consumer with its understanding of the working of the national economy. In the past this analitical weakness has limited the effectiveness of national planning efforts.

This weakness has led me to be somewhat sceptical of agricultural planning efforts that are directed towards the achievement of specific commodity production targets. The record of such effort in both socialist and non-socialist economies has been one of almost unmitigated failure. But what is the alternative? In my judgement the alternative is to be much more conscious of the impact of market price, technology, input, and procurement policies on the returns at the individual producer level. Any policy which does not improve the income of farmers and farm laborers has little chance of success. Peasent producers have demonstrated this over and over during the last decade. It is a lesson that policy markers have found difficult to understand. This perspective, paradoxically suggests that planning to meet the income objectives of farmers and farm laborers will be more effective in meeting food production objectives than production campaigns designed to meet specific commodity targets. It implies, however, a more micro-based--I might even say a more farm management based--planning procedure.

Appendix C

Summary of the Recommendations of the
Preparatory Workshop on Food and Nutrition

Jakarta, June 13, 1978

Problem

1. Calorie and protein shortage causes signs of malnutrition especially in pre-school children (30%, or more than a million children) and pregnant and breast feeding mothers (7% and 3% respectively, or 0.6 million women) which results in a high infant mortality rate (50% of total deaths).

2. Vitamin A deficiency, especially in pre-school children makes 3-4% or 100,000 children a year susceptible to blindness.

3. Iodine deficiency in food and water, which results in endemic goitre in the populations of various areas, affects a total of 12 million people. In its critical stages it seriously limits physical growth and mental development (there are estimated to be 100,000 mentally-retarded due to this cause.

4. Iron deficiency in food leads to anaemia especially in children (below and above the age of 7), in women (especially in pregnancy) and in male and female workers in the lower income groups.

5. Lower income groups: low buying power prevents this group from achieving a balanced diet with adequate protein.

6. Environmental health conditions or infections prevent the body's proper use of proteins. On the other hands shortage of protein reduces resistance to disease and in children results in a high mortality rate.

7. Socio-cultural patterns, especially bad eating habits, cause people to choose kinds of food which are of poor nutritive value.

8. Water use in Java and Madura is still limited to 1/4 of total available water supply; in Bali and Nusa Tenggara to about 1/5; in Sumatera and Kalimantan to 1/16; in Sulawesi to 1/25; and in Maluku and West Irian to a very small fraction indeed.

9. Not all available land can be used for agriculture. Insufficient attention is given to apply appropriate technology in farming, particularly for the less suitable land for agricultural purposes. This leads to several constraints (for example water management and drainage; the effects of aluminium toxicity and infertility).

10. Indonesia relies too heavily on rice as a source of carbohydrate.

11. Domestic rice production does not meet the level of consumption with the result that a large amount of rice has to be imported.

12. Use of resources is sub-optimal both from the point of view of efficiency and from that of increasing or distributing income more equally, because other sources of carbohydrates are neglected (cassava, sweet corn and sorghum).

13. The public is reluctant to adopt other kinds of food, especially unconventional foods. Spoilage and loss of agricultural products is estimated to be high. Efforts to increase agricultural production (such as the use of wastes as fertilizer) have not been sufficiently explored.

Policy Objectives

1. Increase agricultural productivity in each area according to its potential.

2. Improve nutrition in the lower income groups by a nutritional program (through education on nutrition supported by a nutritional package).

3. Information on nutrition that is as widely disseminated as possible.

4. More equal distribution of profits from development and an increase in the incomes of the lower income groups so that their nutritional level will be raised.

5. Step up work in plant genetics in priority crops both food crops and other kinds of industrial raw material.

6. Contol and improved management of water use as a fundamental element in agriculture. Protection of existing water supply is essential and other sources of water should be urgently sought.

7. The productivity of agricultural land should be increased and conserved. Agricultural land use should be made efficient and effective.

8. Decrease reliance on rice by introducing other types of cereal crop.

9. Develop other types of food commodity.

10. Increase rice production and discourage increased consumption.

11. Increase the production and consumption of soya beans as a protein and carbohydrate source.

12. GBHN (National Policy Guidelines) place priority to:

Improve the quality of food by increasing the supply of plant and animal proteins; raise farmers incomes; expand job opportunities; guarantee the supply of food and encourage entrepreneurship, enterprise and public participation.

13. Incentives for production:

a. price incentives such as: fixing basic prices; fixing maximum prices; providing subsidy on inputs

b. providing services as incentives.

Program

1. A program of nutritional information with first priority given to nutritional intervention with the support of a nutritional package which is directed to the low income groups and based on local entrepreneurship with the assistance of a government program.

2. Nutritional surveillance and monitoring to direct and evaluate the program in critical areas.

3. Nutritional fortification (iodine and iron) to be developed through commercial channels by cooperation with food processing industries which will enrich food with these chemicals.

4. To intensify the planting of crops most suitable to particular areas whether these are food crops, cover crops, forest crops or timber for fuel wood.

5. Concentrating on food crops with the following characteristics: high yield; resistant to damage, short-leafed and good palatability.

6. A program to develop fast growing trees which are multi-purpose.

7. Exchange of germ-plasm with other countries as a mean of obtaining genetic materials needed all improvement program.

8. Extending climate monitoring to places which can be developed into agricultural areas or transmigration settlements.

9. Land and water use must be studied so that it can be adapted, on the basis of climate, to particular plant crops.

10. Protection of river areas in order to guarantee a continual supply of water for agricultural purposes.

11. Development of public awareness for the need to conserve rainfall for agricultural purposes.

12. Increasing efficiency of water use in controlled irrigation areas limiting amounts applied.

13. Control of water supply by developing artificial rain (cloud-seeding).

14. Continued inventory of land so that up-to-date data is always available on which to base alternative land use choices.

15. Development of criteria to match land use to various agricultural needs.

16. Intensify efforts to find ways of opening up land with heavy machinery which is overgrown with cogongrass (Imperata cylindrica) under brush and in some cases primary forest.

17. Study of the preparation of land for agricultural use with heavy machinery, with special attention to misuse.

18. A program of fixed basic prices for rice, sweet corn, cassava, sorghum soya beans. Criteria to be used:

a. Basic price should be higher than market price.

b. Basic price should be calculated on the basis of B/C minimum 2.0 (as in rice).

c. Basic prices should be at least equal to the average cost of production.

d. Fixing of the basic price should also take account of 'terms of trade' between commodities associated with basic materials needed by farmers.

19. The program of fixed maximum prices should stimulate consumption of sweet corn, cassava and sorghum. It should be arranged so that the maximum price of rice is relatively quite high while that of sweetcorn, cassava, sorghum and so a beans is relatively low.

20. The conservation of agriculture production by use of postharvest technology with first priority to fisheries and cereals, and secondly priority to other kinds of agricultural products.

21. Increased use of food processing technology.

22. Introduction of new adaptive technology which is simple and inexpensive.

23. Intensifying food production to fulfill the following conditions; high nutritional value; liked by the public; easily made, easily stored and handled and not easily contaminated.

24. Increased use of fermentation technology.

25. Concentration on a changed system of technology.

Institutes

1. An institute is necessary which is capable of developing nutritional education and of reaching and improving, as a primary target, the nutritional level of the lower income groups.

2. An institute is required to become the centre of encouraging and directing government potential and public organizations as entrepreneurial agents at the village level .

3. An institute is required to act as a training centre for officials, leaders and planning cadre at the provincial level, Kabupaten and Kecamatan in order to guarantee sufficient rewards and motivation to all personnel.

4. An institute is necessary which will utilize the results of nutritional surveillance and monitoring through up-grading education in the field of nutrition.

5. Several institutes are now working together in research groups and determining and implementing policy. The cooperation between the three groups of institutes is extremely good. However, there is a need to increase awareness that research findings should be supported by activities which ensure that the data can be adapted in other places.

6. A policy and problem-solving unit, to be under the guidance of interdepartmental Working Group on Food, headed by the Minister of Agriculture and the Junior Minister of Cooperatives/Director of BULOG, should be established.

7. Buying of paddy when the price is below the basic price should be carried out by BUUD/NUD with credit from the Government.

8. BULOG is to be responsible for carrying out the maximum price policy in the framework of price stabilization and solving emergency situations in food and nutrition.

9. It is necessary to create an institute which will be responsible for such problems. Activities of the institute will include:

- diversification of the public's diet including monitoring and evaluation.
- a postharvest system to solve problems of the conservation and use of agricultural food production.
- a continuous adaptation of technology
- food enrichment activities
- finding a solution to critical food problems.

Expert Manpower

1. Graduates consisting of:
   - Nutrition experts
   - Organizational experts
   - Experts in program management based on local entrepreneurship.
2. Other types of experts required:
   - Meteorologist
   - Agro-Climatologist
   - Water-use and water technology experts
   - Water Quality control experts
   - Experts in water, land and plants
   - Water management experts
   - Water-ways management experts
   - Land classification experts
   - Survey and mapping experts

- Land physics experts
- Land chemistry experts
- Biologist
- Land conservation experts
- Land fertility experts
- Land management experts
- Information experts
- Appraisal/land experts
- Planning experts
- Agricultural technologist
- Food technologist
- Food storage experts, etc.

PROJECT
CATALOGUE return to 1656
ABSTRACT
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