



## Pathways out of Poverty through Cassava, Maize and Soybean in Thailand

*Nareerat Roonnaphai\**

### Introduction

**A**gricultural diversification has a number of positive effects, among others, food security, risk mitigation, labour absorption and the conservation of biodiversity. Thailand has the potential for sustainable farm diversification development as most farm producers are diligent and have accumulated substantial farm experience. Conversely, the constraints are numerous too, for example, landlessness and the small size of landholdings. Awareness of the driving forces and constraints to agricultural diversification is crucial to formulate policy options that realize the coexistence of sustainable agricultural development and poverty reduction in rural areas.

This article presents the salient points of the results of AGRIDIV country studies in Thailand, which were conducted as part of a three-year research project, "Identification of Pulling Factors for Enhancing the Sustainable Development of Diverse Agriculture in Selected Asian Countries (AGRIDIV)" from April 2003 to March 2006. The study was co-ordinated by UNESCAP-CAPSA and funded by the Government of Japan. The complete study results were published as CAPSA Working Paper No.90 "Enhancing Sustainable Development of Diverse Agriculture in Thailand", and No. 93 "Pathways out of poverty through cassava, maize and soybean in Thailand".

The studies consist of Phases I and II. The major objective of the Phase I study was to review and analyse past trends in the production, marketing, consumption, processing and related policies of major secondary crops, of which maize, cassava and soybean were selected. Phase II covers the case study survey and interviews with farmers growing the three selected secondary crops in major producing areas. Policy recommendations for the development of sustainable, diversified agriculture towards poverty alleviation were provided as overall outputs of the studies.

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## Historical and current status of secondary crops

During the past ten years, the planted area and production of maize and cassava in Thailand have faced decline due to competition from other crops generating higher returns. The planted area and production of soybean has also declined as prevailing prices have not stimulated production. The utilization of maize is primarily domestic with a small amount for export. Locally used cassava products represent 20 per cent of production with the rest exported. Soybean production often falls short of demand and large quantities are imported for crushing.

Maize, cassava and soybean are not staples in Thailand, they are food supplements and ingredients. They are also used in the non-food industry. Locally produced soybean is usually not large-scale but is popular used for food supplements and as food ingredients. With regard to maize, 90 per cent of maize production is used as feed, very little is processed. Furthermore, most cassava production is not readily available for direct consumption. Many industries absorb the cassava supply to produce chips, pellets, native starch and modified starch. Between 1996 and 2003, the demand for chips grew at an annual rate of 77 per cent, whereas pelleting faced a downward trend of 21.2 per cent. Flour production rose by 3.1 per cent and the flour linkage industry grew by 6.3 per cent.

## Impact of global trade orientation on secondary crops

Liberalizing trade according to WTO commitments for 1995-2003 saw more exports and less imports of maize in terms of the increase in domestic production. Therefore, tariff reduction can be said NOT to stimulate more imports. Regarding soybean and soy meal, after opening up the markets, there have been more imports than permitted within the WTO commitments because of booming livestock production. With respect to cassava, China has reduced the tariffs imposed on cassava chips and other cassava products, therefore, more such exports are happening together with more exports of starch and flour to Japan, Hong Kong and the United States of America. However, exports of cassava chips to the

European Union have declined due to higher subsidies on cereal production, which are cassava substitutes.

With regard to the impact post AFTA (ASEAN Free Trade Area), since 2000 Thailand has had to reduce import taxes imposed on farm commodities put on Fast Track totalling 7,737 items to 0-5 per cent together with tariff reductions on 37 import items to 0-5 per cent by 2003. Maize exports to ASEAN continue to rise but with little in the way of imports. Imports of soybean and its by-products are negligible, while cassava flour accounts for 17.94 per cent.

With China (the impact of FTA agreement with China), taxes on vegetables, fruits and cassava were agreed to be scrapped as of late 2003. In the period of October 2003-April 2004, exports of cassava slices rose to 1.27 million tons from 1.05 million tons.

## Case studies on secondary crop farmers

Case study surveys and interviews with secondary crop farmers were conducted in three areas, which represent the production centres of the respective target crops.

### Cassava farmers in Nakhonratchasima

Cassava is cultivated under rainfed conditions and takes 10-12 months to harvest. As a result, very few farmers spare farmland for other crops. The farmers under survey realize a cassava yield per hectare of 21,575 kilograms, which is greater than the national average of 20,275 kilograms. Farmers are aware of the need to improve the soils and most of them acknowledge the need to use improved varieties. As prices of farm goods have been favourable in the last few years due to the continuous growth of demand, farmers growing cassava can usually generate profit. However, the peak harvests are always concentrated, thus prices depress and freight becomes expensive for the farmers. Cassava monoculture has potential through the use of improved varieties suitable to the agro-climatic conditions but faces the additional expense of chemical fertilizers and labour shortages. On the other hand, farm diversification has proved to have the potential to raise income and mitigate risks through a wider crop choice, though farmers are constrained by insufficient investment capital. Some groups of

## *Message from the Director*

### **Decentralization: the Challenge for Local Development and the Role of Agriculture**

A recent report by the World Bank describes the process of decentralization in a number of Asian countries including Indonesia as an implosion. The author referred to a very sudden process of transfer of power to local administrative areas; districts.

The theory behind this huge and far-reaching change holds that by bringing local decision-making closer to beneficiaries and stakeholders in the web of government, more transparency and efficiency is achieved.

There are, however, so many different aspects to consider such as taxation, local law as well as the registration of people, land and objects, budgets, finance and resource allocations that one must be reluctant to accept a stylized outcome, which is by necessity positive.

The onus for development is now, by and large, on district staff. Their task has many dimensions and requires know-how, resource allocation and thoughtful planning. Although it maybe too early to draw a definite conclusion, there are many signs that the institutional change by itself requires substantial investment and time to become effective.

In virtually all districts of countries in the process of decentralization, agriculture is the main source of livelihood for people in rural areas. It is well known that in Asia poverty is largely centred in rural areas. Virtually all countries have embraced the Millennium Development Goals, of which the first aims to reduce poverty and hunger.

It follows that one of the main outcomes of the current process is that districts need to plan and invest in agriculture to reduce poverty. It is also well known that agricultural development requires long-term and stable investment in technology as well as the dissemination and adoption of technology.

In order to enable districts to achieve the MDGs, new modalities of collaboration and partnership have to be found and developed.

I would like to draw the attention of policymakers to this area because development and the alleviation of poverty take places on the ground. There is an ever growing need to assist and enable local stakeholders to achieve development goals and the role of national level programmes as well as institutes is of paramount importance.

*Taco Bottema*

farmers generate value-added through the production of clean chips and, therefore, receive a 20 per cent higher price. Aside from processing cassava into chips, flour, pellets and ethanol, simple farm processing activities performed by the farmwife groups involving different uses of cassava flour have the potential to expand the business further. They are located close to the supply sources and the activities have the potential to produce food with the use of natural colours to satisfy rising demand. Unfortunately, there are a lack of production techniques and no development funding.

### **Soybean farmers in Sukhothai**

In any given year, soybean can be grown three times: the early rainy season crop, late rainy season crop and the dry season crop with irrigation. Most farmers hold many farm plots and they combine paddy, mung bean, morning glory and chilli with soybean in their cropping pattern. Net family cash income from soybean and other crops grown in the irrigated zone is higher than multiple cropping in rainfed areas and also higher than farmers who practice soybean mono-cropping in both irrigated and rainfed areas. Soybean enriches the soil and therefore, there is no need to

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**Policy recommendations**

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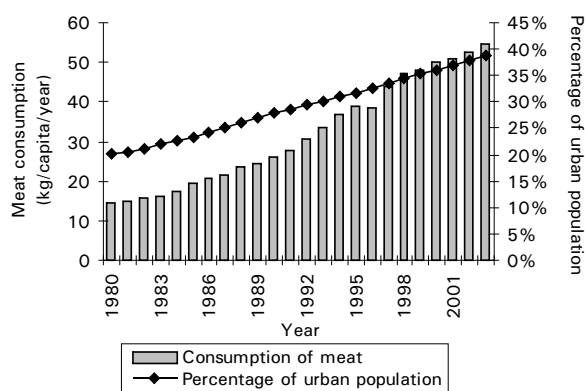
## Changing Consumption Patterns Requires an Appropriate Response from Secondary Crops

Koenraad Bosman\*

### Introduction

The population of the world is growing and so is the population of the Asia and Pacific region. More people in the world means more people demanding food. In addition, the population is not only growing, but also changing in composition. The number of people in Asia and the Pacific living in cities is increasing faster than of those living in rural areas. This urbanization coupled with a higher standard of living alters food consumption patterns, leading to higher demand for animal derived food products, like meat and eggs, and manufactured food. Figure 1 shows that a higher share of urban population goes hand in hand with higher per capita meat consumption.

**Figure 1. Evolution of meat consumption per capita and urban population as share of total population in China (1980-2003)**



Source: FAO statistics division.

To answer the burgeoning demand for animal derived products more animals are required and consequently, both the human and animal populations are growing. These animals require feeding, so there is also higher demand for animal

feed. Such changes in demand for food and feed require an appropriate response from agriculture.

This article provides an overview of these changes and the consequences for domestic supply of some secondary crops, namely coarse grains, pulses as well as roots and tuber crops. These crops can be helpful in fulfilling demand for human food and animal feed, for they have a good nutritious value, are suitable as animal feed and can be included in many cropping systems.

The article is based on an update of Monograph 45 of the then CGPRT Centre, currently UNESCAP-CAPSA: 'Domestic supply and consumption patterns of coarse grains, pulses, roots and tuber crops in Asia and the Pacific', which is still in process. In this publication, domestic supply is analysed for 26 countries in South, East and Southeast Asia and in the Pacific. The development of domestic supply is analysed through production, trade and the share of domestic supply used as animal feed for all three categories of crops and some other significant crops, in particular for the period 1980-2004.

In the subsequent three sections developments in the domestic supply of coarse grains, pulses, roots and tuber crops are presented together with changing consumption patterns and future prospects.

### Coarse grains

Within the coarse grains category, maize is the most important crop. Other significant crops in the region include barley, sorghum and millet. Notably coarse grain yields increased over the reporting period. These yield increases together with an increase in the harvested area of maize boosted maize production and prevented a drop in the production of the other coarse grains despite a shrinking harvested area. China produced almost three quarters of the regional maize output. Barley, millet and sorghum have dominant producers that produce more than 90 per cent per sub region: India in South Asia, China in East Asia, and Australia in the Pacific. Southeast Asia is only a minor producer of these crops.

Maize imports have increased tremendously, most of which is imported from the United States. Maize exports were irregular and destined to other countries in the region. The region as a whole is a net importer of coarse grains, however, it has

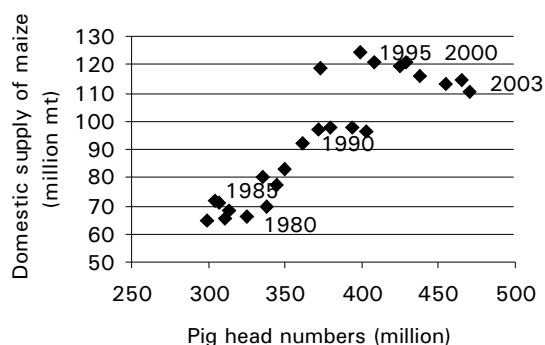
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recently become a net exporter of millet and the export deficit is declining for sorghum. Net imports represent only a small part of domestic supply, which has risen for maize and barley, declined for sorghum and is irregular for millet.

The share of domestic supply of coarse grains used as animal feed has expanded strongly. Most of the region's maize is used to feed animals, whereas a major part of other coarse grains is still used as human food. Other coarse grains are becoming more processed before they are consumed as human food, for example barley is processed into malt.

Since 1980, production and domestic supply growth of coarse grains has been higher than population growth. This is an indication that coarse grains are helpful in feeding the population, even though imports are necessary to fully satisfy domestic supply and a large part of domestic supply is used as animal feed. Indirectly, animal feed is used for human consumption through the consumption of animal derived products.

**Figure 2. Correlation between the domestic supply of maize and the number of pigs in China (1980-2003)**



Source: FAO statistics division.

As indicated in the introduction, a higher urban population generally leads to higher meat consumption. This is particularly true for China, where higher meat consumption requires a larger animal stock. Figure 2 shows that throughout the said period the number of pigs in China has increased and that it largely impacts the domestic supply of maize.

Accelerating population growth and greater consumption of animal products continue to be driving forces that lead to ongoing growing demand for coarse grains in the region, in particular

for maize. Production can keep growing, but imports remain necessary to meet demand. The region will remain a net importer for the coming period, although net imports have decreased in the last five years.

## Pulses

Pulses are divided into two main crops, soybean and groundnut, and another category containing other pulses, of which beans (dry) and chickpea are the most important in terms of production and domestic supply. For this category, yields have increased, especially for groundnut of which yields have almost doubled. Such yield increases, coupled with increases in harvested area, have led to higher soybean and groundnut production. The production of other pulses has increased as well, but shows large yearly fluctuations for almost all crops in this category. Both a fluctuating harvested area and irregular yields underpin the irregular production.

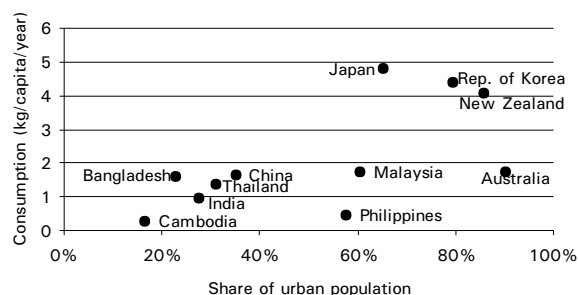
Imports of pulses have increased throughout the period. Imports of groundnut are only marginal, but imports of soybean and other pulses have experienced robust growth. The region is a net importer of soybean, whereas it is a net exporter of groundnut and other pulses. Exports of pulses have increased, but exports of soybean fell after initial buoyant growth.

Domestic supply of all pulses has increased and the growth in production of groundnut as well as other pulses was sufficient to meet domestic supply. Although soybean experienced the strongest growth in terms of production, it was insufficient to meet domestic supply so soybean had to be imported.

Pulses are mostly used for human consumption: more than three quarters of domestic supply is used as food. The share that is used for animal feed is increasing for soybean and other pulses, but by only around 5 per cent for soybean and 15 for other pulses in 2003.

The growth in production and domestic supply of soybean and groundnut has been much stronger than the growth of total and urban population in the region, but growth of other pulses could not keep pace with population growth.

**Figure 3. Correlation between the share of urban population within total population and consumption of soybean oil per capita (12 soybean consuming countries in the region; average 1995-2003)**



Source: FAO statistics division.

The increase in domestic supply of soybean is mostly used to manufacture food, which jumped from 8 million tons in 1980 to 40 million tons in 2003. Figure 3 shows that soybean oil consumption per capita is high in countries where the share of urban population is high. Such countries also have high scores on the Human Development Index. It is not necessarily true that all countries with a high urban population also experience high consumption, but in general countries with a higher level of urbanization have higher demand for manufactured foods.

Regarding the pulses group, soybean has developed as the main strategic crop in the region. Consumption per capita will continue to rise, made possible through increasing production and imports. Groundnut and other pulses' production as well as imports are expected to increase, however groundnut is mostly consumed as food whereas other pulses are increasingly used as feed.

## Roots and tuber crops

The main crops in the category of roots and tubers are cassava, potato and sweet potato. Yields for these three crops have been irregular, but, in general, increased over the period as a whole by at least one-third. Production, however, shows different trends: potato production almost

tripled due to higher yields and a larger harvested area. Sweet potato production has been irregular, but remained relatively stable on average, despite a continuous drop in harvested area. Cassava harvested area was stable, but production has increased through higher yields. Potato production in 1980 totalled 43 million tons, but reached 112 million tons in 2004, almost equal to sweet potato production, which was 113 million tons in 2004 but was even higher at 130 million tons in 1980.

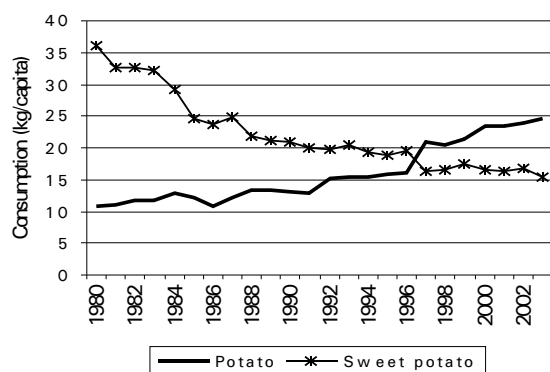
Imports of cassava and potato increased by a multiple factor throughout the period, while imports of sweet potato were very low and irregular. Cassava is the only significant export crop in the region, primarily because Thailand exports large quantities. Exports of potato and sweet potato are low and irregular. The region is a net exporter of cassava, a net importer of potato and has shifted from net exporter to net importer of sweet potato.

As production is more or less sufficient in terms of domestic supply, trade is less important for potato and sweet potato. Domestic supply is irregular and slightly decreasing for sweet potato but increasing for potato. Domestic cassava supply is increasing as well, made possible through lower exports and higher imports as well as production.

The share of domestic cassava and potato supply used as animal feed varies between 10 and 20 per cent. The share of sweet potato used as animal feed has increased from 25 to 50 per cent at the cost of the share used for human consumption. However, the majority of the domestic supply of roots and tubers is still used for human consumption.

Growth in potato production and, therefore, domestic supply was above population growth over the period. The growth of sweet potato and cassava were lower, but since 2001 growth in the domestic supply of cassava has been higher than population growth. This implies a higher consumption per capita of potato and falling consumption of sweet potato (Figure 4). Consumption of cassava was more or less stable over the period.

Figure 4. Changing consumption patterns of potato and sweet potato (food and manufactured food; 1980-2003)



Source: FAO statistics division.

The change in potato consumption is a good example of a changing consumption pattern related to urbanization. Urbanization and higher living standards demand more diversified diets. Higher incomes allow people to buy more expensive potatoes and French fries more often and use potato as an alternate source of food than the main staple. Sweet potato, on the other hand, is considered a poor man's food and its consumption per capita decreases over time. In many countries in the Asia and Pacific region, however, sweet potato has not yet been substituted by potato on a large scale.

The region has been a net exporter of roots and tuber crops for the last 25 years, but the export surplus has dropped from around 20 million tons to almost zero. Because of increasing domestic supply and more imports, the region is expected to become a net importer in the near future. Consequently, domestic supply of cassava will be used more for animal feed and potato for human food.

## Conclusion

This article has outlined the changes in demand of different secondary crops as a consequence of demographic changes. The section on coarse grains showed that higher living standards lead to a higher demand for animal products, which subsequently leads to higher demand for animal feed. The section on pulses showed that higher living standards also lead to

higher demand for manufactured food, which requires more inputs for processing. The section on roots and tuber crops illustrated that higher living standards raise the demand for more diversified diets, of which secondary crops can meet. These changing consumption patterns affect the production and trade of secondary crops. As the population in Asia and the Pacific is expected to keep growing over the next decade; the share of urban population to keep rising; and strong economic growth to raise living standards, higher demand for animal feed and inputs for manufactured food as well as more diversified diets will be prevalent in the next decade. It is a challenge for secondary crops to contribute to feeding a growing population with changing food consumption patterns. ■

(References available upon request)

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## CAPSA News and Activities

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### Seminar on “Secondary Crop Based Agribusiness Development in Indonesia: Its Role in Poverty Alleviation and Food Security Improvement”

The seminar was a national seminar organized by UNESCAP-CAPSA in collaboration with the Indonesian Centre for Food Crops Research and Development (ICFORD) on 13<sup>th</sup> July 2006 at the ICFORD meeting room, Bogor, Indonesia. The objectives were: (i) to accommodate the thoughts and views of the farmers, researchers and related stakeholders in solving the constraints and problems of secondary crop development; (ii) to organize and facilitate dialogue among all parties involved in secondary crops; and (iii) to formulate strategic policy options of secondary crop agribusiness development for poverty alleviation and the food security improvement of rural households.

It was attended by ninety participants consisting of policymakers from the related directorate generals, research and development centres within the Ministries of Agriculture, Industry and Trade; Universities; representatives

of secondary crop agri-businesses; related professional associations; and resource persons composed of senior scientists, producers and farmers involved in secondary crop agri-business development.

The main issues discussed at the seminar included: (i) related policies on technology generation and dissemination, as well as on strengthening food security through secondary crop development; (ii) policies and programmes for secondary crop agro-industries and marketing, and the partnership programme for secondary crop agro-industries; (iii) the achievement of secondary crop development and trade through regional agribusiness development; and (iv) the roadmap for secondary crop development and marketing towards poverty alleviation.

The seminar was officially opened by Dr. Achmad Suryana, Director General of the Indonesian Agency for Agricultural Research and Development (IAARD), Ministry of Agriculture.

Some conclusions and recommendations taken from the seminar include: (i) secondary crop based agribusiness development should take place at the regional level (provincial and regency levels); (ii) the respective regions should be facilitated with the generation and implementation of location-specific technology as well as institutional models of agribusiness development; (iii) the regional authority and related agribusiness stakeholders should be given wider opportunities and support in implementing regional secondary crop agro-industries; (iv) the necessary facilities and supports of the government, in terms of agribusiness development policies related to input price, on farm production, processing and product development, marketing and trade, should be formulated and implemented to improve regional secondary crop agribusinesses; and (v) secondary crops should not be considered "secondary" in terms of development priority. The proceedings of seminar are currently being arranged.

### **A Research Project: Food Security and Community Development in the Decentralization Perspective (SECOD)**

A new research project: "Ketahanan Pangan dan Pembangunan Masyarakat dalam Kerangka Desentralisasi" [Food Security and Community

Development from a Decentralization Perspective (SECOD)] is a one-year project which began in July 2006. The project is a collaborative study between UNESCAP-CAPSA and the Ministry of Agriculture of Indonesia. It is co-ordinated by the Bureau of Planning, Ministry of Agriculture, and has technical substantive support from UNESCAP-CAPSA and the Indonesian Center for Agricultural Socio-Economic and Policy Studies (ICASEPS). The project is led by Dr. I Wayan Rusatra, Research and Development Programme Leader of UNESCAP-CAPSA assisted by a research team (senior researchers of ICASEPS).

The objectives of the project are: (i) to describe the trends and status of food security at the household and regional levels; (ii) to analyse the programmes for food security and poverty alleviation at the household and regional levels; and (iii) to formulate policy options to stabilize food security and alleviate poverty through rural community development. The research is conducted in the villages, sub-districts and districts of three selected provinces in Indonesia, namely East Java, West Nusa Tenggara and West Kalimantan provinces.

The outputs of the project are reports on status and indicators of food security, food insecurity and poverty at the regional and household levels in the decentralization era as well as the achievement of regional programmes for food security and poverty alleviation in the decentralization era; and the formulation of policy options to stabilize food security and alleviate poverty through empowering the rural community/farmers in the decentralization era.

The planning meeting was organized for 10<sup>th</sup> August 2006 at the ICASEPS office in Bogor, Indonesia. The aims were: (i) to discuss detailed research guidelines (scope, concepts and method of study as well as the project schedule); (ii) to seek the general perception on the field implementation of this study; and (iii) to discuss the outline of project reports. It was attended by the project leader and research team. The project is currently in the field study phase, being conducted by the project teams. ■



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## New Publications

### Pathways out of Poverty through Cassava, Maize and Soybean in Thailand

Nareerat Roonnaphai  
CAPSA Working Paper No. 93. 2006. 133 pp.  
ISBN 979-9317-58-4

### Pathways out of Poverty through Maize and Job's Tear in Lao People's Democratic Republic

Linkham Douangsavanh and Bounthong Bouahom  
CAPSA Working Paper No. 92. 2006. 100 pp.  
ISBN 979-9317-57-6

### **CAPSA**

The Centre for Alleviation of Poverty through Secondary Crops' Development in Asia and the Pacific (CAPSA) is a subsidiary body of UNESCAP. It was established as the Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific (CGPRT Centre) in 1981 and was renamed CAPSA in 2004.

### **Objective**

CAPSA promotes a more supportive policy environment in member countries to enhance the living conditions of rural poor populations in disadvantaged areas, particularly those who rely on secondary crop agriculture for their livelihood, and to promote research and development related to agriculture to alleviate poverty in the Asian and Pacific region.

### **Functions**

1. Co-ordination of socio-economic and policy research on secondary crops.
2. Networking and partnership with other international organizations and key stakeholders.
3. Research and analysis of trends and opportunities with regard to improving the economic status of rural populations.
4. Production, packaging and dissemination of information and successful practices on poverty reduction.
5. Dissemination of information and good practices on poverty reduction measures.
6. Training of national personnel, particularly national scientists and policy analysts.
7. Advisory services.

### **Palawija News**

Contributors are invited to submit summaries that cover recent socio-economic or policy aspects related to research or development of secondary crops and rural poverty alleviation in Asia and the Pacific. Submitted summaries should be sent by e-mail to [library@uncapsa.org](mailto:library@uncapsa.org) or by regular mail. Articles must be in English.

Submitted summaries should not exceed eight pages, including graphs, tables, references and author information.

*Palawija News* is distributed free of charge to interested individuals and institutions. Please send address corrections and additions to: Publications Section, UNESCAP-CAPSA, Jl. Merdeka 145, Bogor 16111, Indonesia.

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