



Secondary Crops Based Agribusiness Development: Its Role in Poverty Alleviation and Food Security Improvement*

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Introduction

In July 2006, CAPSA, in collaboration with the Indonesian Centre for Food Crops Research and Development (ICFORD), held a national seminar on "Secondary Crops Based Agribusiness Development in Indonesia". The objectives of the seminar were to bring together farmers, researchers and related stakeholders to discuss the constraints and problems of secondary crop development and to formulate strategic policy options to develop secondary crop agribusiness for poverty alleviation and food security.

The seminar was attended by ninety participants consisting of policymakers from the related directorate generals, research and development centres of the Ministries of Agriculture, Industry and Trade; universities; representatives of secondary crop agribusinesses; related professional associations; and resource persons such as senior scientists, producers and farmers involved in secondary crop agribusiness development.

Topics discussed during the seminar include food security research, agro-industry policy, trade and poverty alleviation. Through presentation and discussion the participants defined important challenges and key policy recommendations for secondary crop agribusiness development.

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

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* A brief conclusion of a national seminar "Secondary Crops Based Agribusiness Development: Its Role in Poverty Alleviation and Food Security Improvement", organized in Bogor, Indonesia, on 13 July 2006.

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Role of secondary crops in food security and agro-industries

In his opening speech, Dr. Suryana highlighted some important issues related to the role of secondary crops in food security and agro-industry, including: (i) the rise of demand for secondary crops in food and industrial use; (ii) secondary crops' ability to fulfil our nutritional requirements; (iii) secondary crops requirements as an input to processed food, in line with the increase of nutrition awareness and income; (iv) the strengthening of household food security through crop diversification; (v) the role of secondary crops in maintaining diverse and environmentally friendly farming systems; (vi) the role of secondary crops in poverty alleviation, especially for farmers with limited and/or marginal land.

Apart from Dr. Suryana's comments, the role of secondary crops in the national economy was also considered. The participants concluded that secondary crops play an important role in the national economy through stabilizing household food security, improving nutrition, absorbing farm labour and generating farm household income. In addition, secondary crops play an important role as a source of raw material for the food and animal feed industry, and as a general stimulus to rural economic growth.

Impediments to secondary crop development

The efforts to increase the role of secondary crops in alleviating poverty and stimulating local economic growth still face various constraints, most importantly the fact that these crops receive a low price, when compared with other crops. Indonesia's competitive advantage in these crops has eroded partly as a result of the heavily subsidized secondary crops by exporting countries. As an illustration, the Producer Support Estimate (PSE) for aggregate agricultural commodities in Organization for Economic Co-operation and Development (OECD) countries for 2000 is around 34 per cent. For corn the value of Producer Nominal Protein Coefficient, Producer Nominal Assistance Coefficient, and PSE are 1.15, 1.51, and 34 per cent, respectively (OECD, 2001, www.OECD.org). Other impediments are poor

market access for producers of secondary crops, and the conversion of 40,000 hectares of irrigated land to urban areas and industrial uses per year has made it difficult to expand the area under secondary crop cultivation.

Secondary crop research and development

Pro-farmer policies and strategies are needed, encouraging the development of secondary crop technology to increase the productivity, and quality of secondary crops while ensuring the economic and ecological sustainability of secondary crop systems. There are already many technological innovations relating to secondary crops available, such as high quality varieties, both hybrid and composite, suitable for marginal land and food; management techniques; and product and post-harvest handling methods and machinery to increase on-farm added-value. A conducive economic environment is still needed to foster extensive adoption and implementation of technology to increase secondary crop production and farmer income.

The goals of research and development on secondary crops as a source of food and a source of income for farm households are as follows: (i) to utilize genetic resources; (ii) to increase access to advanced technology in breeding and integrated crop management; (iii) to develop a model of secondary crop agribusiness development and supporting policies; (iv) to establish a research network among institutes, entrepreneurs, farmers and agribusiness actors; (v) to comprehensively disseminate and utilize secondary crops-related technology; and (vi) to improve public service and professionalism.

Secondary crop-related research and development should aim towards competitiveness in cost and quality, accuracy and timeliness, reinforcing policy and research networks, and research investment priorities. Towards this end, research and development should have the following elements:

- *Planning aspect:* R&D should be oriented to consumer preferences as well as developing new consumer demand;
- *Operational aspect:* the optimal empowerment of human resources;

Message from the Director

Isolated Rural Areas in Asia: Ideas About Ways Forward

There is more to agriculture and local livelihoods than crops such as rice, wheat or maize. While absolutely essential for food security, value added is more likely to come from a much wider range of crops.

The Future Harvest System (CGIAR) covers the main crops globally and the national research system usually covers many more crops. It is a fact, though, that there is limited investment in crops of smaller importance, which leads Walter Falcon to speak of orphan crops. One hopeful exception is The Global Facilitation Unit for Underutilized Species which acts as a 'parent' to these crops. Nationally one can observe a growing number of small foundations and working groups promoting the use of exotic and indigenous species, although one can not speak yet of strong and recognized nodes of knowledge. The trend in the bigger and more developed countries in Asia is definitely positive, but the challenges in these countries are also tremendous: the majority of population lives in rural areas, with 70 per cent of the national poor, while over a half of the rural population can be said to live in isolated conditions, say more than a one day travel to and from the nearest major market place. Although there is already talk about e-farmers, the spatial divide is still the key isolating factor, not the digital divide. Agricultural produce has to travel before it is worth money.

If we look more closely at the isolated rural areas in Asia, we can make a number of observations. Most isolated areas do not have strong and resourceful local governments; services are generally weak, if available at all. Education is usually limited and quality education is relatively far more expensive for isolated people than for peri-urban people; farm inputs are also relatively expensive if obtainable at all. There are in many places also issues such as land rights and rights of indigenous people. Yet the creativity which humankind living in

difficult conditions virtually always shows is worth examining.

In Asia most isolated areas are in fact mountainous or hilly. In the tropics, the temperature in mountain areas is cooler than in the plains, and this means that mountain areas with arable land are islands with a Mediterranean or temperate nature, facilitating the production of temperate crops such as potatoes, onions, cabbages, tomatoes and even strawberries and flowers. In areas of countries such as in Sri Lanka and Indonesia that were formerly exclusively tea plantations, tea now competes for land with horticulture crops. In the highlands around Kunming in China, a sizeable arable land area close to a strong urban centre, a huge flower and horticulture industry has sprung up, in conjunction with livestock. At a smaller scale in the fertile areas of volcano mountains in Indonesia and the Philippines, potatoes, cabbages and onions are a growth industry, again in combination with livestock which provides dung for soil improvement. The same is true in Da Lat in Viet Nam, the northern mountain districts in Thailand and Myanmar where potatoes and other temperate vegetables have become a major source of local growth. In India with its southern Himalaya belt, distances to major market are considerable; the process of local development based on temperate crops is still in early stages, although already strong in some places. It would be very worthwhile to systematically research what it takes to bring about local prosperity. The scarce research that does exist confirms that local prosperity starts with roads. Today it may be the internet, but let us not be mistaken by e-hype, roads are needed first, inputs and education second. The issue is that it takes about 15 years for the synergistic combination of horticulture and livestock to replace less rewarding crops; then the challenge is to consolidate progress. The pattern of development is always based on a diverse package of crops, some of which may be out of reach for the rural poor initially, but which later are in reach of farmers' capabilities. There is a pattern to be identified for development here.

Taco Bottema

- *Service and dissemination aspect:* the improvement of service quantity and quality, acceleration of dissemination, and expansion of research co-operation;
- *Commercial and promotion aspect:* the improvement of business sense among researchers and work units in anticipating the needs of agribusiness actors for research innovations;
- *Monitoring and controlling aspect:* the measurement of working unit performance, especially intensity and quality, in handling secondary crops research and development.

Secondary crops and food security

Programmes for national and household food security should be directed towards strengthening domestic production so that the amount and diversity of available food is sufficient to fulfil the needs of the population, as well as being safe and affordable.

However, efforts to develop secondary crop agribusiness and food security face many difficulties such as the excessive exploitation of agricultural resources and the continuity of raw material supply for industry. The policy related problems faced by an agribusiness sympathetic to the needs of the poor are uneven agricultural development, globalization of trade and investment, and problems with synchronizing agro-food industry development programmes at the central and regional levels with political decentralization.

Three strategies for food security improvement were identified. Firstly, to develop the agriculture and rural-based economy in order to generate employment and income. Secondly, to provide direct transfers to the poor and food-insecure. Thirdly, protection and promotion strategies are suggested to relieve farmers from the pressures of economic globalization and to increase the efficiency and competitiveness of domestic food production.

Strategies to develop secondary crop agribusiness include (i) improving productivity and extending the area under cultivation; (ii) improving product quality; (iii) strengthening farmer institutions, and jointly developing business ventures with farmers; (iv) improving secondary crop added-value and market access; (v) identifying

regional commodity specialization on the basis of availability, added-value, and income; and (vi) developing infrastructure, appropriate trade regulations and commercial incentives.

Agro-industry development policy

Industry experience shows that there are good prospects for industry development based on processing secondary crops. Food processing industries, including those based on secondary crops, have developed rapidly with increases in income. In turn, the industrial demand for secondary crop commodities has increased, creating opportunities for further domestic production to fulfil this demand.

Experience also shows that, through partnerships between large-scale industries and small farmers, production of supply of secondary crop commodities for industrial use is profitable. Production shortages in such partnerships are largely due to the inability of farmers to meet industry demands, rather than capacity shortages in industry. Fiscal incentives are needed to encourage participation by industry in such partnerships, as well as supportive policies from local and central government.

Constraints to secondary crop agribusiness development

Secondary crop agribusiness development faces constraints that are both internal and external in origin. The internal factors include: (i) farmer dependence on market inputs, the prices of which are determined in a monopsonistic markets; (ii) low output prices as farmers are price takers in their output markets, meaning there is little motivation to increase production; (iii) environmental degradation as a result of over-intensive cultivation, resulting in a decline in production potential and an increase in production cost; and (iv) the decrease of comparative and competitive advantages of domestic agricultural production. External factors include government policies which inadequately support farmer interests; global economic, environmental and political pressures; and the poor image of agriculture as a vocation, meaning that well-educated young people do not choose to become farmers.

Case study: maize agribusiness development

Despite the obstacles mentioned above, there are regional success stories in developing secondary crops and related industry. For instance, in Gorontalo province, Sulawesi, Indonesia, the growth of maize agribusiness has raised the prosperity of local farmers. This case is seen as an example of the positive influence that local government can have on improving secondary crop agribusiness and farmers' welfare through making transparent policy, facilitating infrastructure development, developing farmer institutions and ensuring price stability. Much of the success can be attributed to the strong commitment from regional leaders. A vital key of the local administration agenda is an intensive development programme oriented towards farmers' welfare. Another important factor was the actions of the local authority to harmonize various resources such as human resources development, funding, business actors and industries.

The Gorontalo administration developed 'maize-based agropolitan model' by developing physical and institutional infrastructure that is economically and environmentally sound. It identified 'nine pillars for modern agricultural development' that included improvements in irrigation, road and agricultural mechanization; stability of input factor supply; integrated pest management (IPM); accessibility of capital for farmers; improvement of marketing and trade; establishment of agropolitan pilot project; enhancement of the role of the maize research centre; human resource development; and co-ordination of the regional agenda. Partnership development was also included in the model, supported by output marketing and a dynamic floor price maintained by regional enterprise (*Badan Usaha Milik Daerah/BUMD*).

Farmers' experience and poverty alleviation

Problems faced by farmers in improving their production and income are: (i) limited infrastructure development in dry-land areas and technical problems such as the availability and accessibility of seed and organic fertilizer; (ii) limited access to

credit due to the lack of collateral and high interest rates; (iii) price fluctuation which creates difficulties for increasing production and farmers' income; and (iv) limited capabilities in post-harvest handling, product processing and marketing.

Effective strategies to solve poverty alleviation problems consist of two categories of policy reorientations. The first category relates to productivity improvement such as optimal natural resource exploitation to increase production, and increasing productivity through encouraging farmers to benefit from the full commercial value of secondary crops. The second category relates to agribusiness and product development and consists of increasing the value-added by integrating the processing and marketing activities, and developing participatory, village-level agribusiness institutions.

To achieve the first strategy, it is important for farmers to choose commodities based on the relative risk of the commodity in terms of harvest failure and farm management. Ranking commodities from low to high risk we have: sorghum - mung bean (green gram) - cowpeas - maize - groundnut - sweet potato - cassava - soybean. In addition, farmers can plant other commodities that have low risk of harvest failure and have a good selling price: mung bean - cowpeas - maize - groundnut. Otherwise, growing soybean - maize - sweet potato - groundnut, in the fertile (productive) land that has good irrigation system.

The practical methods under the second strategy, improving farmers' income is to link a secondary crop with a processing phase and a specific market, for instance: (i) Maize - feed processing - layer/broiler industry; (ii) Soybean production - tofu and *tempe* (soybean cake) processing - local consumers; (iii) Sweet potato - flour processing - local cake industry; (iv) Mung bean - food industry (bean sprout) - local consumers; (v) Cassava - flour processing - cake home industry - local consumers; (vi) Peanut - roasting - local consumption; and (vii) Sweet corn - boiling and baking - local consumers.

Some suggestions to increase marketing links with the aim of improving farmer welfare and reducing poverty include: (a) improvement of farmers' ability to efficiently access and use market information; (b) diversifying regional farming systems to ensure the magnitude, sustainability

and stability of farmer income; (c) repairing the structure and efficiency of markets to stabilize secondary crop commodity prices and protect against increases in marketing costs; (d) strengthening farmer institutions and establishing effective partnerships so that farmers can access and benefit from market growth.

Conclusions

The conclusions from the seminar are as follows: (i) secondary crop based agribusiness development should take place at the regional level (provincial and regency levels); (ii) the respective regions should be tasked with the generation and implementation of location-specific technology as well as institutional models of agribusiness development; (iii) regional authorities and related agribusiness stakeholders should be given greater scope to pursue the development of secondary crop agro-industries; (iv) government policies related to input price, on farm production, processing and product development, marketing and trade, should be formulated and implemented to improve the regional secondary crop agribusinesses; and (v) secondary crops should not be considered 'secondary' in development priority. ■

Potentials and Constraints of Combined Secondary and Tree Crops Systems in Bangladesh

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Introduction

Combining trees, crops and vegetables is not a new concept in Bangladesh. It has been embedded in traditional forest plantation activities since the adoption of *taungya*. *Taungya* was first introduced in Myanmar where farmers were given parcels of degraded forest reserves to produce food crops and to help establish and maintain timber trees. This system was later adopted in Bangladesh at Kaptai in the early 1870's (Alim, 1993). It includes the planting of shrubs,

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vegetables and other secondary crops i.e., ginger, turmeric, eggplant, lemon, papaya and banana along with different tree species. In the northern regions of Bangladesh, agroforestry serves as an insurance against crop failure and adds extra economic benefits. *Zhoom* cultivation is a traditional practice in the Chittagong Hill Tracts. Growing betel vines on trees and the cultivation of pineapple under jackfruit orchards is practiced in tribal areas in Madhupur, Maulvibazar and other regions of the country. But, in spite of its real potential, agroforestry remains at a low level overall.

The purpose of this article is to discuss some potentials and constraints of combined secondary and tree crops systems in Bangladesh. It is based on results from studies respectively conducted in three different parts of Bangladesh i.e., the Uplands of Khagrachhari district (eastern region), the Rajshahi district (northern region) and the Barind Tracts of Chapai Nawabganj district (north western region). After a brief presentation of the methodology, the paper focuses on a financial analysis of these combined systems showing their comparative profitability and then on their contribution to livelihoods. Constraints to the expansion of these systems in Bangladesh are discussed and policy recommendations are presented.

Methodology

In the three study areas, Participatory Rural Appraisal (PRA), structured and semistructured interviews, and focus groups were used to collect primary information from grassroots stakeholders. Additional data was gathered by way of interviews with key informants (GO, NGO and firms) and market prospecting.

In the stage of data analysis, qualitative and quantitative methods were used. Comparative financial and economic analysis is supported by various indicators such as net product value (NPV), internal rate of return (IRR), benefit/cost (B/C) ratio and payback period. The contribution of the systems to livelihoods is based on socio-economic indicators such as income and the role played in securing access to food, providing opportunities for diversification and combating poverty at the farm level.

Several assumptions were made for the financial and economic analysis as indicated below.

Land. As the real estate market is underdeveloped in the study areas, especially for cultivated land, the price of land is difficult to identify. However, according to MacDicken (1990), there is no need to value the land for comparison purpose because if farmers want to change existing land use to agroforestry the cost of land would be cancelled out in a 'with' and 'without' comparison. Thus, for simplicity we assumed that the value of land remains unchanged over time for both cultivation practices, and it is therefore excluded from the calculation.

Establishment costs. Establishment costs include land preparation, seedlings, planting, etc. Costs for preparation vary greatly depending on the conditions of the site. Farmers in the study areas purchased seeds and seedlings from private or state sources. Price ranges vary depending on species and quantity grown.

Yields. For calculation of yields, crops, fruits, vegetables and other non-timber forest products (NTFP) are considered. Timber value of *Acacia mangium* and *Litsea sp.* are calculated only for the specific agroforestry model practiced in the uplands of eastern Bangladesh.

Labour. Farm work is mainly carried out with household labour, though use of hired labour is also practiced. Family labour is not a cash expenditure from the farmers' perspective, so all calculations are carried out with exclusion of family labour in the production costs. The hired labour costs in the study area are Tk 70/workday, which is the standard price in this region¹.

Pesticides and fertilizers. Pesticides and fertilizer are not used in shifting cultivation but for monoculture, and are only minimally used in agroforestry. This is the common picture of the

study areas. For agroforestry projects, fertilizer is only used for secondary crops to enhance crop production when intercropped with tree species. Pesticides are used when fruit trees start to yield.

Discount rate. The analysis is carried out from the farmers' perspective, thus the discount rate applied here is not social, but individual. It can be referred to as the opportunity cost of capital for farmers, which is closely related to the financial interest rate. The discount rate is estimated at 10 per cent by deducting the inflation rate of 4 per cent from the average nominal interest rate of the loans for agricultural production (14 per cent) in the local banking system.

Time horizon for analysis. Once forest trees are included in the systems, their life span can be considered infinite. However, the productive life of the agroforestry systems is set here at 30 years and it is also taken as the time horizon for this analysis.

Financial analysis of selected models

Different combined systems are observed in the different study areas in Bangladesh. In the uplands of eastern Bangladesh, normally pineapple (*Ananas comosus*), mung bean (*Vigna radiata L.*) And black beans (*Phaseolus vulgaris*) are planted as secondary crops with *Acacia mangium*, *Litsea sp.*, jackfruit (*Artocarpus heterophyllus*) and mango (*Mangifera indica*) trees. The NPV (Tk 349,662) of this agroforestry system is positive and higher than the NPV (Tk 80,869) of shifting cultivation. The net return of this agroforestry system is always positive and higher than shifting cultivation (Table 1, Figure 1).

In the northern part of Bangladesh, ginger (*Zingiber officinale*), turmeric (*Curcuma domestica*), brinjal (*Solanum melongena*), lemon (*Citrus limonum*), papaya (*Carica papaya*) and

Table 1. Compared performance of agroforestry and traditional cultivation systems in study areas

	Uplands eastern region		Northern region		Barind Tracts north western region	
	Agroforestry	Shifting cultivation	Agroforestry	Monoculture	Agroforestry	Monoculture
NPV (at 10%) (Tk/ha)	349 662	80 869	1 620 331	311 760	559 953	204 024
IRR (at 10%)	80%	392%	208%	86%	46%	56%
B/C	26.0	10.3	7.7	3.8	3.5	2.0
Payback period	2 years	1 year	2 years	1 year	2 years	1 year

Source: Field observation.

¹ 1US dollar = 68 taka.

banana (*Musa species*) are intercropped as secondary crops with litchi (*Litchi chinensis*). This system is commonly described as a multistrata agroforestry system. This is also financially more beneficial than monoculture (Table 1, Figure 2) where NPV are Tk 1,620,331 and Tk 311,760 respectively. Another important agroforestry model is observed in the Barind Tracts areas of north western Bangladesh, where ginger (*Zingiber officinale*) and turmeric (*Curcuma domestica*) are intercropped as secondary crops with mango trees. This system is also financially profitable (Table 1, Figure 3), giving NPV Tk 559,953.89 compared to NPV Tk 204,024 of monoculture.

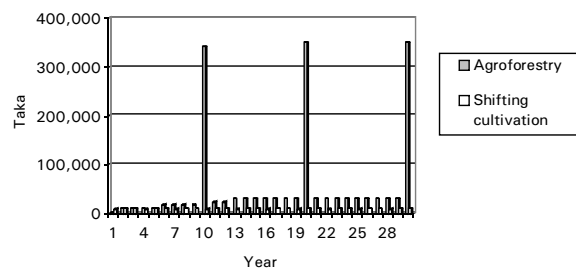
Experimental evidence supporting claims of beneficial effects of agroforestry is provided by a number of studies. Research conducted in Bangladesh (Rahman and Islam, 1997) indicates the NPV of agroforestry is positive under all three situations i.e., forest department situation, participant situation and whole agroforestry system situation. The B/C ratios stand at 1.43, 2.21 and 1.95 respectively in all situations. The IRR under the above three situations are 21 per cent, 250 per cent and 42 per cent respectively. In another study

the IRR of agroforestry in five different areas of Bangladesh i.e., Dinajpur, Sylhet, Tangail, Mymensingh and Cox's Bazar were 22.9 per cent, 39.1 per cent, 27.6 per cent, 12.7 per cent and 59.8 per cent respectively (Kibria *et al.*, 1999). At central Tamil Nadu, India, agroforestry systems also showed comparable financial results giving B/C ratio of 1.65 and IRR of 40.8 per cent (Sekar and Karunacharan, 1994). Elevitch and Wilkinson (2000) also reported the cost and benefit of agroforestry systems in Hawaii is financially viable and less risky than monoculture and forestry. As indicated in Table 1, IRR of shifting cultivation are very high since family labour is not included in the production cost and the establishment costs are very low. With very low monetary investment farmers get very high return from the existing natural capital (soil fertility, presence of diverse plants, water, etc).

Contribution to livelihoods

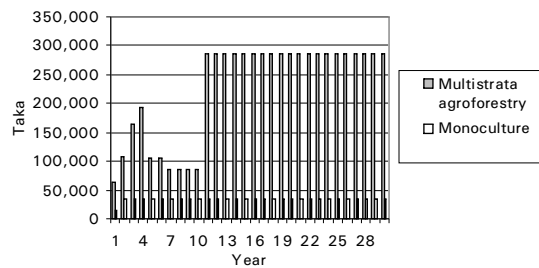
Research indicates that agroforestry directly and indirectly helps to maintain livelihoods in various ways. Data shows that the number and diversity of products increased substantially in all of the three

Figure 1. Net returns of agroforestry and shifting cultivation in the uplands of eastern Bangladesh



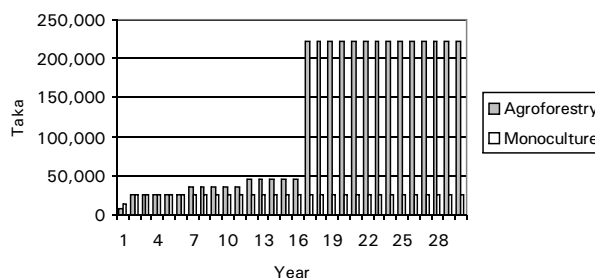
Source: Field observation and projection.

Figure 2. Net returns of multistrata agroforestry and monoculture in northern Bangladesh



Source: Field observation and projection.

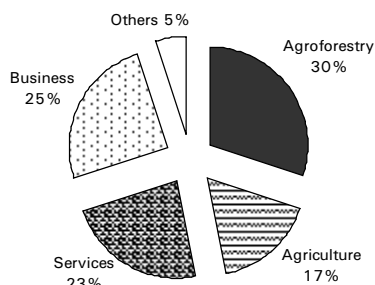
Figure 3. Net returns of agroforestry and monoculture in the Barind Tracts of north western Bangladesh



Source: Field observation and projection.

sample sites, and that these products have been used by local households to support subsistence needs and as a significant option for income generation. It is found that harvested products from these combined systems contributed to more than 30 per cent (i.e. Tk 115,704/ha) of the total household income over one year (Figure 4).

Figure 4. Percentage of yearly agroforestry income compared to other household income sources



More to the point, agroforestry can contribute in several ways to empowerment, security and opportunity for rural households, factors increasingly recognized for their importance in poverty alleviation. Devolution of forest management through agroforestry to local communities has empowered them with a greater say over the resources upon which their livelihoods depend; and women, the poor and other marginalized groups have been able to participate in decision-making processes traditionally closed to them. Agroforestry has increased people's sense of security by providing the important 'safety-net' function, which helps them through periods of increased vulnerability, such as crop failures, natural disasters and illness. Without this natural insurance policy poverty and economic insecurity is exacerbated, and people on the margins are at increased risk of falling into poverty. Agroforestry has also helped households to secure tenure over farm areas and stop illegal logging, forest encroachment and 'land-grabbing', a significant problem in Bangladesh. Moreover, agroforestry initiatives have helped increase the opportunities available to the poor, through capacity building activities and livelihoods improvement.

Agriculture, wage labour and small business are the largest sources of cash income in the study areas and agroforestry products support some income generating activities. For example,

processing and marketing of agroforestry products i.e., timber, fruits, vegetables and cereal crops, are playing a critical role. So, agroforestry specifically has a supporting role in raising the income levels of poor households and thus reducing poverty. Alam *et al.*, (1996) indicate that a good number of landless and marginal farmers earn their livelihoods for a particular period of the year from agroforestry. The cash received from agroforestry is mainly used for purchasing or leasing of land, buying bullocks, agricultural implements, supplementing expenses of marriages and social obligations, meeting educational expenses, repaying of loans, etc. NTFPs and vegetable gardens are components of agroforestry systems in poorer households as compared to the relatively affluent households (Siddiqui and Khan, 1999). Agroforestry systems are most extensive in developing countries where approximately 1.2 billion poor people depend directly on a variety of agroforestry products and services (IPCC, 2000). In five sub-Saharan African case studies in Franzel and Scherr (2002), agroforestry is shown to have potential to increase farm incomes and solve difficult environmental problems. It is financially more profitable to local farmers in comparison with traditional cultivation, beside its other economic and social benefits. Thus, combined trees and secondary crops systems have potential as alternative cultivation practices that help to enhance poverty reduction and transition to permanent cultivation (Mai, 1999).

Overall, the analysis shows that agroforestry is a far superior land use option, financially speaking. One might wonder why, if indeed it is as financially viable as the analyses suggest, combined tree and secondary crop systems are not more present in developing countries and do not constantly expand? A logical prediction would see agroforestry prevailing in the region, or at least spreading. That, however, is not the case at all. As found in the study, only some 18 per cent of the households practice agroforestry systems, and neither the adoption rate nor the total area under agroforestry shows any tendency to increase. The obvious question is: Why? This is the subject of the next section, which taking a broader look aims to come to grips with relevant aspects of the full set of factors taken into account by farmers in their land use considerations.

Constraints to the expansion of combined tree and secondary crops systems

Several factors are potential constraints to the spreading of systems combining tree and secondary crops. These are discussed below.

Establishment cost and delay in profit earning.

The initial investment in agroforestry for the non-agroforestry farmers is the first constraint. Agroforestry systems require higher financial but also psychological establishment costs, since it is a rupture with established routines. Farmers with monocropping systems do not face them as they reproduce each year existing and well known cropping patterns. Similarly, this does not hold for the group of experienced agroforestry farmers. Delay before earnings is mentioned as a constraint by non-agroforestry farmers, referring to the lack of income during the period before the agroforestry tree species bear fruit. However, this argument contradicts the financial analysis based on field data from the same study areas. This means either that farmers do not know well the performance of agroforestry systems, or that they do not believe it will also be possible on their farm, or that they refer to a time span of less than one year, since even the fastest agroforestry species are not as fast as rice or wheat that mature within a few months.

Unstable market prices. This is a major issue mentioned by the farmers themselves. In view of the financial analysis, they must be referring here to something more structural than just a simple drop of prices. We surmise that farmers here refer to a deeper feeling of insecurity beyond price fluctuations. Investing in agroforestry amounts to locking oneself practically irreversibly into the markets of vegetables, spices, fruits and other secondary crops markets that to the farmers may feel more like niche markets for luxury goods, which are inherently less stable than those of rice and wheat. Rice and wheat are basic food grains; the agroforestry products have a volatile economic future.

Dearth of appropriate agroforestry models and extension. Various technical aspects are involved in practicing agroforestry such as selection of appropriate species for a given site, which should not interfere with other crops, use of correct planting techniques, carrying out timely maintenance and adopting scientific management

principles. Different ecosystems need specific agroforestry models. Research back up for appropriate models in the study areas could not be found, due to the poor focus of government and non-government organizations, and research institutions. There is also a strong need for training and education to optimize productivity. Presently there are few mechanisms to provide training and demonstrations to farmers. Extension and transfer of technology for growing, harvesting, processing, product diversification and innovation of new product designs are crucial for development and expansion of agroforestry in the area.

The general atmosphere of insecurity surrounding the agroforestry option in this region is augmented by a lack of government backing. Insufficient back-up is provided to agroforestry in any form. There is not enough agroforestry extension and training; no market information; no price guarantees; no on-farm research and development; insufficient agroforestry credit, seedlings supply and support to start co-operatives or value-added or similar activities. These services are not only important for the farmers as such; their absence reinforces the general message that monoculture is important for the government and therewith the safest bet for any farmer.

Absence of economic security and incentives for tree growers. Tree plantation has a minimum gestation period of five years and is more risky and uncertain than monoculture. Agricultural policies in Bangladesh provide a lot of security and incentive to farmers in the form of subsidies, support prices, soft loans, and income tax concessions. The Government has also recently introduced comprehensive crop insurance scheme for the farmers. However, agroforestry is not given any special support other than some publicity and is left to the vagaries of fluctuating markets and exploitative middlemen.

Schultz (1964) argues that farmers' skills, knowledge and technological progress play an important role in agricultural development. Others (Binswanger and McIntire, 1987; Lipton, 1989), however, consider that knowledge and skill are necessary for agricultural improvement, but are not enough to facilitate the change. Despite having knowledge and skill, poor farmers cannot use improved seeds, chemical fertilizers, and irrigation because of structural constraints imposed by institutions. A number of researchers (Allan, 1986;

Turkelboom *et al.*, 1996; Reardon *et al.*, 2001) have emphasized the equally important role of infrastructure, including transportation facilities, and access to market centres as they broaden the scope of new crops and technologies. Several scholars (Feder *et al.*, 1988; Thapa, 1998) have laid emphasis on tenure security as an important factor influencing land use decisions. Insecure land tenure not only constrains such investments, but also deprives farmers from formal credit, inputs and other institutional services required for improved land use practices. As a result farmers are forced to continue their traditional land use practices, despite their willingness to change (Lele and Stone, 1989; Rasul and Thapa, 2003).

Conclusion

Bangladesh is facing problems of unemployment, poverty and food deficiency. Significant efforts are required to overcome the constraints that limit agroforestry systems in their capacity to address food security and environmental challenges. Indeed, combined tree and secondary crop systems could contribute to ensure meeting the basic needs of people, environmental protection, food accessibility and productive employment generation and thus bring desirable peace, prosperity, happiness, livelihood security and sustainable development.

While our studies show the real profitability of such systems compared to more traditional agriculture under various and diverse environments, the lack of appropriate policy focus represents a major limit to the expansion of these systems.

In the field of Research and Development, several actions are required to provide real support for the development of agroforestry systems in Bangladesh. From a research viewpoint, the generation of specific knowledge is badly needed. Technical support in plantation, tending and harvesting is essential, as improved agroforestry systems are still alien to local people. This includes technologies of tree nursery and grafting to reduce expenditure on seedlings, species chosen and for their suitability to the locality with preference given to indigenous and fast growing productive ones, crop combinations selected with minimum

negative interactions, appropriate spacing for each species with reference to soil and climate, and selection of multi-tier systems for effective utilization of land as well as balancing secondary crop production.

Ensuring proper education and training for farmers to improve crop and farming techniques is also crucial and depends very much upon the capacity of Forestry Department staff to conduct extension activities with farmers on the benefits and techniques of agroforestry. Ensuring supply of quality seedlings/seeds to farmers for instance would have a significant impact.

This has to be accompanied by supportive policies through a set of incentives that would bridge the discriminating gap in the treatment of agroforestry systems compared to more traditional agricultural activities. In order to promote agroforestry, an initial investment is necessary to improve the attractiveness of the system, through projects with potential spillover effects. Such initial investment has to be concentrated on a few pilot projects with periodic review and constant monitoring to ensure their success.

Then, more flexible credit systems with simpler forms and procedures for credit application, longer terms for repayment and closer monitoring and follow-up are needed. Repayment schedules must match the household crops cycle so that periodic settlements can be made when money is available.

Finally, given the multifaceted dimensions of agroforestry systems the co-ordination between research, extension and supporting policies is a key issue. The combination of knowledge, know-how and incentives required for the expansion of agroforestry systems in Bangladesh as a means to improve the livelihood of poor farmers implies that research institutes, universities, and governmental and non-governmental and international institutions, organizations and programmes should work together and generate appropriate innovations and new ideas, technologies and institutional arrangements in order to provide farmers with more economic opportunities to follow pathways out of poverty. ■

(References available upon request)

CAPSA News and Activities

Conference on Simulation and Modelling in Asia, Chiang Mai, Thailand

The 2nd International Conference on Asian Simulation and Modelling (ASIMMOD2007) was held from 9 to 11 January 2007 in Chiang Mai, Thailand. The event was an attempt to set up International Asian collaboration research concerning simulation and modelling. The theme of this year's conference was "Towards Sustainable Livelihood and Environment".

During the three days more than 70 papers were presented covering a wide range of modelling and simulation topics and methods used in Asia. These included crop growth modelling, multi-agent modelling, and social and economic models and results.

The conference gave the opportunity for researchers to meet and discuss current innovative research methodologies. Erika Speelman from UNESCAP-CAPSA attended the conference. Her discussions with scientist about new methods have provided ideas to enrich the variety of techniques currently used by CAPSA. For more information: erikaspeelman@uncapsa.org. ■

Agribusiness Workshop

Dr. Robin Bourgeois, attended a workshop on "Agribusiness Value Chain Assessments, Recommendations and Plans for Current and Future Assistance" organized by USAID Indonesia and AMARTA (Agribusiness Market and Support Activity), in Jakarta, Thursday, 8 March 2007.

The objective of the workshop was to share the results of eight commodity chain assessments conducted by AMARTA in 15 provinces, interviewing more than 1,000 stakeholders. AMARTA plans to implement actions during the next three years with a total budget of 17 million dollars. Commodities include cocoa, specialty Arabica coffee, rubber, bio-fuels, horticulture, aquaculture, beef, and spices.

For more info, contact: ecopol@uncapsa.org. ■

Biodiesel and Ethanol Conference

Dr. Togar A. Napitupulu, senior economist at CAPSA, attended a one day National Conference on "The Uses of the By-products of Biodiesel and Ethanol Industries and the Opportunity to Develop its Integrated Industries", in Jakarta on 13 March 2007. The Conference was organized and co-sponsored by Bogor Agricultural University (IPB), the Ministry of Industry of Indonesia, and the Surfactant and Bioenergy Research Centre. Of particular interest is the use of *Jatropha* as a source of raw material for biodiesel. In general, there was a common understanding that there could be potential competition for land allocation between *Jatropha* and other main crops such as rice and maize. At current productivity level and price, it appears that *Jatropha* is less profitable compare to rice and maize except in less productive (marginal) areas. It is also worth noting that there is now small-scale technology available to produce crude *Jatropha* oil that can be used to replace kerosene in traditional household-cooking burners. This opens a new possibility of the development of rural self-produced energy. ■

ECOIN

ECOIN (Impact Analyses of Economic Integration on Agriculture and Policy Proposals toward Poverty Alleviation in Rural East Asia) started in 2006 as a collaborative research project between CAPSA and JIRCAS. Seven countries (Cambodia, P.R. China, Indonesia, Lao People's Democratic Republic, Malaysia, Thailand and Viet Nam) participated in the project. In Indonesia, rural surveys to identify the competitiveness of crop production at six study sites were completed by March 2007. The target commodities were selected from the viewpoint of potentials in international market in the era of economic integration in Asia region. Three kinds of vegetables were selected as high value commodities and cassava was selected

considering its growing demand as a source of alternative energy. The survey results will be analysed with PAM (Policy Analysis Matrix) to further understand the current situation of comparative advantage of the commodities and effects of agricultural policies. ■

BIOMASS

B IOMASS (Development of Methodology for Analysing Sustainability of Biomass Resource Use in Tropical Asia) started in 2006 as a collaborative research project between CAPSA and JIRCAS. Four countries (Indonesia, Malaysia, Thailand and Viet Nam) participate in the project. Secondary data collection on energy crop production in participating countries has been completed. The data set contains information about production, cost and future prospect of major energy crops in the region. A rural survey to analyse farmers' attitude to biomass energy use was conducted in Lampung, Indonesia from February to March 2007. ■

Preparation of WDR 2008

D r. Robin Bourgeois, CAPSA IS/DB Programme Leader and Senior Agricultural Economist from CIRAD-Environment and Societies participated as Lead Discussant in an Internet-based Global Electronic Consultation on the World Bank's World Development Report (WDR) 2008 "Agriculture for Development", from 9 to 21 April 2007. This event, organized by Rimisp on behalf of the World Bank, involved ten Lead Discussants. Rimisp also invited more than 600 persons from around the world who share a critical interest in agricultural and rural issues and their relations to development. They include government officials, farmers and other private sector organizations, social movements, NGOs, researchers and academics, and members of international multilateral and bilateral development agencies.

The purpose of this activity was to facilitate an open, yet structured, discussion on the strengths, weaknesses and missing points in the current draft of the WDR 2008. It is part of a global process that will lead to the elaboration of the final document.

Rimisp -Latin American Center for Rural Development (www.rimisp.org)- is a non-profit organization funded in 1986, supporting organizational learning and innovation for the promotion of equity, welfare and democratic development in the rural societies of Latin America. ■

Food Security and Community Development in the Decentralization Perspective (SECOD)

T he SECOD project, a collaborative study between UN-CAPSA and the Bureau of Planning, Ministry of Agriculture of Indonesia, is currently in the final phase. It focused on the dynamics, performance and prospects of national and regional food security, and was conducted in three provinces: East Java, West Kalimantan and West Nusa Tenggara.

The team has finalized the main technical reports that consist of: (a) Report I - National policy analysis on food security, poverty alleviation, and food-insecure household empowerment; (b) Report II.A - Case Study of East Java; (c) Report II.B - Case Study of West Kalimantan; and (d) Report II.C - Case Study of West Nusa Tenggara.

In view of food security, community development and decentralization are important issues. UN-CAPSA will develop the reports into CAPSA Working Papers composed of an integrated report and three study theme reports. These working papers are presently in preparation stage and expected to be finalized in the mid of this year. ■

Linking Small-Scale Mango Producers to the Dynamic Supply Chain in Indonesia: The Bimandiri Business Partnership Model (Regoverning Markets - REMARK)

T he REMARK study is a collaborative research project between UN-CAPSA and the Center for Agricultural Policy and Agribusiness Studies (CAPAS), University of Padjadjaran, Bandung, Indonesia, with the University of the Philippines Mindanao Foundation, Incorporated (UPMFI) that performs as a Regional Co-ordinator of Regoverning Markets Programme for Southeast Asia. The study is co-ordinated by CAPAS and Dr. Ronnie S.

Natawidjaya, Senior Agricultural Economist, CAPAS, is the Project Team Leader.

The main objective of the study is to generate policy lessons and working methods to guide public and private actors in supporting greater inclusion of small-scale producers in dynamic markets. The specific purposes are to analyse: (i) the hypothesis that emerged in the first round of the REMARK study; (ii) the main characteristics of the partnership between the chain leader and small-scale farmer group and its immediate context; (iii) the motivation of the chain leader to deliberately work with small-scale producers on a significant scale; (iv) the costs and benefits of the partnership versus conventional supply chain; and (v) the potential for up scaling or replication of the partnership model between the chain leader and small-scale farmer group.

The study started in January 2007 and is scheduled to end in June 2007. The study locations are: Bandung (West Java), Jakarta, and Pematang (Central Java). The methods of study include: interviews, focus group discussion with chain leader and farmers, and a field visit.

A planning meeting was held on 27 to 28 February 2007 at the CAPAS office, Bandung. It aimed to discuss the project implementation, to finalize the operational proposal and to improve the questionnaires. It was attended by UN-CAPSA and CAPAS project teams.

In March 2007, the CAPAS team conducted a pre-survey on the transparency margin partnership system in Asem Doyong village, Taman sub-district, Pematang, Central Java.

A focus discussion was conducted in Bandung, on 24 March 2007, to discuss the role of chain leader (CV Bimandiri) in agribusiness partnerships. It was followed by a visit to the packing-house of CV Bimandiri in Lembang, Bandung. The discussion was attended by the UN-CAPSA and CAPAS project teams and the Director and staff of CV Bimandiri.

The draft report on initial findings is expected to be completed in April, and the project workshop to discuss findings and policy implication will be organized for May 2007. The final report is expected to be submitted to the REMARK Regional Co-ordinator by the end of June 2007. ■

Outlook and Prospect of Secondary Crops Development in Wetland Area (OUTLOOKSEC)

The OUTLOOKSEC project is a collaborative study between UN-CAPSA and the Indonesian Center for Food Crops Research and Development (ICFORD) and funded by the Government of Indonesia (GOI) through the Indonesian Agency for Agricultural Research and Development (IAARD) of the Ministry of Agriculture for the 2007 fiscal year. The project is a one-year study conducted by a multi-discipline specialist team from ICFORD, ICASEPS and UN-CAPSA, and led by Dr. I Wayan Rusastra, Research and Development (R&D) Programme Leader, UN-CAPSA.

The objectives of the study are: (i) to assess the trends and factors affecting secondary crop production by region and agro-ecological zones; (ii) to analyse secondary crop agribusiness dimensions (input market, on-farm, post-harvest and marketing) and supporting policy; (iii) to analyse the impact of farm diversification to farmer income and poverty reduction; and (iv) to formulate strategic policy options for secondary crop agribusiness development in wetland areas.

The study will be conducted in selected wetland areas in West Java experiencing major progress in secondary crop farming. The applied research methodologies include literature review, desk study and field observation using PRA. It focuses on three commodities: soybean, maize and groundnut, as these are substitute import commodities that have substantial prospect in supporting agro-industry, domestic food demand, and sources of farmer income.

A planning meeting was held at the ICFORD meeting room, Bogor, on 14 February 2007, to discuss the workplan and to improve the planning document of the project. Main survey and data analysis are planned to be carried out from April to August, and the project report is expected to be completed in November. A seminar will be arranged in Bogor, in December 2007. ■

Poverty Indicators in the Asia-Pacific Region

William Deyegbe who joined CAPSA in February 2007 has started his work by reviewing literature on poverty indicators in order to develop specific indicators of poverty for the Asia-Pacific region. The broader goal of this activity is to expand CAPSA's knowledge, information and understanding of poverty in the region. ■



Editorial Note:

Palawija News Periodicity Modified

As of January 2007 the periodicity of Palawija News has been modified. The newsletter will be published three times per year instead of four times. The three issues will be released in April, August and December.

Two articles will be published in each issue. Feature articles will provide information on research results from the Centre's own projects or from research institutions in member countries. These articles will be reviewed internally by the Editorial Committee with the support of CAPSA's TC members or by external peers upon request by the author. Feature articles providing evidence of good practices in research and development related to rural poverty alleviation and the agriculture-based sector will be particularly welcome.

Discussion articles will present intermediary/preliminary research results, documented advocacy work and reports of relevant activities such as seminars, workshops and conferences. Discussion articles are internally reviewed by the Editorial Committee.

The Editorial Committee expects that these new standards will give scientists in the region a better opportunity to improve the quality of their research results and to communicate them to a wide audience of scientists, analysts and policymakers.

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BY AIRMAIL

Forthcoming Publications

Feasibility Study of Sustainable Diversified Vegetable-based Farming Systems in Highlands Regions of West Java

Edited by Tomohide Sugino

Working Paper No. 100. 2007. 83 pp.

ISBN 978-979-9317-67-4

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 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.