Chapter 13

Small-holders and Development

Agriculture in Thailand is both a major export income source and a social welfare system. Small-holders produce the majority of agricultural products, the raw materials utilised by agribusiness, and contribute most of the labour.[1] Thus polarisation of Thai agriculture into commercial and self-sufficient types necessarily involves small-holders in both categories. Development will ultimately address the social needs of all small-holders. However, the convenient separation between agribusiness and small-holders allows consideration of issues not evident in discussions with a commercial orientation. This chapter therefore introduces arguments for specific policies and programs relevant to small-holders as a primary responsibility of government in both social and economic sectors.

Policies which supported agribusiness as an instrument of national development assumed that resulting innovation would meet wider government objectives. However, the diffuse benefits of agricultural research discouraged agribusiness to assume a creative role, and interpretations of declining comparative advantage in agriculture with rising labour and resource costs, led to reduced investment, as small-holders became increasingly associated with poverty.[2]

Marginalisation of small-holders arose from foreign development systems which contained forgotten assumptions that sound governance systems, efficient legal environments, and practical social welfare programs were common to countries such as Thailand. This may be more clearly expressed by considering the specific economic context in which small-holders operate, while noting the sharing

[1] Suphanchaimat, Nongluck. (1998)
[2] Christensen, S. (1992)

of some characteristics of family farms across cultures. Differences between small-holder integrated farms and agribusiness monocultures require different research and other support services, with government ensuring that public good research continues, while encouraging funding by agribusiness of research which generates capturable benefits. Elements of traditional or risk management agriculture remain in small-holder agriculture as misnamed 'low input' systems, which appear to include means for improving environmental management, social well-being, and yields.[3] Such non economic factors are already as important as economic aspects of the sector, even if not recognised.

Thailand's special case as a nation with a small-holder base providing the primary historical material of national wealth creation has possibly been under-emphasised in development plans built on a generic industrialisation model. The compounding factor of an urban bias, reflected in the haiku,[4]

sitting on top of the rice heap
marvelling how distant peasants toil

describes part of a socio-economic context which culturally values small-holders while often overlooking their rights to share national wealth. However, economic development approaches have perhaps been most significant is setting the context for small-holders in recent decades.

Economic Context

Models for agricultural development in less developed countries focus on one of:

- social issues associated with agriculture and rural dwellers in industrialised countries
- producing a higher proportion of domestic foods in food-deficit developing countries
- economic and political interventions for major industrialised food exporters.

A fourth category, the major agricultural exporting developing country, has often been an assemblage of the above models, rather one than suited to the special case which is Thailand.

[3] Uphoff, N. and Fernades, E. (1999)
[4] Klausner, W. J. (1997)

Human, natural environment, and economic factors form part of any comparison of alternative policies. The natural environment is assumed to be stable, although it has been substantially modified through irrigation and other interventions. The economic environment for Thai agriculture is characterised by changes in domestic markets, fixed marketing costs such as transport, access to international markets, and inferior negotiating power in an over-supplied global economy.[5]

Thai capital has been oriented to manufacturing and industry as these appeared to provide higher economic returns. Such adopted policies have included implicit assumptions of economic surplus and international negotiating power and, incidentally, a low proportion of agricultural producers in the labour force; this was clearly not the case for Thailand. In addition, the model assumes a free market and that agricultural productivity will increase continually; this occurs where research and education support expansion, such as in Australia where agricultural productivity rises faster than most other sectors of the economy and thus can support an acceptable farmer standard of living.

In Thailand, increases in agricultural productivity have not matched those of manufacturing and industry, creating a concentration of poverty around small-holder agriculture. The employment role of agriculture for more than 70 percent of the workforce, and its limited returns, introduce social policy imperatives which do not naturally arise from conventional models. Developing countries more commonly can fall back on the link between food production priorities to reduce a national food deficit, through such means as price setting which incidentally assists small-holders. Thailand, again does not fit this mould.

Thai institutions ostensibly oriented to assisting small-holders have been constrained by the historical orientations of government and roles in garnering central monies, and by what recent analyses have considered predatory State behaviour. Inconstant policy choices have favoured minority objectives and reduced public accountability resulting in, for example, increased cassava grower poverty and relative reductions in educational access, which might otherwise have allowed informed bargaining with the State.[6] This institutional constraint has not been

[5] Malcolm, B., Sale, P., and Egan, A. (1996)
[6] Sirirprachai, Somboon. (1998)

specifically addressed through aid financing organisations, and has been exacerbated by other economic conditions which impact on producers.

Thailand's small-holders are caught in a wider economic context which includes the factors of:

- an inferior international negotiating position in political and agricultural commodity price terms
- poor government regulation leading to potential for exploitation of less educated rural dwellers
- a history of taxing rural surpluses to support national, and particularly, urban programs with minimal social investment into agricultural areas
- a conceptual, knowledge, and empathic separation between central planning oriented more to the region and the world than to the hinterland
- industrialisation policies which favour foreign firms seeking low-cost skilled labour, with supporting government-related funds and finance
- assumptions that agriculture represents less than 20 percent of economic activity when the combined sector may comprise as more than 50 percent.

The link between agriculture and the Thai economy has been clear through the recent financial crisis;[7] in such times it limits economic contraction, in other times, it funds growth.

Agriculture and Growth

In creating growth, Thai agriculture has provided a rising range of goods that have benefited all, particularly the urban populace. The common path of development is based on agricultural surplus being invested in manufacturing, usually agro-industries, to create further surpluses for investment in other industries, with the increased national wealth so generated creating demand for manufactured products. This is the model of agriculture as the engine of economic growth (Figure 13.1).

[7] ADB (1999)

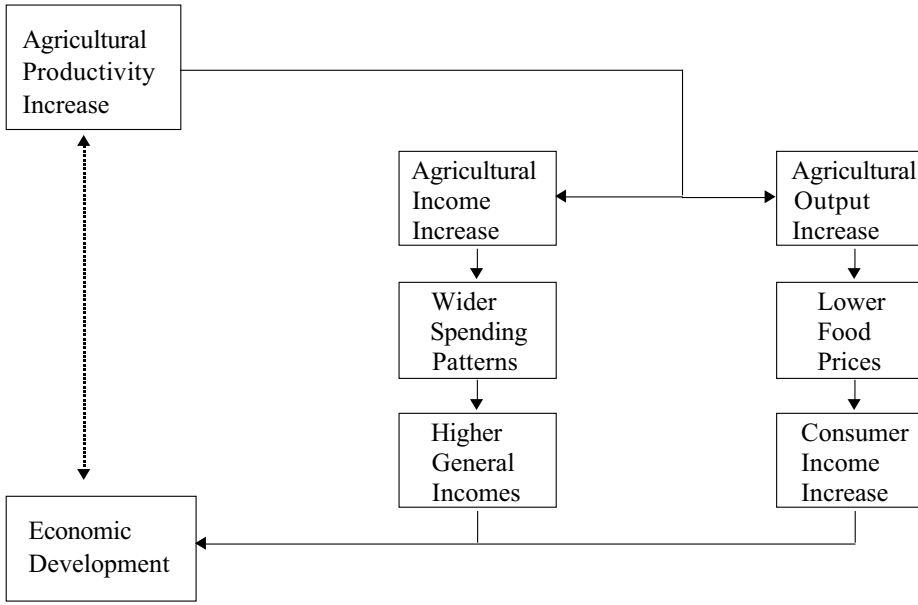

Figure 13.1 *The Agricultural Engine of Economic Development*[8]

Following from this agriculturally-created economic growth, the rising proportion of the work-force engaged in, and economic output of, the industrial sector, necessarily leads to a declining proportion of the work-force engaged in agriculture. Agriculture as a proportion of total value within the economy also declines while agricultural output per unit of labour in agriculture increases. In industrialised countries, the rate of change will be largely determined by the relative returns that can be received in the industrial, compared to the agricultural sector.

Assumptions of the past two decades, that a significant decline in the numbers engaged in agriculture in Thailand would be associated with rising employment in the manufacturing and industrial sectors, confirm adherence to the Western industrialised economic development model. This may yet prove to be valid, although the export orientation of Thai agriculture and agribusiness, and the high proportion of the population engaged in the sector, indicate that the change

[8] Falvey, L. (1996)

will be slow. Small-holder production systems, high rural populations, urban policy biases, inequities in agricultural land ownership,[9] and poor access to capital, among other factors have led to a higher relative rate of poverty in rural areas. Unlike Thailand, occurrence of such an outcome in an industrialised country is usually addressed through broad social welfare policies and continual increases in agricultural output efficiency; the dotted line in Figure 13.1 stresses the need for agricultural producers to benefit from national economic growth in a viable development model.

In industrialised countries such as the USA and Western Europe, domestic demand for agricultural products did not respond markedly to price changes in the agricultural sector. This outcome, caused by low price elasticities, high levels of competitive production, rapid technological change, and relative immobility of production resources in agriculture, produced declining net incomes in agriculture compared to industrial sectors. Expansion of an economy leads to a declining proportion of additional income being allocated to food and other agricultural commodities. The response in industrialised countries is one of rising technological innovation to increase efficiency of agricultural output, in order to allow producers to maintain income levels. This treadmill is accelerated by rises in agricultural production and oversupply, which in turn further drives down agricultural prices, leading to global competition for development, ownership, and application of innovations in agriculture.

Major agricultural nations such as Thailand require constant technological innovation in an age when their ownership limits access and necessitates high levels of research investment.[10] Agronomic techniques, use of disease controlling organisms and varieties, continuous breed improvement strategies, market research, storage enhancement, as well as genetic modification of crops and a range of other outputs from high cost and high management-demand agricultural research programs, highlight imperatives for both government and private investment.

Farmers in industrialised countries may choose to remain in agriculture despite these pressures and declining incomes, either in response to lack of

[9] Feder, G., Onchan, Tongroj., and Hongladorom, Chira. (1987)
[10] Malcolm, B., Sale, P., and Egan, A. (1996)

alternatives for their skills and the assets of their farms, or because of intangible benefits associated with a rural lifestyle supported by social equity policies. However, increased output per unit of input allows maintenance or increases in commercial farmer incomes, as the total number of farmers declines. The industrialised country model for economic development and agriculture requires close government monitoring; an alternative is the recognition of the different rates of growth of the industrial and agriculture sectors, and increased public desire for perceived improvements in management of the natural environment, and hence direct subsidy of farmers by tax payers and consumers.

The option of subsidising farmers through price support requires even greater government skill. As adopted in the USA and Western Europe, this approach can stimulate surplus production with unfortunate consequences for other major agricultural countries which operate on world market prices. Countries such as Thailand, may well be excluded from these and other high priced markets.

Where one country's volume of product does not significantly depress global prices, such a situation can be tolerated. However, if one country is the main supplier, and particularly if the commodity is its major agricultural product, as is the case of rice for Thailand, the full impact of being a global price taker with an inferior negotiating position may accrue to small-holders. In addition, government intervention in the markets for rice, sugar, maize, and rubber have, at different times, caused small-holders to react in a manner unfavourable to their interests, and those of the country.[11] The logical economic response suggested by the conventional model might be for large numbers of farmers to exit from the industry; however, such an option is not possible in Thailand where alternative forms of employment, once promised from an industrialising economy, have yet to develop.

The pattern of a declining proportion of national income and employment deriving from agriculture is common to wealthy nations, and is a major influence on economic approaches to agriculture and rural development. However, to suggest that Thai agriculture will decline in importance and that within one decade the 70 percent of the population associated with agricultural production will decline to 4 percent[12] seems at best, unrealistic. Hence small-holders are of continuing critical

[11] Siamwalla, Ammar. and Setboonsarng, Suthad. (1989)
[12] Bello, W., Cunningham, S. and Kheng Poh, L. (1998)

importance to Thai agriculture, and the economy.

Small-holders as Family Farmers

Visions of a future Thai agriculture operated by agribusiness on large holdings applying ever new technologies appear to assume economies of scale in agriculture analogous with manufacturing processes. In fact, the majority of farms, even in industrialised countries, remain as family units employing minimal additional labour, because opportunities to reduce average costs by increasing the size and introducing job specialisation are few in the biological and human fields of farming. Sequential tasks that provide economies of scale in manufacturing are uncommon in agriculture beyond a farm size manageable by a family, except in industries with high levels of mechanisation, and in intensive agricultural industries.

Farm size is also limited by the levels of risk manageable within an enterprise. Debt servicing ability is affected by seasonal and market variations, with rising levels of borrowing incurring higher interest rates. Requirements of around 80 percent equity[13] in a farm enterprise, to maintain viability in the cost-price conditions of unsubsidised agriculture, further calls into question some small-holder credit-based development strategies in Thailand.

Contract farming has been assumed in some projections to be an interim stage to industrialised agriculture. Instances in the Chiang Mai valley indicate that a diversified product base can encourage small-holders to enter into supply contracts in order to gain the requisite skills and contacts to trade in the open market themselves. Variations occur according to the individual small-holder and crop type; for example, tomato and potato crops are tradeable in the local market and Japanese cucumber and hybrid maize seed are not, while contract vegetable soya bean requires large uniform pods, rejects of which can be sold on the local market.[14] Such contracts suit larger farmers in better areas. Small-holders in poorer areas may lack both the requisite initiative and investment for joining agribusiness, which itself will invest first in higher potential areas in terms of management, marketing, and productivity.

[13] Malcolm, L.R., and Lloyd, A.G. (1996)
[14] Wiboonpoonse, Aree. et al (1998)

Small-holder farmers seek to avoid price and seasonal risks through farming systems which have evolved sophisticated management approaches viable under sometimes oppressive economic conditions. Thus, economic development models derived from the different conditions of industrialised countries are not necessarily the only viable approach for agriculture.[15] Small-holder farmers who tolerate the impact of their own poor decisions and unforeseen circumstances may fail under policy environments which assume a level of formal education uncommon in rural Thailand. The first and major input for improvements in agriculture, whether following the modernisation path or one of self-sufficiency, remains improvement of the ability of small-holder farmers to access and use information.

The intensive care which a small-holder can invest in individual plants or animals contribute to the sustainability of the farming system. By contrast, industrialised agriculture, covering large areas through mechanisation, relies on judicious yet widespread use of chemicals which fuel concerns of environmental contamination and food safety. In a global agricultural trading economy, free market platitudes can easily be confounded by chemical residue levels in food products. However, the natural advantage of small-holders being able to use less chemicals to produce a quality product is not realised where high technology packages form a critical part of a national agricultural development strategy. Integrated pest management seeks to gain the benefits of both approaches, and provides a partial solution; another part is effective marketing investment.

In discussing small-holder agriculture, some analyses have focussed on small land holdings and the crops which are grown on them. A wider view acknowledges the integrated nature of small-holder farms and the impossibility of segregating crop from animal production from social well-being. Consideration of small-holder farming from the perspective of livestock in a total farming system provides a view of integration with cropping and social aspects.

[15] Berhman, J. R. (1967)

Integrated Crops and Livestock

Small-holder production systems show low outputs of conventional items such as meat, fibre, and milk. For this reason, past development policies have assumed that output efficiencies can be improved by changing small-holder systems to intensive monocultural systems. That such approaches have been largely unsuccessful has been seen as a failure of government investment in technology transfer; in fact, the costs can be greater in terms of the loss of the real benefits of integrated small-holder agriculture, as can be illustrated in such industries as poultry. The use of by-products as feed, and multiple outputs such as draught and social functions, can be shown to exceed the production efficiencies of intensive animal mono-cultures. Likewise, improvement of small-holder systems need not rely on replacement by intensive production approaches; for example, rather than intensive Western dairy complexes, increases in milk production from working cows can be effected from feeding to meet nitrogen needs according to the cow's physiological state, work needs, and age.[16]

In the same way, the two to five buffalo per small-holder which graze rice straw and stubble and receive traditional medical attention, provide draught power, fertiliser for rice fields, clearing of stubbles, and weed control as an integral component of small-holder family life. The 40 million ton of rice straw and stubble available annually for bovine consumption[17] otherwise contributes substantially to the annual Southeast Asian smoke haze.[18] Nevertheless, mechanisation of irrigated agriculture under the Sixth and Seventh Plans[19] led to a decrease in buffalo numbers by about 60 percent by 1999, as BAAC credit for two-wheeled tractors, engines, four-wheeled tractors, simple farm trucks, threshers, sprayers, water pumps, and mowers spread, even to rainfed where some buffalo were used in conjunction with two-wheeled tractors.[20] Buffalo cows substituted for males and were valued above their cost[21] in reflection of the intangible benefits of integrated systems,[22] which while widely recognized,[23] have usually been undervalued in national

[16] Zerbini and Wold (1999)
[17] Chantalakhana, Charan (1993)
[18] Kaosaard, Mingsarn and Rerkasam, Benjawan (1999)
[19] Rijk, A.G. and van der Meer, C.L.J. (1984)
[20] Bunyavetchewin, P., Singdid, S. and Chantalakhana, C. (1994)
[21] Chantalakhana, Charan (1995)
[22] Chantalakhana, Charan (1994)
[23] Chantalakhana, Charan (1996)

planning analyses.

Small-holder chickens and pigs meet short term cash requirements while bovines can be long-term saving devices against crop failure and family emergencies. Traditional companionship between buffalo and small-holders, where buffalo are named instead of branded, where children spend school holidays playing with the family buffalo, and where farmers contemplate a trip in terms of their reluctance to entrust their buffalo to another's care, demonstrate the archetypal role of Thai buffalo, of which less than one percent are raised on ranches.[24]

Small-holders raise cattle as the preferred bovine meat associated with its loin cut size and marbling, which have been enhanced with Brahman and other cross-breeding. However, small-holder risk perceptions[25] have led to low levels of technology uptake, with less than one percent adopting 18 of 24 simple available technologies, and with only one technology, castration, being conducted by more than 50 percent.[26] Such observations can now be related to reconsideration of indigenous cattle,[27] which have been subject to research biases which overlooked such advantages as early maturity and small size. Weighing less than 70 percent of, and maturing earlier than, crossbreds[28] can allow indigenous breeds to show higher live weight production per hectare, and represent a more easily divisible asset which can produce a smaller whole steak for a rising market. Demand for meat and milk in less developed countries[29] appears to offer small-holder systems with their labour and feed-base efficiencies, a prosperous future which can extend to marginal areas with appropriate research and policy development.[30]

Small-holder pigs are mainly imported breeds raised on rice bran, cooking refuse, and weeds. Being more closely linked to commercial production demonstrates the disadvantage of small-holders competing with agribusiness. Infectious diseases including Foot and Mouth Disease and Hog Cholera as well as internal parasites, require investment by small-holders who have limited access to

[24] Chantalakhana, Charan (1995)
[25] Jeamsinkul, Maneeratana. (1989)
[26] Chantalakhana, Charan (1990
[27] Ministry of Agriculture and Cooperatives (1999)
[28] Yodseranee, S., Naphuket, S.R. and Oonyavong, R. (1963)
[29] Delgado, C. et al (1999)
[30] Vercoe, J. et al. (1997)

either higher technology or full market price, and whom government programs appear to view as adjuncts of the commercial industry.[31] By contrast, indigenous chickens attract a 30 to 50 percent market premium for taste and texture. The more than 120 million Thai village chicken flock suffers high mortality from endemic infectious diseases each year, including Newcastle Disease and Fowl Cholera. Vaccination services cover less than ten percent of chickens which, from more than 50 eggs per bird per year and 80 percent hatchability and 80 percent chick survival, could have a much larger impact, even allowing semi-commercial production of native chickens instead of their replacement with high input imported breeds.[32]

Small-holder calving rates reportedly vary from 30 to 50 percent, calf mortality rates from 10 to 30 percent, and live weight gain from 100 gram to one kilogram per day, although records are often incorrect. Improvement of feed base, utilisation of by-products, new technologies, animal health services, use of appropriate bulls, and improved harnessing systems for draught and traction, can improve productivity substantially within small-holder systems.[33] Uncommon success in the non-traditionally Thai industry of dairying has been attributed to its integration with small-holder practices. Colonies of small-holders use crossbred cattle, artificial insemination, forage crops, and supplementary feeding to produce fresh milk for increasing market demand. Government has created an external environment for small-holder acceptance of risks[34] while a milk drinking populace developed,[35] which has in turn improved child nutrition and stimulated imports of milk products,[36] while simultaneously assisting small-holders

The integration of livestock in small-holder agricultural systems provides an example for consideration in development plans. Other examples could be elicited such as mixed cropping to minimise the rainfall and price risks of monoculture, rice and fish systems which can also integrate with livestock to reduce fertiliser and feed requirements, and interplanting of green manure or forage crops in maturing rice fields to increase soil organic matter and reduce fertiliser needs.

[31] Chantalakhana, Charan and Bunyavejchewin, Pakapun (1993)
[32] Chantalakhana, Charan and Bunyavejchewin, Pakapun (1993)
[33] Falvey, L. (1983)
[34] Chantalakhana, Charan (1995)
[35] Office of Agricultural Economics (1995)
[36] Chantalakhana, Charan (1995)

Some are attracting attention as alternative forms of agriculture, such as discussed later. Seeking viable means of enhancing integrated small-holder agriculture therefore cannot rely on spin-offs from industrial agricultural research; a specific research focus is required, such as now evident in Thai Research Fund programs.

Research and Development

Effective small-holder agricultural research and education will acknowledge integrated systems and the role of small-holders, when researchable technical parameters including cost-effective alternative development approaches,[37] are being considered.

Small-holder system needs not met by simple importing of technology require local applied research initiatives. Their continued adequate funding relies on an understanding by national planners and analysts of the benefits of small-holder systems. These may be grouped as:

- potential for year round engagement of rural and peri-urban labour
- high levels of biological efficiency through utilisation of by-products
- risk minimisation through integrated diversification, which reduces government relief
- chemical fertiliser minimisation through farm-produced manure application
- maintaining rural populations *in situ*, with an adequate diet
- potential for integrated supply to commercial agriculture
- retention of national ruminant herds as multi-purpose work animals
- potential for development of new niche products and organic produce
- landless persons engaging in small-holder industries such as dairying
- maintaining Thai values which are easily subverted by market forces.

Treating small-holder agriculture as a phase to be transcended by industrial agriculture has led to rural adjustment programs that encourage small-holders migration to urban centres, while incidentally widening the rural and urban gap.[38] Recent acknowledgment of small-holders as a continuing component of Thai society seems to owe as much to their new association with poverty and urban migration,

[37] Cornell University (1999)
[38] Ieosriwong, Nithi. (1993)

as to wider understanding of their economic contributions. Thus small-holder agriculture may well receive increased research attention as a significant component of domestic and export primary production.

Research needs extend beyond technical and economic considerations into social requirements. Social equity programs for small-holders are warranted as a result of low commodity prices partly caused by welfare payments to farmers in richer nations, historical biases in Thailand of investment to non-agricultural sector, and the need for greater access to basic government services. These have already stimulated policies to improve equity in land ownership, employment, education, and health care. Credit based programs which aim to improve small-holder well-being through increased agricultural incomes require favourable market environments before they can be effective, and enhanced rural employment opportunities may well be a required parallel program which allows small-holder choice in modes of income production from a farm residential base.[39] Such realisations have stimulated consideration of alternatives to commercial agriculture.

Alternatives and Self-Sufficiency

Most so-called alternative approaches are merely an alternative to conceptions of conventional agricultural scientists. Small-holders have once known or practiced many of the techniques now popularly promulgated by concerned development specialists. Such techniques can produce higher yields from lower imported inputs in some circumstances,[40] and thereby allow small-holder contributions to the commercial agricultural sector. In other cases, they can allow a higher quality of life in a self-sufficient production system. Most importantly, rational consideration of a broader context for improved agriculture, allows small-holders a greater choice. Choice, productive work, and access to social infrastructure are elements of rural investment which can contribute to real development and political stability in Thailand.

Alternatives to intensive commercial agriculture are discussed in terms of religious and social context and origins in the following chapter; a summary of

[39] Chaipon, Chaiwat. (1994)
[40] Uphoff, N. and Fernades, E. (1999)

some systems trialed in Thailand is introduced below as a context for current trends affecting Thai small-holder agriculture. Low input, ecologically considerate forms of food production[41] which incorporate essential human values[42] including self-reliance,[43] and healthy lifestyles and diets, while providing the possibility of some income, have been imported in various forms to Thailand.[44]

The Fukuoaka farming system, for example, which emphasises spiritual aspects in subsistence farming, failed in Thailand's tropical environment. Similarly, the Kyusei Nature Farming system[45] which uses microbial inoculants to improve soil quality and plant growth was not adopted widely, probably for both cultural and technical reasons. Adoption of alternative agricultural approaches based on religious or spiritual objectives appears likely to be limited to adherents, such as the natural systems of the Santi Asoke sect.[46]

Permaculture[47] remains poorly understood and difficult to distinguish from existing integrated Thai agriculture.[48] On the other hand, an agri-aqua-culture system with modest chemical usage, has evolved to appeal to many Thai farmers and extension agents,[49] as has the idea organic farming. Organic farming requires sound managerial and marketing skills, and access to capital, which has to date limited adoption in Thailand compared to, for example, Japan.[50]

A system of producing for the family without major external inputs while adhering to what are seen as Thai and Buddhist values, has become known in Thailand as self-sufficiency.[51] Buddhist principles within a global ethic[52] are invoked to re-join man and nature[53] in contrast with selfish commercial behaviour at both individual and institutional levels.[54] Balancing material with social and

[41] Schaller, N. (1993)
[42] Beus, C.E. and Dunlap, R.E. (1990)
[43] Pretty, J.N. (1995)
[44] Udagawa, T. (1993)
[45] Matsumoto, Y. (1993)
[46] Wasi, Prawase (1988)
[47] Mollison, B. (1988)
[48] Sheng-ji, Pei (1985)
[49] Wetchaguran, K. (1980)
[50] IRRI (1992)
[51] Wasi, Prawase (1990)
[52] Nakasone, Y (1985)
[53] Sakharin, Rapee (1998)
[54] Sakharin, Rapee (1997)

spiritual needs[55] within an environmental context, goals of peaceful coexistence[56] and national security are linked to historical religious principles of governance, implicitly including the doctrine that 'the whole realm dwells in happiness if the King lives aright'.[57] Among the unique aspects of Thai agriculture is the incomparably wise influence of His Majesty the King,[58] who has evoked an ethic of self-sufficiency for all, not only small farmers.

Within the embracing philosophy of self-sufficiency, a rural component is expressed in terms of recommended land use for a small family farm. Cooperative action in collective bargaining, sharing of capital items, and negotiation with outside parties including government officials and commercial interests,[59] forms part of the approach. Building on statements of His Majesty the King that participatory forestry is the only viable means of reforestation in populated areas,[60] the forgotten social aspects of agriculture are given prominence. A continuing concern of the approach is attitudes within the civil service and agri-business.

Self-sufficiency has always been a theme of Thai agriculture at small-holder level, and is likely to remain so. In its present conception as a means of re-educating the whole society, it may receive a higher funding profile through social equity programs. As a whole-life philosophy, it retains eternal appeal. Within agriculture *per se*, it not only provides timely message, it allows sensible consideration of traditional and small-holder agricultural practices. In a materialistic era, such a message can be under-valued unless its adherents can also indicate wider benefits, as is being attempted in Thailand. Coincident with a growing global appreciation of small-holder solutions for commercial agricultural problems, this link between Thailand's two agricultures can work against further marginalisation of small-holder farmers.

[55] Wichiarajote, Puntape (Weerayudh) (1998)
[56] Wasi, Prawase (1998)
[57] *Digha Nikaya* Volume 3:85
[58] Board of the Royal Projects (1999)
[59] Board of the Royal Projects (1999)
[60] Adulyadej, Bhumibol. (1997)

De-marginalising Small-holder Agriculture

Small-holder agriculture is easily assumed to be a low technology and inferior form of production to which the attendant biases against physical labour accrue, in contrast to the modern commercial agriculture sector with its separate business vocabulary. For Thailand, the two types of agriculture may well persist, with a rising respect for self-sufficiency[61] as international interest widens in scientific interpretation of the hitherto denied benefits of alternatives.[62]

Incipient adoption of a modern 'scientific' worldview[63] emanating from the West has encouraged an association between quality of life and consumable goods, and a view that all problems, including those of health and the environment, have technical solutions. Small-holders and their actions and language are thus seen as primitive. The Thai word for agriculture *kaset*, recalls its Indic derivation from the Sanskrit and Pali of words for plough work *krsi*, and even modern imports of Latin derived terms of agriculture, such as *ager*, now connote manual field work. Such associations contribute to the inferior status accorded those engaged in the sector including government officials.[64] Thus all production agriculturists are marginalised, especially small-holders.

Well-intentioned research and development activities have tacitly assumed that the agriculture of the more developed world contains the essence for global agricultural improvement. The successful Green Revolution[65] relied on improvements of yields through, for example, plant breeding which had conferred such benefits in more developed countries. However, small integrated farmers do not rely on the production of one commodity, even rice; they depend on, among other actions, the integration of backyard gardens, fish in rice paddies, shade and orchard trees, and livestock in an overall production system. Improving the output of one component in such systems requires compensation for any consequent losses from the total system. For this reason, high yielding cereals with high grain to stalk ratios were not universally popular[66] where small-holders relied on straw as livestock

[61] Board of the Royal Projects (1999)
[62] Cornell University (1999)
[63] Stace, W.T. (1952)
[64] Uphoff, N. and Fernandes, E. (1999)
[65] CGIAR (2000)
[66] Lund, S. and Fafchamps, M. (1997)

feed, water conserving mulch in gardens, and for other domestic purposes. Small-holders in marginal areas are easily further marginalised by generic recommendations of such apparently superior technologies.

Single crop research can also inadvertently add to small-holder and environmental challenges as externalities such as declining watershed viability impact. Agro-ecological approaches advocated by latter-day Green Revolutionaries[67] may thus evolve to an 'agro-socio-ecological approach'. The scientific method requires such criticism of the Green Revolution as a vital continuous questioning which leads to new knowledge; thus, rather than a belittling of the coordinated international intellectual effort which devised means of feeding millions otherwise destined to starve, current criticism may be used as a constructive input to current research. Science relies on such constant cognitive re-orientations; perhaps one example may yet be a return to small-holder practices of early rice transplanting and wide spacing to stimulate tiller and roots growth and hence grain production sites and nutrient uptake per plant in areas suited to hand harvesting.[68]

Intensive monoculture substitutes capital, through tractors and chemicals, for labour, producing images of efficient modern agriculture with tidy symmetric vistas which contrast with the apparently unplanned mix of enterprises on an integrated small farm. Clean, ploughed USA corn fields for example, became a benchmark which the mulch-strewn plots of Thai small-holders failed to meet, even though they may represent a biologically, environmentally, and agriculturally more efficient system[69] which can offer technologies to improve commercial systems.[70] The beginnings of this meeting of small-holder practices and commercial agriculture may be seen in modern corn harvesters which chop stalks, husks, and cobs as mulch, and the re-discovery of 'conservation tillage'.[71] Demarginalising of small-holders might occur if the source of such research outcomes were fully attributed.

[67] Altieri, M. (1995)
[68] Uphoff, N. and Fernandes, E. (1999)
[69] Steiner, K. (1996)
[70] O'Connell, P. (1999)
[71] Avery, D. and Avery, A. (1996)

Integrated pest management practices, organic fertiliser, prescriptive chemical fertiliser application, root to plant biomass ratios, and improved water use are seen as new scientific insights that can further enhance commercial agriculture, yet each has is antecedents in the type of agriculture practiced by small-holders. These farmers have long known or simply assumed; that hand removal of undesirable insects and judicious use of insecticides is more effective and cheaper, that manure and plant residues enhance fertility and soil structure, that wider spacing of plants increases the yield of individual plants, and that watering and concentrated fertilisers should be oriented to the needs of individual plants. So, the link between small-holders and commercial agriculture, rather than an assumption of a superior-inferior relationship, can assist in demarginalising small-holders.

In areas with poorer natural resource endowments, higher population densities, and inferior support services, such as sections of the Northeast, the primary development consideration after social equity is the ensuring of livelihoods. Hence, self-sufficiency, and sensitive improvement of small-holder practices where possible, constitute the main approaches to small-holder development. This relies on active engagement of small-holders in research and project planning in a manner which can be edifying and humbling to the development expert,[72] and help retain the interest of young people in rural communities and perhaps arrest their emigration.[73]

The role of small-holders in Thai agriculture appears secure, with sensible self-sufficient approaches providing not only release from inappropriate economic forces, but also a focus for research based on a two way respect of knowledge flow. That small-holder farmers continue to exist in more developed countries, often as a matter of personal choice where financial returns are not the overriding objective, should cause pause in any policy makers who seek to commercialise all aspects of Thai agriculture. Small-holders provide a cultural and traditional harbour for Thai agriculture and society as it struggles to accommodate foreign values that compromise perceptions of religious and cultural norms; these matters are discussed in the following chapter.

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[72] Merrill-Sands, D. and Collion, M. (1995)
[73] Uphoff, N., Esman, M and Krishna, A. (1998)

Summary

Key points pertinent to Thai agriculture which arise from the discussion of small-holders include:

- Small-holders underpin the economy through exported and domestic product, supporting their 70 percent of the population, without government welfare, although unique social needs of a middle-income, major agricultural exporting country which is unlikely to rapidly industrialise continue to require redressing.
- As the engine of economic growth, family farming cannot be viewed as a phase toward industrial agriculture, especially when the global efficiency of such systems is high if debt is low, and innovation, supported by education and research, allows continual increases in efficiency, which can frequently exceed those of industry.
- Intensive small-holder agriculture permits production of high quality produce, efficient use of by- and waste-products in integrated systems, and maintenance of cultural values which may be periodically recalled by urban society, although in need of an ennobling of views of agricultural production activities and lifestyle.