Chapter 14

Agriculture, Environment, and Values

The origins of Thai agriculture and environmental management, and socio-cultural aspects of both commercial and small-holder agriculture described in the preceding chapters provide a context for a discussion of traditional agriculture and the evident link between rural poverty and environmental decline.[1] While the private sector may assist sustainable agriculture,[2] policy-maker attitudes toward marginal poor small-holders will now need to consider enduring human values. This broad subject is approached in a hierarchical and integrated manner, perhaps contentious in its implications.

The chapter differs from others in being highly synoptic, as indicated by many paragraphs containing several references that each draw on hundreds of pages of others' thoughts. Conceptually, the chapter follows the book's theme of an evolution of Thai agriculture from environmental and social perspectives. Thus the progressive globalisation of agriculture is discussed through global food requirements and their inevitable impact on the natural environment, and the globalisation of economies and values, experienced in Thailand's case through international development practice. Deficiencies of the economic development model resulting from partial adoption of the underpinning essentials of development have accrued as costs to Thailand, in turn stimulating the domestic intelligencia to debate moral values ascribed to tradition and religion, which has produced embryonic practical outcomes in self-sufficient agriculture.

[1] CGIAR (1999)
[2] FAO (1996a)

Global Agriculture and Environment

Thai agriculture has significantly changed the natural environment as one part of global food production. As a major agricultural exporter, further modification of the natural environment is likely, even with improved resource regulations and environmental research and education. Romantic views of environmentally sensitive traditional forms of agriculture must ultimately acknowledge the realities of a higher global population density. Reliance on export income has irreversibly made Thailand part of this global culture, which relies as much on over-production as over-consumption among the wealthy of the world. Stability gained through appeasement of the urban elite has allowed an increasing gap between urban and rural persons. Current debates acknowledge Thailand's global position, as well as international views on environmental care, and the redefinition of agriculture as a social sector involving the majority of the population. The environmental context for Thai agriculture is thus affected both by global influences and Thai culture.

Thai culture instils a respect for authority which can enhance dissemination of embracing environmental views, as is clearly personified in His Majesty the King. Likewise, spiritual insights are probably more acceptable to an older Thai world-view than to a wholly materialist view.[3] Yet mystics and scientists share views often overlooked in technical solution-oriented cultures.[4] Scientists seek knowledge and probably share an awe and reverence for the universe, partly expressed as care for the environment.[5] However, popular quasi-religious replacement of scientists for lost superstitions[6] produces such fallacial beliefs as knowledge being sufficient to produce future global food requirements from chemical-free farming. Sustainable food and fibre production has long required new technologies and ideas,[7] and these have long transcended individual cultures.

Sustaining productivity is a responsibility beyond agricultural planners or any one group, involving moral values concerning natural resources and their

[3] Capra, F (1991)
[4] Stace, W.T. (1952)
[5] Knudtson, P. and Suzuki D. (1992).
[6] Stace, W.T. (1952)
[7] Rostow, W. W. (1987)

care on behalf of future generations.[8] Ideally, an environmentally educated populace could allow individuals to arrive at informed views;[9] however, in Thailand, polarised opinions can raise environmental issues without prior analysis.

Likely perceptions, derived from elsewhere,[10] of the probable sustainability of an agricultural system (Figure 14.1), indicate that low input wet

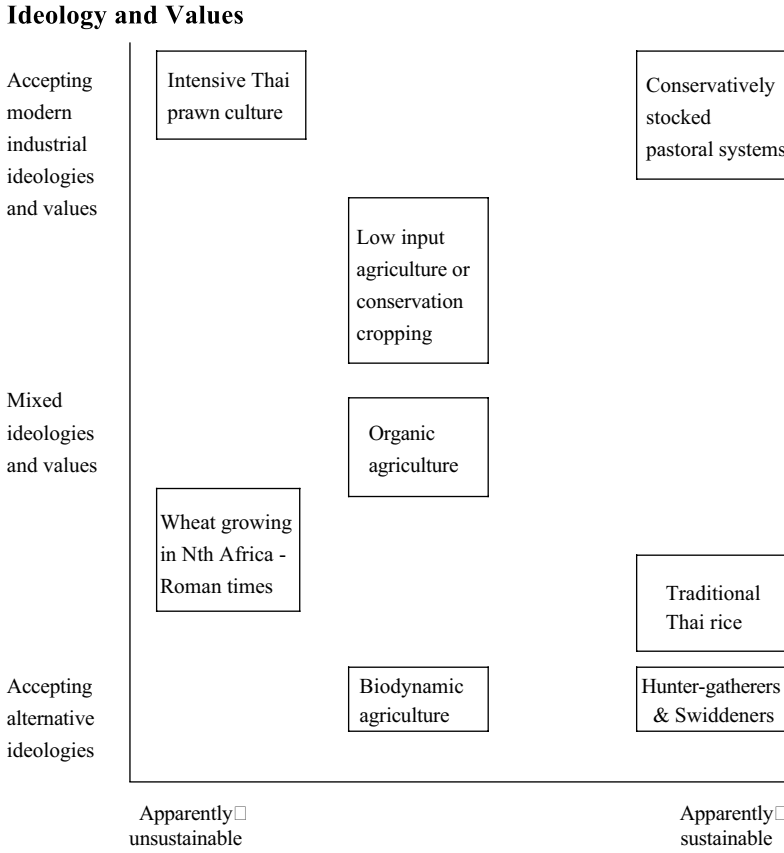

Figure 14.1 *Map of Agricultural Systems by Sustainability and Ideology*

[8] NZNHF (1995)
[9] Falvey, L. (1996)
[10] Reeve, I. (1992)

rice culture may is considered more sustainable than other modern intensive cropping systems. Thailand's lower input system compared to its exporting competitors suggests higher levels of sustainability. Informed education in the principles of natural resource management[11] already requires a higher scientific input in Thailand. Wealth from Thai wet rice produced today's dominance by a city society, which is now separated from the past society-wide ethic of land management and ignorant of the environmental approaches of informed farmers. Agriculture is critical to the materialistic development of Thailand and to feeding the world, and in common with all agriculture, significantly changes the natural environment.

State of the Thai Environment

Ecological modification in Thailand has followed the usual trends of; genetic manipulation of plants and animals to suit an environment, modification of the environment through such mechanisms as greenhouses, and persistent interventions through management techniques as simple as ploughing. Modernisation of Thai agriculture has led to a research, education, and extension system which outwardly mimics effective systems of countries in which there is now active care for the environment. However, just as current institutions struggle to meet today's needs, so today's concerns represent only a partial awareness of the impact of human actions on the Thai environment. Some examples from rice agriculture, soil degradation, chemical and water use, dams, forest encroachment, and biodiversity serve to introduce the need for informed Thai understanding of agriculture and the environment.

Ancient rice breeding and modification of environments to favour wet rice is one of the world's significant human environmental interventions, probably of greater impact than present day issues. Nevertheless, intelligent consideration of such recent impacts as; soil degradation, chemical contamination, dams, forest destruction, aquatic plants and animals, Green House Gas emissions, and reductions in biodiversity is essential to ongoing improvements to agriculture. Intensification of Thai agriculture has degraded soils such that, by 1990, 27 precent were very seriously eroded, 29 percent severely eroded, and 18 precent moderately eroded, with salinity, organic matter loss, and structural changes rising in incidence.[12] Local

[11] Falvey, L. (1995)
[12] Trebuil, G. (1995)

rice varieties have reduced from several thousand to a few hundred planted by less than five percent of farmers[13] while fertiliser and pesticide use have increased[14] without environmental or health regulatory controls.[15] Loss of indigenous agricultural practices[16] with adoption of credit-based cash cropping has been extended to situations where a self-reliant agriculture would have been more suitable.[17] The North, once faunally diverse and abundant is now said to be a near faunal desert.[18] Each of these examples is but a symptom of a deeper complacency which flows through agricultural expansionism.

Expansion of agriculture through opening new lands can now only access marginal and fragile soils, including steep, shallow and skeletal soils, with limited nutrients and moisture. Fertile, deep, relatively flat, well-drained soils of high natural organic matter[19] have been degraded, and regeneration will be according to biological or geological time frames (Figure 14.2), their sometimes faster apparent

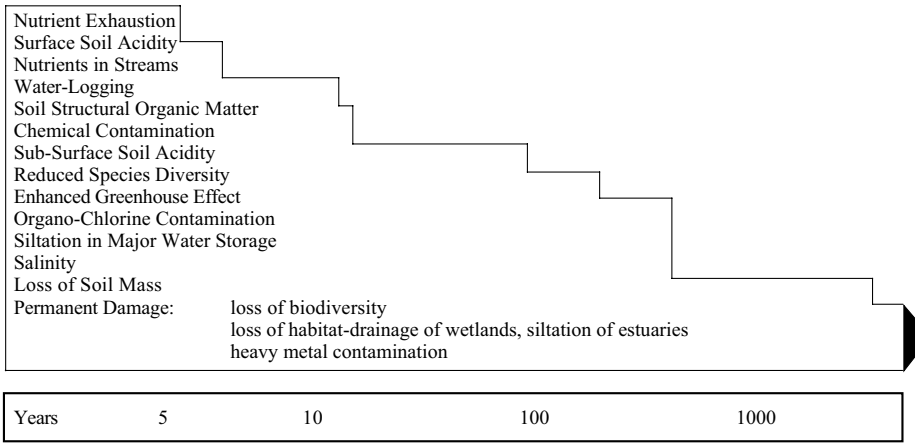

Figure 14.2 *Restoration Periods for Various Forms of Soil Degradation*[20]

[12] Trebuil, G. (1995)
[13] Choice, W. (1995)
[14] Siamwalla, Ammar (1992)
[15] AAF (1992)
[16] Lucas, B. and de Buque, T.L. (1993)
[17] Pretty, J.N. (1995)
[18] Dearden, P. (1995)
[19] IFAP (1991)
[20] Roberts, B (1995)

regeneration in the tropics belying their higher fragility to mismanagement.

Chemical herbicides utilised in Thai agriculture are of rising public concern; while residues are a trade and health issue, contamination of soil and water is the primary environmental impact. Extrapolating from other environments, seven of ten commonly used chemicals presently critical to food production systems will be found moving through Thailand's soil and water. Volatile organic chemicals such as pesticides are suspected of being transported through the atmosphere[21] and, in USA agriculture, atrazine has been confirmed[22] in rainfall.[23]

Water use and availability problems in Thailand are widely under-estimated and require resource pricing to stimulate sensible use and adoption of appropriate techniques. Thai farmers till wet paddies to facilitate transplanting of seedlings, and to assist land levelling, ploughing of weeds and stubble, and soil conditions for plant growth. Some irrigated cracking soils can lose up to 60 percent of water to permeable subsoils, yet simple post-harvest tilling can fill cracks and reduce both irrigation and chemical needs.[24] As rice is expected to feed more than half of the world's population over the next thirty years through yield increases of more than 40 percent, the world's largest rice exporter should be at the forefront of such water saving techniques as: [25]

- wet seeding - pre-germination of seeds by soaking for 24 hours prior to being direct sown onto muddied fields
- intermittent irrigation - rather than constant flooding, irrigation is applied only when soil has nearly dried out, on a continuing basis until harvest
- land levelling - eliminating land depressions which require additional water
- weed management - flooding fields to suppress weeds before planting can be replaced by alternative cultural, mechanical or chemical means
- management of cracked soils - straw mulching and shallow surface tillage during the fallow period reduces subsoil and lateral water losses.

[21] Atlas, V. and Giam, C.S. (1988)
[22] Nations, B. K. and Hallberg, G. R. (1992)
[23] Hatfield, J L and Karlen, D L (1993)
[24] IRRI (1995)
[25] IRRI (1999)

Water storage proposals with Thailand's neighbours suggest an orientation to current practices; Lao-PDR has supplied Thai electricity since 1970 and Thailand continues to lobby for additional capacity. Proposals also include: a dam on the upper Salween River with the Myanmar government; diversion of waters from the lower Salween into the northern Thailand river Mae Taeng; and the larger scale Pa Mon Dam project on the Mekong River with an eight dam cascade, or diversion of Mekong River waters to hydro-electric generating facilities in Thailand.[26] More than 20,000 square kilometre of forest lost to dams since 1960,[27] illegal logging conflicts,[28] underestimates of silt loads, filling rates, evaporation rates, urban and rural water conflicts,[29] and reduced fish catches,[30] have yet to be fully accounted in these proposals.

Rubber plantations in the South are a form of reforestation, which like other mono-cultures, support low levels of bio-diversity; by 1986, some 35 percent of rubber was within designated native forest areas.[31] Likewise, oil palms were expanded by government provisions for private leasing of degraded forests. The extensive mangrove forests degraded in recent decades by pollution, logging, and fishing, have been decimated by conversion to prawn farms. Over the period 1961 to 1992 mangrove areas declined from 2.3 to 1.1 million rai; an estimated 90 percent of mangrove wood was processed into high grade charcoal.[32]

Prawn aquaculture exemplifies technology exceeding ecosystem management ability. In addition to mangrove destruction, chemical treatment to extend pond life inhibits organisms which consume residual feeds and wastes, allowing nutrients to accumulate until algal blooms occur and consume available oxygen. Ponds abandoned for new mangrove areas are constituting a form of shifting aqua-cultivation;[33] costs are only beginning to be estimated.[34] Agribusiness in the white paper and sugar industries have also polluted unnecessarily with dioxin and molasses releases respectively into the Phong River near Khon Kaen, apparently

[26] Bello, W., Cunningham, S. and Kheng Poh, L. (1998)
[27] Hubbel, D. (1992)
[28] MIDAS (1991)
[29] Sukkamnert, Decharat (1998)
[30] Roberts, T. (1996)
[31] MIDAS (1991)
[32] Jitsanguan, Thanwa (1993)
[33] Weber, M.L. (1996)
[34] Jitsanguan, Thanwa. (2000)

without contravening existing regulations[35]

Destruction of Thailand's forests, rice cultivation, and ruminant husbandry are said to contribute to regional CO_2 and CO levels,[36] although the main sources of such Green House Gases (GHG) are the highly industrialised countries. Thailand produces less than one percent of global GHG emissions, which could be reduced through known technological innovations for rice [37] and ruminants.[38] Current reliance on a narrow gene pool in Thai agriculture is a risk in itself[39] as such reduced biodiversity creates vulnerability to climate changes, and reduced wild gene pools which limits ready genetic modification of major food crops. Of the some 300,000 plant species, between 10,000 and 50,000 may be edible, and 5,000 are used as human food; yet only three species, rice, wheat, and maize provide almost 60 percent of the global human diet. Within these species, breeding has eroded their genetic composition and hence their adaptability to new environments.[40] A casualty of modern Thai agriculture,[41] biodiversity cannot be recreated on demand as suggested by some,[42] as current knowledge of future genetic needs is limited and assumptions of omniscient and responsible social behaviour have always proved false.

As the issue is global, Thailand's consideration of solutions must include:

- the consequences of importing short term economic solutions to agriculture without adequate controls as used in the country of origin of technologies
- whether development to a level similar to, for example, Singapore, is possible in the Thai culture with a large and poor rural population producing raw materials for technologically more advanced countries
- the viability of relying on research concentrated in more developed countries and oriented more to agribusiness than to the economies of subsistence,
- the applicability of research that is concentrated on developing know-how for tomorrow while Thailand has not yet integrated present technologies;

[35] Bello, W., Cunningham, S. and Kheng Poh, L. (1998)
[36] Arrhenius, E and Waltz, T U (1990)
[37] IRRI (1995)
[38] Gibbs, M.J. and Lewis, L. (1989)
[39] Rosenberg, N. and Scott, M. (1993)
[40] Tribe, D. (1994)
[41] Srivastava, J., Smith, N. and Forno, D.(1995)
[42] Huber, P (1992)

- the effect of technology imports in inhibiting the development of local technology.

Emotive environmental discussions cloud balanced consideration of human needs and environmental tolerance, even when changed environments do not suit modern sensitivities. For example, objections to programs supporting agribusiness plantations of *Eucalyptus* at the expense of small-holder forest access have invoked environmental arguments reminiscent of medieval England superstitions in agriculture.[43] Rational discussion is thus difficult although an opportunity for informed and responsible academics continues to exist. Just as rice culture dramatically changed the natural environment, so new tree species will lead to change. Subverting social equity and rural development to a quasi-environmental issue has reduced government and agribusiness focus on both social and environmental responsibilities. Such Western-influenced environmental interest should widen to an understanding of related social equity views, which will inevitably cause some consideration of the shifts in Thai attitudes to the environment, and global forces on these in recent times.

Tracing Thai Attitudinal Shifts

Attitudes to peasants and the environment are influenced by commerce; in Thai agriculture, foreign contact and goods from the early export markets of Ayutthaya, marked the beginning of a shift from traditional Tai cultural values. Ayutthayan skill in creating effective institutions allowed domination of other Kingdoms; one of these institutions, the predecessor of the Ministry of Agriculture and Cooperatives, oversaw contentious issues affecting Crown revenue raising from agriculture. By the early Bangkok period, the *Krom Na* formed one of seven key ministries[44] which separated worldly-wise aristocrats from peasants, who thus became *de facto* repositories of traditional environmental and other values.

Values of peasant self-sufficiency began to shift toward commercial production under King Chulalongkorn's modernisation,[45] although adherence to traditions by semi-subsistence small-holders remained significant through to the 1970s. Traditions also subtly shifted through the social mobility offered by monkhood

[43] Huber, P.W. (1993)
[44] Wyatt, D.K. (1968)
[45] Dilokvidhyarat, Lae (1995)

education which linked aristocrats and peasants while supporting social stability[46] and conveying basic Buddhist values of right livelihood and reverence for life. Adoption of Western schooling from about 1900[47] initially included a religious ethic but soon was oriented to the foreign skills which proved more personally rewarding in the expanding and prestigious civil service. Thus environmental traditions in education from pre-Buddhist times were blended with Buddhist values which in turn were subjugated to Western influences at a central level.

Increased demand for practical skills produced vocational training as an antecedent to modern education, with token links to religious values. Agricultural education, emerging with the 1900s modernisation, expanded rapidly in the 1940s and adopted a production orientation which has, globally, strayed from its philosophical and moral foundations.[48] Education in Thailand can thus be seen as both an indicator, and a product, of shifts in cultural attitudes. The influence of Western education and associated economic forces of recent decades has forced Thailand to conform with global developments, which had a differing underlying approach to environmental management.

Global Development Forces

Global economic development has been assumed in polices of international development agencies[49] with environmental matters added after experience with narrowly based programs. Global commercial networks[50] have suited Thailand's modernisation objectives,[51] allowing dominant transnational and national agro-food complexes[52] to determine commercial production systems in concert with structural adjustment policies of the 1980s.[53] Mobility of capital renders reliance on this system risky; for example, contract growing can link small-holders to global price variations while exposing them to risks of transnational relocation of investments.[54] A tendency towards over-production which reduces

[46] Wyatt, D.K. (1966)
[47] Wyatt, D.K. (1975)
[48] Falvey, L. (1996)
[49] Biot, Y. et al (1995)
[50] Mikesell, R. (1992)
[51] Reus-Smit, C. (1996)
[52] Bonanno, A. (1991)
[53] Reed, D. (1992)
[54] Mikesell, R. (1992)

prices, while theoretically not an output of efficient systems,[55] introduces further price and market risks.

Small-holders, the majority of Thai farmers, have long been lobbied through extension promises; a current one is sustainability. New ideologies, justifications for unsustainable practices such as prawn aquaculture, and renewal of Thai Buddhist principles, have all used this new catch cry.[56] The concept originated from good intent[57] to balance Keynesian economics with social welfare, and continues to assume that the Western capitalist model is reproducible.[58] As small-holders have become a distant and uninformed component of a global trading system, their traditional environmental practices have been subordinated to so-called Western attitudes of nature domination.[59]

Rather than Western or any society developing a nature exploitation ethic, it probably originated as a by-product of political development in post-agrarian societies.[60] Emergence from feudal societies allowed individuals to become intellectual and economic entities which incidentally allowed a separation of socio-cultural matters from the natural environment.[61] In place of superstitions, science and economics evolved into such ideologies as fundamental ecology[62] and related political thought[63] , albeit with some questioning of the approach.[64]

Concurrent emergence of regional markets, essential to development theory, does not appear to have arisen from simple aggregation of local systems; rather, it was probably a system imposed by dominant entrepreneurs, eventually covering most of the globe.[65] Success of the free market approach separated economic from environmental interests,[66] effectively downgrading environmental

[55] Jacobs, M. (1991)
[56] Payutto, P.A. (Phrathamatidok) (1995)
[57] WCED (1987)
[58] McMichael, P. (1996)
[59] Murphy, R. (1994)
[60] Kuper, A. and Kuper, J.(1995)
[61] Murphy, R. (1994)
[62] Naess, A. (1989)
[63] Merchant, C. (1982)
[64] Shiva , V. (1990)
[65] Friedlan, R. and Robertson, A. (1990)
[66] Redclift, M. and Woodgate, G. (1994)

concern[67] as a matter of social choice,[68] which money and skilled technologists[69] could address at any time in regulated systems.[70] However, the separation of individuals from their natural environment stimulated neo-Marxist emphasis on responsibility in ecological management[71] which evoked views that society may have evolved through householder resource-sharing prior to transformation by market mechanisms.[72] These differing views led to central economic planning in systems upholding individual freedom supported by curbing of human excesses through education of the whole society.

Failures to balance long and short term societal needs is manifested in environmental decline[73] and its treatment as a technological problem, which supports a belief in continuous economic development, in Thailand's case through intensification of agriculture.[74] Application of Western development theory beginning with the US Marshall Plan successes in post-World War II Europe,[75] used State economic planning,[76] which assumed adequate education levels, rule of law, and codification of moral values; as each was subsequently found to differ between countries, interest in the social values of specific cultures arose.[77] The evident social and environmental costs then caused development specialists to reconsider the simple Western model through emotive analysis which produced often impractical social and individual choice models,[78] and worthwhile commitments to basic human values.[79] The early intuitive link between development projects and local requirements[80] was thus shown to be appropriate in the resulting two-tiered development approach where the first tier concerned national structural adjustment including legislation,[81] and the second aimed at specific local needs.

[67] Dryzek, J. (1987)
[68] Smith, A. (1986)
[69] Pearce et al (1990)
[70] Smith, A. (1986)
[71] O'Connor, M. (1994)
[72] Polanyi, K. (1957)
[73] Murphy, R. (1994)
[74] Mol, A. and Spaargaren, G. (1993)
[75] Falvey, L. (1994)
[76] Leys, C. (1996)
[77] Leake, J.E. (2000)
[78] Serageldin, I. (1996)
[79] Long, N. and van der Poleg, D. (1994)
[80] Streeten, P. (1995)
[81] Reed, D. (1992)

The Asian crisis highlighted the forgotten assumption of adequate governance, thereby completing the circle of social-economic factors long earlier defined by Adam Smith.[82] Sustainable development may therefore be conceived as a recollection of past insights into human behaviour and experience in international development. However, an entrenched technological orientation focussed on understanding the limits of sustainability,[83] and exaggerated claims of the superior 'sustainability' of a technology has undermined the credibility of technologists. The truth is that, in Thailand as elsewhere, little is known of the relative sustainability of intensive agricultural practices. Sustained rice production across millennia does not indicate the sustainability of modern rice systems, and both the Thai economy and projected world food consumption[84] rely on these modern systems.

Agricultural exporters are affected by global forces[85] which themselves encourage sustainable practices. Transnational companies can no longer expect to exploit one area and move to another with impunity. International development agencies can no longer plan projects in isolation from related developments globally, and national planners can no longer ignore legal, social equity, and environmental needs.[86] Thus environmental values are added to economic models[87] as social needs were before them. Notwithstanding neo-Malthusian spectres,[88] and public environmental concerns, development specialists should be optimistic about Thailand with sound assimilation of imported knowledge in all arms of government as a function of four decades of post-graduate education in Western countries.

World Bank analysis of the past 50 years of international development produced four conclusions,[89] viz:

- macro-economic stability is an essential pre-requisite of the economic growth essential to development
- economic growth does not filter down to poorer elements in a society which

[82] Smith, A. (1986)
[83] Redclift, U. (1987)
[84] Falvey, L. (1996)
[85] Giddens, A (1990)
[86] Mol, A. and Spaargarem, G. (1993)
[87] Daly, H. and Cobb, J. (1994)
[88] Falvey, L. (1996)
[89] World Bank (1999b)

must be addressed through specific human needs projects and programs
- a comprehensive group of integrated policies is essential to stimulate development
- sustained development requires socially inclusive and responsive institutions.

Accordingly, the World Bank has embraced sustainable development, including improvement of the quality of life through improved health and education, greater public involvement in government, inter-generational equity, and good governance in civil societies.

The preceding international development overview omits broader views of over-consumption and its links to control of the new engines of growth, knowledge and technology. The indicators of concern may already be generous intellectual property laws, and alienation of millions from new communication technologies.[90] It also omits the effects of development experience in Thailand. Imported advice and policies can now be seen to have placed undue emphasis on financial costs and benefits to the detriment of social and environmental values, in what was an imbalanced and partial approach to development. Such imbalance introduced costs greater than benefits in many cases, such as for small-holders. Nevertheless, future interpretations are likely to note the resilience of the development model through its ability to accommodate new challenges as societal values are costed.

Missing the Middle Path

Thai agriculture in the year 2000 is dominated by poor small-holder producers. Nevertheless, analyses of Thai agriculture focus on commercial agriculture and agribusiness as products of modern economics and science, with economics narrowly portrayed as a means for planning wealth creation. Development Plans even noted that social inequities arising from industrialisation would be addressed through greater national wealth benefiting the whole populace. Science likewise was portrayed as applied problem-solving technology to increase and sustain wealth generation, and as scheduled discovery of transferable proprietary techniques. By contrast, environmental values ascribed to Thai Buddhist traditions are romantically said to reside in once 'noble' peasants; of course, such depictions

[90]UNCTAD (2000)

are each but part of the whole of economics, science, and Thai Buddhism.

Importing of development planning to Thailand, without the cultural associations which created the German/Japan economic paradigm, allowed contextless expectation of theoretical outcomes. Keynes' warnings against the subordination of matters of greater and more permanent significance[91] were not heeded in technically oriented development practice, and the deliberately narrow methodology of economics which interprets past interactions were trusted as forecasts. Human factors and natural resources were thus unwittingly valued at zero, and it was assumed that all income was of the same value regardless of whether it was derived by human effort or speculative activities.

Of course, economic analysis allows such items as sustainably produced food, mined natural resources, or labour in primary, manufacturing, and services sectors to be valued on the any agreed basis. Emotive views that economists know the cost of everything and the value of nothing[92] are belied by natural resource and welfare economics, which could estimate the efficient price for a resource as the marginal cost of; supplying a resource to a user, plus any lost ecological functions, co-lateral pollution, lost future options, and lost existence and bequest value. However, this is still a partial recognition of values ascribed to life-style, culture, and other costs of development.

Science approaches imported to Thailand have similarly been misinterpreted into a belief system which delivers eternal consumer improvement. Its treatment in isolation from the humanities separated it from parallel Western moral precepts once maintained through religion, such that life is characterised in terms of scientific solutions to mental and physical health, and environmental problems. This precarious interpretation applies to all materialistic societies which assume continuous technological development and the honesty of the market place; for Thailand, it means that sustainable development cannot be expected from simple adoption of a foreign model. Nevertheless, Thailand was shepherded into the industrialisation model from this position of unbalanced views of economics and science.

[91] Schumacher, E.F. (1973)
[92] Young, M.D. (1993)

Competing with other low-middle income countries[93] to join industrialised countries which consume a disproportionate amount of global non-renewable primary resources, is anathema to Buddhist economics. Forty years of experience since the Marshall Plan in Europe[94] had showed that rapid resurgence in Germany, and Japan, was possible because essential foundations existed, including broadly based education, relatively equitable and working political and legal systems, and values which linked development to social stability. Thailand's adoption of the accoutrements of industrialisation without such essential elements limited its development to being an adjunct of industrialised countries and requiring foreign management personnel, while relying on cheap labour, and becoming a price taker to larger industrial groups.

Development following this model in Thailand would have included broadly based and effective education, social welfare policies, the rule of law, and adoption of a materialistic ethic in place of traditional values.[95] If Buddhist ethics suggest that means are more important than ends, output oriented policies seem anti-cultural; valued and valuable work opportunities might thus be worth more than production of weapons, for example. To suggest that Thailand eschew social policies until industrialised wealth can redress social inequities[96] placed ends above means, and recalls Keynes'[97] prescient, and perhaps cynical advice, that traditional virtues should be sacrificed to avarice and usury until economic growth had been achieved, when a return to enduring values would be possible. Imbalance produced Thailand's quandary of apparently outstanding growth followed by rapid decline.

World-leading economic growth obscured concern over the loss of traditional values, unsustainable environmental exploitation, and corruption which exceeded the generous cultural levels of tolerance. With economic crisis has arrived a reconsideration of views propounded by philosophically informed persons who have sought to redirect Thai society to its traditions, and to link these to Buddhist environmental values. A curious development which evokes emotion and argument around its inconsistencies, it holds practical opportunities for Thai agriculture, small-

[93] World Bank (2000)
[94] Falvey, L. (1994)
[95] Schumacher, E.F. (1973)
[96] NESDB (1988)
[97] Schumacher, E.F. (1973)

holders, and the environment. The first, although not critical step, has been to highlight Thai environmental traditions.

Seeking Environmental Traditions

The usually irresistible forces of economic development waned slightly from 1997, allowing some balanced views to be aired among recriminations about financial management. These views had been formulated against the success of the wealth creation model and were sufficiently formed to allow significant Thai contributions to a rising Buddhist environmental ethic. Before tracing the impact of popular Buddhist thought on agriculture, a cursory addition to the earlier discussion of Thai environmental views is helpful.

Chapter 2 has indicated that traditional Thai environmental management pragmatically modified the environment to suit rice production,[98] which co-exited with other more benign systems such as shifting cultivation. All involved appeasement of spirits in the natural environment combined with practical husbandry[99] to produced a new and stable ecosystem.[100] Successfully living in harmony with nature[101] appears to have been a Thai ethic from this anthropocentric perspective, as suggested from Ramkhamhaeng's description of human arranged landscapes,[102] the Sibsongbanna Tai ideal of holy hills and village forests,[103] and ancient Thai literature eulogising nature's bounty.[104] Environmentally related beliefs and ceremonies such as *Naak Hai Nam, Phra Mae Thoranee, Phra Mae Khongkha, Pharajaphithi Lai Ruea, Pharajaphithi Lai Nam, Pharajaphithi Phirunsat, Bang Fai, Songkran*,[105] and *Prapenee Pharya Mae Phosob,* as well as a range of folk sayings,[106] confirm the primary link of environmental traditions to agriculture rather than conservation *per se.*

[98] Falvey, L. (1996)
[99] Kunstadter, P. et al (1978)
[100] Geertz, C. (1959)
[101] Kriengkraipetch, S. (1989)
[102] Khanittanan, W. (1989)
[103] Sheng-ji, Pei (1985)
[104] Rutnin, C.L. (1989)
[105] Sriwatanapongse, S. (1997)
[106] Senanarong, Ampon (1997)

In seeking Thai environmental traditions in residual superstitions, practices, and unconscious actions, the example of plants long associated with Tai Buddhism being spread along trade routes through Thailand,[107] may indicate a tenuous environmental interest. Yet the agriculturists' wont to improve on the natural environment is evident in superstitions concerning plants which have evolved to decoration and landscaping. For example, plants with foreign names which, in the Thai language, have unfortunate connotations, are allocated specific sites - some such plants are:[108]

Thai Name	Botanical or Common Name	Thai Belief
Tau rang	*Caryota mitis*	'Rang' sounds similar to 'deserted' or 'abandoned'
Sala, rakam	*Salacea Wallichiana*	Spines; sala = 'forsaken'; rakam = 'affliction'
Soak	*Saraca indica*	Soak = 'sorrow'
Lanthom	*Frangipani*	Sounds similar to 'agony'
Anga	*Canagium odoratum*	Easily broken branches can damage houses
Champa	*Michelia champaca*	Easily broken branches can damage houses
Chaba	*Hibiscus rosa*	Associated with convicts
Malakaw	*Carica papaya*	Shallow rooted, susceptible to falling
Mayom	*Phyllanthus acidus*	Sounds similar to the Indian God of Death

However, rice is the central component of Thai tradition. Its spirit allows avoidance of famine,[109] a concept implied in the sophisticated old Mon language of rice culture and associated philosophical concepts derived from introduced Buddhism,[110] and made real through continued advances in rice irrigation.[111] Respect for rice, formalised through everyday rituals akin to saying of grace in Western cultures, once acknowledged *Mae Phosop*, the Rice Mother in the raising of one's right hand while one's mouth held rice, and by a *wai* at the end of the meal. Appropriate reverence throughout planting, harvesting, threshing, pounding, polishing, transporting, and storing of rice ensured good harvests. Animistic references to rice being 'pregnant', similarly reflect assumption of the vital spirit of rice;[112] more virtues were once nominally ascribed to rice and *Mae Phosop* than to the Buddha by northern Thai persons. An extensive range of rituals varying by

[107] Needham, J. (1956)
[108] Rajadhon, Anuman (1961)
[109] Izikowitz, K.V. (1951)
[110] Luce, G.H. (1965)
[111] Plagden, G.O. (1906)

region across all months of the year to a total of more than ninety ceremonies and actions have been documented.[113]

With the shift from traditional to institutionalised irrigation systems, a reduction in the perceived influence of spirits on the control of natural events occurred, leading to a reduction in ceremonies to the Great Mountain Lord *Jao Khao Luang*, Lord of One Hundred Thousand Elephants *Jao Saen Chang*, Lord of the Golden House *Jao Ho Kham*, Lord of the Iron Wrist *Jao Kho Mu Lek*, and ceremonies on specific days of the waxing moon of selected months. Irrigation managers, who had previously organised these ceremonies, accordingly lost their power as the *kamnan*, an institutionally approved locally elected leader, assumed authority; villagers perceived increased frequency of flooding, siltation of irrigation systems, and variations in rainfall regimes, and attributed these to a progressive reduction in the power of the spirits as the Royal Irrigation Department assumed authority.[114] Interestingly, some ceremonies have been absorbed into modern Thai institutions.[115]

As the spirits lost power to officials, once acceptable practices, such as lower social status conferring lower levels of duty, led to reductions in; maintenance of irrigation canals, protection of public forests, and even tidiness of communal areas.[116] Moral and religious silence on environmental matters falsely assumed continued sensible behaviour; merit making rituals performed for traditional reasons remained unconnected to environmental matters.[117] By the 1970s, diversification away from rice became policy,[118] severing the remaining link between animistic belief, and economic and environmental well-being.

[112] Rajadhon, Anuman (1955)
[113] Suratanakavikul, Puangphep et al (1997)
[114] Lando, R.P. (1983)
[115] Chunnapiya, Supatra (1997)
[116] Hafner, J.L. (1973)
[117] Mulder, J.A.N. (1968)
[118] Muscat, R. (1994)

Upland export crops[119] introduced from the 1960s had few traditional associations, and the overriding influence of cash incomes favoured acceptance of the view of continued economic growth supported by faith that science[120] could solve all problems, including environmental problems. From this perspective, modern Thai environmental thought may be seen as derived from the West rather than a direct outcome of tradition. Coincidentally, attempts to find a Thai eco-Buddhism in popular interpretations of ancient teachings, may unwittingly be also drawing on Western thought.

Popular Buddhist Thought

Thai environmental thought has been strongly influenced by Western ideas.[121] Local environmental arguments against intensive agriculture have sought a value base in Thai Buddhism[122] and modern perceptions of traditional Thai values[123] of environmental respect. Thus the following can be read as both an emerging Thai environmentalism in the face of undesirable foreign influence, and as the balancing forces of Western environmental and materialistic thought pervading an Asian culture.

Buddhism might be seen as seeking to unite man with life and himself, while the unenlightened majority remain ununited and hence strive to solve recurring conflicts as *... a stranger and afraid, in a world I never made.*[124] Such transcending of the common intellectual and emotional approaches to life suggests cessation of categorisation into familiar frameworks which, by separating subject and object, precludes unity in understanding. A technological society seeking solutions to problems through reductionist approaches contrasts with the wholeness view of Buddhism, even the simpler codified principles for the laity. Medieval subordination of individuality to an ultimate meaning might have been one Western holistic approach, yet is difficult to recall today when individual freedom pervades and is separate from minority interest in spiritual matters. However, popular thought is

[119] Christensen, S. (1992)
[120] Stace, W.T. (1952)
[121] Rigg, J. (1995)
[122] Harris, I. (1995b)
[123] Sheng-Ji, Pei (1985)
[124] Phillips, B. (1962)

less concerned with philosophy than the meaning for everyday worldly life, where faith in codes and rules is the main form of religion.

Buddhist love of nature is likened to respect and friendship with a fellow being seeking spiritual growth and hence essentially part of the same entity, which in worldly terms, might be considered the external environment.[125] Species eradication, economic development, individual acquisitiveness, technological control, and anthropocentricism ascribed to Western values are easily contrasted with Buddhist views of; humans as part of nature, non-violence, mental awareness, conscious action, and ego extinction.[126]

Claiming a long tradition of environmental awareness among forest monks[127] devoted to hermitic personal meditation as distinct from urban-based monks reliant on text learning, provides a convenient metaphor for rural and urban values; yet the essence of forest monkhood has been separation from worldly society. Some might therefore see the proposed environmental education roles for forest monasteries such as Suan Mokkhaphalaram[128] as a modern protest rather than as revival of a tradition. Likewise, promoting temples as havens for endangered animals[129] and highlighting apocryphal Buddhist stories concerning the cutting of trees,[130] appears to suit modern environmental messages yet may be ex-contextual. Notwithstanding purist concerns, a popular Buddhist environmental movement has begun. Even if only a fraction of the some 25,000 temples in Thailand[131] assumed such a moral orientation to worldly conservation, one might expect a general change in lay persons'attitudes to recent actions.[132]

For those who decry such manipulation of Buddhism in Thailand as an instrument of national integration, the unification of various aspects of Theravada Buddhism to form a national religious system in the early 1900s might be seen as the first error. However, this helped to create the nation of Thailand, and for this

[125] Suzuki, D. (1962)
[126] Sponsel, L.E. and Natadecha-Sponsel, P. (1995)
[127] Rigg, J. (1995)
[128] Visalo, Phaisan (1990)
[129] Kabilsingh, Chatsumarn (1987)
[130] Bhutagama, Vagga, Pacittiya (no date)
[131] Kabilsingh, Chatsumarn (1990)
[132] INEB (1990)

reason appears consistent with religious support for moral national objectives, including balanced economic development and assimilation of tribal peoples. Nevertheless, alignment with national policy may have reduced the religion's subsequent influence in Thai society.[133] Recent popular thought in Thailand has caused its emergence as a leader in modern Buddhist environmental thought, notwithstanding the difficulties inherent in claiming canonical authority for new religious ideas.

Conservative Canons

The mixed objectives variously ascribed to Buddhism, which surround increased environmental awareness, social responsibility, and sustainable agriculture, rely on interpretation of the Pali canon. The question as to whether Buddhism advocates an environmental ethic, is ambivalent to the environment, or in fact contributes to environmental degradation, can perhaps be addressed through such discussion.[134]

Buddhologists differ over the extent of the religion's environmental ethics[135] which are confused by adoption of anthropocentric interpretations. If Buddhism advocates individual release from ego, and other teachings are interpreted as means to assist this end, including a correct world-view attained through contemplation, then original Buddhism can be interpreted as affirming the world rather than escaping it;[136] however, others consider that Buddhism accommodates human values before those of other creatures and plants.[137]

As the environmental issues discussed today were not conceived when Buddhist texts were written, explicit Pali statements on current issues cannot be expected. However, to remain a vital social force, the religion probably needs to address current issues through modern exegesis of traditional teachings. Traditional teachings appear to consider care for nature as a spontaneous outcome of an individual's spiritual development, but not as a valued entity in its own right. The

[133] Charles F. Keyes, C. F. (1971)
[134] Schmithausen, L. (1999)
[135] Harris, I. (1995a)
[136] Macy, J (1990)
[137] Hakamaya, N. (1990)

state of the environment might therefore be interpreted as a karmic outcome of the actions of individuals and groups.[138]

The most common invocation of Buddhist teaching as environmentally enlightened is the prohibition of killing sentient beings. To argue these as environmental ethics within original teachings requires uncommon objectivity, especially if precepts are seen as preparatory moral steps toward wisdom.[139] In terms of evaluation of existence, Buddhist texts seem to be ambivalent, seeking only to liberate from suffering. Likewise, the mystical doctrine of causal dependence can hardly be claimed as a specific prescient statement of ecological interdependence.[140]

Removal of suffering by eliminating desire, including greed for material possessions, social prestige, and perhaps even sexual gratification when linked to population growth, may reduce environmental destruction. Teachings on loving-kindness and consequent unification with other living beings similarly impart incidental environmental benefit, although minimising pain to individual animals relates poorly to biodiversity concerns. Thus early Buddhist teachings may incidentally promote environmental care.[141]

However, objective consideration must also include teachings which conflict with current environmental values, such as killing introduced animals to return an environment to a modern perception of its original form. Individual Buddhist teachings which prohibit injury to plants because they house insects, or pollution of water because it contains small animals, can be used to both support and criticise sustainable agriculture approaches within an ecosystem. Such worldly impractical teachings have led to lay propitiation for essential agricultural actions, such as killing small animals and insects, through meritorious deeds, and to allocation of killing for meat to other persons in the Thai society.[142]

[138] Schmithausen, L. (1999)
[139] Schmithausen, L. (1999)
[140] Macy, J (1990)
[141] Batchelor, M. and Brown, K. (1992)
[142] Spiro, M. (1982)

Another strand of Buddhist writings with environmental references relates to remote forest monks whose spiritual search is intensified by the attendant dangers of wild animals. As introduced earlier, Thai forest monks support environmental protection today, although the original association derives from times when forests were abundant, and it was probably inconceivable that they would one day be threatened. Purists note that the tradition is derived from Hindu practices, as may be the anthropocentric adaptation of environments to suit mankind[143] which pervade Thai environmental history. Modern views of animal species preservation are unsupported by Buddhist texts which view animals as a lower life form than man with concomitant greater levels of suffering. The more popular Jataka texts anthropomorphise animals and allow some to be considered more worthy than others. While precepts which prohibit killing may appear to favour conservation,[144] human population growth which causes the demise of wild animals takes precedence.[145]

Early Buddhist sources present an ideal world as populated by villages and wealthy cities which are, reminiscent of Western fears, wary of nature.[146] However, the Discourse on True Blessing, *Mangalasutta,* also assumes that individual morality is essential to an ideal society that would exhibit a constructive and harmonious environment in visual and auditory terms, and ensure excellent education, income, and public services for all members who would retain an excellent ideology;[147] the parallels with modern advocations of good governance are clear, with incidental environmental benefits. Many ideas were absorbed into Buddhism from Indian civilisations of the time; the same era of Indian spiritual development also influenced Western thought. As discussed below, the wheel has turned with the West influencing modern Buddhist environmental thought.

These, perhaps eclectic, examples about Buddhism's view of nature indicate that it is not domination, but transcendence of all such views through detachment which is the religion's concern.[148] Such negation of nature includes

[143] Schmithausen, L. (1999)
[144] Sober, E. (1986)
[145] Schmithausen, L. (1999)
[146] Schmithausen, L. (1999)
[147] Chandra-ngarm, Saeng (1998)
[148] Otto, R. (1932)

negation of civilisation; nature is thus not treated separately in higher teachings. So, while essential Buddhism did not acknowledge ecology in the modern manner, many of its lay values enhance environmental care, particularly compassion. Modern Thai Buddhism contrasts with some early teachings simply because the issues of today were not foreseen and hence not used as examples to explain desirable moral codes for lay persons. Seen in this light, there may be no reason to seek further textual derivations for modern eco-Buddhism.

Rising Eco-Buddhism

If the link between Buddhism and environmental consciousness is thought to lie in modern thought, then the origins of eco-Buddhism deserve consideration. Stumbling-blocks such as the doctrine of causation might be ignored as a separation between mystical insight and religious practice, as occurs in all religions. In Thailand's case, the close relationship of State and religion in Thailand appears to facilitate development of an intellectual eco-Buddhism.

Five intellectual groupings of eco-Buddhist thought have been elicited from recent writings, viz:[149,150]

- authoritative endorsement, including by the Dalai Lama, without canonical reference[151]
- endorsements by scholars and activists referenced to Buddhist doctrine[152]
- actions by high profile monks, nuns, and lay persons, particularly in Thailand[153]
- concern about doctrinally validity coupled with sympathy and support[154]
- objection on the grounds of canonical inconsistency.[155]

Notwithstanding doctrinal problems, eco-Buddhism is widely supported. Accepting change, Buddhism denies the universal purposive intent of other religions and hence is silent on the maintenance of an environment[156] suited to humans

[149] Harris, I. (1994)
[150] Harris, I. (1995b)
[151] Gyatso, Tenzin (1986)
[152] Macy, J (1990)
[153] Buddhadasa (1956)
[154] Schmithausen, L. (1999)
[155] Hakamaya, N. (1990)
[156] Harris, I. (1991)

and ascribable to God. Leaning more to a pragmatic 'scientific' world-view than a purposive teleological view of the world in Stace's definition,[157] eco-Buddhism draws on a Western[158] philosophical and intellectual base, as part of rising global eco-religiosity, building on liberal Christian philosophy from the 1960s.[159]

Inter-religion dialogue over the past three decades found a common and unthreatening theme in the environment.[160] The interconnectedness of mankind is reflected in global environmental issues, discussion of which facilitated intellectual congruence in fora removed from cultural and historical sensitivities of each world religion.[161] The evolution of religions towards an all encompassing philosophy is clearly attractive to many, and some even suggest an outcome of a future unified eco-religion itself.[162]

Categories of eco-religious thought include:[163]

- eco-spirituality with an holistic view of the universe[164]
- eco-justice with a political and social orientation to global equity[165]
- eco-traditionalism, resource stewardship, associated with past superior values.[166]

The first category has Buddhist and Christian advocates whose similar views possibly arise from earlier dialogues, yet are attributed to the nature of an essential truth. The third category suits most Christian sensitivities and also idealistic views in Buddhism.

Eco-justice views have been evident in Thailand among social activists who link sustainability of society to Buddhist principles. Post-economic crisis emotions have allowed these views to be widely canvassed as an antidote to excessive consumption, and to advocate attenuated industrial development as part

[157] Stace, W.T. (1952)
[158] Harris, I. (1994)
[159] Harris, I. (1995a)
[160] Beyer, P. (1994)
[161] Harris, I. (1995b)
[162] Falvey, L. (1998)
[163] Harris, I. (1995a)
[164] Berry, T. (1988)
[165] World Council of Churches (1991)
[166] Granberg-Michaelson, W. (1992)

of moderation and personal responsibility. Activists have been able to invoke authority through, for example, respected monks ordaining threatened trees which, while causing conflict within the *Sangha*,[167] has been politically effective.

At the heart of eco-Buddhism approaches is the stumbling block of the intellectual tool of separating subject and object in relativistic comparisons. This very facility which allows human material development, impedes spiritual development according to mystics of all great religions.[169] Worldly approaches which seek to accommodate such unintelligible truths in, for example, practical agriculture will therefore inevitably produce conflict; nevertheless, recognition of different approaches for commercial and self-sufficient agriculture is producing outcomes that may yet attach some unique qualities to future Thai agriculture.

Thai social activists aligned with eco-Buddhism and liberal Christian eco-justice advocates are linked through some NGO development philosophies, which in fact lends credibility to these new religious views. However, extreme measures to motivate environmental action, such as warnings of an apocalyptic environmental catastrophe are more easily accommodated in Western than Buddhist thought. Ironically, in accepting the approach of eco-justice, Thai activists may have accepted a largely Western philosophy to counter the perceived unsuitability of Western economic approaches of recent decades. Such considerations presumably support conclusions that development activities are self-perpetuating and a threat to the poor.[170] In any case, pragmatic Thai Buddhism may well embrace such global environmental views as the outcome appears beneficial, and the cost of acquiescence low. In so doing, Thailand would be part of wider revisions which seek to produce practical approaches.

[167] Harris, I. (1995b)
[169] Suzuki, D.T. (1962)
[170] Hershock, P. (1999)

Practical Approaches

Practical outcomes derived from mystical experiences of all great religions necessarily creates various worldly interpretations. Within Buddhism, this has been explained in terms of two types of truth, ultimate truths derived through personal mystical experience and incommunicable to those without such experience, and conventional truths interpreted by insightful mystics who have attempted to assist others in their personal spiritual development. An essential component of conventional truth, that the world is not as it is perceived through the human senses but rather is an outcome of physical and psychological effects,[171] provides a context for common environmental teachings.[172]

In environmental terms, treating nature as separate from humans, is said to neglect individual spiritual development to the detriment of both individuals and society.[173] From this integrated perspective, economics, environmental concern, and human existence are inseparable, and consequently economic activity must ensure that it does not harm society in the broadest sense. Practical outcomes of such thoughts include the eight components of the Buddhist Path which aim to curb human desires and support teachings that all should engage in honourable, fulfilling, and creative activities, and that a government economic objective should be absence of poverty rather than high national income.[174] This practical view shows the illusory character of economic growth based on environmental destruction,[175] rising rural poverty, and unemployment.[176]

Buddhist principles, long interpreted flexibly, have inhibited rather than prohibited meat consumption, although the bulk of Thai dietary energy and protein has been derived from rice, and to a lesser extent fish,[177] until recently. Moral and religious pragmatism in Thai subsistence agriculture continues in rural communities with some cultural memory of migration; for example, the Tai Yong in the North consciously observe the need for recreation and reproduction as well as transitory

[171] Dhamma, Reweta (Bhikku), (1990)
[172] Gyatso, Tenzin (1986)
[173] Payutto, P.O. (no date)
[174] Payutto, P.A. (1994)
[175] Payutto, P.A. (no date)
[176] Bello, W., Cunningham, S. and Kheng Poh, L. (1998)
[177] Hasek, H.M., Seatsaneh, Saovanee and Hanks, J.R. (1958)

aspects of being and non-violence in the composition and presentation of the meal.[178] Symbolically, the matri-focal Thai culture intertwined with religious values in self-sufficient agriculture is recalled through the embracing word *khropkhrua* (family) incorporating the word *khrua* (kitchen) in the manner of home-and-hearth.

Practical interpretations of Buddhism also derive curiously from dissatisfaction with divergence of institutionalised Thai, Sri Lankan, and Indian forms from original teachings, leading to new sects of 'Protestant Buddhism'; the term has no connection to Christian denominations. Environmental concern is one unifying factor in these sects, which in Thailand, have also highlighted related behavioural excesses of some monks, politicians, and businessmen. Restating the moral benefit of practical religious guidelines for common lay persons, this reformed Buddhism also tempers the effects of materialism through insightful thinkers, unconstrained by culture as advocated in the *Kalamasutta,*[179] who have advanced a form of Buddhist economics.[180]

Buddhist Economics

One Buddhist conception of economic systems views work as a means to employ and develop inherent faculties and to reduce ego-dominance by cooperating in common tasks while providing essential components for life. The expected outcomes of human dignity, freedom, and spiritual well-being contrast with economic planning which values outputs above intangible human welfare benefits such as creative activity. This approach may, for example; rank full self-fulfilling employment as a higher objective than increased GNP, ascribe a high value to the natural environment, and require industries to compensate for environmental incursions.

Application of the approach to Thai agriculture leads to equally radical outcomes. For example, as is clear to those experienced with small-holders, a working animal has a broader inherent value than a tractor; why then would mere work output determine the relative values of tractors and buffalo? If the animal and tractor are considered a metaphor for agricultural and industrial development, the

[178] Trankell, I.B. (1995)
[179] Chandra-ngarm, Saeng (1998)
[180] Payutto, P.A. (1994))

paucity of understanding about agriculture engendered by its treatment solely as an economic activity may be clearer. Buddhist agriculture values working with soil, being involved with countless living organisms in the soil, plants and animals, and the interaction of humans as part of the biological process, above the repetitive, machine-dominated, and sterile environments of industry with its reliance on supervision, management, sick leave, holidays, and a diversionary-based lifestyle outside the factory. The difference is inadequately captured in such terms as 'rural life'.

Practical religious thought, including new economic perspectives, have attracted attention within and outside Thailand. One bridge between apparently conflicting human and environmental views has been consideration of alternative agricultural production systems.[181] A practical interpretation of such alternatives as a middle path for poor small-holders in Thailand, has been promoted and trialed with varying success.

Alternative Agriculture

Concern that intensive agriculture[182] neglects beneficial components from traditional farming systems[183] is likely to lead to absorption of alternative agriculture into institutional definitions of sustainable agriculture.[184] Technologies to increase food production and divert famine[185] may have reached a peak,[186] thereby suggesting potential for traditional or alternative agricultural practices to complement Green Revolution technologies in the next step of agricultural research and development in less developed countries. Agro-ecological approaches already attempt this by reducing costs for socially[187] and environmentally informed technologies which do not assume lower yields.[188]

[181] Cornell University (1999)
[182] Wasi, Prawase (1996)
[183] Conway, G. (1997)
[184] Altieri, M. and Uphoff, N. (1999)
[185] Crosson, P. and Anderson J. (1999)
[186] Pingali, P., Hossein, M. and Gerpacio, R.V. (1995)
[187] Thurston, H.D. (1994)
[188] Francis, C.A. (1986)

Alternatives to intensive commercial agriculture[189] may be profitably considered in terms of their origin, application, and success in either more developed, or less developed, countries. Self-sufficiency implies quite different qualities of life in different countries in terms of health services, access to education, opportunities for one's children, and communication. As a lower middle income country[190] unlikely to achieve rapid industrialisation of a sustainable or highly profitable type in the next decade, Thailand's tentative moves to greater social equity might indicate some acceptance of the values introduced above.[191]

Alternative agriculture is associated with low input and ecologically considerate forms of food production[192] which incorporate essential human values[193] including self-reliance,[194] healthy food, and some income.[195] One approach tried in Thailand was the Japanese Fukuoaka[196] farming system which eschews ploughing, weeding, commercial fertilisers and pesticides, and pruning, while emphasising spiritual aspects of the practice of farming and producing sufficient food for the family, possibly with a small surplus for security or sale. Developed in a temperate climate, its application to Thailand suffered from rapid tropical weed growth. A modification, the Kyusei Nature Farming system, aimed to produce high quality food while meeting economic and spiritual objectives for both farmers and consumers[197] through use of microbial inoculants to improve soil quality and plant growth. Relying on a well developed delivery infrastructure, and some doubt of the efficacy of the micro-organisms in the Thai environment, the system was not adopted widely in Thailand.

Permaculture,[198] a system based on industrial chemical-free integration of forestry with agriculture, a multi-crop mix, and hydroponics linked to aquaculture, has been tried with limited impact in Thailand, possibly because it is hard to distinguish its benefits from those of existing integrated agriculture. A Thai variation

[189] Wasi, Prawase (1996)
[190] World Bank (1999d)
[191] Payutto, P.A. (1994)
[192] Schaller, N. (1993)
[193] Beus, C.E. and Dunlap, R.E. (1990)
[194] Pretty, J.N. (1995)
[195] Udagawa, T. (1993)
[196] Wasi, Prawase (1988).
[197] Matsumoto, Y. (1993)
[198] Mollison, B. (1988)

based on a symbiotic agri-aqua-culture system utilising reduced levels of industrial fertilisers and pesticides has proven more culturally acceptable to both Thai farmers and extension agents.[199] Farming systems research and extension approaches in Thailand have also embodied elements common to alternative agriculture.[200]

One successful alternative agricultural approach seems to be organic farming. Hardly new in any traditional agricultural society, its modern guise was foreshadowed in Thailand in the 1950s,[201] and expanded to the use of natural fertilisers, nutrient recycling, and weed control without industrial chemicals to service a middle class market. Pesticide free rice products and organic fruits and vegetables to be exported from Thailand should benefit from certification of organic produce which became possible from 1998 with the passing of the Alternative Agriculture Certification Act.[202] Differing from self-sufficiency systems, organic farming requires market understanding and access to capital. Opening of organic produce outlets in Thailand has highlighted the higher marketing costs for such specialised goods compared to the usual bulk commodity trading. It has also revealed the distinction between, for example, Japan and Thailand, in domestic rice pricing.[203]

Perhaps the closest association of alternative agriculture with Thai Buddhism has been through the Santi Asoke sect which adapted Japanese Nature Farming with the additional stipulation of avoiding the deliberate killing of pests through any means including non-chemical approaches. Produce is sold through the sect's vegetarian restaurants with profits allocated to charitable activities. Adoption of this alternative agricultural approach is most likely to remain restricted to members of the sect,[204] which is tolerated by the Thai *Sangha* as a renegade religious group which substitutes work for meditation and maintains political affiliations,[205] yet appeals to values espoused by many eco-Buddhists.

[199] Wetchaguran, K. (1980)
[200] Shinawatra, Benchaphun (1991)
[201] Smith, H.L. (1969)
[202] Liamjamrun, Wirajit (1996)
[203] IRRI (1992)
[204] Wasi, Prawase (1988)
[205] Fukushima, M. (1999)

Another alternative is to reduce input costs rather than binding small farmers solely to chemicals, credit, and forest encroachment to produce commodities such as cassava, sugar, and kenaf which offer declining returns in global markets. A further step based on producing one's own family food without major chemical inputs in an integrated farming system has been described in Thailand as one element of self-sufficiency.[206] Viewing man as part of this integrated system, Buddhist principles are made practical for millions of Thai small-holders within a global ethic.[207] The value of all individuals in the society, of physical work associated with producing one's food, and of a broader philosophical understanding of the true nature of the world, offers a means of enhancing small-holder agriculture.

Small-holder agriculture has been ill served by the systems which supported the separation of man from nature through destruction of forests,[208] and adopted foreign culture without valuing the loss of traditions, leading to abuses of power in Thai society. For example: inappropriate policies to prohibit export of genetic material of tropical fruits lost valuable patenting opportunities on behalf of Thai farmers, and created an illicit trade and import barriers in countries seeking open trade; the absence of humanities subjects in agricultural courses allowed small-holder agriculture to be considered in isolation from small-holders as it created technicians without a broad knowledge of the real nature of the world; promotion of new crops to small-holders exposed them to unexpected markets risks, and coordination between ministries and departments has ignored the primary purpose of government agencies.[209] While such views are not new to Thailand, official interest in balanced development may be.

Seeking a balance between social, spiritual, and material needs[210] and maintaining cohesiveness of connections between human beings, the environment and the various aspects which make up life, are assisting realistic consideration of small-holder self-sufficiency. Rather than focusing on economic development or even environmental remediation, these are seen as natural outcomes from a goal of peaceful coexistence.[211] Conceptually difficult for decision makers inculcated

[206] Wasi, Prawase (1990)
[207] Nakasone, Y.(1985)
[208] Sakharin, Rapee (1998)
[209] Sakharin, Rapee (1997)
[210] Wichiarajote, Puntape (1998)
[211] Wasi, Prawase (1998)

with materialist values, there appears sufficient respect for such a philosophy residual in Thailand for self-sufficient agriculture to be seriously considered in the next decade.

The exemplary role of His Majesty the King in advocating self-sufficiency in the style of ... 'the whole realm dwells in happiness if the King lives aright',[212] provides hope for re-evaluation of the role of small-holder agriculture. Such ancient responsibilities have long been shifted to government and its agents with the creation of a constitutional Monarchy and righteous governance is perhaps the aim of popular aid approaches to 'good governance'. However, as the cargo-cult copying approaches to industrialisation failed, so may simple adoption of supposed 'good governance' until all elements which contribute to such systems are in place. These include widespread effective education, adherence to common values including environmental values, freedom of information and debate, and active participation of concerned citizens in the political process, all reminiscent of *Mangalasutta* teachings.[213] Self-sufficiency embraces all of these factors across the whole society.

Self Sufficiency

Among the unique aspects of Thai agriculture, culture has a specific role. The distinctive historical, cultural, and political factors of Thai agriculture include; the legal system, patronage based relationships, assimilative social character, and reliance on born leadership. The legal structure for Thailand, in such areas as land ownership for example, has drawn heavily from the West although it has lacked the supporting education, administration, and legal structures.[214] The Thai patronage system has and continues to assist transference of knowledge of rural development in Thailand[215] although it can impede civil servant effectiveness. The flexibility of Thai society has created an envied stability while absorbing different cultures into an evolving national identity, which is now faced with channelling the influence of Chinese Thai wealth into a unique democratic form of government for Thailand while meeting wide social objectives.

[212] *Digha Nikaya* Volume 3:85
[213] Chandra-ngarm, Saeng (1998)
[214] Wijeyewardene, G. (1967)
[215] Silcock, T.H. (1970)

Flexibility is coupled with a high expectation of leadership from those in authority. Common persons continue to view the King as the ultimate authority, notwithstanding constitutional limitations to the power of the Monarchy. In fact, the leadership of His Majesty the King continues to be a major force in sensible development and amelioration of circumstances surrounding crises. Societal trust in leadership from others in authority, or those accorded status from higher levels of university education, has been less well rewarded.

Such special Thai characteristics lead to outcomes unforeseen by foreign observers, such as the rapid adoption of the self-sufficiency ethic by politicians previously opposed to the approach,[216] except as a means of risk minimisation with crop diversification.[217] Self sufficiency is a bold initiative which would be difficult to introduce in the absence of a such a respected leader, and offers hope for some traditional values residual in rural Thailand[218] to be reinstilled more broadly as its becomes more difficult to promote the Thai identity as having one cultural base or ethnic uniformity.[219,220] As in times of crisis when familiar beliefs[221] embodied in everyday Thai Buddhism[222] have resurfaced and moderated behaviour, including that of migrants,[223] so the authoritative and religious associations of self sufficiency should enhance its application in Thailand.

Self sufficiency in all aspects of Thai life draws on Thai Buddhism and common sense in advocating frugality, thrift, self awareness, and lay precepts which were forgotten by many through the 1980s and 1990s. Nevertheless they have been consistently advocated by His Majesty the King.[224] Redoubled efforts to communicate the essence of self sufficiency in the wake of the economic crisis has raised general awareness, although perhaps only as lip-service across sectors of the urban elite including the civil service.[225] The concept is now important to a sensible

[216] Phongpaichit, Pasuk. (1999)
[217] Siamwalla, Ammar. et al (no date)
[218] Nartsupha, Chattip and Satyawadhna, Cholthira (1998)
[219] Evans, G. (1997)
[220] Wyatt, D.K. (1982)
[221] Keyes, C.F. (1977)
[222] Terwiel, B.J. (1976)
[223] Tobias, S.F. (1977)
[224] Board of the Royal Projects (1999)
[225] Tandhanan, Mallika et al. (2000)

view of Thailand's agricultural sector, and is intended to apply to all walks of life.[226]

Application of the approach to the rural sector has been codified in recommendations which aim to produce sufficient food for a farm family on-farm, and to use limited resources, particularly water in an equitable and frugal manner. The system would use minimal external inputs and operate within the ecosystem of the present day. Farm land would be allocated, for example, 30:30:30:10 to: on-farm water conservation for irrigation, integrated poultry production, aquatic plant production and aquaculture; wet rice production; cash and other crops including perennial trees; and housing, composting and backyard production. Indicative rather than prescriptive, the approach provides a starting point within an overriding theme of sustaining a family without reliance on external assistance and without requiring credit based links to a distant commercial chain. It further promotes cooperative action within a community for self improvement in such areas as collective bargaining, sharing of capital items, and negotiation with outside parties, including government officials and commercial interests.[227]

Recognising the existence of two agricultures in Thailand, self-sufficient and commercial, is but one outcome of the approach which links to earlier recommendations of the King that community participation in reforestation is essential in populated areas, and similar thoughts on communal pasture management.[228] It further embodies overt recognition of agriculture as a social support system which has been undervalued since the 1960s. The opportunity for a post-crisis reconsideration of values, together with exceptional respect for the King, suggest that it is timely to consider significant changes to Thai rural development. However, while the approach would redress urban-rural disparities, urban middle class feelings of impoverishment from the crisis recall pre-crisis insularities which can easily undermine the intent of broader social equity.[229]

Self-sufficiency for the small farmer may be seen in a global context as a means of easing the burden assigned by participation in a complex commercial industry without adequate knowledge or protection. Leo Tolstoy described the

[226] Adulyadet, Bhumipol. (1997)
[227] Board of the Royal Projects (1999)
[228] Adulyadej, Bhumibol. (1997)
[229] Phongpaichit, Pasuk. (1999)

broad issue in personal terms as ... 'being carried on the peasant's back while choking the peasant, and yet assuring himself and others of his concern to ease the lot of the peasant by whatever means, except getting off the peasant's back'. Transcending the materialistic developmental approach seems impossible; thus a practical solution seems to be the accepting two types of Thai citizens, the urban and the rural, or, those consumers forming part of the global elite and the self-sufficient. However, the self-sufficient are, by definition, no longer existing to subsidise the lifestyle of the privileged, which includes the middle classes. If the poverty is considered as the absence of an ability to work in a creative and productive manner to look after one's self and one's family, allowing a self-sufficient farmer to live in peace while enjoying social services similar to others in the society may represent true development in Thailand. It would also facilitate consideration of environmental care as part of a life-style approach to agriculture.

Summary

Key points pertinent to Thai agriculture arising form this discussion related to social, cultural and environmental matters may be summarised as:

- Environmental management in Thailand is inseparable from global food demand and development thought which respectively require an efficient and responsible Thai agriculture in an environment which it has significantly changed, mainly through rising commercial demands which emerged in Ayutthaya, increased with Rama IV's modernisation, and assumed national importance in recent decades.
- Through a period of rapid population increase, poor farmers have been forced into more sensitive areas while urban values shifted with Western influences which falsely assumed that all essential underpinnings of economic development existed, resulting in environmental decline and social inequity.
- The recent economic crisis and religious philosophers have stimulated a rise in environmental concern which, notwithstanding purist religious views, has led to a popular eco-Buddhism which promotes environmentally and socially sensitive alternatives to commercial agricultural practices, one of which is a broadly based and uniquely Thai approach to self-sufficiency for small-holder farmers.