Food, Fiber and Fee Simple Ownership in the People=s Republic of China

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Shamu, or Chinese-Fir (*Cunninghamia lanceolate*), has the world=s longest history of management for timber production (China Woody plant Flora Committee [CWPFC], 1981; Yu, 1983; Menzies, 1985, 1988a, 1988b). About 1200 years ago in southern Shejiang Province it also became the focus of the world=s oldest known timber scaling system, the *Longquan Majie* (Xia, et al., 1979). This system estimated timber value based upon log length and clarity, but unlike most scaling systems not an diameter. This means smaller, usually younger trees, as long as they meet a commercial minimum, are of equal per volume value as larger, usually older trees. Various production systems called *shamu jianzhong* (A*shamu* space-planting) were built around and dependent upon agricultural inter-cropping within a small stand of *shamu,* usually one hectare or less. Several variants of this system had been in practice for over a millennium across the highlands of Fujian, Guizhou and other Provinces of south China until a 1958 political campaign caused the system to be applied on a collectivized scale of hundreds or even thousands of hectares. On this scale Agreat losses@ were incurred through soil erosion, water loss, and other similar ills (Yu, 1983; Menzies, 1988a). Reactions to these losses and the associated 1960-61 famines effectively ended the entire system by the mid-1960s, although a few variants were practiced in isolated areas as recently as the late 1970s during the uncertainties of authority of the post-Mao transition. For the highland peasants elimination of the system also meant elimination of its interplanted food crops as well as their incentives to restock, tend and protect the most valuable forests in south China.

In 1978 Deng Ziaoping emerged as China=s paramount leader and began an era of limited private enterprise and limited free markets. To his critics who labeled this as a backslide into capitalism, Deng observed, AIt doesn=t matter if a cat is black or white, only that it catch mice.@

One such cat of this era was the AHousehold Responsibility System@ (HRS). HRS policies permit individual rural peasants to sign lease contracts with the government granting them and their families exclusive 15-year use rights to agricultural land. While still required to produce a per *mu* (15 *mu* - 1 hectare) set minimum of staple food stocks any surplus beyond that minimum as well as any non-staple food stocks, including cash crops, were regarded as the individual farmers= to do with as they pleased (Nyberg and Rozelle, 1000). Deng=s expressed opinion of these changes was that Ato get rich is good.@

The success of these policies in increasing the quantity, quality and variety of foods available to the Chinese people made further revisions attractive (Deininger and Jin, 2003). By 1997 the government of the People=s Republic of China had again revised its policies regarding access to rural land. These changes extended land-use contracts in both time and space. Of interest here are the extension of land-use rights to rural forest lands in southern China. In some cases those lease contracts permitted exclusive use of forest lands for up to 50 years, and in the cases of relevance here those use rights were for up to 60 years (Nyberg and Rozelle, 2000).

This paper presents an argument that peasants= fee simple ownership of all surface rights to forest land in south China is likely to be more sustainable, more productive, more rewarding, and more likely to lead to market activity beneficial to those peasants than the smaller bundle of limited term exclusive land-use rights now available to them. The argument requires testing four related hypotheses. The hypotheses are: (1) Fee simple ownership is a stronger guarantee of ecological sustainability in the *shamu*-growing region than long-term leases. (2) Fee simple ownership is a better guarantee of subsistence

self-sufficiency; (3) offers greater market rewards than the current leases in the *shamu* region; and (4) fee simple ownership, explicitly desired and readily adoptable by south China=s rural population, offers them more efficient investment opportunities.

The argument concludes with a discussion of how this population will be better able to achieve the highest and best available use of their limited investment capital and hence the highest and best use of rural lands, thereby maximizing those lands= productivity if and when working markets in real property are added to fee simple ownership of China=s scarce forest land.

Ecological sustainability through fee simple ownership=s long-term view

In the research village of Lijiayang in northern Fujian Province the last example of the *shamu jianzhong* were initiated opportunistically on 13.3 hectares between 1976 and 1979 (Chen per.com., 1988). One family lineage, the Wu, used a traditional, sustainable variant of the *shamu jianzhong* derived from about 800 years of practice in Lijiayang. That experience had followed over 400 previous years of practice in the Zhejiany Province region where the *Longquan Majie* timber scaling rules were developed. The Wu=s continued success with their variant of the system for a span of over 1200 years constitutes more than a rhetorical indicator of sustainability.

The Wu=s system required an average of about 150 years. It featured three consecutive 35-year rotations of *shamu* timber production, each accompanied by varying spans of food crop, oil-seed, and medicinal herb production (Table 1). After these three cycles, abandonment of the site to a 40-to-50-year broadleaf fallow restored forest soil quality. The long experience of the Wu family lineage with their particular variant of the *shamu jianzhong* had, in fact, allowed them to understand, recognize, and avoid threats to sustainability that scientific chemical and biological analysis of soil properties revealed only in the 1980s (Zhang et al., 1983).

Another traditional, but unsustainable variant of the *shamu jianzhong* is more likely to re-emerge under the 60-year lease terms of the latest reforms. This variant was practiced by the Wu=s neighbors, the newer and smaller Ye family lineage. The Ye system began the same with four years of agricultural crops, but differed from that of the Wu as less valuable but faster growing *wenmu* (*Cryptomeria fortunei*) were inter-planted amid the *shamu* in a roughly 3:1 *shamu*-to-*wenmu* ratio. The Ye preferred this system as, in addition to the mid-rotation *wenmu* timber, its longer rotation also roughly doubled the years of medicinal herb production (Table 1). The Ye=s variant was derived from much less experience, about 160 years of practice in Lijiayang and about 225 years in another nearby village. In fact, their move to Lijiayang had been prompted by the need to find more productive soils (Ye, n.d.). With no familial experience to the contrary, the Ye believed these 65-year rotations could be repeated indefinitely. As a result their *shamu-wenmu* planting sites were never given over to a broadleaf fallow. Another century of experience would have shown them that by the beginning of a fourth rotation, *shamu* growth is greatly reduced and the seeds of the associated intercrops, including the inter-planted and under-planted

Table 1: Traditional *Shamu Jianzhong* Variants in Lijiayang[1]

Traditional Sustainable Wu System		Traditional Unsustainable Ye System	
0-4	Food crop production[2]	0-4	Food crop production[2]
1	*shamu* inter-planted	1	*shamu*, *wenmu* inter-planted
5-10	oil-seed production	5-10	oil-seed production
15-35	medicinal herb production	15-20	medicinal herb production
35	*shamu* harvested	20	harvest *wenmu*
36-70	repeat	25-65	medicinal herb production
71-105	repeat	65	harvest *shamu*
105-150	broadleaf succession		repeat until soil decline occurs
	repeat indefinitely		

[1]Chandler, 1990, 1994a, 1994b

[2]Typically daikon turnip, corn, millet, and peanut in succession.

medicinals, often fail to germinate (Zhou *et al.*, 1980; Zhang *et al.,* 1983; Chandler, 1990, 1994a, 1994b).

To proceed from this initial argument, the reader should carry away two points. First, the longer rotation Wu lineage system with its embedded fallow period can guarantee ecological sustainability of the soil resource by means of its changes in plant community composition over time (Chandler, 1990, 1994a, 1994b). Second, without the guarantee of permanence within the Abundle of rights@ of fee simple ownership, the broadleaf fallow necessary after a century of *jianzhong* cultivation is unlikely to occur. Without such permanence, unsustainable variants are much more attractive due to their ability to capture the value of the *shamu* stand by the end of the 60-year land-use contract term be it through a single 60-year rotation like an abbreviated Ye variant or, even more destructively, through two 30-year cycles like an abbreviated Wu variant, but in either case without the necessary restorative fallow.

In sum, an ecosystem-friendly 150-year rotation is impossible under the limited term of a 60-year land-use contract, thereby guaranteeing an absence of sustainability in any *shamu* management systems emerging in south China within the constraints of the 1997 reforms. Only the permanence of fee simple ownership offers the possibility of sustainability.

Fee simple versus leased human subsistence

In 1988 intensive annual agriculture occupied all but two of the 91 households (357 persons total) in Lijiayang. These farmers engaged in both irrigated terrace rice cultivation as well as dry field cultivation of corn, soybeans, plus beans, and sweet and white potatoes. Each household also kept a garden to supply itself with two harvests per year of corn and dietary variety in the form of cabbage, long beans, plus beans, and a small selection of spices and medicinal plants for household use (Tables 2 and 3). To calculate human

carrying capacity possible with these agricultural and agro-silvicultural systems, the relevant formulae are (adapted from Carneiro, 1956).

(1) A = (2500 kcal/person/day x 365 days/year) / {Y x V X (1-W) }, and
(2) P = La x U x { (h/r) /A}

where: A = area needed to support one person (ha/person/year)
Y = crop yield less losses by waste (kg/ha)
V = nutritional value of crop (kcal/hg)
W = loss by waste (expressed as a decimal)
P = supported population (persons)
La = arable land area for each component of the system (ha)
U = percent land used to produce calories (decimal)
h = number of crop harvests per rotation
r = total length of rotation (crop plus fallow periods, years)

Applying the data from Tables 2 and 3 to formulae (1) and (2) results in an estimate of only 221 of Lijiayang=s 357 persons supported by its intensive agriculture; including 185 persons from the irrigated rice crop, 30 persons from the dry field crops, and 6 persons from the house gardens. Wastes, surplus crop production, limited grazing, and collected forage supported an emergency-and special-occasions-only food reserve consisting of 789 chickens, 205 swine, 21 cattle, 11 goats, 2 dogs, and about 50 cats, and a much smaller draft power system comprised of 4 buffalo. As the problem is not currently an emergency, these livestock are not included as part of the carrying capacity calculations.

Table 2: Typical Crops in Lijiayang
(n/a = not applicable)

crop	intensive yields[1] (Y) kg/ha	extensive yields[1] (Y) kg/ha	nutritional value[2] (V) kcal/kg	% loss by waste[1] (W)
rice	3000	n/a	3675	10
corn	2750	3500	4285	5
millet	n/a	2250	4120	10
peanut	n/a	2250	4050	20
soybean	2750	2500	4060	5
other beans	2000	2000	3550	10
daikon turnip	n/a	4550	1335	10
sweet potato	6500	n/a	3580	20
white potato	3500	n/a	2850	10
all cabbages	not known	n/a	<100	20

[1] kg/ha; data derived from local peasant estimates and Shouning County Agricultural Bureau 1980, 1986, 1987.

[2] kcal/kg; Morrison, 1951; Winton and Winton, 1932

Table 3: Land Areas in Lijiayang Village (hectares)

Annual croplands	21.9	
rice fields	17.1	
non-irrigated grain and bean fields	3.5	
non-irrigated house gardens	1.3	
Bamboo groves	45.1	
Cultivatable forest	158.2	
Shamu/wenmu forest		64.3
mixed-age *guamu* forest	93.9	
Pine and other forest	383.5	
Wasteland, homesites, *etc.*	11.4	
Total land area	620.1	

Sources: Shouning County 1987; Chen 1988, per.com.

Clearly, since land-use laws eliminated its peasants= last rights to practice the *shamu jianzhong*, Lijiayang has not been able to feed itself from intensive cultivation alone. Review of Shouning County Agricultural Bureau statistics (1980, 1986, 1987) indicated that the Lijiayang share of the annual post-1980 shortfall averaged almost 26 metric tons of rice, all of which had to be trucked in by the People=s Liberation Army. The author=s own somewhat greater shortfall estimate of 34 metric tons likely overestimates the local caloric intake (2500 kcal/person/day) as, without the aid of any illness, his own body mass declined from 87 kg to 55 kg during just 124 continuous days on site.

It is likely that no shortfall make-up would be necessary were the Lijiayang peasants permitted to resume practice of the Wu-lineage version of the *shamu jianzhong*. The number of persons that could be supported by the practice of this variant of the traditional agroforest system is calculated to be an additional 133, or all but three of the remaining 136 not supported by intensive cultivation alone. Thus far however, this compares only the carrying capacity possible by lifting the relevant bans and resuming practice of the traditional long-rotation, multi-cycle, multi-generation Wu-lineage system of *shamu jianzhong* to what is possible without its resumption, or what was usually the situation from the mid-1960s until at least 1997.

By contrast, the coincidence of the length of rotation of the Yes= variant of the system with the 60-year forestland lease terms makes this a likely variant of the *shamu jianzhong* to continue in practice under the current law. Beyond those supported by local intensive cultivation, practice of the Ye variant to *shamu jianzhong* should result in an additional 95 persons supported, or 51 persons still without adequate food supplies in Lijianyang. Even this number of persons unsupported by local food production would be certain to increase when the system=s soil-degrading aspects began to manifest themselves with the fourth rotation (Zhou *et al*., 1980, Zhang *et al.,*

1983), a situation rapidly worsened by an abbreviated Wu system (Table 4). And compared to ownership, the uncertainty of even a long-term lease would also tend to ensure a continued, fallow-omitting repetition of the Ye system.

Table 4: Likely *Shamu Jianzhong* Variants Under Lease in Lijiayang

Abbreviated Wu System	Abbreviated Ye System
0-4 Food crop production	0-4 Food crop production
1 *shamu* inter-planted	1 *shamu, wenmu* inter-planted
5-10 oil-seed production	5-10 oil-seed production
15-30 medicinal herb production	15-20 medicinal herb production
30 *shamu* harvested	20 harvest *wenmu*
31-60 repeat	25-60 medicinal herb production
repeat indefinitely with each new least awarded	repeat indefinitely with each new lease awarded

Here the reader should recognize that the current lease situation in south China favors a *shamu jianzhong* variant that not only is unsustainable, but also incapable of supporting the existing local population even in its earlier, more productive rotations. This would not be the variant chosen were the permanence of fee simple ownership available to the local peasants.

The value of forest products for owners and Lessees

Thus far, the discussion has compared the important, but non-market values of sustainability of forest productivity and self-sufficiency in food production. If however, as Deng observed, Ato get rich is good,@ then the peasants of Lijiayang must move beyond both subsistence self-sufficiency and ecosystem sustainability to invest in and develop their resource base and enter into some form of market exchange with Athe outside world.@

Lacking other natural resources, commercial infrastructure, and the location to gain by tourism or trade facilitation, a few peasants of Lijiayang have joined the world=s rural-to-urban exodus. Most peasants
prefer to stay within the security of the known but until now largely cashless economy of their village (1996 per. Obs.). Nonetheless, they should be able to enter local and regional markets as suppliers of at least three commodities: *shamu* timber, *wenmu* timber, and medicinal forest herbs.

In 1988 the author witnessed an arrest for timber theft in Lijiayang. This neighbor intended to sell the timber in a local Black Market, the surest sign of unmet demand and an indication of Lijiayang=s limited need to invest in additional infrastructure to extract or transport timber. Ironically, the stolen timber had a willing buyer in Lijiayang. This was an older peasant who had pooled his family=s resources to build a Achair factory@ in 1986, but this workshop made only eight chairs in two years due to a lack of legally available wood from the state-owned forests that surrounded the village. As for demand for medicinal herbs, the author has observed many examples of the social prominence and economic centrality of medical herbalists in rural areas in China, and the reader who has visited an overseas Chinese pharmacy, food store, video parlor, or

other business has likely observed the international demand for such herbal medicinal products as well.

No consistency usable retail, wholesale or commodity price data for either timber or medicinal herbs could be obtained. This dictates that present value analyses of timber and medicinals will have to be done separately. Fortunately, the relative utility value of *shamu* and *wenmu* were subjects of several interviews (Chandler, 1990), so their timber value may be analyzed as a single production process. The range of these relative utility values was estimated from 4:1 to 10:1, most often toward the lower end of this range, so a 5:1 *shamu*-to-*wenmu* ratio of per cubic meter value will be assumed for the sake of simplicity. Lacking usable price data, an arbitrary monetary value, 1 T/m^3, will be assigned to each cubic meter of *wenmu* timber, meaning each cubic meter of *shamu* timber will be assigned a value of 5 T/m^3.

To calculate the present values of resource production the relevant formulae here are:

$$(3) \qquad P = A \times \{(1+ i)^n - 1\} / i (1+i)^n, \text{ and}$$

$$(4) \qquad P = F \times 1 / (1+i)^n$$

where : P = present value of specific forest products
A = annual value of medicinal herbs
F = future value of specific forest products
i = estimated rate of return
n = number of years

Formula (3), much better known as the discounted annual payment multiplier (Fabrycky and Thuesen, 1974), will be applied to the relatively high-value medicinal herb crops occurring annually within the mid-rotation years of the *shamu* crop. This will produce a present value calculated to the initiation of each medicinal herb-

yielding phase of a rotation. To this future Apresent@ value formula (4), the discounted single-payment multiplier (Lundgren 1971), will be used to bring the value to the actual present, the beginning of the entire rotation. Formula (4) will also be applied to bring the future value of each rotation=s total timber harvest to the present.

The Wu family system of three consecutive 35-year timber-producing rotations followed by a 45-year fallow would be most likely under a fee simple regime (Table 1).

As summarized in Table 4, a slightly abbreviated 60-year version of the Ye family=s traditionally repeated 65-year rotation, featuring the 3:1 initial ratio of *shamu* to *wenmu* stems, represents one of the two most likely management systems to be practiced under the current 60-year lease regime. A still more likely system under lease is two consecutive 30-year rotations, as in an abbreviated half of the Wu system, but with any subsequent or prior fallowing omitted.

As for discount rates, one applicable and classic truism is that subsistence peasants are risk averse. Accordingly, the range of discount rates that will be employed here are 2% and 4% to reflect the levels of risk and return that would be acceptable to the peasants of Lijianyang. The peasants= worst nightmare, a more inflated level of risk, say 8%, will also be included in the analysis.

Using timber production estimates for each of the system variants (Table 5), the present values of the timber and medicinal herb crops possible by these approaches are presented in Tables 6 and 7, respectively.

Table 5: Volumes and Values of Timber Harvests per Rotation[3]

[3]Data abstracted from Chandler, 1990, 1994a; CWPFC, 1981; Lin *et al.*, 1984; Ruan and Dou, 1981; Zhang *et al.,* 1983.

Property Rights and Cultivation Regimes	Final Stand Density (#/ha)	HarvestedCrop Value at Volume (m^3/ha)Harvest (t/ha)
Wu system under Fee simple ownership (rotation = 35 years)		
shamu	1410	504.42522.00
Ye system under 60-year lease (rotation = 60 years)		
shamu	1103	568.92844.50
wenmu	356	106.8 106.80
Total	1459	675.72951.30
Wu system under 60-year (rotation = 30 years)		
1st rotation *shamu*	1410	408.42042.00
2nd rotation *shamu*	1410	408.42042.00

Table 6. Present Values of Medicinal Herb Harvests[4]

Property Rights and Cultivation Regimes	Crop Value at Years of Harvest	Harvest	Present Value (T/ha) of Timber Harvests at 2%	4%	8%
Fee simple by Wu system					
1st rotation *shamu*	2522.00	30th	1392.32	77.38	250.64
2nd rotation *shamu*	2522.00	60th	768.66	239.74	24.92
3rd rotation *shamu*	2522.00	100th	348.11	49.93	1.13
Sub-total	n/a	n/a	2509.09	1067.25	276.69
All subsequent harvests	n/a	n/a	119.29	23.36	0.00
Total	n/a	n/a	2628.38	1090.61	276.69
60-year lease by Ye system					
shamu	2844.50	60th	866.95	270.40	28.10
Wenmu	106.80	20th	71.87	48.74	22.91
Total	n/a	n/a	938.82	319.14	51.01
60-year lease by Wu system					
1st rotation *shamu*	2042.00	30th	1127.33	629.59	202.93
2nd rotation *shamu*	2042.00	60th	622.36	194.11	20.17

[4]Annual cash yield is assumed to be 1M/ha/yr on all forestland.

Total		n/a	n/a	1749.69 823.70 223.10

Table 7: Present Values of Medicinal Herb Harvests[5]

Property Right and Cultivation Regimes	Initial Year	Years of Duration	Present Value M/ha) of Herb Crops at 2%	4%	8%
Wu system under fee simple ownership					
1st herb phase	15th	20	12.15	7.55	3.10
2nd herb phase	50th	20	6.08	1.91	0.21
3rd herb phase	85th	20	3.04	0.48	0.01
4th herb phase	120th	30	2.08	0.16	0.00
Sub-total	n/a	n/a	23.35	10.10	3.32
all subsequent harvests	n/a	n/a	1.35	0.03	0.00
Total	n/a	n/a	24.70	10.03	3.32
Ye system under 60-year lease					
1st herb phase	15th	5	3.50	2.47	1.26
2nd herb phase	25th	35	15.24	7.00	1.70
Total			18.74	9.47	2.96

[5]Annual cash yield is assumed to be 1M/ha/yr on all forest land.

Beginning with Table 6, several scenarios appear plausible. In the preferred low-risk, low-return 2% world of the Wu family peasant, sticking with tradition, including pre-Maoist fee simple ownership, offers the psychic value of staying with the known. Also, by maximizing his family=s wealth, fee simple ownership in this environment presents that peasant with the greatest likelihood of testing Deng=s claim that Ato get rich is good.@ However, even within a low-risk 60-year lease environment, the Ye family will find present values that encourage them to adopt the curtailed, even more destructive double-30-year Wu system.

Within a 60-year lease regime and at a rate of return of 4%, one roughly comparable to a 30-year U.S. Treasury Bond, the psychic value of adhering to tradition begins to suffer a deflation. The present cash value of the traditional Wu system only slightly exceeds that of the more ecologically adverse abbreviated Wu system. The riskier 8% environment indicates shorter, more destructive rotations by both owners and lessees and virtually dictates a liquidation of the forest resource by any lessees employing the Ye family system. In such an inflationary environment, the most rapid destruction of the soil resource becomes economically justifiable. An owner=s ability to leverage the value of land held fee simple might be all that could spare the liquidation of the forest resource.

The present value of the medicinal herb harvests presented in Table 7 supports largely the same argument, although not so starkly. The longer duration of medicinal crop production of the traditional Ye system under the 60-year lease regime still does not almost allow it to compete with a fee simple Wu system, but differences become less pronounced under riskier, more inflationary scenarios.

As these simple calculations demonstrate, fee simple ownership offers greater value to the peasant cultivator from both

timber and medicinal crops under all but riskier inflationary conditions. Under inflationary conditionsCwhen all long term investments come into questionCthe highly destructive use patterns of the 60-year lease systems effectively compete with fee simple ownership, at least until repeated rotations degrade the forest soil resource.

A future for China=s forests: the suitability of fee simple ownership

Thus far this paper has demonstrated support for the hypotheses that fee simple ownership of forestland in south China would be more ecologically sustainable, offer greater subsistence self-sufficiency, and be more economically rewarding than the current system of long-term leases. The remaining hypothesis holds that fee simple ownership offers greater opportunities for and efficiencies of investment than leases.

This fourth hypothesis has gained support from recent research in China on land tenure security, investment and policy preferences among rural households. First, Jacoby *et al.* (2003) found that the tenure insecurity built into the original HRS reformsCshort lease durations, weak verbal Acontracts,@ and frequent, unpredictable land reallocationsCprevent investment in local forest resources and encouraged ecologically unsustainable methods of forest management. Second, tenure insecurity in rural China has also been shown to reduce productivity enhancing land-use right transfers in rental markets (Kung and Lilu, 1997; Liu *et al.*, 1998). And last, Deininger and Jin (2003) documented an applied public policy experiment in Guizhou Province to study the potential impact of increasing the duration of land-use rights in south China. The experiment discovered that Asecure land-use rights increase

agricultural investments by individual households@ (865), Agreatly increase scope to agricultural investments, especially planting trees@ (867), and promote a Astrong learning effect@ (876) regarding the advantages of more secure, longer duration land tenure rights.

While Deng may have asserted in 1978 Ato get rich is good,@ China=s earlier Maoist and Cultural Revolutions had both sought to assure a broad equality of resource access explicitly to minimize rural China=s differences in socio-economic class. This egalitarian ideology still stands as the greatest obstacle to fee simple ownership of rural lands. However, Deininger and Jin (2003) have documented a Astrong learning effect@ apparently brought about by widespread acceptance of greater tenure claims by rural Guizhou households whenever and wherever the Atwo no=s@ policyCno land increases for increased village population, no land decreases for decreased village populationChas limited land reallocation. Deininger and Jin also found that secure land-use tenure combined with active rural land rental markets permitted many households to pursue another preferred investment, education for their children. And, as Kung and Liu (1997) found, increasing awareness of such options increased acceptance of a Ano redistribution@ policy still further.

Taken together, this recent research indicates that an assignment of fee simple rights to the forestlands of south China would generate a tendency toward highest and best use of those lands, either through investment in the resource base itself or relinquishment of the resource base through sale or rent to those peasants willing to so invest. And of course, a tendency toward its highest and best use is also a tendency toward maximum market value for the productive resource, in this case South China=s forests. Adding the security of permanence to fee simple ownership of that productive resource further increases its value. Such increases in

value also maximize the options for south China=s rural population in moving beyond sustainable subsistence and self-sufficiency into the cash world of raw commodity market exchange, education and urban living, and much in between.

As South China=s economy continues to expand and returns to labor increase, the *shamu jianzhong* could well have a competitive place in the rural sector. High-value commodities such as medicinal herbs offer greater rewards per unit of both land and labor than intensive rice cultivation, and low-labor commodities such as *shamu* timber offer the rural producer the time to invest in the region=s growing non-agricultural enterprises, perhaps including a chair factory.

Conclusion: the market for the fee simple stewardship

This paper has argued from ethnoecological, agricultural, market and investment perspectives, and found support for hypotheses generated from those perspectives, that fee simple ownership of South China=s highland *shamu* forestlands offers a comprehensively superior circumstance for the region=s rural population than the current long-term land-use leases.

For China=s peasant, uncertainty is a great reality, certainly as great as the law, especially a law that has changed repeatedly over his lifetime. The uncertain and changing conditions of land ownership in the case of the 60-year maximum lease term currently in effect would almost surely result in a shortening of the sustainable, long rotation variants of the *shamu Jianzhong*; uninterrupted repetition of these shorter rotations; elimination of any soil-restoring fallows; and more rapid soil decline than had previously existed under even the Ye family=s traditional system. While a shortened Wu-lineage system would be able to support an additional 190 persons, twice that of the

Ye lineage, the pattern of soil degradation would eventually manifest itself about halfway through the second 60-year lease. However, if no land reallocations occurred during the first of these shortened rotations, it is likely that confidence in the permanent aspects of property rights within fee simple ownership would grow enough to permit a fallow.

Deininger and Jin (2003) showed a time frame much shorter than 60 years was sufficient to generate such confidence. Given that confidence, short-term and long-term self-interests would be served by stewardship of the peasant=s resource base; in this case, by a resumption or an adoption of the Wu family=s traditional long-rotation *shamu jiazhong*. Although it will not be true much longer, a practical guide to such stewardship still lies within the oral traditions of indigenous knowledge among the time-tested Wu. Similar and equally valid traditions are known to exist in other poor isolated highland villages in the *shamu*-growing region of South China. Such locally adapted knowledge, combined with self-interest and the exclusive right to use (perhaps in fallow while serving as financial leverage), to rent, or to sell to others who will use this land would make resumption more than merely possible. If, as is argued here, the *shamu jianzhong* is the highest and best current use of these isolated highland forestlands, then fee simple ownership=s transferability of permanent, exclusive land-use rights is likely the most, and currently only, effective and sustainable means to achieve its widespread application. The estimates of the present value of the various timber and medicinal cash crops from the forests also indicate that whatever hope China has of safeguarding these rural agro-forest resources, utilizing the wealth of indigenous ecological knowledge of how best to manage those resources, increasing rural self-sufficiency and standards of living, adding both options and security to the lives of

the rural peasantry, and easing the pressures of rural-to-urban migration on the nation=s urban environment most are likely is to be found down the road to private property, and from there perhaps down the capitalist road itself. If the traditions of sustained productivity are to serve the people of rural south China, or perhaps even help them get rich, the peasant=s fee simple ownership of the highland forests may be not just the best, but the only cat for the job.

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