

The Walking Tractor: Trojan Horse in the Cheju Island Landscape

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1. Introduction

Since the early twentieth century, the economic plans of developing countries have emphasized modernization and technological change in the rural sector. The diffusion of modern farm technology from Europe and the United States into Asia increased rapidly after the Second World War, and now the most rural, isolated agricultural lands throughout Asia are being transformed in the wake of this diffusion wave. Tractor technology has played a major role in this transformation process.¹

Today Mattingly (1987) writes in retrospect of far-reaching economic impacts during the evolution of tractor power and devolution of horsepower on midwestern American farms, a theme introduced earlier, for the entire United States by Eisenhower (1932:411-441). An even broader perspective on this theme is provided by Fussell (1965:226), who writes, "the most spectacular and probably most well-known change in farming methods made during the past half-century is the substitution of mechanical traction for animal draught over most of the civilized world."

This evolving substitution of machine power for biological power in agricultural production is now almost a closed book in much of the advanced industrialized countries (AICs) or "developed" world. However, it is still an ongoing evolutionary process in many newly

industrialized countries (NICs), including South Korea, and in the least industrialized countries (LDCs), the “underdeveloped” or Third World. This particular rural technical transformation—the substitution of mechanical for biological power plants on the farm—can be discussed as a deliberate transformation process in the LDCs, one motivated by a powerful growth ideology emanating from the AICs. In this case the tractor, for example, is much more than a modern technical device that plows and cultivates and thereby improves production efficiencies on the farm, it is also a powerful ideological weapon that systematically transforms rural agricultural landscapes by waging successful wars against traditionalism.

My research focuses attention on the landscape transformation process of modernization, or growth ideology, in rural South Korea; here from the perspective of a cultural geographer. I will attempt to provide a reasonable and meaningful synthesis of three distinct conceptual themes, and offer an illustrative case study of rural landscape transformation from Cheju Island. The concepts are 1) stages of economic growth (Rostow 1960); 2) technologies as political artifacts (Winner 1980); and 3) cultural landscape as the architecture of ideology (Nemeth 1987). I will begin with a brief discussion of growth ideology.

2. Growth Ideology

Powerful forces of change generated by growth ideology have been sweeping out of the West and over rural South Korea for decades, bringing far-reaching and irreversible impacts and meanwhile converting South Korea from an LDC to an NIC. At the heart of growth ideology is the seed of technological rationalism that has spread abroad from early eighteenth-century Europe, along with the Industrial Revolution. Markovic (1979:49) explains that technological rationalism is “characterized by a continuing expansion of material production and an accelerated increase of efficiency and output.” Growth ideology subsumes many alternative ideas about how to increase efficiency and output; for example, capitalism and communism:

If there is one point on which even the most militant Soviet ideologists have to fully agree with their American opponents, it is that technology or productive forces ought to grow as quickly as possible and that the maximum increase of material output is a highly desirable goal (Brandt 1979:44).

Not surprisingly, such a powerful and popular ideology is also

value laden, and “interpreted in a way that very often serves the purpose of a certain ideological infrastructure and invariably reflects deeper cognitive or moral value assumptions” (Markovic 1979:50). For example, industrial economic “growth” conveniently becomes glossed as “progress,” and something “good.” This pro-growth bias, in turn, conveniently allows for the castigation of competing ideologies. For example, “no growth” or “slow growth” ideologies are perceived as “bad.” As it happens, the prevailing ideology in South Korea from the fourteenth century to the mid-twentieth century was the “slow growth” ideology of Chu Hsi Neo-Confucianism, whose watchword was, and remains in spite of its rapidly diminishing adherents: “Obey heaven and adjust to time; be content with oneself, and accept fate” (Yang 1961). This traditional attitude was deeply entrenched in rural agrarian South Korea until the 1960s, creating major inertia there to the spread of growth ideology. Impatient development planners then devised and implemented a successful national strategy—*Saemaül Undong*—for spreading new farm technologies to increase rural productivity. Their tactics—described in the next section—successfully undermined what they perceived to be the useless torpidity of traditionalism.

3. Rostow’s Stages of Economic Growth and South Korea’s *Saemaül Undong* [New Village Movement]

During the late 1950s, there was growing optimism in the Western industrialized countries and all AICs that the economies of the Third World could be developed in a relatively short period of time. Much optimism became focused on a development planning strategy introduced in Walter Rostow’s best-selling *Stages of Economic Growth* (1960). Rostow’s simple and straightforward description of economic growth stages provided a non-communist historical model of socio-economic development, and encouraged Third World leaders to believe that their less-developed countries “merely lagged behind in their development, and could catch up if they traveled the same road as the advanced countries had traveled, that is, modernize and industrialize” (Reitsma and Kleinpenning 1985:11).

Rostow presented five stages for evolving economies. **First Stage:** A *traditional society* exists in which most people are farmers living in self-sufficient village communities, using effective yet primitive methods and techniques of production. **Second Stage:** This traditional agricultural society becomes *preconditioned for industrial takeoff* by awakening

to a desire for achieving a higher standard of living that cannot be provided by maintaining its traditional self-sufficiency, but only by accepting into its midst external new technical means for increasing agricultural production. **Third Stage:** *Industrial economic takeoff* may then occur, when the external new technical means of production have been widely accepted by the awakened farmers, and production has increased dramatically. **Fourth Stage:** The *drive to industrial economic maturity* is characterized in the rural sector by a massive shake-out of unproductive farmers who migrate to the cities to become urban industrial workers, and by a high rate of productivity among the more successful farmers who remain to dominate the rural economy. **Fifth Stage:** The final stage is one where a *consumer society*, whose members experience the fruits of industrial economic advancement and "the good life," is supported by ever-increasing rural productivity.

Rostow emphasized the importance of "a productive agricultural sector and a prosperous farming population" as preconditions for industrial development (Reitsma and Kleinpenning 1985:133). Thus Ros-

tow's Stage Two, the "preconditioning for takeoff" stage, influenced the growth strategy of many Third World governments who were beginning at the Stage One position. These latter therefore were inspired to begin to plan and implement major agricultural reforms. Within their typical operational framework, Third World development experts moved forward rapidly and sometimes ruthlessly to transform their traditional agrarian societies. As indicated, most rural development strategy and tactics cast in this general mold were extremely biased against any village traditionalism that was perceived as delaying Rostow's stage-by-stage economic evolution.

In sum, the idea of industrial economic progress through Rostow's evolutionary stages resulted in the early eradication throughout the Third World of traditionalism, in order to bring about more quickly the "inevitable" benefits of industrialization and prosperity. This has been the case in South Korea.

In South Korea, the spearhead of industrialization ideology and antitraditionalism in the rural sector of the economy has been the government's *Saemaül Undong* [New Village Movement], launched in 1971. Keim (1979:19) describes the ideological crux of the *Saemaül* Movement: "to advance national solidarity by eliminating the cultural imbalances between the urban and rural communities." The government reasoned when first implementing *Saemaül Undong* reforms that while South Korean cities were

moving ahead at a dizzying pace . . . the countryside was still sunk in lethargy, passivity and even cynicism. Rural people were straggling behind their urban brethren. Something had to be done to correct the situation. The farmer had to be awakened. (*Handbook of Korea* 1979:583)

Thus a rationale was given for why it was necessary and excusable to prod farmers into being pragmatic: in order to increase their productive potential.

In 1971, *Saemaül Undong* began to wage war against rural traditionalism by offering selected villages 335 bags of cement each, to be used for local rural reconstruction projects (Kim Hyong-hyo 1979:200). Several years later the villagers were being offered a variety of modern agricultural technologies; for example, small tractors that allowed farmers to cultivate more land more rapidly could be purchased at low interest rates. In the following section I suggest that by accepting these initial gifts of advanced technology from *Saemaül Undong*, traditional villagers were severely limiting their future options to resist growth and modernization. This is because the gifts not only created future dependency on outsiders, but embodied in themselves the irresistible force of an advancing juggernaut: growth ideology.

4. Technologies as Political Artifacts

In 1980, Langdon Winner asked "Do Artifacts Have Politics?", and then answered with a convincing "Yes!". In posing his question, Winner was particularly concerned with the important role of technologies as ways of "settling issues in communities" and "building order in our world," and hypothesized that commitment to specific technologies, once begun, reduces future options in ordering human activity since the commitments become embodied in material equipment, economic investment, and social conventions (Winner 1980:127-128). He added that "special features in the design or arrangement of a device or system [can] provide a convenient means of establishing patterns of power and authority in a given setting" (Winner 1980:127).

His ideas illuminate the process by which self-sufficient traditional agrarian landscapes in many Third World countries have evolved into atrophying appendages of modern industrial landscapes, after development strategists have introduced a technical-political device into a traditional landscape, thereby committing the inhabitants to a new economic order. We can summarize this transformation by paraphrasing the

words of George F. Carter (1964:465): In isolated regions where new ways of life are introduced, new wants will arise that can only be met by continuing to live within a modern, industrial society; the overall result is likely to be abandonment of the simpler economies. Winner intimates through several examples that introducing new farm technologies embodying growth ideology into traditional agricultural landscapes may or may not achieve increased efficiencies over old devices and techniques, but they will certainly reshape social relationships and redistribute power once the political artifacts have been adopted by farmers.

The successful political artifact is therefore somewhat analogous to Homer's Trojan horse that, once accepted by a society into its midst, works from within to destroy its traditional power and defenses, ultimately bringing about the rapid transformation of its familiar landscape.

5. Cultural Landscape as the Architecture of Ideology

Winner's discussion of political artifacts that function to restructure cultural values would appear to have important implications for an analytical cultural geography that focuses on Third World rural development problems. Wherever the battle of ideas for people's minds is being waged—as it is still being waged in the Third World between traditionalism and modernism—the cultural landscape changes its physical appearance as the cultural values of the people who shape the land undergo change. The cutting edge of an aggressive ideology is ever intent on the transformation, through human action, of the cultural landscape, creating physical structures that embody its underlying philosophy. These serve as didactic instruments to reeducate future generations of farmers and thereby to enhance the survival prospects of the ideology. Meanwhile political artifacts in the arsenal of weaker competing ideologies are systematically wiped from the terrestrial slate by human reconstructions; once these are out of sight, so the ideas that they embody are safely out of mind. This conceptualization of cultural landscape as the architecture of ideology is summarized in Nemeth (1987:3).

Ideology is a potent political juggernaut that deliberately forces and reinforces reality to fit an idea about reality. An ideologically motivated society is compelled by doctrine, dogma, and coercion to reshape, and then conserve its living environment. It is in this way that cultural landscape becomes the architecture of ideology.

It has already been suggested that an externally introduced political artifact can be a Trojan horse of sorts, quite capable of wrecking

an established social order and its cultural landscape. In my research, the plains of Troy will be the Cheju Island rural landscape. The old economic order will be the traditional village-centered agrarian system, organized and long-sustained by the Yi dynasty political state (1392–1910) and its once-powerful Neo-Confucian ideology of constrained growth. The new economic order will be the modernizing agrarian system spawned by the spread of technological rationalism on Cheju Island, first sporadically introduced by the industrializing Japanese during the colonial period (1910–1945), but later fortified by the power of successive governments of the Republic of Korea, and especially by the introduction of *Saemaül Undong* growth ideology in 1971. Our Trojan horse will be the walking tractor, called *kyöngungi*^a by most Koreans, and affectionately addressed by islanders with the impressionistic mimetic word *taltali*.^{b 2}

6. Cheju Island: Site and Situation

Cheju Island, located in the northern reaches of the East China Sea, is the largest island and sole island province in South Korea. The island is a 1,810 sq. km. volcanic mass, oval shaped and measuring 353 km. in circumference. It consists of the crown, cape, and spurs of Halla Mountain, an eroded strato-volcano now standing 1950 m. above the surrounding shallow seas. Cheju Island is the 95 percent of Halla Mountain that rises above the present sea level, forming a cratered dome that tapers off in all directions to the coast. Today the composite cone of Halla Mountain, the dense field of protuberant cinder cones, basalt cones, and ash cones rising on its flanks, the weathered black basalts and reddish pyroclastics found almost everywhere on the surface, and the numerous lava tubes snaking underground, are all indicative of the island's volcanic origins. Grotesque and amazing volcanic formations are encountered everywhere on the Cheju Island surface. These are the salient geologic features whose omnipresence awes outsiders, but mainly interferes with the productive tilling of the soil by the islanders.

Some insight into the problematic soil conditions shaping agricultural tillage and technology on Cheju Island is provided by Wilson (1979:69), who examined some dark to very dark brown, freely draining, volcanic ash silt loams on the island's southeastern inland plain. Throughout the soil profile there was a very heavy occurrence of rock and stone; rocks also covered about 20 percent of the ground surface. Cleared of rocks and stones, these soils were easily worked, but also

easily eroded by wind and water, and it is these soils that have been slowly transformed into productive plots by island villagers over the centuries, to support Cheju's increasing population.

Water scarcity for settlement and agriculture is also a problem on Cheju Island. Almost all of the lavas on the surface of Cheju Island have a columnar formation that is quite permeable, thus capturing the overland flow of rainwater. This natural piracy of surface waters into the porous bedrock renders useless for agricultural purposes much of the copious precipitation that annually falls onto the island. This helps explain why the Cheju agricultural landscape in early summer is characterized more by its dry upland field crops—Cheju's proverbial "barley hills"—than by the familiar shimmering irrigated paddy fields that dominate much of South Korea.³

7. The Traditional Agricultural Landscape

The agroecosystem that supported the Yi dynasty state for over five hundred years early on calcified into an efficient and stable agricultural landscape. The Neo-Confucian scholar-officials who administered the agroecosystem throughout the Korean state and on Cheju Island were morally committed to commanding only the technology appropriate to labor-intensive farming at a level permitting continuous and rational use of the land. As a result, their successful administrative system might be described as "enlightened underdevelopment," characterized by a planned economy of constrained growth. This equilibrium of economic production came to be enforced by the inhabitants of the isolated and self-sufficient agricultural villages as their "tradition."

During the age of European exploration and colonization in the China Sea, when Korea was being called the Hermit Kingdom because of its self-enforced isolation, volcanic Cheju Island was Korea's most isolated internal territory. As a result, when Korea began to emerge from its isolation in the late nineteenth century, with technological rationalism already entrenched in nearby Japan and spreading, Cheju Island remained for a long time relatively self-sufficient and undisturbed by these developments. Its inhabitants were a mixture of mostly poor farmers and fishers of diffuse origins. There were, for example, long-indigenous coastal dwellers with a bewildering mix of Korean, Chinese, Japanese, Malay, and Mongol bloodlines. There were also many more recent immigrants from the Korean mainland—Neo-Confucian sophisticates in contrast to the older animist and Buddhist inhabitants—who

were either official representatives of the government in Seoul, or those disgraced government scholars cast off on Cheju as Korea's political exiles.

Despite their diversity, the inhabitants of Cheju as a whole had acquired a rather nasty reputation among European sailors over the centuries since the beginnings of their China seas' explorations; for example, as suspected pirates, and also as members of a bloodthirsty matriarchal society, an "Amazonia" according to a rumor circulated widely by Europeans plying the high seas. Since there were no safe deepwater harbors for ocean-going vessels anywhere on the entire island, most foreign mariners avoided closing on its uncharted and treacherous shores, and the rumors persisted.

LaPérouse, skirting Cheju in 1787, remarked (1807, vol. 1:534): "The island belongs to a people to whom all intercourse with strangers is prohibited." He adds:

It is scarcely possible to find an island of a more pleasing aspect . . . The soil [is] cultivated to a great height. . . . The land [is] parcelled out into very small fields, a proof of a very numerous population. The greatly varied tints, arising from the different kinds of cultivation, [contributed] to the beauty of the prospect.

Nineteenth-century Western travellers (for example, Belcher [and Adams] 1848; Chaillé-Long 1890) and early twentieth century scientific observers (for example, Genthe 1905; Lautensach 1935, 1945; Heydrich 1931; Hall 1926) were inclined to think of Cheju's economic productivity in terms of their own home-grown values and experiences. All were educated in a European cultural environment where the ideology of economic rationalism was triumphant. The European travellers were impressed, mostly in a negative way, by the Cheju inhabitants' precarious living conditions, remarking often on a "stagnant" economy and "medieval" implements. These travellers described many of the traditional native tools designed locally for digging and plowing.

As observers from a rapidly industrializing Europe, their biases cannot be explained apart from their ideologically shaped attitudes as Christians and technological rationalists. Therefore, the possibility that Cheju's Neo-Confucian administered agricultural economy, the entire technological system, and its component parts, however primitive, were once smoothly working characteristics of a viable agricultural equilibrium, was overlooked repeatedly in their reports despite their fugitive commentaries about a "beautifully cultivated" landscape (Belcher [and

Adams] 1848:450), “very numerous population” (LaPérouse 1807:534), and “good physique of both the male and female” (Chaillé-Long 1890:249). It is therefore possible from these and other Western travellers’ descriptions of Cheju Island to piece together an unintended but nevertheless positive picture of a productive society of village agriculturists.

Although Cheju islanders appeared dirty and poor to outsiders, lived in modest dwellings, and used simple tools, many of them had a generally healthy opinion of themselves and their activities. For example, it appears that from the traditional inward perspective of Cheju’s strongly Neo-Confucian farmers that their productive agricultural endeavour, despite its uncertainties and simple economies, had earned them a priceless social “virtue” [*in*^c] which was reflected in their major achievement—a “sincere” [*sōng*^d] surrounding agricultural landscape. It was by making their habitat into something beautiful and productive that Cheju’s Neo-Confucians actively cultivated their own propriety [*yeui*^c], and thereby could realize their correct place in nature and their proper relation to the universe of things. Given the natural conditions of their physical surroundings, however, their task was far from easy.

8. Some Traditional Survival Strategies

When mankind began to follow the plow on Cheju Island, apparently sometime shortly after the fourth century A.D., agricultural villages were located in the first instance according to water availability: as shown in Figure 1, either near isolated springs forced to gush here and there at the coastal surfaces by the towering reservoir of Halla Mountain, or where topographic and soil conditions permitted rain-water to be trapped and ponded for human and domestic animal use. In any case, the major grains supporting the population were those that could be grown with simple technologies and adapted to acidic soils with problematic phosphorus deficiencies, and could withstand drought conditions, *and* Cheju’s notorious high winds. Brittle-stemmed maize was rather risky, for example. Millet and beans, and to a lesser extent barley and buckwheat, were more practical choices. Ground-hugging vegetables were indeed highly reliable and always very important dietary supplements to the coarse grains like millet and buckwheat. Wet rice production, however desirable from a Korean cultural perspective, could never command more than 1 or 2 percent of the productive lands

on Cheju Island, and though rice had important ritualistic uses to islanders, it was not a life-supporting grain for them. Although subtropical conditions on some parts of the island favored citrus production of rugged and exotic native thorn varieties, until the twentieth century citrus production was small-scale and was undertaken primarily to fulfil tribute quotas to meet the demands of Korean elites, and therefore the fruit was not available for consumption by island inhabitants.

Offshore harvesting of various plants and animals also provided important dietary supplements to help meet islander nutritional needs. Perhaps the most important use of sea resources was the harvesting of various types of inedible seaweeds for the purpose of enriching Cheju soils and balancing their natural acidity with basic sea salts. It was therefore no accident that Cheju Island evolved its famous tradition of specialized women divers to harvest the rich offshore resources of the island.⁴ This activity could even be described as offshore farming, for when the daily allocations of Cheju agricultural labor spread seaward to the subaqueous fields, the tideline provided neither physical nor psychological barrier to the coastal village women; it was a natural extension of

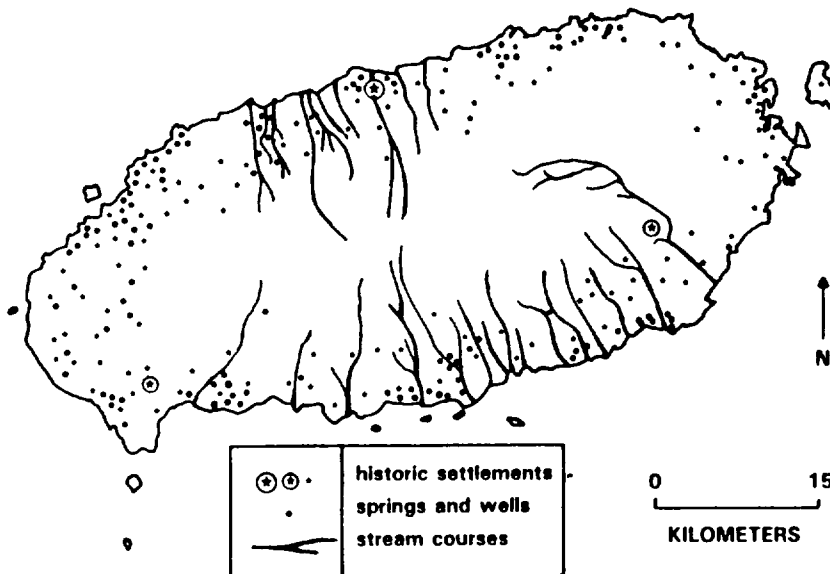


Figure 1. Historic Settlement and Water Availability on Cheju Island;
Source: Nemeth 1987:264

their productive efforts. Indeed from the perspective of the Cheju villagers, their exploitable landscape extended from the high mountain flanks where roots, berries, and herbs were collected, across expansive government-managed grasslands where tribute herds were grazed, to the coast where barley hills and plains mixed with vegetable gardens, and then beyond the tideline to the harvested seabeds.

9. Traditional Farm Layout on Cheju Island

In 1980, 28 percent of the island was under cultivation, and over 80 percent of these cultivated lands were severely atomized and allocated to dry-field farming, as shown in Table 1. Traditional farm holdings on Cheju are not only small typically, but are increasingly so as they continue to be subdivided through inheritance practices. They are also scattered to the four directions: the plots are widely distributed around the villages in a conscientious way, because of the almost universal peasant logic that will minimize losses in the event of natural catastrophe. That is, the premeditated atomization of productive landholdings is a proven form of crop insurance in the event of floods, fires, pests—anything that might endanger or destroy productivity in one location yet spare it in another. Another reason for the irregular shapes and exceedingly small size of many fields is that historically the frequent outcroppings of sterile basalts projecting above the soil were often avoided rather than removed. In fact, many Cheju field plots are but tiny walled-in pockets carved out of solid slopes of lava sheets and filled with compost. These then project outward, helter-skelter, from the villages.

The plots thus laid out over the centuries were each bounded by stones removed from them, arbitrarily and conveniently constructed into grotesquely misshapen enclosures.⁵ Field walls were highest near the villages and around the older farmsteads, where stone removal had been undertaken more scrupulously and over a longer period. Walls also served to mitigate the deleterious effects of strong winds, which otherwise would more easily have blown away the erodable topsoils and snapped off the long-stemmed crops at their bases. The enclosures also well served to corral livestock in certain areas. The inaccessibility of most walled-in plots except by footpaths and over hurdles has seriously impeded the introduction of mechanized plowing and prevented the easy consolidation of farm fields during the twentieth century.⁶

Almost all Cheju villages are located on the coastal margin of broad plains circling Halla's volcanic peak, amidst hundreds of parasitic

Table 1. Number of Cheju Farm Households and Size of Upland Land Farmed, 1979.

Households	Land Farmed. (in hectares)
363	0.1 or less
3,878	0.1-0.2
4,862	0.2-0.3
9,171	0.3-0.5
6,799	0.5-0.7
7,842	0.7-1.0
6,121	1.0-1.5
2,405	1.5-2.0
862	2.0-2.5
356	2.5-3.0
363	3.0 or more
TOTAL: 43,022	32,302

Source: *Agricultural Census*, 1980

cinder cones. Narrow footpaths are still the only access to many villager farm plots reclaimed from the wilderness in older times, and to walk them today remains a circuitous journey into the medieval Cheju landscape, where one is everywhere flanked by misshapen walls of black stone, piled high over the centuries to protect the rare, rich earth that has successfully sustained so many generations of Cheju islanders. Sometimes the ubiquitous stone-walled tombs of ancestors are easily mistaken for the agricultural plots surrounding them, such is the proliferation and confusion of green vegetation and grey-black stone beyond the village bounds. Many of these sacred tombsites are themselves larger than the arable fields they border.⁷ Obviously such a complexity of sacred and secular land use, formed over centuries into a single cultural landscape, cannot too easily be disassembled, re consolidated, and re-dedicated merely to accommodate new farm technologies. But the most amazing part of the story of the transforming of the rural landscape of Cheju Island over the past two decades is just how mass mechanization has been achieved and islander economy and society transformed, without much change in the traditional field layout on the island. In the following section I will briefly describe some of the positive and negative results to date of that rapid transformation, and then the role of the walking tractor in this transformation will be described and analyzed.

10. The Impacts of *Saemaül Undong*

The rapid and recent transformation of Cheju agriculture and society under *Saemaül Undong* rural development ideology has been strikingly successful. Where Izumi (1971:21) reported that in 1934 over 90 percent of the islanders were working farm families, and as recently as 1963 farm households still constituted over 85 percent of the island population, by the beginning of the 1980s farm families had become for the first time in Cheju agricultural history a minority of the islander population. Whereas there were 53,162 farm households in 1979, by 1984 there were only 44,790 farm households; a rapid decline from 51 percent to 39 percent over a span of just five years!⁸ Meanwhile the population of Cheju had increased by 25,000 persons in those five years, bringing the total to nearly a half-million, the majority involved in non-farm activities in the towns and cities. The farm animal population on Cheju has also declined dramatically during the recent, rapid urbanization: between 1967 and 1981, pigs decreased from 67,000 to 47,000 head; cattle from 43,000 to 28,000; and horses from 5,300 to 2,000.

Over the past two decades, while the total value of agricultural production has increased; local food production for islander consumption and for their domestic animals has decreased. This is because arable lands long committed to subsistence food crops for local consumption rapidly have been converted to commercial crop production (see Table 2). Although the amount of land being farmed has not increased significantly on Cheju since the 1930s, farm activity has shifted to agricultural production for export rather than for local consumption.

Continued increases in the dollar value of agricultural productivity on the island may be realized if and when current *Saemaül* efforts to remove family tombs and field walls, and to otherwise consolidate traditional miniscule farm plots, become more widely implemented. Already the central government is considering raising the maximum legal landholdings of farms throughout South Korea and on Cheju Island from three hectares to ten, a legal maneuver designed to encourage field consolidation and facilitate the increase of mechanized tilling, thus further increasing productivity.⁹ This effort may not have the desired effect on Cheju, however, where there are unique physical environmental conditions that make the laborious consolidation of its agricultural plots for increasing dry-field farming purposes an invitation to erosion, and therefore ill-advised. Perhaps for this reason, agricultural investment on the island has lately focused more on converting upland fields into orchards and hothouses, a costly agricultural transformation that has resulted in some consolidation of traditional fields.¹⁰ Introduction of

Table 2. Cheju Farmlands Utilized for Upland Crops.*

	Area (hectares)	1984 ¹ (percent)	1930 ² (percent)
Major Food Crops			
barley	14,745	26	28
soybeans	7,451	15	8
sweet potatoes	5,138	10	4
garden vegetables	4,169	8	?
beans	980	2	2
white potatoes	789	1	
rice	424		
buckwheat	216	} ——— 2 ——— 2	
corn	204		
millet	620	34	1
Major Commercial Crops			
sesame	7,668	16	
rapeseed	7,403	15	
cotton	121		2
perilla	16		
total	49,274	78	98

* Not included: paddy, 950 hectares; permanent orchards (orange and pineapple), 17,064 hectares; open rangeland, 5,527 hectares.

¹ Not shown if less than 1 percent. Source: *Cheju Statistical Yearbook*, 1985.

² Total upland cropland unknown. Missing data for some crops. Source: Lautensach 1935:197. Regarding crops planted in the early Yi Dynasty (circa 1500), *Sejong Sillok* (vol. 151, p. 293) ranks millet, beans, buckwheat, barley, and corn in order of importance. In 1983 the most profitable farm crops per unit area on Cheju, according to an informal poll on market day, were garlic, strawberries, carrots, sesame, and oranges, in that order.

sophisticated well drilling technology also has the potential to tap potable water in places never before settled or cultivated, promoting agricultural expansion (Nahm 1966). A tangerine plantation boom of the 1960s and 1970s appears now to have peaked, due to increasing competition and overproduction, and many orchards are today being replaced with vinyl houses for pineapple and banana production.

By 1983 the Cheju islanders had become the most mechanized agriculturalists in all of South Korea, with for example one walking tractor for every 3.7 farm households, and one for every four hectares of cultivated land (*Agricultural Machinery Yearbook* 1984:96-97). But by 1985, the island farmers were carrying a heavier debt burden than farmers in any of the other South Korean provinces ("Agricultural

Problems. . .” 1985:5). Not surprisingly, traditional Cheju farmers were increasingly leaving the farming sector to join the urban work force on the peninsula.¹¹

There can be no question that *Saemaül Undong*—motivated economic growth has transformed the Cheju Island agricultural landscape over the past two decades. At the same time there has been disruption of rural lives and dislocation of poor rural peoples under *Saemaül Undong* mobilization. I shall now argue that the islanders chose disruption by initially accepting certain new technologies into their rural villages and daily lives that would begin to disrupt and subvert their traditional productive farming patterns, and thenceforth drive many of them from their inherited lands. One of the most popular new technologies introduced by *Saemaül Undong* into the traditional villages and wholeheartedly accepted by the island farmers was the walking tractor. The following section will describe this interesting device and assess its positive and negative impacts.

11. The Walking Tractor

Tractors are powered by internal combustion engines, and are the farmer’s alternative in the industrial age to the traditional biological power plant of horse, ox, or mule. The word “tractor” is a compression of the two terms “traction” and “motor,” and the implication is that the main utility of the device is in plowing and cultivating fields, for tilling, planting, and weeding. However, tractor technology has evolved during the past century to provide the farmer with a very versatile main power plant, capable of doing more than pulling and pushing loads; for example, for turning belt and chain drives as a stationary power source for numerous agricultural and nonagricultural activities: pumping, spraying, mixing, crushing, and so on.¹² The first tractors were large, heavy, and cumbersome, designed for increasing production on level unobstructed fields with rich, friable soils, as were found in the midwestern United States at the time of their introduction. It was, however, unfeasible until well into the twentieth century to develop and manufacture a special purpose tractor for poor farmers working small fields in rough terrain.

The walking tractor, variously described in English as a rototiller, power cultivator, power tiller, hand tractor, or garden tractor, is a small tractor invented in Europe in the early 1900s.¹³ The invention appeared in response to the special needs of isolated Swiss dairy farmers who, in

an industrializing economy, occupied fields which were too small in scale for the maximum utilization of their capital, and which could not be easily enlarged to accommodate big tractors. The potential for its use in distant Asian rice paddies was not immediately apparent to its inventor, even when prototypes were eventually exported to the Japanese Alps to service dairy farmers there.

The walking tractor was an attractive machine to traditional farmers of modest means, not only because of its small size, easy operation, manageability, and reasonable cost, but because the operator walked behind the machine at close quarters, guiding the tractor much as he and his forefathers had guided the horse or ox. Thus the psychological transition from the biological power plant to the mechanical power plant on the traditional farm was not such a traumatic adjustment; the easy transferability of the farmer's affectionate bond from the biological power plant to the mechanized power plant helped earn the walking tractor quick acceptance in many conservative farming villages throughout the world. It explains why farmers around the world, speaking many languages, have nicknamed the walking tractor their local equivalent of "iron horse" or "iron buffalo."

In 1958 Robert B. Hall described the rapid spread of the walking tractor for cultivating wet paddy fields in Japan as a "significant advance in the mechanization of farming." As indicated, the Japanese had originally imported the walking tractor from Europe for pasture management and dry-field cultivation, after the Swiss had demonstrated its utility. An ingenious modification of the tractor wheels adapted the machine to an even more productive environment in Japan's many tiny muddy and flooded rice fields. Hall (1958:315) remarked that this adaptation in a typical village was "a very important change, as it shows increasing efficiency of the tractors and certainly a much more economical use of them." He added that by increasing Japanese agricultural productivity "the machines contributed to a better way of life and a higher cultural standard" (Hall 1958:320).¹⁴ These positive claims attest to both the success of the walking tractor in Japan and to the idea of increased production that gave rise to it and which the machine embodies. That idea has subsequently spread from Japan throughout East Asia with the diffusion of the machine.

Japanese walking tractors were first imported and used in South Korea to cultivate paddy fields. Prior to 1962 the Dae Dong Industrial Co., Ltd., provided walking tractors for the domestic market under a technological license from the Mitsubishi Company of Japan. There-

after farm mechanization began in earnest and the machines began to be produced in South Korea (personal correspondence from Andre Brandel, July 18, 1985). By the mid-1970s several Korean companies were competing to meet the demand created by the spread of *Saemaül Undong* growth ideology, which used walking tractor technology to spearhead its rural modernization drive.¹⁵

The success of the walking tractor on Cheju Island, however, cannot be related to a widespread need in peninsular South Korea to increase wet-field rice production efficiency, since wet rice production is such a minor part of the island's agricultural economy. Nevertheless by 1983 there were 14,548 machines on the island, as shown in Figure 2. Interestingly one rarely saw them being used in the fields for plowing and cultivating. One must assume the tractor was being accepted for other reasons.

Walking tractor promotion and its versatility go far toward explaining the initial popularity of the device. Cheju farmers, however poor, initially could receive loans at low interest (10 percent) to purchase their machines—and the first year of ownership was free! The repayment period was a long seven years. The South Korean government, through *Saemaül Undong*, aggressively encouraged tractor

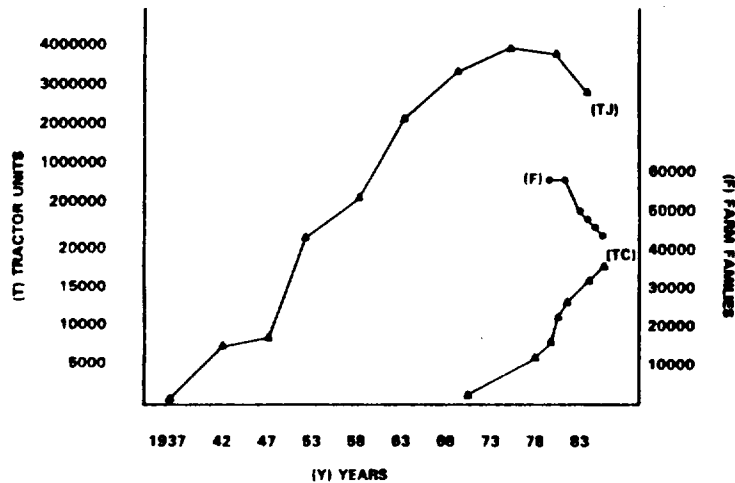


Figure 2. Walking Tractor Acceptance by Japanese (TJ) and Cheju Islanders (TC), 1937-1984, with Numbers of Cheju Farm Families (F); Source: *Agricultural Machinery Yearbook*, 1984; *Cheju Statistical Yearbook*, 1985

sales and provided easy loans, underwriting about two-thirds of the cost of providing the farmers with their walking tractors.¹⁶

The top choice of Korean farmers is the eight horsepower model manufactured by the Dae Dong Company. It weighs about 450 kilograms. However, there are several companies manufacturing similarly constructed walking tractors for the domestic market in South Korea, with a variety of models from which to choose. They all run on gasoline or kerosene, and all are similarly attractive in terms of their versatility as stationary and traction power sources. For example, they may be used for pumping water, spraying insecticides, and for hauling and transport.

Mr. Kim Tae-gu, a representative of the Cheju Agricultural Machine Institute, explained that while the first of Cheju's walking tractors may have indeed been purchased to improve yields in several hundred hectares of paddies near Sogwipo City, their widespread use and popularity began after the *Saemaül Undong* had promoted a citrus boom during the 1970s, when the walking tractor, as a labor-saving device for spraying insecticides and fertilizers, proved itself in the then proliferating orchards. The walking tractor, with appropriate attachments like mixing tanks, pumps, and hoses, was used in the orchards primarily as a stationary power source. Small orchards could indeed benefit from the stationary engine alone, without wheels, through the use of long hoses. Since Cheju is an entomologist's paradise, the island experimental stations recommended approximately ten insecticide sprayings per tree during the hot and humid months preceding each winter harvest. However, Cheju citrus orchards, like the upland fields, are atomized, in which case the engine on wheels is preferable.

Once the machines were increasingly accepted by the citrus farmers, their limited use by poor farmers as power tillers in Cheju's upland fields was inevitable. Certain limitations on their efficient use can perhaps explain why they have not yet replaced the horse, ox, and cow *in the fields*, but does not explain the widespread acceptance of walking tractors by Cheju's poor farm families. First as to the limitations: Small, inaccessible fields and abrasive soils would seem to combine to discourage poor farmers from purchasing the tractors for use in the fields. Tractor implements are easily damaged by rocks and, worse, volcanic dust and grit can penetrate faulty oil seals and neglected air intakes to abrade internal combustion mechanisms and ruin the entire power plant. Even if Cheju soils were soft and slick with clay, and the upland plots spacious and accessible, the time required for planting, cultivating, and weeding during the year is so brief as to recommend the rental rather than the

purchase of walking tractors by poorer farm families. Why then have they been accepted so wholeheartedly by so many of the low-income island farmsteads?

The heavy use of the walking tractor on Cheju Island for transport is worth special note, especially since village-dwelling farm families for so many centuries lived and worked in a completely rural setting, isolated from other island villages by rough terrain, intervillage competition, and social conventions. Their experience has been strikingly similar to that of the village-dwelling Chinese of the North China Plain, who during the same recent era of rapid development have accepted the walking tractor into their lives for many of the same reasons as the Cheju islanders. Norman Chance has written of the walking tractor phenomena in China (1984:30):

There is one other form of transportation well recognized throughout rural China: catching a ride on the back of a wagon . . . the old horse-drawn wagon is being replaced with large two-wheeled hand-held "walking tractors." Although originally designed for agricultural purposes these machines can be easily converted into motorized four-wheeled vehicles by attaching a cart or wagon to the frame.

Chance (1984:132) also notes that mechanized transportation is a high priority item for today's Chinese peasant farmers, and that few are actually found in the fields, where they are also needed.

Cheju farm families of modest means seem to have the same aspirations and priorities, and have taken to the walking tractor for its transportation utility more than for its cultivating utility. Indeed walking tractors are observed everywhere on the roads of Cheju, between villages and towns, and always with trailer hook-ups that convert them into four-wheeled vehicles. Unfortunately the small horsepower ratings of their engines—however fuel efficient—do not generate much speed. Increasing numbers of farm families riding their small tractor-trailers on Cheju's narrow, paved roadways, where speeding buses, trucks, and taxis reign, risk their lives for the convenience of their increased mobility. Farm tractor accidents are rapidly increasing, but not on the farm. Interestingly the factory-made walking tractors come equipped with headlights, though no sane farmer plows at night. More interesting, driver's licenses are not required for operating tractor-trailers on the roads, nor are the tractors themselves licensed as vehicles. Few poor farmers could afford such licenses and taxes. But is this so incredible? If it is the goal of the government to awaken poor farmers to accept change and modernization into their lives, what better way than to provide them

with cheap transportation to the towns and cities where their wants and needs for modern techniques of all kinds will be stimulated? Owning a walking tractor is therefore the beginning of their transformation from traditional, rural, self-sufficient producers to modern, urban, dependent consumers.

12. Analysis

Cook et al. (1956:390–391) have outlined many of the reasons why a poor farmer anywhere in the world may accept a tractor substitute for a time-tested biological power plant: farm animals require a larger storage space than tractors; they cannot easily be adapted to stationary power production; they cannot operate over long periods of time at high speeds or work continuously under heavy loads; their performance decreases as daytime temperatures increase; they can't see well enough to work after dark; they are not easily and quickly put into operation in emergency situations; and they must be fed whether or not they work.

On the other hand, nothing short of coercion or low risk could entice many a poor farm family to substitute its familiar ox or mule for a tractor, which is totally unfamiliar to its experience and understanding. Yet a tractor's promise of increasing yields is appealing, and can override whatever the affectionate bond formed between the farm family and its animal power plant during years of close association and mutual dependency.¹⁷ Farmers are fundamentally pragmatic. Their fear of tractor substitution for farm animals can be mitigated if the government promises to provide expert advice in all matters related to the use, care, and maintenance of the tractor, and especially if the cost of the substitution is heavily subsidized by the government.¹⁸

Since the costs of having both a biological power plant and a mechanical substitute are prohibitive to the poor farmer, the choice is difficult and has a profound aftermath. What many farmers do not realize is that once the substitution has been made, and time passes, the impact of their initial vote for modernization becomes irreversible. Worse, most of the shortcomings of the mechanical power plant become obvious only after the biological power plant has been removed. For example, the fuel and lubricants for the noisy machine—oil, gasoline, and kerosene—must be purchased with cash. That fuel does not periodically and conveniently fall from the machine as free fertilizer usable for enriching the soil, as if it were a dumb, providing beast; arti-

ficial fertilizer must also be purchased with cash. A more serious disadvantage of a machine is painfully obvious when even a minor breakdown renders the entire power plant inoperable. Broken parts can be replaced—again for cash—and even without necessarily threatening the agricultural timetable, but only if one knows how to diagnose problems and make repairs, and if one can be supplied by dealers with replacement parts, on short notice.¹⁹ Otherwise the whole farming operation is jeopardized. Should fuel become scarce and expensive, or should the price of artificial fertilizers, insecticides, and repair services escalate, production problems quickly multiply and debts increase. What then? The poor farm family may learn too late the significance of its loss of self-sufficiency. E. Estyn Evans (1956:237) described the situation in rural Europe after its widespread acceptance of tractor power there; the outcome will be no different in Asia: “Surveying the present cultural landscape [in Europe] we see a countryside parceled out into isolated farms which have won their freedom but have lost their self-sufficiency and their local leaders.” The Cheju cultural landscape, after two decades of experience with the walking tractor, has become similarly transformed. Its rural poor have been freed of the past and dispossessed of the future.

13. Conclusion

The increase of tractor utilization everywhere in the world after its introduction has usually been explained by the accomplishment of the specific economic motive that makes their manufacture and sale profitable (Eisenhower 1932:411). Large farm tractors have historically increased agricultural production in the major industrializing countries, which has recommended them as practical alternatives to the traditional kinds of major biological power plants used previously: the horse, ox, and mule. Smaller tractors would seem to have succeeded in replacing biological power plants for the same reason. However, a closer inspection of tractor acceptance in Asia indicates that this may not be so in all cases.

Langdon Winner (1980:124) states that “if we suppose that new technologies are introduced to achieve increased efficiency, the history of technology shows that we will sometimes be disappointed.” My research describes the introduction of a walking tractor designed for plowing and tilling into the hostile physical environment of Cheju Island, where these functions would seem to be particularly inappropriate.

There the device is rarely seen tilling the upland fields of the poor, but is frequently found on the roadways leading to urban service centers, serving well to induce modernization and change and to wipe out Cheju's once large class of poor farmers; it has "awakened" them into accepting modernization, as Rostow envisioned. Thus the walking tractor on Cheju plows deeper and more rapidly than heretofore acknowledged, preparing Cheju for its future role in national urban-industrial development.²⁰

Motivated by Winner's query, "Do Artifacts Have Politics?", this research has inquired as to whether this particular technical device in the Cheju landscape "may have been designed and built in such a way that it produces a set of consequences logically and temporally prior to any of its professed uses" (Winner 1980:124). It apparently has, and has succeeded without the conscious invitation of many Cheju villagers, who were prodded by *Saemaül Undong* to accept it into their once self-sufficient communities, and who have subsequently been socially transformed after their original choice to experiment with the device for purely economic reasons. Their transformation has been rapid and profound, as is apparent in the words of one city-dwelling young Cheju resident who laments the loss of community spirit taking place over the past two decades, since the first walking tractor appeared in his village:

When I was young, in my village during certain times of plowing, seeding, and harvesting, our house was filled with people. Their spirit of cooperation was everywhere. My parents never paid for the help they received, but returned help in kind wherever there was a need. Today I go back to my village and the villagers work alone and never give their labor for free, or ask others to do so (interview with Ha Ung-ch'ong, July 12, 1985).

NOTES

AUTHOR'S NOTE: This is a revised version of the paper, "The *Tialnali*: Power Tiller and Rural Development Strategy on Cheju Island, Republic of Korea," which I presented at the 50th Anniversary Meeting of the Association of Pacific Coast Geographers, September 12-15, 1985, at the University of California, Los Angeles. I would like to thank Murray Denoon, O. B. E., and Kim Tae-gu for their assistance during the fieldwork portions of this research project.

1. For India, see Agrawal 1980:346; Japan, Kodansha 1983:25; and Asia in general, Carter 1964:127.

2. *Kyôngungi* is a Sino-Korean word composed of three characters: to plow^a, to weed^b, and device, or machine^c, and is perhaps most accurately translated into English as cultivator or tiller. A cultivator or tiller powered by an internal combustion engine is a "power tiller," and technically a *tongryôk*^d [self-powered] *kyôngungi*. The *kyôngungi* is described by the 1980 *Agricultural Census* as a two-wheeled tractor usually with a five to

ten horsepower engine, performing a variety of agricultural work by attaching auxiliary implements. Technically a tractor is a four-wheeled vehicle of more than fifteen horsepower, and usually a riding operator. Perhaps it is best to define a "walking tractor" as a single-axle tractor, and a "riding tractor" as double axle by design. As I shall explain, the former can conveniently be converted into the latter, with some profound results. *Tialnali* apparently also has a few slang connotations besides walking tractor, such as masturbation and dissolute male activities.

3. The three intensively worked components of the agricultural landscape on Cheju Island are upland, orchard, and paddy. "Upland" refers to farmland having no facilities to hold water for the cultivation of temporary crops, that is, dry-field cropland. "Orchards" are for permanent crops, and are predominantly tangerine orchards on Cheju Island. "Paddy" refers to a farm field having facilities to hold water for cultivating rice. In 1984 there were 41,792 hectares of upland, 9,078 of orchard, and 938 of paddy. Orchard orange production increased dramatically from 257 hectares in 1961. Interestingly the islanders had removed or neglected almost all of the tribute orchards after the fall of the Yi dynasty. While the Japanese replaced some of these during the Occupation, dramatic growth in the orchard industry on Cheju did not occur until *Saemaul Undong* mobilization began in 1971. Today 25 percent of the island's economic product is from its orchards. This emphasis is precarious for the Cheju economy because the United States is now pressuring South Korea to ease its import restrictions on the import of American citrus products.

4. As everywhere in the world, Cheju men traditionally have had *their* own exclusive place behind the plow.

5. The local histories indicate that excavated field stones began to be used systematically as protective windbreaks and impediments to sheetwash erosion beginning in the thirteenth century A.D. (Kim Sok-ik 1976:355).

6. Some plots are inaccessible even to the innovative yet primitive pony-drawn plow, which was long the islander solution to the problem of servicing all but the tiniest garden plots. These latter could be cultivated only with the smallest of hand tools.

7. In 1985, 350,432 tombs on Cheju occupied 1,454 hectares. One hundred thousand of these were located in cultivated fields and orchards, displacing 600 hectares of potentially productive land.

8. Mechanization of agriculture and the consolidation of fields to increase food production was not seriously attempted by the Japanese on Cheju Island, unlike on Okinawa and some other Japanese-occupied colonies in the China Sea. There was an attempt to increase the yield of coastal fisheries, to substitute cash crops for food crops, and to extend dry-field farming into marginal areas (for example, by terracing the steep slopes of cinder cones). These attempts were not always successful, and remnants of abandoned terraces are still visible; they testify to the difficulties of modernizing dry-field farming on the island.

9. R. Burnett Hall (1926:67) reported during the 1920s that Cheju farm size increased inland from the coast, as yield decreased and fallowing increased, and farms averaged five acres in the coastal district, seven in the plains, and thirteen in the uplands and foothills. Table 1 indicates that a large percentage of Cheju family farm holdings in 1979 were less than one hectare in size, even though Korean law permitted farmholdings as large as three hectares ("Farm Land Possession Law . . ." 1985).

10. Of course, energy costs are very high for these new, capital intensive forms of agricultural production on Cheju Island. Caloric content of the product hardly justifies ecologically the massive inputs of energy invested, though economic returns may be great. By way of contrast, traditional millet production resulted in a substantial caloric gain and an efficient investment of energy.

11. Poor farm families seem particularly plagued by increasing fuel prices, rising taxes, and soaring medical and educational costs. In addition, their propensity to consume home appliances and articles of convenience for conspicuous consumption, on credit

terms, has dramatically increased during the *Saemaül Undong* era. Meanwhile the values of their crops rise slowly, or even decrease, due to the vagaries of the market ("Agricultural Problems . . ." 1985:4).

12. The first patent for a farm tractor was issued in the late nineteenth century in the United States, but rapid substitution of biological power plants on American farms did not begin until World War I. In 1909 there were 2,000 tractors manufactured in the United States; by 1919, 82,000 tractors had been produced. At that time tractor power was accepted only as a supplement to biological power. However, as the machines became more trouble-free and efficient, the biological power plants were discarded. Between 1918 and 1931, the number of horses and mules decreased from 26,428,000 to 18,643,000 (Eisenhower 1932:418, 441). This process of substituting mechanical power plants for biological power plants continues today on Cheju Island.

13. The walking tractor was invented either by Konrad von Mayenburg of Basel, Switzerland, in 1910 (Pitts and Park 1984:2), or by Pfarrer Fahrnis, a Swiss Methodist preacher, in 1920 (Aeschbacher 1982).

14. Oshiro (1985) provides an additional and more recent case study that describes and analyzes the tremendous success of the walking tractor in another Japanese village.

15. The *Agricultural Machinery Yearbook* (1984:3) reports that during this development period the walking tractor has had the most dramatic success of all farm machines introduced. There were 15,499 walking tractor units in Cheju in 1984 (interview with Kim Tae-gu, May 1985). Other farm machinery used on Cheju include 12,868 sprayers; 1,576 threshers; 356 forage cutters; 282 water pumps; 274 mowers; 242 binders; 210 riding tractors; and others, totalling 31,413 units.

16. In 1979 the average income of a South Korean farming household was estimated to have been 2,227,483 wón (approximately \$2,500 at the wón/dollar exchange rate of 900 wón to the dollar). The Dae Dong eight horsepower unit sold then for 1,059,300 wón, without those attractive accessories and implement attachments most useful to the Cheju Island dry-field farmer (plow, cultivator, trailer, and so on).

17. Planting and cultivating the soil have always been the hardest tasks of upland farming, explaining the primary need for biological power plants as traction. The energy demand on the traditional farmstead varies greatly throughout the year, however, according to the farmer's calendar: the main upland plowing and cultivation period in traditional Korean agriculture occurred from April and June; during August and September, and especially December through February, the main biological power plant for tilling was underutilized (*Agricultural Cooperative Yearbook* 1982:86). However, it produced fertilizer continuously and offered warmth and companionship throughout the year. Moreover it reproduced itself on the farm. Tractors as power tillers and cultivators work faster than animals and are therefore even more underutilized in the fields. They are anyway cold companions, however much more versatile they are than the beasts they replace.

18. In 1983 the farmer's initial financial burden in purchasing a walking tractor amounted to 22.5 percent of its total cost. Approximately 73 percent of the cost was carried by the government's low interest, long-term loan. The balance was covered by a small 3 percent grant (interview with Kim Tae-gu, April 1985).

19. Estimates from a newspaper survey conducted in 1984 were that, at any one time, 17 percent of the island's 30,777 agricultural machines were broken and useless. At the time of the survey there were only seventeen agricultural machine repair shops on the entire island. A survey of these shops indicated that 75 percent of the machines needing repair were walking tractors. The most frequent problem was leaking or exploding(!) fuel tanks; replacement of tanks was averaging one replacement every two to five months per tractor. Also the belt drives used for transferring power to accessory devices (pumps, sprayers, and so on) broke frequently. The farmers' major complaint about their machines was that broken parts were expensive to replace, and parts were not readily available ("Frequently Broken Agricultural Machines" 1985).

20. A good measure of *Saemaül Undong* success is the rate at which poorer island farm families acquiesce to the relocation of their geomantically sited ancestor's tombs, from private lands to public cemeteries. Once these tombs are removed from the land, and spiritual ties severed, these farm families are themselves more easily separated from their farms to relocate in the urban-industrial centers.

GLOSSARY

a	경운기	f	耕
b	딸딸이	g	耘
c	仁	h	機
d	誠	i	동력
e	禮儀		

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〈國文抄錄〉

제주도에서의 트랙터

데이빈 J. 니멜스

20C초부터 개발도상국의 농업기술 현대화 정책에 따라 농촌지역은 큰 변화를 가져왔다.

본고는 “새마을 운동”이란 이름으로 시작된 정부의 농업기술향상 정책에 따라, 제주도에 도입되어 20여년 동안 제주지역 농업기술 향상에 큰 영향을 끼친 트랙터에 대한 고찰이다.

본고는 다음과 같이 전개된다.

1. 한국이 저개발국에서 신흥공업국(NIC)으로 변화되는데 영향을 준 성장 정책과 새마을 운동
2. 제주도의 자연환경과 전통 농업 및 생계방법의 소개
3. 제주도 전통농가의 형태
4. 성공적 측면에서 새마을 운동이 제주에 끼친 영향
5. 새마을 운동 이후 제주에 보급된 트랙터의 실태와 그 영향

결론적으로 제주 농가에 트랙터가 도입된 이후 많은 농가가 농업생산량의 증대를 가져왔으며 그들의 생활 역시 급속도로 변화되었다. 또한 트랙터의 도입은 여러 사람의 도움없이 농사를 가능케 하였지만 제주 특유의 공동체 정신을 줄어들게 한 문제점도 없지 않았다.