Ecological Economics 128 (2016) 106–116

Contents lists available at ScienceDirect

Ecological Economics

journal homepage: www.elsevier.com/locate/ecolecon

Analysis

The rise and fall of the sand monopoly in colonial Hong Kong

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ARTICLE INFO

Article history:
Received 4 October 2015
Received in revised form 7 March 2016
Accepted 24 April 2016
Available online 6 May 2016

Keywords:
Schumpeterian innovation
Transaction costs
Open access property
Sand
State monopoly

ABSTRACT

A state monopoly over a scarce natural resource under open access can theoretically reduce the costs of supply by constraining rent dissipation and innovations. A monopoly over the collection and trading of sand was formed in Hong Kong by legislation in 1935 in the wake of disputes between sandmen and villagers and imminent shortages of sand. Arguably, a monopoly at this stage of Hong Kong's development was a better alternative to merely defining rights over sand extraction in terms of the transaction costs of enforcement. During the 1950s and 1960s, when Hong Kong's economy and construction industry began to boom, the monopoly's existence was further justified due to the politics of China being the sole source of Hong Kong's sand supply. However, this case study of the sand monopoly and its post-war operation as a bilateral monopoly shows that it did not protect coastal villagers, as violations of the sand law were not infrequent. The local sand supply was huge, and the monopoly's abolition in 1981 was followed by a long period of falling, rather than rising, real wholesale prices of the resource. Nor was there any sign of scale economies, as claimed by the government. The policy implications of this are discussed.

> "Where monopoly rests on man-made obstacles to enter into a market, there is every case for removing them." (Hayek 1960: pp. 265–266)

1. Introduction

The words of Hayek as quoted above the type of monopolies. In this paper, which investigates the genesis and destruction of a sand monopoly, reference will be made to some government-regulated monopolies that, contra Hayek, enjoy economies of scale, earn profits and cross-subsidize unprofitable services. There are also many examples of government departments providing monopoly services (like fire services) which do not charge a fee or (like water supplies) which charge on a cost-recovery basis, but they do not trade on other things in the economy. The state itself is, in fact, a monopoly of protection. The question is whether a state trading firm in a building material, sand, is sustainable. The discussion inevitably involves a cost dimension in relation to scale economies but the practical socio-ecological background is not so much cost of sand but the policy need to constrain rent dissipation in a de facto open access resource. Our chosen focus is whether a monopoly can solve a tragedy of the common problem; and our answer is no, even though theory would suggest that a granting of exclusive rights will result in optimal extraction. The question is Coasian: whether a state trading monopoly or state-regulated monopoly was a better institutional alternative, bearing in mind that there was econometric evidence that the latter did enjoy economies of scale in Hong Kong and survived as profit-making concerns.

Building construction and many industrial processes consume a lot of sand. In the making of concrete, (fine aggregates) is mixed with stones or gravel (coarse aggregate), cement and water. The mixture of aggregate is bonded together with by a fluid composed of the cement and water which hardens, or sets as it cures chemically. Sand is used to fill in the spaces left by stones and cement.[1] In Asia, river sand is preferred by contractors in making high-strength concrete and mortar. Sand naturally exposed on beaches or river banks can be removed using simple methods. Natural sand can also be found on the seabed or a river bed and dredging or siphoning is required to excavate it. Finally, sand can also be obtained by mechanically breaking up rocks. Beach sand can be captured or replenished by such engineering efforts as weir construction but the rate of exploitation must be carefully controlled.

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[1] The usual ratios of the cement used in Hong Kong are: M-15 = 1:2:4 (cement:stones:sand); m-20 = 1:1.5:3 (cement:stones:sand) and m-25 = 1:1:2 (cement:stones:sand). The sand (ballast) provides strength, hardness, and durability. The cement binds the sand/gravel together, though in two different ways depending on the use of non-hydraulic cement (uncommon) or the more common hydraulic or Portland cement.

http://dx.doi.org/10.1016/j.ecolecon.2016.04.021
0921-8009/

In the policy arena environmental protection, the conservation of river and marine sand within a given territory has become a major sustainable concern. Ecological economists have paid much attention to measuring its costs (Kim et al., 2008). Governments often make laws and regulations to limit exploitation of the resources because uncontrolled mining of coastal and riparian sand can cause not only ecological but also social problems, as violence would be used to appropriate state resources when competition becomes fierce.

To avoid or control these problems, the standard government practise is to limit sand excavation by law or administrative fiat to licensees. However, the most drastic practise is to establish a state monopoly on the quarrying and trading of sand. A sand monopoly existed in Hong Kong from 1935 to 1981.

Government legal monopoly of natural resource is nothing new to Hong Kong. New land for development is the classic example, as the state is at law the landlord of all land in Hong Kong with one single exception for a piece of land granted as freehold to the Church of England. The Fish Marketing Organization (FMO) established under the Marine Fish (Marketing) Ordinance introduced after the Second World War was also the legal monopoly of non-living marine fish. Potable water supply has remained the monopoly of the Water Supplies Department. Lai and Yu (2002a) showed that the FMO ran into financial difficulties, as its trade-restrictive practises were bypassed by fishermen in the form of aquaculture and selling fish outside Hong Kong.

This article reconstructs the neglected history of a sand monopoly and seeks to evaluate the conjecture that it served the purpose of keeping sand prices low as a social policy. Special attention has been paid to the likelihood of scale economies, which lends support to the presence of a monopoly.

1.1. Theoretical Context: Property Rights, Monopolies and Transaction Costs

The discussion of this ecological resource is informed by theories on property rights, monopolies and Coasian transaction cost.

1.1.1. Property Rights

In mainstream economics, it is 'received theory' that the establishment of exclusive property rights over natural resources could not only limit rent dissipation by curtailing access but also encourage investment and innovations by creating titles to the resources. Evidence of this has been found in marine creatures, which actually inspired the genesis of the term "the tragedy of the commons". From their studies on the economics of cultured versus captured marine fish, it has been found (Lai, 1993; Lai and Yu, 1995, 2002b; Chau and Ho, 2002) both the prices and quantity supply of domesticated species are much more stable than in the case of capture fisheries, as planned production and inventory is only feasible for the former. By similar reasoning, such natural resources as minerals and wood subject to more access restrictions would exhibit a similar pattern of resource allocation.

In resource and neo-institutional economics, fisheries (Gordon, 1954; Cheung, 1970; Lai, 1993; Lai and Yu, 1995) and trees have been treated by models of rent dissipation on a par with gold (Umbeck, 1981), coal (Anderson and Hill, 1981) and crude oil (Libecap and Wiggins, 1984). Sand should not be an exception as it is also sometimes in short supply. It is true that renewable resources theoretically can be treated differently than minerals, sand in this case. However, the nature of sand and sand mining is also interesting in one aspect. Unlike living organisms, say, fish or human beings (who can be subject to slavery), but like gold (Umbeck, 1981), sand can neither "adapt" to human intrusion nor negotiate with its own conservation. Its protection, as in the case of trees, lies entirely on the will and wisdom of property management, if any, as regards access control and investment. But unlike goldmines, which tend to be territorially compact and in a limited number of locations so where exclusive rights are usually granted if not created (Umbeck, 1981), marine sand is scattered all over coastlines so in many regions of the world, it probably is not considered to be scarce and hence is not an obvious candidate for similar treatment. This makes the Hong Kong study unique. Because of the hectic construction activities on this small maritime city region, sand rapidly became a scarce commodity. Depletion of that could be similar to the depletion of any minerals which are usually treated to be much more valuable to be protected by the country where the minerals are found. The laws in those countries will be explicitly structured to prevent over exploitation. On the distinction between renewable versus mineral resources, the difference could be a matter of formulation. Instead of aiming at maximum yield, exploitation should aim for sustainable yield. Again, the question would be, what type of institution that will be best to provide for a sustainable yield.

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The standard approach to economic research following the above line of thinking focuses on the prices of the resources. This paper adopts that approach and examines if the sand monopoly had an impact on price. This concern with prices should be viewed in light of the considerations that prices are amenable to empirical analysis, as prices are observable.

1.1.2. Monopolies

Pigovian economists have long taken up arms against monopolies as a type of market failure on the basis of "efficiency". The three types of market failure were external effects; public goods, and monopoly. Each type of market failure involves an efficiency problem, such as an inequality between marginal valuation (MV) and marginal cost (MC). Any government policy seeking to distinguish between the two may or may not achieve the equity rule, which requires distinguishing between average revenue (AR) and average cost (AC). The constant marginal cost monopoly can be driven to produce at an efficient (MV = MC) equilibrium, which is also the break-even (AR = AC) point.[2]

There are several libertarian approaches for defending a monopoly. First, to punish a monopoly is the same as punishing a firm that is successful. This has a "disincentive effect". Second, most arguments against monopolies are based on a static view of the economy. In reality, facing potential competition, monopolies will push costs down and lower prices to discourage rivals from entering the market. The shifting down of the supply functions can be explained in terms of the differences between Coasian and Schumpeterian economics (Lai and Lorne, 2014). The latter focuses on institutional reforms that facilitate a more efficient identification of parties to contract, negotiation, bargaining, etc., so that the maximum welfare under a given set of demands and cost conditions is attained. The former considers efficiency in transactions under given cost conditions less important than innovation, which is the real driving force of the economy. Innovate or die.

[2] The rising marginal cost monopoly can also be driven to produce at the efficient (MV = MC) equilibrium, which is above the break-even point. Political pressures tend to move the monopoly to the break-even point by sacrificing some efficiency. The decreasing cost monopoly (often called a "natural monopoly") cannot break even and, in fact, would result in a loss if it is forced to produce at the efficient point (MV = MC). This is the key efficiency reason for nationalization (the state taking over ownership), as in the case of water supplies and telecommunications. Public policies forcing or bargaining to induce a constant MC monopoly to produce at an efficient level of output are feasible, as that is identical to the break-even solution. No public subsidy is necessary for attaining an efficient output. Public policies forcing or bargaining to induce a rising MC monopoly to produce at an efficient level of output are also feasible, as the firms can still retain some abnormal profit. However, pro-labour groups would tend to pressure the state to require firms to produce at (greater) break-even and less-than-socially-efficient levels. Public policies forcing or bargaining to induce a falling MC (or "natural") monopoly to produce at an efficient level of output are not feasible for private firms unless there they are given state subsidies. Either the profit-maximizing or break-even level of production is feasible for the firm, but neither is sufficiently efficient due to under-production. This kind of monopoly is particularly susceptible to nationalization or direct state operation.