

Viewpoint

Gold mining and the golden rule: a challenge for producers and consumers in developing countries

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Abstract

The environmental and social impact of gold mining is particularly acute and hence there has been a call on the part of numerous activists to reconsider the necessity of mining this metal when more supplies of gold are above than below ground. This is especially true since gold is eminently recyclable and is primarily used for ornamentation. However, the key issue with regard to the gold industry is that unlike most luxury commodities, the largest areas of gold consumption are found in impoverished developing countries. Cultural factors play an important role in gold consumption and Western anti-mining activists are often tepid on this issue to avoid being blamed for lack of sensitivity. Yet, if developing countries are to accuse developed countries of over-consumption and resulting environmental impacts, they must also evaluate their own consumption patterns of gold. This paper explores the ways in which this issue can be approached as an integrated societal concern. By following these measures, both developed and developing countries can avoid breaking the “golden rule” of personal accountability and reduce the potential for conflict.

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1. Introduction

In his recent book, *Environmentalism of the Poor*, ecological economist Joan Martinez-Alier begins a chapter with reference to the gold market as exemplifying “conspicuous consumption” in which “east meets west” – referring to a common affinity which different cultures have had for gold [1]. Perhaps what is even more interesting is how in this context North meets South. While usually, it is the rich countries and communities of the “North” that are accused of excessive consumption (particularly of minerals such as oil), gold is an unusual case in which “Southern” countries and communities, despite their poverty, are just as culpable.

Indeed, some of the largest consumers of gold in the world are India, Pakistan, China and Vietnam, in spite of the “luxury good” status which it occupies in the popular imagination and the fact that over 80% of it is used for jewelry [2]. Excessive consumption of gold in developing countries has thus created an uncomfortable anomaly for many activists who have blamed modern high-consumption lifestyles for many contemporary social and environmental ills.

In May of 2002, the mining industry completed a two-year process of self-evaluation to assess progress towards sustainable development in a report entitled *Breaking New Ground: Mining Minerals and Sustainable Development* [3]. The findings of its evaluation were presented before delegates at the World Summit on Sustainable Development in Johannesburg in August, 2002. Much to the dismay of many stakeholders in the mining sector, the process leading to the final report was

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boycotted by many prominent non-governmental organizations, because of a perception that substantive change in restructuring the mineral sector was not forthcoming.

A major issue of contention was the mining of this precious and persistent metal. There is little doubt that gold mining at both small and large scales involves enormous environmental changes through chemical usage and waste management concerns [18,19]. While many of these concerns could be managed through technological solutions [2], there is always an element of substantial risk in terms of occupational and environmental safety. Thus, it is quite appropriate to constantly compare costs and benefits and ask consumers and producers to consider issues of social responsibility. Environmental activists have argued that the mining of gold, in particular, is governed by human “wants” rather than “needs,” and the processes used for its extraction, which often employ mercury or cyanide, are particularly deleterious for the environment, and could not be an ingredient for sustainable development. Thus, there have been repeated calls by activist groups to have a moratorium on gold mining worldwide. In February 2004, Oxfam-America, the Mineral Policy Center in Washington DC (now called Earthworks) and 12 other activist groups around the world launched a No Dirty Gold campaign [4]. The focus of their activities is to inform consumers about the heavy cost of gold mining, and to enlist consumer support for reform of mining practices. Gold producers, particularly mining companies, are frequently cited in their literature as needing to overhaul irresponsible mining practices. These groups acknowledge that the largest consumption centers for gold are in developing countries such as India and developed countries such as the United States. They believe that consumer pressure on the suppliers of gold, both retailers and mining companies, will ultimately drive changes in the way that gold is produced. Their campaign material mentions that almost 50% of gold is mined from indigenous lands. While some indigenous groups such as the Western Shoshone Defense Project in the United States, and Indigenous Justice Advocacy Network in Australia have joined the campaign indigenous artisanal miners are noticeably absent.

The movement against gold mining on the basis of business ethics and social responsibility has gathered alarming pace in the last two years. A major milestone for the activists has been the decision of some mutual funds to divest from gold mining companies. Several mutual funds have been forced to put the question of gold mining divestment on their voting ballots for shareholders [5].

The central question which this paper seeks to address is how reforms in the gold mining sector might be introduced when demand centers are generally not being held accountable for processing and consuming

large amounts of gold. When the consumption of products in developed countries is in question, there is far greater culpability ascribed to affluent consumers. If we were to follow the “golden rule” of having the same expectations from ourselves as we do from others, might we approach the issue a little differently? Some of the specific questions this paper attempts to develop for self-assessment on the part of gold producers and consumers are:

- What is the historical culpability of colonialism with regard to gold production and consumption trends in developed and developing countries?
- Are current production and consumption patterns a consequence of policies in developed countries, and hence should the focus of reform remain on gold mining companies from developed countries?
- Would it be more ethically appropriate to also target the consumers in developing countries in the same way, and also have the same standards of cleaner production applied to legal artisanal and small-scale miners in these countries?
- Finally, should cultural determinants of “wants” for a luxury good such as gold be evaluated differently from excessive consumption of other commodities?

Recognizing the scope of the questions, this paper will only attempt to present an overview of the issues, using an ethnographic methodology. Process tracing of gold production and consumption patterns across countries is used to establish trends and infer relative responsibility for environmental and social performance. The ultimate goal of this paper is to provide cognitive clarity in conflicts over-consumption patterns between communities in the North and South and a concerted effort towards constructive reform of the gold mining sector.

2. Economic and chemical roots of reform

The calls for a moratorium on mining are a direct result of major structural changes in the banking sector, related to macroeconomic policy and credit norms that no longer require gold bullion reserves for backing currency. Since 1971, the U.S. government has disengaged from gold bullion backing of reserves. Thus, there is an enormous stockpile of gold residing in national gold repositories such as Fort Knox or in vaults of international financial institutions perceived to be serving no meaningful purpose and could supply world demand for gold through controlled releases [6]. Fig. 1 shows the above and below ground reserves of gold, which certainly strengthens the argument from the activists’ perspective regarding a diminished need for mining the metal.

Source: Lehman Brothers, USGS

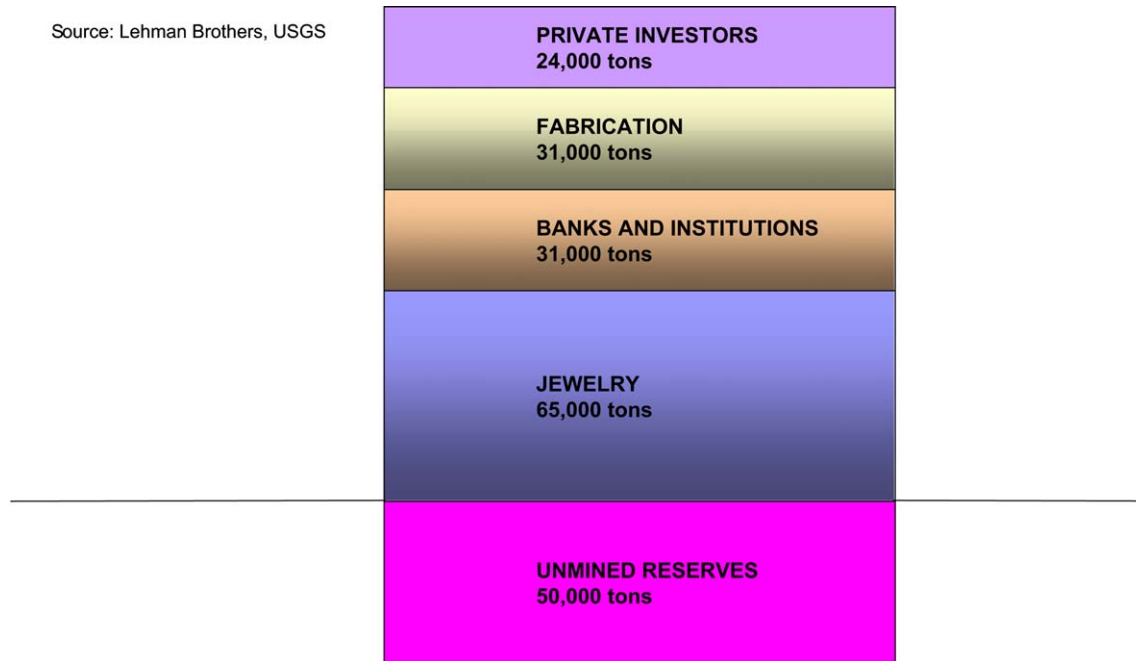


Fig. 1. Gold reserves above and below ground [18].

The chemistry of gold has much to do with its economic value. Gold is chemically among the most inert metals and is not easily oxidized; thus, it is several-fold more recyclable than most other metals [7]. The gold in repositories is thus likely to be in a fairly pure state and would easily be sold in the market. Indeed, this was one of the reasons why gold was chosen as a standard in the first place. However, in an increasingly globalized world where there is enough mutual dependence and trust between countries at an economic level, currency convertibility has become an inexorable trend – indeed the launch of the Euro was a hallmark in this trajectory that may ultimately lead to a global currency [6]. Paradoxically, there are also moves towards local currencies in many ecological communities to reduce excessive consumption, and gold could potentially be used as a “local currency” in this regard [8].

Before the end of the gold standard, many Marxist scholars could blame the wealthy capitalist economies for gold consumption and hoarding, but nowadays the patterns of production and consumption are clearly far higher in developing countries [9]. Thus, when gold mining companies are challenged by activists from groups such as *Project Underground* (closed operations in October 2003) to have a moratorium on gold mining, they are able to more easily defend themselves on the basis of demand in developing countries. It is also important to note that industry groups such as the Gold Institute continue to market gold as a sound investment based on their view that despite the demise of the gold standard, the value of gold has usually not followed cycles of economic decline. According to a report

commissioned by the World Gold Council, the exceptional character of gold as an investment vehicle is also attributed to three factors: “it is fungible, indestructible and the inventory of above ground stocks is enormous relative to supply flow” [10]. Thus, a sudden surge in gold demand can be easily met through gold scrap recovery, having a stabilizing influence on price. Therefore, in times of crisis, the liquidity of gold actually increases. While gold price has fluctuated over the years, and has certainly diminished since its all-time high of over \$600 per troy ounce, it has remained relatively stable between the \$300 and \$400 per troy ounce range since 1980 [11]. This has happened despite the gradual sale of institutional holdings of gold, particularly in Europe.

The durability and relative ease of recycling of gold poses important ethical questions about the need to mine the mineral, given the potentially severe environmental and social consequences of mining. Should the gold mining industry transform itself into a material-service provider regardless of whether the material is mined or recycled? Indeed, this is the trend which oil companies are beginning to follow by referring to themselves as energy service providers. Whether such slogans are mere rhetoric remains to be seen [12], but the social obligation to recycle scarce materials certainly falls across the supply chain as well as on consumers. If consumers choose to hoard gold, then recycling is, of course, much more difficult. Unlike savings of cash, savings in gold may also pose some latent questions of societal responsibility, since the choice to save in terms of gold indirectly necessitates more mining.

On the other hand, the argument could also be made that the choice to have more mining could be potentially positive for emerging economies that have little else in terms of catalyst industrial or service sectors for development. In addition, the livelihoods of the artisanal and small-scale miners who are dependent on revenues from gold should be considered [13]. However, the relatively small margins which these miners get versus the overall profits further up the supply chain again raises the question of whether a focus on recycling gold and providing higher value-added segments of the supply chain to these mining areas would, in fact, further improve their development path. There is also an uneasy relationship between the artisanal miners and the gold mining companies, since many of the miners illegally utilize the mineral leases of the companies. Moreover, these small-scale operations are often not endorsed by governments since they get no share of the tax revenues. Clandestine mines of this kind are also much less likely to have any environmental and safety provisions [14]. While some attempts are being made to mainstream these operations, the systemic question of long-term sustainable livelihoods for these communities remains elusive. These concerns deserve more in-depth empirical study but lead us to further question the symptomatic responses to mining impacts, and rather point towards an integrated economic and engineering approach.

3. Gold production patterns

The world's supply of gold has many diverse sources but the one that clearly dominates in terms of its environmental impact is large-scale mining. However, even small-scale gold miners, who by some estimates number as many as 10 million individuals in developing countries, have a significant environmental impact, primarily due to their use of mercury for gold amalgamation. In terms of the world's largest gold producers, Fig. 2 shows that the production of gold among the top

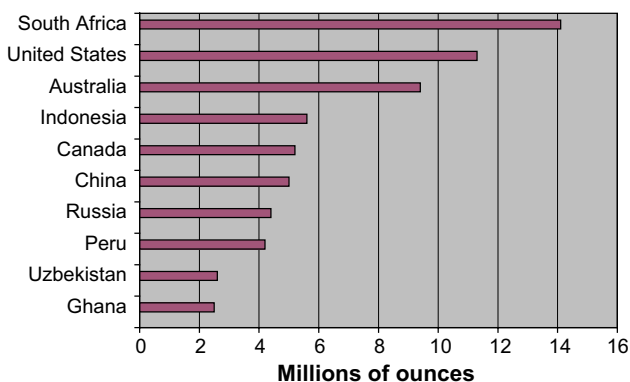


Fig. 2. World's largest primary gold producers [11].

10 producers is relatively well balanced across a wide range of developing and developed countries.

South Africa is by far the largest producer of gold and there is no question that gold mining has contributed enormously to the country's development [15]. The country provides fertile ground for studying the ethics of gold mining because of its long and established history and its contribution to economic progress. However, it was also a means of empowerment for the oppressive and racist apartheid regime for many decades and the role of gold mining in perpetuating this regime is well-documented [16]. Indeed, much of the wealth from this mining did not reach the indigenous African population and hence, an ethical argument for compensation and reallocation of contemporary profits is quite plausible. This may have seemed a far cry some years ago but recent success of litigation for environmental health and safety lapses against asbestos mines in South Africa have also led to compensatory litigation against some gold mining companies [17].

The connection between technological advancement and accelerated gold production also finds its roots in South Africa. Gold is so rare that the share of ore representing usable metal is 0.00033% compared to 0.91% for copper, 2.5% for lead, 19% for aluminum, and up to 40% for iron [18]. Therefore, to have profitable extraction in great quantities, there was a need to be able to extract such minute quantities. This innovation came in the form of the cyanidation process which was developed and applied specifically in South African gold mines in the later part of the nineteenth century and led to a much larger market for gold production. Gold production in South Africa rose from less than a ton in 1886, when the first discoveries were made, to 14 tons in 1889 and around 120 tons by 1898 [19]. According to a former President of the South African Institute of Mining and Metallurgy, "had it not been for the cyanidation process, there is every likelihood that South Africa's economic development would have died before it even had a real chance to begin its true growth" [19]. This process, however, led to much more intensive mining and hence far greater environmental stresses. From an engineering perspective, economically viable and chemically efficient alternatives to cyanidation are arguably close to development but cyanidation continues to be the major means of industrial gold operations. Similarly, for artisanal miners, the alternatives to mercury usage for amalgamation appear to be equally elusive. While technologies have been developed and proposed, even the United Nations Industrial Development Organization (UNIDO) believes that mercury usage will continue for this purpose in the foreseeable future. The focus of UNIDO's efforts is thus reducing miners' exposure to mercury by providing retorts to capture noxious vapors during gold recovery [20].

While the cyanidation process has been refined considerably since its initial use, and industry has certain environmental safety protocols for cyanide, there remains tremendous resource usage for *large-scale* gold mining. Historically, the mines, required inexpensive labor that was in ample supply in colonized Africa, where miners to this day work as far down as 12,000 feet shafts at temperatures as high as 130 ° F [19]. These enterprises were managed by ruling elite of European mineral entrepreneurs in South Africa, often referred to as *The Randlords* [21]. According to an estimate, to produce one ounce of gold from industrial mines requires “thirty-eight man hours, 1400 gallons of water, electricity to run a large house for ten days, 282 to 565 cubic feet of air under straining pressure” [22].

The relationship between gold production in South Africa and consumption of gold in Europe, particularly in Great Britain, is also stark, and poses interesting ethical questions about responsibility for contemporary environmental and social issues of gold mining. In his landmark study of the relationship between the gold producers in South Africa and the Bank of England, Russell Ally reveals that much of the prominence of gold in the global financial system at the turn of the twentieth century arose from this relationship [23]. The study also reveals that the minting of gold coins and bullion that could have provided added value to the African economy was controlled in London and consumption patterns across the British Empire were managed largely from there. Thus, the demand for gold in this case was spurred in Britain and hence responsibility for impacts can be ascribed to British policies. This does not preclude local culpability but shows how we need to be more discerning in who is held accountable in supply and demand relationships.

4. Gold consumption patterns

The almost universal allure of gold in most societies and cultures has been well-documented by numerous researchers [19,22]. Societies as far apart geographically as the Mayas of the Yucatan peninsula to the Khmers of Southeast Asia, have treasured gold. However, the overwhelming obsession with gold procurement for trade has been a largely European trait – leading to the phenomenon of “gold rushes” [24,25]. While gold rushes are now occurring in many developing countries such as Mongolia, the phenomenon has its roots in the accumulative tradition for gold as an investment, which developed in Europe. For example, the Ashanti rulers in pre-colonial Ghana used gold for ornamentation but the West African gold rush was spurred not by their demand but by European demand for the metal [26].

Times have, however, changed dramatically, and norms for evaluating the responsibility of demand

centers must also change accordingly. While historically, gold consumption was largely intertwined with colonial expansion, contemporary gold consumption is occurring in many erstwhile colonies of their own free will. While consumption trends are often blamed on cultural imperialism through the advertising and branding of products such as fast food or designer clothing, the same cannot be said of gold. Instead, gold consumption in developing countries reflects the resurgence of latent demand with deep indigenous roots. Fig. 3 shows the three largest gold consumers in the world – two of them, India and China, the world’s largest “developing countries.” The rapid rise of gold consumption in India during the 1990s is particularly striking and can be attributed to the deregulation of gold [27]. What is important to consider is that gold ornamentation has strong cultural roots but the quantity of gold consumed and the propensity for “aggrandizement” of the metal is now particularly acute in the developing world. Fig. 4 shows the consumption of gold as an off-take of GDP. Apart from the wealthy Gulf economies, the highest consumers of gold are relatively impoverished developing countries. Even in the Gulf States, most of the gold is being consumed by migrants from South and East Asia. Table 1 also shows the different kinds of uses of gold and the relative consumption patterns in terms of fabricated goods in both industrialized and developing countries. Jewelry stands out as the largest segment by far in both categories but the growth of jewelry fabrication in developing countries has almost doubled. Interestingly enough, most of the fabrication is for local use, particularly in countries such as India [27].

The Indian case deserves further attention because of the significance of gold in matrimonial customs, particularly dowry. Gold jewelry is regarded a family heirloom and passed on from generation to generation. For women, gold is an important personal asset which is not only met through the recycling of old jewelry but also through additional acquisition – hence, the need for an external gold market, which in India totals over \$7 billion annually and accounts for their second largest

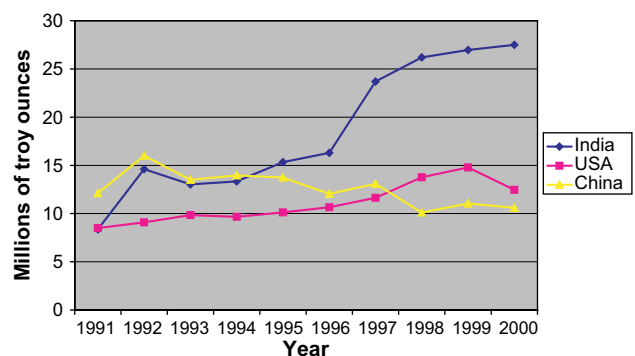


Fig. 3. Gold consumption trends among the top three consuming countries [11].

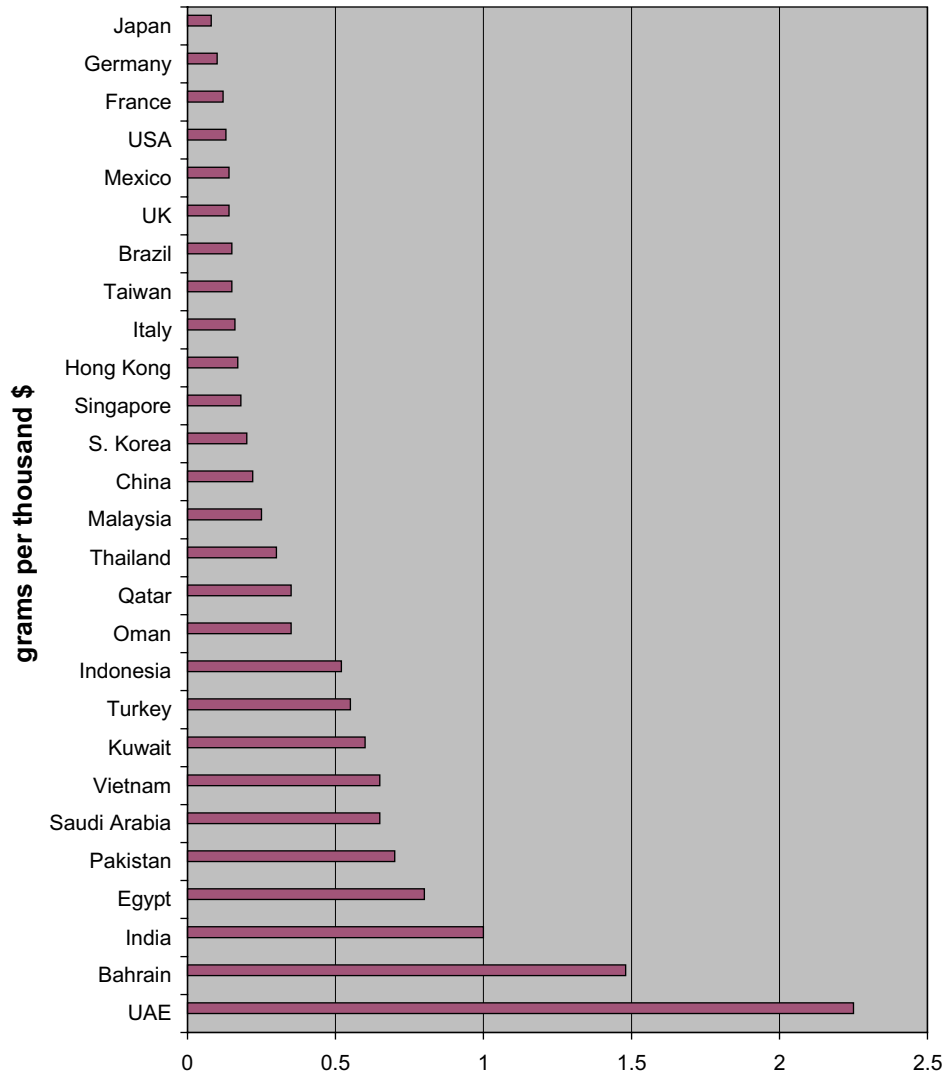


Fig. 4. Jewellery off-take per unit of GDP 2002 [11].

import after oil [11]. Gold has traditionally been an important constituent of dowry as well, and even activists in organizations such as *Project Underground* have acknowledged that this use of gold may be necessary in the short-term though obsolescent with changing times and empowerment of women. There is also a perception that the gold given to women in dowry is a sort of fee to win a man's hand in marriage, and there are, indeed, several activist groups in India trying to fight matrimonial customs that are allying with anti-matrimonial activists [28].

Recent historiographic work on dowry reveals an interesting colonial connection as well. In her recent book *Dowry Murder: The Imperial Origins of a Cultural Crime*, Veena Oldenburg has argued that the commodification of dowry, particularly gold occurred during the British Raj, when land tenure became the unit of capital accumulation for Indians instead of the traditional practice of land use and access rights [29]. Since

property was essentially allocated to male heads of household and the use of land became "subservient" to ownership, women were essentially disempowered. Whereas previously, women would always retain land use as a right wherever they went after marriage, the delineation of property precluded that for them when they moved to their husband's domain. Their sole "worth" was thus relegated to dowry, particularly gold.

Regardless of how the process of excessive gold consumption arose in developing countries such as India, the contemporary situation deserves to be analyzed using conventional consumption analysis by differentiating between "wants" and "needs." Clearly, countries such as India with very low per capita incomes showing such a high-consumption pattern for luxury commodities such as gold could reveal a troubling trend. The main caveat which may lead us to conclude otherwise would be if the gold was purely a form of income savings. As noted earlier, the liquidity of gold as

Table 1
Gold fabrication in industrial and developing countries [11]

In millions of troy ounces	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Industrial countries										
Jewelry	28.45	29.83	28.72	28.66	29.02	28.71	30.67	32	31.18	31.14
Electronics	4.46	4.09	4.39	4.67	5.09	5.14	5.76	5.3	5.69	6.49
Dentistry	1.63	1.75	1.73	1.77	1.9	1.91	2	1.84	1.86	1.96
Other industrial	1.85	1.98	1.99	2.07	2.14	2.16	2.13	1.98	1.77	1.75
Medal sales	0.29	0.19	0.13	0.13	0.09	0.06	0.08	0.06	0.12	0.07
Coin sales	3.89	2.48	3.14	1.87	2.24	1.52	2.65	3.54	3.71	0.88
Sub total	40.56	40.32	40.11	39.16	40.48	39.5	43.28	44.71	44.33	42.3
Developing countries										
Jewelry	47.39	58.97	53.4	55.53	60.74	62.96	77.01	69.46	70.07	70.94
Electronics	2.1	1.51	1.35	1.4	1.47	1.57	1.79	1.94	2.24	2.61
Dentistry	0.39	0.35	0.31	0.28	0.27	0.26	0.25	0.22	0.27	0.26
Other industrial	0.49	0.76	1.21	1.3	1.37	1.44	1.57	1.44	1.46	1.61
Medal sales	0.57	0.73	0.67	0.73	1.02	0.99	1.28	1.43	1.44	1.87
Coin sales	0.95	0.46	0.75	0.45	0.54	0.5	0.51	0.54	0.57	0.61
Sub total	51.9	62.78	57.69	59.69	65.4	67.73	82.4	75.02	76.04	77.91
World total	92.47	103.1	97.79	98.85	105.89	107.23	125.68	119.73	120.37	120.2

an asset is one of its redeeming qualities. Nevertheless, constructive savings arise when there is some level of disposable income, whereas savings in the face of pressing human needs such as health care and sanitation or education could not be considered prudent. Some cultural introspection on the part of citizens in developing countries is in this order.

5. Culture and credibility: some concluding thoughts

If combating excessive consumption of luxury commodities is to be the main thrust of environmental arguments from developing countries, they must also show some consistency with regard to their own consumption patterns. The ethical imperative which the “golden rule” highlights is thus missing in much of the discourse on consumption differentials between developed and developing countries. Movements against gold mining present an interesting case of trying to apply this ethical rubric to galvanizing action among impoverished small-scale and artisanal gold miners as well as jewelry consumers in relatively poor communities.

Returning to the initial questions posed in the introduction of this paper, we can reach the following tentative conclusions:

- The allure of gold has been engrained in most human societies. However, there is some evidence to suggest that colonialism, particularly in South Africa and India, may have played a part in further augmenting gold demand patterns.

- Given the shared responsibility for gold consumption patterns, the responsibility for addressing environmental impacts should be shared between policy makers and corporations in both developed and developing countries. Consumption campaigns should thus reflect this shared responsibility.
- There is a plausible case to be made for channeling current gold consumption through controlled recycling of existing reserves, and/or through small-scale miners, provided they comply with the same level of environmental and social responsibility that mining corporations are held accountable for.
- When prioritizing areas for reform in mining, it is appropriate to raise the question of necessity in consumption patterns. While in a free market, demand for luxury goods should be accessible and determined by individual preferences, and the cost of those preferences should be made clear to consumers independent of cultural proclivities.

In order to have constructive reform of the gold mining sector, we must look at the entire life cycle of the metal and the shared responsibility which producers, processors and consumers in all parts of the world have towards the metal. In targeting particular agents for reform, we should, however, also consider the temporal scale — how certain historical events may have affected consumption patterns, as well as the transformation of cultural attributes and their effect on “wants” versus “needs”. With such a concerted and comprehensive approach, we are likely to have less tension developing between developed and developing countries, and also have a more ethically robust and technically efficient outcome.

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