

# Dutch Disease

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## Public Choice and the Generalized Resource Curse

Majah-Leah V. Ravago, James A. Roumasset, in [Sustainable Economic Development](#), 2015

### 9.2 Other Boom Sources

The term Dutch disease was coined by *The Economist* (November 1977) to describe the decline of the manufacturing industry of the Netherlands following its discovery of natural gas in the 1960s. The concept of Dutch disease was later expanded to include other extractive natural resources, such as oil, gas, agriculture, minerals, and fuel (Sachs and Warner, 1995, 2001; Bulte et al., 2005; Brunnschweiler and Bulte, 2008a,b) to explain the possible impediment to economic growth due to a *resource curse*. South Africa, Nigeria, Egypt, and Venezuela, among others, are sometimes offered as examples of economies constrained by this curse of abundance. Symmetrically, the economies of Hong Kong and Singapore are said to have been blessed by a lack of natural resources.

Corden and Neary (1982) generalized the notion of “sectoral booms” to include nonextractive as well as extractive sectors. Tourism in Greece, Cyprus, and Malta (Copeland, 1991; Palma, 2008); the “export” of financial services in Switzerland, Luxembourg, and Hong Kong (Palma, 2008); and foreign aid in developing countries (Paldam, 1997; Rajan and Subramanian, 2009) exemplify nonextractive booms. These sectoral booms displaced economic activities of lower commercial value and increased foreign exchange into the economies (Torvik, 2009). Contrary to expectation, however, these [windfall](#) incomes have often decelerated growth. We refer to this negative effect as a *generalized resource curse*.

The Philippines has had several missed opportunities with episodes of abundance becoming an antidevelopment force rather than a propeller of growth (see also Chapter 21). Over the years, the country has experienced several episodes of boom that brought foreign exchange earnings into the country. These include foreign borrowings in the 1970s (Bautista, 1988); the United States military bases in the 1970s and 1980s; foreign direct investments (FDIs) in the late 1990s; and more recently the surge in [remittances](#) (Medalla et al., 2007; Tuaño-Amador et al., 2007; Bayangos and Jansen, 2010) and business and knowledge process outsourcing (BPO/KPO). Figure 9.1 shows a snapshot of these sources.

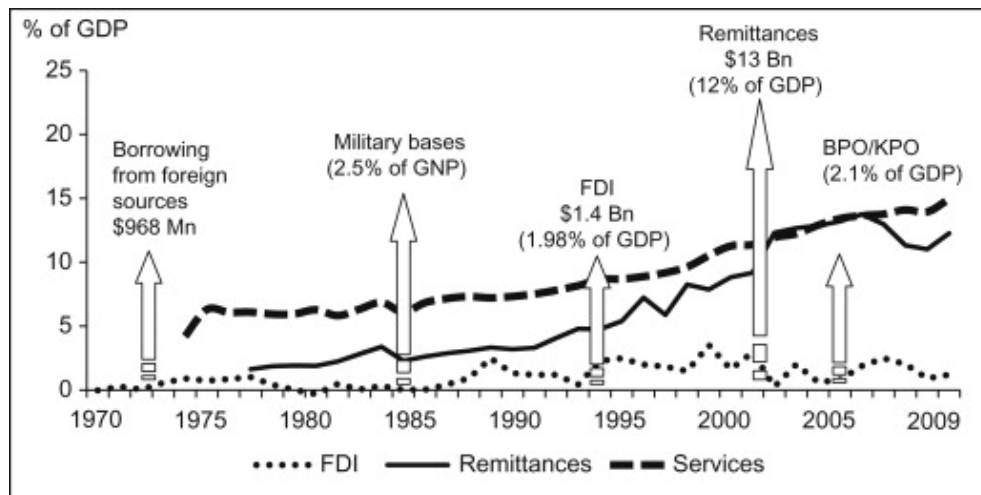


Figure 9.1. Sources contributing to exchange rate appreciation, Philippines.

Sources of data: Foreign borrowing is average of 1975–1976 from Bautista (1988). Military bases figure is an estimate of contribution to the Philippine economy sourced from Henry et al. (1989). Data on FDI and remittances are decadal averages from World Development Indicators (World Bank, 2011). Data on BPO are from the Philippine Statistics Authority-National Statistical Coordinating Board.

In the 1970s, the Philippines suffered from exchange rate appreciation due to the large increase in foreign borrowings used to finance its trade deficit.<sup>1</sup> The upsurge of FDIs in the 1990s had a similar effect. Long-term [capital inflows](#) have been on the rise<sup>2</sup> after the passage of the Foreign Investment Act of 1991.<sup>3</sup> The policy of deregulation and [privatization](#) of the service sectors (e.g., water, communications, and transport), especially during 1992–1998, attracted FDIs into the services sector, away from traditional manufacturing. More recently, efforts are made to attract FDI into BPOs.<sup>4</sup> The steady increase of remittances is likely to have the same effect of increasing exchange rate. Remittances accounted for an average of 12% of GDP during 2006–2009 (World Bank, 2008).

Like a booming mineral sector, these activities also bring in foreign exchange, resulting in appreciation of the [real exchange rate](#), a contraction of the Philippines' manufactured exports.<sup>5</sup> Since manufactured exports serve as an engine of growth, economic development is likely to be adversely affected (World Bank, 1993) unless

there are offsetting effects. Even the FDI in finishing-stage semiconductors and electronic equipment (accounting for more than 60% of merchandise exports) have had disappointing effects both on innovation and on the [exploitation](#) of backward and forward linkages (Canlas et al., 2011).

If, as suspected, the lagging sector is more labor intensive than the booming sectors, downward pressure on wages and increasing unemployment may also result. This effect has been exacerbated by the country's high population growth. While outward migration serves as a safety valve, higher skilled workers and entrepreneurs tend to leave the country, thus the moniker, "brain-drain." The [unskilled workers](#) who remain are more likely to live in poverty.

In what follows, some mechanisms by which abundance can become a curse are presented, focusing on the real exchange rate effect and a political economy explanation. A theory on the distribution of gains and losses from a boom is presented to motivate the public choice aspect of abundance. The implication of the model is then applied to the Philippine case, where the virulence of the political economy curse varies according to the source of the boom.

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## Handbooks in Economics

Jonathan R.W. Temple, in [Handbook of Development Economics](#), 2010

### 5.3 Evidence on the Dutch Disease

Empirical researchers have searched for the Dutch Disease in various ways, corresponding to different links in the argument. Some results on aid dependence and the relative price of nontraded goods, or the share of manufacturing exports in total exports, can be found in Arellano et al. (2009) and Yano and Nugent (1999). The cross-country study by López, Molina, and Bussolo (2008) finds that a surge in worker [remittances](#) does indeed cause an appreciation in the [real exchange rate](#). But for aid analysts, the most interesting papers attack the problem more directly, either using differences in outcomes at the sector level, or investigating the relationship between real exchange rates and productivity growth.

As Neary and van Wijnbergen (1986) note, the sectors most likely to be affected by the Dutch Disease are those exposed to foreign competition and with little price-setting power. In many poor countries, the leading candidates will be producers of labor-intensive traded goods. These are the sectors most affected by [real wage](#) increases when labor demand in the nontraded sector increases. With this in mind, Rajan

and Subramanian (2006) look for Dutch Disease effects by examining the relative growth rates of industrial sectors within each country. We should expect to see that the difference between growth rates in labour-intensive sectors and other industrial sectors is largest in the countries receiving large aid inflows. They find support for this hypothesis, using UNIDO data on industrial value added for 28 sectors, and data on 33 countries for the 1980s and 15 countries for the 1990s.

The use of sectoral data allows relatively clean identification, and is among the most persuasive evidence for the [general equilibrium](#) response predicted by standard models. But none of these findings confirm the existence of adverse effects on overall welfare. That question is harder to answer, for reasons similar to those in the separate debates about appropriate trade and industrial policy.<sup>27</sup> The most relevant evidence here is the panel data study by Rodrik (2008b), which indicates that real exchange rate undervaluations have significant growth benefits, especially for industrial growth. A corollary is that the Dutch Disease may be a genuine disease.

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## Deviant Behavior

Emmanuel S. de Dios, Jeffrey G. Williamson, in [Sustainable Economic Development](#), 2015

### 21.4.4 Overseas Labor Migration?

As a candidate for explaining the failure of Philippine industrialization, Dutch Disease caused by overseas migrant [remittances](#) is only relevant beginning with the early 1990s. Data on remittances are deficient before the mid-1980s, but overseas deployment, with a lag, can serve as a proxy for remittance trends. Prior to the early 1980s, overseas migration was a minor phenomenon. In relation to the domestic labor force, overseas migration became significant only from 1983, when registered annual deployment shot up to more than 2% of the labor force. A further acceleration occurred in 1998, when registered deployment rose 56% and exceeded 3% of the labor force (Table 21.8, line 1). These growth spurts in overseas deployment coincided with or occurred shortly after major economic crises at home, when domestic urban employment opportunities were shrinking significantly<sup>15</sup> and overseas markets were relatively open.

Table 21.8. Deployment of Overseas Workers and Remittances (1975–2009) (percentage of domestic labor force; annual averages by period)

1975–1979 1980–1984 1985–1989 1990–1994 1995–1999 2000–2004 2005–2009

Deployment	0.48	1.70	2.02	2.65	2.75	2.96	3.44
Remittances	5.26	7.86	7.75	10.48	13.56	13.95	19.78

*Notes:* Annual overseas deployment is a percent of the domestic labor force. Remittances (current transfers) are a percent of total current-account receipts. The labor force figure for 1979 is a between-year interpolation.

*Sources:* Philippine Overseas Employment Authority; National Statistical Coordination Board.

Increasing foreign deployment is mirrored, with a lag, by rising inward remittances by workers based overseas. The leap in the importance of remittances occurred in the late 1990s (Table 21.8, line 2), when they came to represent 14% of all current-account receipts (from only 5% in the late 1970s). This figure rose further to 20% by the late 2000s, but the country had already begun to run current-account surpluses on a regular basis as early as 2003. The upshot is that overseas remittances had only modest impact on the current-account and exchange rates before the early 1990s. If they have generated a significant industrial Dutch Disease, they can only have done so from that time onward.<sup>16</sup>

Furthermore, it is unlikely that the surge in [emigration](#) was exogenous to the poor industrial performance. Rather, it seems more probable that the poor industrial performance after 1972 pushed out emigrants in the 1980s, thus raising remittances and making the exchange rate less competitive for manufacturing subsequently. Of course, it might also be argued that once the labor force was stripped of potential new industrial workers by emigration, firms were faced with higher [unit labor costs](#) when other conditions improved.

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## Monetary Policy in Emerging Markets

Jeffrey Frankel, in [Handbook of Monetary Economics](#), 2010

### 7.3 Commodities and the Dutch Disease

Clear examples of countries with very high export [price volatility](#) are those specialized in the production of oil, copper, or coffee, which periodically experience swings in world market conditions that double or halve their prices.

Dutch Disease refers to some possibly unpleasant side effects of a boom in petroleum or other mineral and agricultural commodities.<sup>92</sup> It arises when a strong,

but perhaps temporary, upward swing in the world price of the export commodity causes the following pattern: a large real appreciation in the currency, an increase in spending (in particular, the government increases spending in response to the increased availability of tax receipts or royalties<sup>93</sup>), an increase in the price of nontraded goods relative to nonexport-commodity traded goods, a resultant shift of resources out of nonexport-commodity traded goods, and a current account deficit. When the adversely affected tradable goods are in the manufacturing sector, the feared effect is [deindustrialization](#). In a real model, the reallocation of resources across tradable sectors may be the inevitable consequence of a global increase in the real commodity price. But the movement into nontraded goods is [macroeconomic](#). That it is all painfully reversed when the world price of the export commodity goes back down is what makes this a disease, particularly if the complete cycle is not adequately foreseen.

Other examples of the Dutch Disease arise from commodity booms due to the discovery of new deposits or some other expansion in supply, leading to a trade surplus via exports or a capital account surplus via inward investment to develop the new resource. In addition, the term is used by analogy for other sorts of inflows such as the receipt of transfers (foreign aid or remittances) or a stabilization-induced [capital inflow](#). In all cases, the result is real appreciation and a shift into nontradables and away from (noncommodity) [tradables](#). The real appreciation takes the form of a nominal appreciation if the exchange rate is flexible, and inflation if the exchange rate is fixed.

A wide variety of policy measures have been proposed, and some adopted, to cope with the commodity cycle.<sup>94</sup> Some of the most important measures are institutions to ensure that export earnings are put aside during the boom time, into a commodity saving fund, perhaps with the aid of rules governing the cyclically adjusted budget surplus.<sup>95</sup> Other proposals include using futures markets to hedge the price of the commodity and indexing debt to the price.

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## Political Economy of Foreign Aid, Bilateral

E. Werker, in [Handbook of Safeguarding Global Financial Stability](#), 2013

It's the Economy, Stupid

Foreign aid can also affect the political economy of the recipient country through economic channels. One of the primary channels echoes the natural resource problem, just as it does via political channels. Just as natural resources can lead to ‘Dutch disease’ through currency appreciation, so too can the [capital inflows](#) associated with the unearned income of foreign aid lead to a rise in the [real exchange rate](#). In Dutch disease, the demand for local goods and services associated with a boom in the natural resource sector (or aid projects, in this case) raises the real exchange rate, which harms the competitiveness of the manufacturing sector, since it competes with the aid sector for inputs. There is no shortage of descriptions of aid booms that drive up factor prices in the economy. In postwar Mozambique, for example, the price movements were evident to a contemporary observer:

Donors buy up the best people – most engineers will not work for the government for \$100 a month when they can earn 20 times that much working for a donor. Mozambique now has about 3000 foreign aid workers employed by the United Nations, World Bank, bilateral donors and [non-government organizations](#). Often they simply fill gaps caused by other donors having hired Mozambican technicians at high salaries ... The streets of the capital, Maputo, are full of new luxury four-wheel-drive vehicles. There is a building boom of expensive houses. (Hanlon, 1996)

But when countries have a vast pool of labor and land, can aid significantly affect prices that the productive sectors actually face?

Rajan and Subramanian (2011) pool data on foreign aid and growth in manufacturing and find evidence suggesting that Dutch disease is prevalent in aid more generally. Their analysis finds that when countries have received more in foreign aid, the ‘exportable’ sectors of the economy experience slower growth. This reduced performance appears to be driven by an increase in the real exchange rate. How is this seemingly abstruse economic effect political? For one, if manufacturers once commanded extensive political power, the gradual erosion of their competitiveness could reduce their control over political outcomes. Second, it could generate new power brokers, as construction magnates and property owners (not to mention politicians themselves) become the new titans. A critical analysis of the Mozambique boom, for example, found that the prime beneficiaries were “large Mozambican trading companies, a new Mozambican aid and comprador group, white South Africans and foreign companies” (Hanlon, 1996). These changes could have nonrandom effects on longer term economic and political development, given a possibly vital role of the tradable sector (Rodrik, 2008).

Foreign aid, then, can enter and change the political equilibrium of the recipient country when it constitutes a large resource flow. Unlike in aid disbursement, the political economy effects of aid receipt are invasive, and the challenges affect the recipient population at all levels. That said, donors can also be a force for positive

political change, when they target their aid to reformers within the country, and when they provide positive incentives that outweigh the negative effects of aid on the political climate.

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## Remittances and Well-Being

M. Orozco, in [International Encyclopedia of Housing and Home](#), 2012

### Remittances and foreign exchange

Another strand in the literature on the macroeconomic impact of [remittances](#) deals with the relationship between remittances and foreign exchange. One of the original studies on this issue was done by El-Sakka (1999) on the case of Egypt and the effects of remittances on parallel exchange rates. More recently, studies have analysed the relationship between these flows and foreign exchange rates within the context of the Dutch Disease, or currency appreciation resulting from increased inflows, which makes the manufacturing sector less competitive and can even result in job losses. According to the World Bank, workers' remittances have a positive impact on the incomes of receiving households and thus tend to positively impact consumption. As a result, remittances may drive up the price of nontradable goods relative to that of tradables, leading to exchange rate appreciation. In turn, there are macroeconomic effects that can result from a real exchange rate appreciation, including: a negative impact on the tradable sector of the economy, including the loss of international competitiveness; widening of the current account deficit; weaker monetary control, inflation, sectoral allocation of investment (particularly in real estate); and upward pressure on wages that may result in job losses in the tradable sector.

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## Handbook of Computable General Equilibrium Modeling SET, Vols. 1A and 1B

Hans Lofgren, ... Carolina Diaz-Bonilla, in [Handbook of Computable General Equilibrium Modeling](#), 2013



### 4.7.3 Summary of insights from MAMS applications

The MAMS country applications may be divided into two groups, with the first focused on an analysis of requirements and [general equilibrium](#) repercussions of pursuing full achievement of key MDGs by 2015 and the second being more eclectic, but typically looking at the impact of alternative scenarios for public spending (in terms of total resource envelopes and sector priorities), financing (domestic and foreign) and efficiency of public service production and delivery. The Yemen analysis presented above belongs to the second group.

With regard to MDG strategies, the many applications confirm that initial country conditions are the major determinant of whether achievement of the MDGs is feasible or not. For countries, like Ethiopia, for which full MDG achievement would require progress at speeds that go far beyond the historical record of virtually any other country, on-time achievement would accordingly require rates of expansion in grant aid and government services that seem infeasible, at least without a serious deterioration in government efficiency and would create imbalances between government and private sector growth (Lofgren and Diaz-Bonilla, 2008). This outcome is a reflection of the manner in which the targets are defined, and suggests that countries in this category may be better off pursuing poverty and human development targets that are home-grown, reflecting the initial situation, government priorities and plausible scenarios for foreign aid and domestic resource mobilization (*cf.* Easterly, 2009). At the other end of the spectrum of developing countries, comparative cross-country analysis of MAMS results for countries in the Latin America and Caribbean region (which tend to be more middle income) indicate that, even if the prospects for achieving each MDG vary considerably across countries, the required additional financing (which often has to be domestic) of well-conceived programs (covering human development services and infrastructure) are relatively modest and feasible, especially in settings with good income growth for the poorer groups in the population (Vos *et al.*, 2010, pp. 9–12).

Across the board, the second, eclectic group of applications has generated relatively uniform findings related to sectoral allocation of government spending, domestic versus foreign financing, foreign aid and “Dutch Diseases” and government efficiency. These insights may be summarized as follows:

- *Spending on human development versus infrastructure.* The findings in this area indicate that: (i) Marginal changes in infrastructure spending tend to have a more positive impact on production and income growth than human development (i.e. health, education and water–sanitation) spending, especially within a shorter time frame (e.g. within the next five years); (ii) while strategies that on the margin expand spending on human development tend to

have more positive human development outcomes than scenarios expanding infrastructure spending, the fact that they tend to generate reduced growth in household incomes noticeably mitigates the gains in human development outcomes while reducing the pace of poverty reduction; and (iii) a relatively balanced expansion of government spending in multiple areas with identified gains (especially public infrastructure and human development services) tend to generate overall outcomes that seem more attractive to policy makers. Such scenarios may also be more feasible politically since they permit a larger number of government functions to expand in real terms, albeit at different rates.

*Income distribution.* A major short- to medium-run effect of scenarios focused on scaled-up human development spending is a switch in relative wages in favor of the more educated, reflecting that an expansion of health and education sectors leads to a disproportionate increase in demand for relatively educated labor. A byproduct of such scenarios is a general increase in the wages of educated labor throughout the economy (also in the private sector), putting sectors that are intensive in educated labor at a relative disadvantage. In the long run, this relative-wage switch may be reversed as scaled up education spending raises the supply of educated labor, giving rise to the opposite long-run challenge of absorbing rapidly growing highly educated labor stocks with acceptable wage growth, something that requires rapid economic growth and structural changes that, in different sectors, permit productive use of more educated labor.

*Domestic financing versus foreign aid.* Reliance on domestic financing (taxes or borrowing) to cover rapid expansions in government spending on human development tends to give rise to difficult tradeoffs between the poverty and non-poverty MDGs as the former tend to suffer while the latter gain, reflecting the reallocation of resources from private demand (consumption and investment) to government demand. Reliance on grant aid for marginal financing makes it easier to address these tradeoffs; whether receipt of sufficient additional grant aid is likely or not depends on country context.

*Foreign aid and “Dutch Disease”.* Whether foreign aid expansion leads to “Dutch Disease” effects is an empirical question, primarily depending on the marginal import share of government spending. “Dutch Disease” effects may be stronger for scenarios that emphasize human development spending given that human development sectors are relatively non-traded, with domestic wages representing a large share of input costs, whereas investment spending often has a large import share. The symptoms of “Dutch Disease” are a decline in export growth and an increase in import growth. Whether this should be viewed as a disease depends on whether, in the future, an export/import growth reversal is both needed and difficult to bring about.

*Government efficiency (allocative and productive)*. Simulations suggest that improvements in [allocative efficiency](#), via seemingly feasible marginal reallocations over time of government resources from areas with little or no return to human development and/or infrastructure can lead to noticeable improvements in performance. The same applies to increases in productive government efficiency in different areas of service delivery except for that it is difficult to assess the extent to which such efficiency improvements are feasible.

These findings have been generated by a consistent framework that incorporates a fair amount of economic behavior. They also seem intuitive, supported by basic economic logic. Nevertheless, given the complexity of these issues and uncertainty about parameter values, it is important not to take the exact quantitative results at face value but rather to view the results as aids to thinking that should be cross-checked against insights based on other methods and pieces of analysis. The development of streamlined validation procedures could add to our confidence in the results generated by MAMS and other [CGE models](#).

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## Handbook of Computable General Equilibrium Modeling SET, Vols. 1A and 1B

Peter B. Dixon, ... Maureen T. Rimmer, in [Handbook of Computable General Equilibrium Modeling](#), 2013

### Abstract

[MONASH models](#) are descended from Johansen's 1960 model of Norway. The first [MONASH model](#) was ORANI, used in Australia's tariff debate of the 1970s. Johansen's influence combined with institutional arrangements in their development gave MONASH models distinctive characteristics, facilitating a broad range of policy-relevant applications. MONASH models currently operate in numerous countries to provide insights on a variety of questions including: *the effects on:* macro, industry, [regional, labor market](#), distributional and environmental variables *of changes in:* taxes, public consumption, environmental policies, technologies, commodity prices, interest rates, wage-setting arrangements, infrastructure and major-project expenditures, and known levels and exploitability of mineral deposits (the Dutch disease).

MONASH models are also used for explaining periods of history, estimating changes in technologies and preferences and generating baseline forecasts. Creation of MONASH models involved a series of enhancements to Johansen's model, including: (i) a computational procedure that eliminated Johansen's linearization errors without sacrificing simplicity; (ii) endogenization of trade flows by introducing into computable [general equilibrium](#) (CGE) modeling imperfect substitution between imported and domestic varieties (the Armington assumption); (iii) increased dimensionality allowing for policy-relevant detail such as transport margins; (iv) flexible closures; and (v) complex functional forms to specify production technologies. As well as broad theoretical issues, this chapter covers data preparation and introduces the GEMPACK purpose-built CGE software. MONASH modelers have responded to client demands by developing four modes of analysis: historical, decomposition, forecast and policy. Historical simulations produce up-to-date data, and estimate trends in technologies, preferences and other naturally exogenous but unobservable variables. Decomposition simulations explain historical episodes and place policy effects in historical context. Forecast simulations provide baselines using extrapolated trends from historical simulations together with specialist forecasts. Policy simulations generate effects of policies as deviations from baselines. To emphasize the practical orientation of MONASH models, the chapter starts with a MONASH-style policy story.

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## The Arab Countries' Economies and Development Policies

Omar F. Bizri, in [Science, Technology, Innovation, and Development in the Arab Countries](#), 2018

### 2.5.8 Socioeconomic Development in the Arab Gulf Countries

Although the Arab Gulf countries' hydrocarbon wealth has enabled them to take significant leaps in terms of overall socioeconomic development, with particular emphasis on infrastructures and institution building, it has also resulted in some serious challenges. Thus, not only are hydrocarbon [resources exhaustible](#), additionally their prices have recently been particularly unstable, rendering related rents uncertain.

The fact that some of the Gulf Arab countries have now moved up on world human development rankings might be taken to signify weaknesses in ranking systems

rather than concrete outcomes in terms of inclusive and sustainable human development.

In general, it would be true to say that the Arab [Gulf countries](#) represent the closest incarnation of the fabled Dutch disease. Symptoms of this disease naturally vary from one country to another. However, for the most part they include structural imbalances in labor markets, growing unemployment among nationals coupled to a culture of dependence on public sector occupations, limited incentives for youth and women to partake in economic and social activities. Additionally, several Arab Gulf countries lack adequate policy framework to regulate public and private sector activities with underdeveloped transparency and accountability for the most part.

Vision and long-terms strategy documents have been drawn up by several Arab Gulf countries, with emphasis on building or approaching knowledge economies. For the most part, however, these documents seem to approach glaring economic and social problems using modalities known to have had limited if any tangible positive outcomes. Many of the Vision and Strategy documents reviewed in preparing this chapter lacked numerical goals, or were exceedingly selective in stating such goals. Additionally, almost all such documents had little to say about implementation plans as well as monitoring and evaluation modalities. In short, they may not be considered valid tools for facing the challenges created by the depletion of hydrocarbon resources or their price instability, and may well fall short on many scores, including diversification, local technological capacity building, and labor market restructuring.

Finally, it is extremely unlikely that the GCC countries might achieve extended socioeconomic development, whereas Yemen, suffers endemic [underdevelopment](#) and abject poverty. Inclusive regional development is not favored only on moral grounds, it is even more essential for practical reasons.

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## The Principles and Practice of Sustainable Economic Development

Majah-Leah V. Ravago, ... Ujjayant Chakravorty, in [Sustainable Economic Development](#), 2015

### 1.5 Development, Vulnerability, and Poverty Reduction

Section V addresses poverty, development, risks, and vulnerability from the perspective of specific countries. Chapter 21 by de Dios and Williamson zeros in on development lessons from the Philippine experience. Examining a century of the country's

deviant behavior in industrialization sheds light on the various antidevelopment forces, including institutions, liberalization [policies](#), [labor emigration](#), and Dutch disease that brought down the growth trajectory of the country. Understanding the past avenues of unsustainable development helps prevent history from repeating itself and promotes sustainable development and poverty reduction. Disaster management has emerged as a major issue in recent years, both in developed and developing countries. Given the increased damage from natural disasters, economists have increasingly started to focus their attention in that direction. Farmers' vulnerability to weather shocks such as drought will remain central to global poverty concerns. In Chapter 22, Lybbert and Carter investigate the proper bundling of two innovations, drought tolerant crops and drought index insurance, and how to leverage the complementarities between them. They calibrate such a package for Ecuador to illustrate alternative policy options.

Chapter 23 by Gaiha et al. identifies factors associated with the frequency of natural disasters and the resulting impacts on mortality. This chapter concludes that the payoff from learning from the experience of natural disasters is high; even moderate learning from responding to it can save a large number of lives. More rapid economic growth can also help avert deaths by providing resources for disaster prevention and mitigation. A challenge for development assistance is to combine accelerated growth with better disaster forecasting, rapid response, and speedy relief in order to reduce vulnerability to natural disasters.

In Chapter 24, Balisacan brings the reader back to the Philippines. While the Philippine experience illustrates the various sources of unsustainable development (see Chapters 9, 19, and 21Chapter 9Chapter 19Chapter 21), history also shows that the country has had episodes of substantial growth (Balisacan and Hill, 2003; Canlas et al., 2011). The subsequent question is whether these spurts of growth helped in lifting the poor out of poverty. Using the Alkire–Foster aggregation methodology, which preserves the “dashboard” of poverty dimensions, to systematically assess the magnitude, intensity, and sources of multidimensional poverty over the past two decades and across subpopulation groups, Balisacan finds that poverty did actually decline. While income-based poverty remained largely unaffected by economic growth during the past decade, the multidimensional metric of poverty has decreased. From a policy perspective, this result reinforces the view that economic growth, even in the short term, is required to reduce poverty.

The last but certainly not the least chapter in this volume, by Warr, has taken the discussion of structural transformation (see Chapter 21) and measures of poverty reduction (see Chapter 24) to the Mekong economies consisting of Cambodia, Laos, Myanmar (Burma), Thailand, and Vietnam and including two provinces of China: Guangxi and Yunnan. Lessons from this study strengthen the view highlighted in Chapters 8 and 9Chapter 8Chapter 9 that poverty reduction is strongly related to

growth of real [gross domestic product](#) per person but that the sectoral composition of this growth also matters.

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