



**From Natural Resources to Human Capital:  
Practical, feasible, immediate resourcing solutions for  
Myanmar's children**



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## Executive Summary

Myanmar has embarked upon an ambitious reform package characterised by people-centred participation, development and inclusion. The task is ambitious and presents real opportunities for a successful transition from a heavily natural resource-reliant economy to an economy that leverages the skills and expertise of its human capital. As a newcomer to the 'Asian Century', Myanmar is geographically well positioned to transition into an 'Asian Tiger' economy personified by fast-paced growth and innovation.

One of the key lessons learnt globally when transitioning from a lower to middle income country and upwards to an advanced economy is that successful countries do not first become wealthy and then decide to invest in human capital rather they become wealthy by investing in both physical and human capital simultaneously. Equitable access to quality social services is both good for people and for the economy. For mineral-rich countries,<sup>1</sup> investing natural resource revenues in expanded health and education services and social transfers - including pensions, family allowances and social assistance – is fundamental. Such investments build human capital and generate employment. They reduce distributional conflicts, enhance social cohesion, and lessen gender, ethnic and regional disparities. Myanmar is blessed with an abundance of natural resources which can be turned into meaningful, sustainable, impactful social investments right now, starting with children.

At this pivotal moment in the nation's history, the good news is Myanmar could enjoy a high level of human capital return for a relatively small amount of fiscal spend. For example:

- Less than 9 days of natural gas revenues would be needed to ensure one teacher per each primary school grade;
- A 0.57% increase in the actual tax collected on hardwood extraction would secure the annual salary of 6,000 social workers;
- 0.87% of revenues from new natural gas projects would provide for the purchase of all the vaccines needed annually in Myanmar;
- One extra dollar in tax collected for each kilogram of jade could have built 14,596 classrooms over the last 9 years; and
- Just over one quarter of Myanmar's 2010 sales from the auction of precious and semi-precious stones could have provided for a universal child benefit of 15,000 Kyat per month for all Myanmar children under 5.

UNICEF encourages the Myanmar Government to actively explore such options as part of the next 30 months of socio-economic reform. The time for enhanced social investment is now and if done right, will dramatically propel Myanmar along its transition to becoming the next economic 'Asian Tiger'.

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<sup>1</sup> Including for example Chile, Indonesia and pre-1980s Nigeria. See UNRISD, *Mineral rents and the Financing of Social Policy: Options and Constraints*, Research and Policy Brief 16, December 2012.

## Myanmar: A Short Economic Overview

In 2011, Myanmar had a GDP of approximately USD51.9 billion, and a per capita income of USD856.8. The majority of the country's population – about 65% - work in agriculture. Employment in other sectors, including manufacturing and services, is less common and concentrated in a few urban areas, namely Yangon and Mandalay. According to the UN, 25% of the country's population lives below the poverty line of USD1.12 per day, however about 85% fall below the World Bank's higher poverty measure of USD2.25 per day. These people have limited access to social services including health, education and social welfare, which are essential to increase the country's human capital and household incomes.

In a country where disparities and inequities are evident - and bound to grow - social investments are a necessary and sure way to foster people-centred development and to ensure the social cohesion required for economic growth. Even a minor reconfiguration of how extractive industry and natural resource income is spent by the Myanmar Government is likely to have a life-changing impact on Myanmar children and their families, provided such income is specifically allocated to social investment.

## Trade

Agricultural products and natural resources dominate Myanmar's exports, making up about 80% of the country's total exports. Natural gas is by far the largest, and in FY2011-12 accounted for 38.3% of the country's total exports. Beans and pulses are Myanmar's primary agricultural export, worth over USD1 billion in 2011. This is more than 4 times as much as the country's rice exports - its largest traded good for much of the 20<sup>th</sup> century. The largest manufactured export from Myanmar is garments, which accounts for about 5.5% of total exports. Minerals and precious and semi-precious stones are also a major export of Myanmar but their importance is obscured as the Central Statistical Organization classifies them as "other exports," making it impossible to attribute them directly to a particular category.<sup>2</sup>

Figure 1. Myanmar's Top Exports by Commodity in FY2011, USD millions

Natural Gas	3,502
Beans and Pulses	1,044
Teak & Hardwoods	604
Garments	498
Fish and Fish Products	443

Source: Myanmar CSO, "Statistical Yearbook 2011," Naypyitaw, 2012.

## Investment

Extractive industries are also the most important sector for foreign investment in Myanmar's economy. Nearly 74% of the country's investments since 1988 have come through either mining, oil or gas. Other sectors which are often associated with growth and

<sup>2</sup> All trade statistics come from Central Statistical Organization, "Selected Monthly Economic Indicators: September 2012," Naypyitaw, Myanmar, 2012; and Central Statistical Organization, "Statistical Yearbook 2011," Naypyitaw, Myanmar, 2012.

development – notably manufacturing – have attracted little investment. Over the same time, manufacturing has drawn only 5% of the country’s total foreign investment -under USD440 million. Hotels and tourism have accounted for just over 7% of total investment, at about USD650 million. Overall, investment in Myanmar up until recent reforms began gathering momentum was heavily skewed towards extractive and natural resource-based industries.<sup>3</sup>

## Government Revenue and Spending

Government revenue and spending figures help to show both income from natural resources and spending on social services. However, they fail to provide a detailed picture because these statistics are often lacking in transparency. The IMF includes data on government revenue and spending in their annual Article IV reports, as well as other documents including the 2012 “Staff-Monitored Program.” The following chart demonstrates the rapid rise in the government budget over the last half decade, with a notable rise between FY11/12 and FY12/13 of 51.2%.

Figure 2. Myanmar Government Revenue and Spending

	FY07/08	FY08/09	FY09/10	FY10/11	FY11/12*	FY12/13**
Government budget (Kyat billions)	2,161	2,269	3,175	4,379	4,719	7,133
Defense Expenditure (Kyat billions)	385	465	740	1,642	1,463	2,739
Social sector spending excluding pensions (Kyat billions)	259	302	346	512	566	2,069
Defense Expenditure (% of total expenditure)	17.8%	20.5%	23.3%	37.5%	31.0%	38.4%
Social sector spending excluding pensions (% of total expenditure)	12.0%	13.3%	10.9%	11.7%	12.0%	29.0%

Source: IMF, “Staff-Monitored Program” 2013. \*estimated \*\*projected

This rise in government spending is largely the result of exchange rate unification, which dropped the official exchange rate of 8.5 Kyat to 1 Standard Drawing Right – with a valuation of the Kyat that was 139 times its market value. This change is important because until the end of FY11/12, the government used this official rate to value imports to Myanmar. This gave the appearance that expenditure on imported goods such as pharmaceuticals or medical equipment was far less than what was actually spent. However, no statistics are available on exactly what percentage of each ministry’s budget was spent on imports, making it impossible to assess actual spending on health, education and social services at that time.

<sup>3</sup> See Jared Bissinger, “Foreign Investment in Myanmar: A Resource Boom but a Development Bust,” *Contemporary Southeast Asia*, Vol, 34, No. 1 (2012), pp. 23-52.

Myanmar has increased its budget for FY 2013-14 considerably, including allocating approximately USD936 million for education and USD514 million for health. While these figures are an improvement on previous years, they are still small in comparison to the needs of the country. For example, government health expenditure is budgeted to be less than USD9 per person per year in FY13/14, and spending on social welfare will likely be far less.

Figure 3. Myanmar's 2013-14 Budget, Kyat billions

	FY13/14
Total Revenue	13,805
Total Expenditure	16,732
Defence	2,245
Health	499
Education	908
Net	(2,926)

Source: Xinhua 2013<sup>4</sup>,

### Financing social policy through natural resources income: a quick win

Considerable and steady increases in social investments in Myanmar are needed to ensure reduction of inequities and vulnerabilities, and ensure social stability. There is growing recognition at a global level that access to social services is good not only for human well-being, but also for economic growth. An expansion of social protection is urgently needed to help people cope with market volatility processes associated with demographic and structural change, and the changing circumstances of life.<sup>5</sup> Many of today's rich countries have sustained development with the help of natural resources. In Myanmar - as in other resource-rich developing countries - rents from mineral extraction and other natural resources can play an important, if not leading, role in fostering social development and funding social policies.

The following examples illustrate ways that Myanmar could increase its investment in social services and human capital through the use of natural resource revenues.

#### 1. One teacher per grade in primary school = 8 days, 8 hours, and 31 minutes of the 2012 government revenue from natural gas exports.<sup>6</sup>

According to the most recent Statistical Yearbook released by the Myanmar Government, there were 36,129 primary schools in the country. UNICEF sources note that, in many of these schools, teachers instruct multiple grades. About 60% of schools are understaffed, with an average of 3 teachers covering 5 different grades.<sup>7</sup> If Myanmar wanted to add an average of two teachers to each of these schools, it would require hiring an additional 43,355 teachers.<sup>8</sup>

<sup>4</sup> Xinhua, "Myanmar Parliament approves 2013-14 re-drawn state budget," March 21, 2013, [http://news.xinhuanet.com/english/world/2013-03/21/c\\_132252445.htm](http://news.xinhuanet.com/english/world/2013-03/21/c_132252445.htm)

<sup>5</sup> See UNRISD, *Mineral rents and the Financing of Social Policy: Options and Constraints*, cit.

<sup>6</sup> Fiscal year and year are used interchangeably in this document (FY11/12 and 2011 are equivalent).

<sup>7</sup> Central Statistical Organization, "Statistical Yearbook 2011," Naypyitaw, 2012.

<sup>8</sup> Average number of deficient primary schools (36,129\*.6), multiplied by average number of teachers needed (2). This yields a total additional need of 43,355 teachers.

In 2012, the average salary for a primary assistant teacher (PAT) was approximately 55,500 Kyat per month.<sup>9</sup> Teachers also received a cost of living adjustment of 30,000 Kyat, which started in April 2012. Including this adjustment and salary, PATs had a total annual compensation of about 1.03 million Kyat (USD1192) per year.<sup>10</sup> The cost of hiring all the additional needed teachers in FY12/13 would have been 44.7 billion Kyat (USD51.7 million). Since the government collected approximately 5.35 billion Kyat per day in revenue from gas exports in FY12/13, funding the additional teachers would have required only 8 days, 8 hours and 31 minutes of revenue from gas exports.

In 2013, the government is projected to collect 2.254 trillion Kyat (USD2.32 billion) from natural gas projects or about 6.175 billion Kyat per day. To hire the same number of teachers in FY13/14 would cost 54.88 billion Kyat (with an average annual salary of 1.27 million Kyat, inclusive of an additional 20,000 Kyat per month living allowance which started in April 2013). Hiring these teachers would cost just 8 days, 21 hours, and 18 minutes of Myanmar's 2013 gas revenue.<sup>11</sup>

## **2. Hiring 6,000 social workers = raising the actual tax rate collected on the extraction of hardwood trees by 0.57%**

In 2010, Myanmar's government collected about 4.5 billion Kyat in taxes on the extraction of hardwood trees. Based on export values and production figures provided by the Myanmar's Government, the total value of these trees is estimated at approximately 759.6 billion Kyat (USD946 million). Therefore although the stated tax rate for the extraction of hardwoods was between 20% and 25%, the effective tax rate was in fact a very low 0.59%.<sup>12</sup>

The requisite expansion of social welfare and social protection services to the most vulnerable of Myanmar's citizens will not be possible without the involvement of a professional cohort of service providers. Just as health services must be delivered by professional nurses and doctors and education services require experienced teachers, social welfare services necessitate the employment of well-educated social workers.

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<sup>9</sup> Wages are based on a 2012 survey of the public service. The average wage rate for primary assistant teachers is determined by responses to focus group questionnaires and ranged from 47,000 to 64,000 Kyat/month.

<sup>10</sup> Exchange rate 864 Kyat/USD.

<sup>11</sup> Student and teacher data is derived from Myanmar CSO, *Statistical Yearbook 2011*. Natural gas revenue is from IMF, Staff-Monitored Program, 2013. The exchange rate for 2012 (864 Kyat/USD) is from IMF, Staff-Monitored Program, while the 2013 rate (970 Kyat/USD) is the market rate at the time of writing (July 30, 2013). Calculations are detailed in Appendix 1.

<sup>12</sup> Published tax rates from Myanmar Times. Tax revenues and calculations for effective tax rates based on Statistical Organization, "Statistical Yearbook 2011," Naypyitaw, 2012, p. 428 and refer only to "Taxes on the Extraction of Forest Produce." These figures do not include commercial taxes on companies operating in this sector, and do not include export taxes on any exported products. While many companies may incur these costs, this measure looks only at the direct taxes paid on extraction as specified in the Statistical Yearbook 2011, pg. 428, "Current Receipts of the State Administrative Organizations."

If Myanmar hired 6,000 social workers<sup>13</sup> in 2010 at the wage of 720,000 Kyat (60,000 Kyat per month), it would have cost 4.32 billion Kyat per year (about USD5.38 million at the time). To pay for this, Myanmar would have had to raise the effective tax rate on hardwood extraction by just another 0.57%, bringing the total effective tax rate to 1.16%.

If the Myanmar Government had have wanted to hire these same 6,000 social workers in 2013, they would have earned a salary of about 1.32 million Kyat each.<sup>14</sup> This would have cost a total of 7.92 billion Kyat per year (about USD 8.16 million). If Myanmar produced the same amount of hardwood and sold them for the same USD prices it did in 2010, hiring these additional 6,000 social workers would have required the government to raise the effective tax rate on the extraction of hardwood trees by only 0.86% to a rate of 1.43%.<sup>15</sup>

### **3. Funding 6.76 million vaccines for children in Myanmar = 0.87% of the government's revenue from the new Shwe and Zawtika gas projects.**

Immunization is one of the most successful and cost-effective public health interventions. Global efforts to immunize children with vaccines against life-threatening diseases avert millions of deaths per year along with countless episodes of illness and disability. Immunization in Myanmar has been sustained so far with donor funding. Two large natural gas projects that will come online this year could provide significant new revenues to make immunization for children sustainable in Myanmar. These revenues are new and therefore yet to be allocated to other budgets.<sup>16</sup> The Shwe Gas Project, which consists of three gas fields off the coast of Rakhine State, started operating in July 2013. The Zawtika Project, in the Gulf of Martaban, should commence production soon. Most of this gas - like that from existing projects - will be exported. If this gas sells at the same price as gas from Myanmar's existing projects, it could increase exports by USD2.13 billion per year and provide an additional USD1.31 billion to the Myanmar Government's budget annually from 2014.

In that same year, the already approved immunization plan for all children across Myanmar foresees the purchase of over 6.76 million doses of vaccines covering a wide range of preventable diseases. The total cost of purchasing these vaccines - including all necessary doses plus buffer and wastage - is just over USD11.4 million.<sup>17</sup> That entire amount could be funded by just 0.87% of FY14/15 government revenue from the Shwe and Zawtika natural gas projects.

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<sup>13</sup> The number of 6,000 social workers is the recommendation of UNICEF to have a ratio of social workers to total population of approximately 10,000:1.

<sup>14</sup> The 2013 estimated compensation includes a base salary of 60,000 Kyat per month, plus two cost of living allowances of 30,000 Kyat/month from April 2012 and another 20,000 kyat per month from April 2013, for a total monthly compensation of 110,000 Kyat per month.

<sup>15</sup> A spread sheet detailing all calculations for this section is attached in Appendix 2.

<sup>16</sup> The commercial terms of these two deals are not public, but it is highly likely that in the initial years of the projects government revenue will be lower as companies recoup the cost of their investments. However, in the long run the revenues from these projects should outstrip health spending by the poor many times over.

<sup>17</sup> UNICEF's calculations.

**4. One extra dollar in tax collected for each kilogram of jade could have built 14,596 classrooms in the last 9 years<sup>18</sup>**

Myanmar is the world's leading supplier of high quality jade. While it is difficult to get exact figures on the revenues that flow to the Myanmar Government from the sale of jade, one source indicates that the government made approximately USD1.7 billion in 2010.<sup>19</sup> However, the Myanmar Government does provide estimates of the total amount of jade produced, which has more than quadrupled in the last nine years from under 11 million kilograms in 2003 to almost 44 million kilograms in 2011. Most of the jade is sold at auctions, which in recent years have earned billions of dollars in revenue<sup>20</sup>.

Raising tax rates on the jade industry may not help, because they are already high. Most mines sign profit sharing agreements that give the government 40% of the revenue, plus a small tax of 3% to 5%.<sup>21</sup> This makes mining unaffordable, so many companies simply don't disclose how much jade they actually produce. This - and a poor tax administration - means Myanmar's Government continues to miss out on the millions in tax revenue it is owed through jade.

UNICEF, which currently works to construct schools across Myanmar in response to a critical need for formal educational spaces for children, estimates that the average cost of a new classroom is between USD20,000 and USD30,000, or an average of about USD25,000. If the Myanmar Government could have collected just USD1 per kilogram more in tax from jade production, it could have funded the construction of 14,596 classrooms over the last nine years.

**5. A universal child benefit of 500 Kyat per day for every child under 5 in Myanmar = just over one quarter of Myanmar's 2010 sales from jade and gems auctions**

The universal child benefit is regarded globally as an effective and efficient way to sustain families in providing appropriate care for those successive generations that will build the future of any country. Parents must be enabled to provide for the essential health, nutrition and education of their children especially over the first years of life, which are the most critical for children to develop their full potential. Providing a direct, universal child benefit of 500 Kyat per day for every child under five would be a clear sign of the will of the Myanmar Government to promote people-centred development. It would enable the Myanmar Government to reach and support all families across the country, and especially the most vulnerable and marginalised.

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<sup>18</sup> For detailed calculations and sourcing, see Appendix 4.

<sup>19</sup> Burmese government figures claim that profits made from selling jade has climbed from USD198 million in 2005 to USD1,700 million in 2010, despite seeing falls in profit from other precious stones.

<sup>20</sup> For more details on these auctions, see example #5

<sup>21</sup> Soe Than Lynn, "MP Calls for Changes to Myanmar's Mining Law," Myanmar Times, Feb. 20, 2013, <http://www.mmtimes.com/index.php/national-news/4166-mp-calls-for-changes-to-myanmar-s-mining-law.html>.



One of the largest sources of Myanmar Government revenue is frequent, large auctions of jade, rubies, pearls and other precious and semi-precious stones. In FY10/11, over USD5.1 billion of stones and pearls were sold in the country's largest year for jade and gem sales ever.<sup>22</sup>

That same year, according to the Statistical Yearbook published by the Myanmar Central Statistical Organization, there were 5.78 million children between the ages of 0-4 in Myanmar. If each child under 5 received a child benefit of 15,000 Kyat per month in 2010, the total annual cost would have been 1.055 trillion Kyat (USD1.31 billion at the 2010 exchange rate). This was equal to just over one quarter (25.6%) of Myanmar's sales of jade and gems that same year.

FY10/11 was an exceptional year for jade and gems sales and it is insightful to look at other years to provide a comparison. In FY11/12, for example, Myanmar had jade and gem sales of USD3.18 billion. Assuming that there were about the same number of children aged 0-4 as the previous year, in FY11/12 the child benefit would have cost 1.055 trillion Kyat (USD1.37 billion at the 2011 exchange rate).<sup>23</sup> In FY11/12, it would have taken 43.1% of the country's jade and gems sales to provide a child benefit of 500 Kyat per child per day.

As these statistics clearly demonstrate, increasing social investments for children and families across Myanmar is not only necessary but entirely feasible and sustainable right now.

Even a minor reconfiguration of how extractive industry and natural resource income, for example, is spent by the Myanmar Government will have a life-changing impact on Myanmar children and their families.

All that is required at this historic juncture in the reform of the Myanmar nation is the political will to change. UNICEF calls upon the Myanmar Government to better prioritise social investments through all associated budgeting processes at this time.

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<sup>22</sup> For a detailed appendix elaborating on the calculations for total sales from all jade and gem auctions in a fiscal year, see Appendix 5. Given the opaque nature of the sector, these figures are not comprehensive. Instead they are based on a conglomeration of media reports about sales from individual auctions. If no figures were available for a particular auction, it has been excluded from the calculations.

<sup>23</sup> Official estimates of children aged 0-4 have not been released by Myanmar's CSO for FY11/12.

## Appendix 1: Calculations for Natural Gas Value and Revenue

Revenue	FY07/08	FY08/09	FY09/10	FY10/11	FY11/12	FY12/13	FY13/14
Consolidated Government Revenue (billion Kyat)	3,285	3,753	3,777	4,736	5,144	8,652	9,952
Revenue from gas exports (official, billion Kyat)	7	9	8	10	12	1,952	2,254
<b>Revenue from gas exports (adjusted, billion Kyat)</b>	<b>1,550</b>	<b>1,430</b>	<b>1,298</b>	<b>1,476</b>	<b>1,666</b>	<b>1,952</b>	<b>2,254</b>
Official exchange rate (Kyat/USD)	5.22	5.77	5.66	5.44	5.56	-	-
Unofficial exchange rate (Kyat/USD)	1,156	917	918	803	772	864*	970**

## Source:

1. IMF Staff-Monitored Program, 2013, p. 18. Note that only exchange rates from FY07/08 to FY11/12 come from the IMF Staff-Monitored Program. The IMF also provides a separate set of exchange rates (end of period) on p. 17 of their report. However, we elect to use period average rates given the constant flow of revenue from natural gas.
2. \*Unofficial exchange rate for FY12/13 is 864 Kyat/USD, taken from the IMF Staff-Monitored Program 2013. However, it is not a period average as no such figure was available at time of writing.
3. \*\*Unofficial exchange rate for FY13/14 is 970 Kyat/USD, the market rate at time of final writing (July 31, 2013).

Note: Units may be somewhat imprecise due to rounding. Until April 1, 2012, all exports from Myanmar were recorded at the official exchange rate of approximately 8.5 Kyat per Standard Drawing Right (SDR).

## Appendix 2: Calculations for Hardwood Trees Value and Taxation Revenue

Line	Unit: USD	FY06/07	FY07/08	FY08/09	FY09/10	FY10/11	FY11/12	FY12/13	FY13/14	Source
1	Exchange Rate	1,272	1,156	917	918	803	772	864*	970	IMF Article IV Report, 2011 & IMF Staff-Monitored Program
	Taxes on Extraction of Forest Produce									
2	(Kyat) million	4,283	5,645	4,409	4,415	4,491				Myanmar CSO, Statistical Yearbook 2011
3	(USD) million	3.37	4.88	4.81	4.81	5.59				Calculation: Line (2) x Line (1)
4	Hardwood Production (thousand cubic tons)	1,541	1,613	1,564	1,649	1,530				Myanmar CSO, Statistical Yearbook 2011
5	Hardwood Exports (thousand cubic tons)	985	1,074	728	896	961	947	628**(hy)		Myanmar CSO, Statistical Yearbook 2011
6	% of hardwoods exported	63.92%	66.58%	46.55%	54.34%	62.81%				Calculation: Line (5) / Line (4)
7	Value of exported hardwoods (USD)	511	539	411	494	594	605	302**(hy)		Myanmar CSO, Statistical Yearbook 2011
8	Value of total hardwoods production (USD)	799	810	883	909	946				Calculation: Line (7) / Line (6)
9	Tax as a percentage of total production	0.42%	0.60%	0.54%	0.53%	0.59%				Calculation: Line (3) / Line (8)
10	Value of exported hardwoods (USD millions)	3,114								Ferrarini, Benno, "Myanmar's Trade and its Potential," ADB Economics Working Paper Series No. 325, January 2013
11	Value of total hardwoods production (USD millions)	5,310								Sum of Line (8) * (3114/2549), which reflects the relative values of ADB and CSO estimates of export value
12	Tax as a percentage of total production	0.44%								Sum of Line (5) * Line 13

## Notes:

1. Calculations assume that the quality and value of hardwoods used in the domestic market is comparable to that of export.
2. The above calculations do not reflect other taxes paid by companies, including commercial taxes and export duties. They also do not reflect direct income from

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SOEs including the Myanmar Timber Enterprise.

3. Lines 10 and 11 show aggregated figures for the five year period 2006-2010. Line 12 shows the average effective tax rate across this period.
4. \*Exchange rate for FY12/13 is taken from IMF Staff-Monitored Program p. 17 and is not a period average, unlike all other exchange rates given. No full-year average exchange rate from FY12/13 is available as of yet. Exchange rate from FY13/14 is the market rate at time of writing (July 31, 2013).
5. Net income of Myanmar Timber Enterprise is not included in the above charts, which represent direct tax revenue only. The CSO Statistical Yearbook 2011 indicates that the Myanmar Timber Enterprise has been running at a loss for the last seven years straight, though this is almost certainly due to the use of the official exchange rate for the recording of timber exports through the end of March 2011.
6. \*\*(hy) Lines 5 & 7 for FY12/13 show half year figures only.

## Appendix 3: Calculations of natural gas earnings from new projects

## Natural Gas Production, Export, and Earnings, FY2011-12

	Annual Production (BCF)	Export (mmcf)	Export (BCF, annual)	Export Earnings (USD millions)	Government Revenue (USD millions)	Government Share (2011)	Government Share (last 5 years)
Yetagun	164	424	150	3,282	2,158	65.7%	61.33%***
Yadana	282	755	216				
Zawtika (M-7 and M-9)	91	250*	91*	819**	502	-	-
Shwe	183	400*	146*	1,310**	803	-	-

## Sources:

1. Annual Production: ADB, "Myanmar: Energy Sector Initial Assessment," Manila, 2012, p. 8-14.
2. Export (mmcf): ADB, "Myanmar: Energy Sector Initial Assessment," Manila, 2012, p. 8-14.
3. Export Earnings: IMF, "Staff-Monitored Program," 2013.
4. Government Revenue: IMF, "Staff-Monitored Program," 2013.
5. Government share: Author's calculations

## Notes:

\*Export (mmcf) and Export (BCF, annual) are estimates for the Zawtika and Shwe projects, as these fields have not yet started production.

\*\*Export earnings and government revenue figures for the Zawtika and Shwe projects are projections, based on the planned annual production of the projects and assuming a sale price per volume equivalent to the 2011 price obtained for gas from the Yetagun and Yadana fields. Note that these figures may vary based if the Btu's differ significantly from those of already producing projects.

\*\*\*Government revenue is estimated by multiplying the export earnings by the government share of total export revenue over the last five years (61.33%).

Appendix 4: Calculations for Jade Production and Classroom Construction

Fiscal Year	KG of jade produced	Tax Rate	Inflation Rate	Cost per classroom (USD)	Revenue Generated	Number of New Classrooms Built
FY03/04	10,754,813	\$1	24.90%	\$8,441.12	\$10,754,813	1,274
FY04/05	14,987,842	\$1	3.80%	\$8,761.89	\$14,987,842	1,711
FY05/06	20,390,270	\$1	10.70%	\$9,699.41	\$20,390,270	2,102
FY06/07	20,458,279	\$1	26.30%	\$12,250.35	\$20,458,279	1,670
FY07/08	20,235,030	\$1	32.90%	\$16,280.72	\$20,235,030	1,243
FY08/09	32,921,542	\$1	22.50%	\$19,943.88	\$32,921,542	1,651
FY09/10	25,795,415	\$1	8.17%	\$21,573.30	\$25,795,415	1,196
FY10/11	46,810,120	\$1	7.30%	\$23,148.15	\$46,810,120	2,022
FY11/12	43,185,339	\$1	8.00%	\$25,000.00	\$43,185,339	<u>1,727</u>
						14,596

Source:

1. KG of jade produced: Central Statistical Organization, "Statistical Yearbook 2011," Naypyidaw, 2012, p. 237
2. Inflation rate: IMF Staff-Monitored Report 2013 and IMF database. Rates can also be found in Central Statistical Organization, "Statistical Yearbook," Multiple years.
3. Cost per classroom: UNICEF estimate

Notes:

1. For the purposes of this illustration, tax rates are fixed at USD1 per kilogram of jade produced per year.
2. Costs per classroom are adjusted for inflation, with FY11/12 used as the base year.

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Appendix 5: Calculations on money generated through auctions of jade and gems

Fiscal Year	Totals:
FY03/04	\$41
FY04/05	\$35
FY05/06	\$135
FY06/07	\$435
FY07/08	\$523
FY08/09	\$486
FY09/10	\$909
FY10/11	\$5,126
FY11/12	\$3,176

Source:

1. All figures are compiled using references listed at: [http://www.palagems.com/gem\\_news\\_burma\\_stats.php](http://www.palagems.com/gem_news_burma_stats.php). Figures have been aggregated into the appropriate fiscal year, and inaccurate figures have been excluded. Unfortunately, more accurate data is not available given the nature of the industry.