

# MALI

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Centuries ago, gold made the ancient kingdom of Mali one of the richest in Africa and the fame of the Bambouk goldfields and the glory of Timbuktu spread throughout Europe. Although the modern gold mining industry of Mali, still in its infancy, cannot yet claim that it has had an impact on this scale, it is already making a very significant contribution to the economy and in so doing it is helping the country overcome the natural disadvantages with which it is burdened. These disadvantages include being a land-locked country, 60% of which is covered by desert with the remainder being exceptionally hot and dry for much of the year.

Given these circumstances, it is perhaps not surprising that the 12 million people of this 1.2 million km<sup>2</sup> country are among the poorest in the world (Mali ranked 164 out of 174 countries in the 2000 UNDP Human Development Index). Social indicators are equally gloomy - 70% of the population are below the poverty line, the life expectancy is 50 years at birth, infant mortality is 123 per 1,000 and there is an illiteracy rate of 68%.

On the positive side, Mali has seen a decade of democratic government, from the first democratically elected president in 1992. Although the country is still heavily dependent on foreign aid, the government is making attempts to diversify the economy. In this respect, gold mining has had a major impact in the past few years, and it is strongly challenging the cotton industry as the largest contributor to GDP and to export revenues.

Mali's gold production has increased dramatically in the past few years, from 6 t in 1995 to 41 t in 2001. Gold production in 2001 mainly came from three large operations and numerous artisanal workings. One company, AngloGold Ltd, is involved in all three of the larger operations. The Morila mine in southern

Mali, is jointly owned by AngloGold (40%); Randgold Resources Ltd (40%) and the remaining 20% is held by the State of Mali. The mine commenced production in the fourth quarter of 2000 and last year produced 630,825 oz of gold at a cash operating cost of US\$103/oz and a total cost of US\$125/oz. At December 31, 2001, the reserves were 4.3 Moz (at a US\$300/oz gold price and a 1.3 g/t cut-off) and the resources (including reserves) stood at 6 Moz. The mine is actively trying to increase these resources through exploration. Exploration expenditures on the mine permits in 2001 were US\$1.1 million and this is forecast to increase to US\$1.9 million this year.

## Morila - statistics

	2001 Actual	2002 <sup>†</sup>
Gold Production (oz)	630,825	663,939
Cash Cost of Production (US\$/oz)	103	97
Total Cost of Production (US\$/oz)	125	117
Reserves (Moz)	4.3	
Measured & Indicated	6	
Resources* (Moz)		
Exploration Expenditure (US\$ m)	1.1	1.9

<sup>†</sup> forecast

\* Includes reserves

At the Sadiola gold mine in western Mali, AngloGold and IAMGOLD Corp each has a 38% interest while the State of Mali owns 18% and the International Finance Corp owns the remaining 6%.

The Sadiola gold mine started commercial production in 1997 and has produced to date 2.6 Moz of gold at an average operating cost of US\$124/oz. In 2001, it produced 536,047 oz at an average total cash cost of US\$143/oz. The mine is budgeted to produce 547,000 oz in 2002 at a total cash cost of

US\$158/oz. Reserves at December 31, 2001 (at a US\$300/oz gold price) were 33.5 Mt averaging 3.2 g/t of gold giving a contained gold content of 106.6 t (3.4 Moz). Measured and indicated resources (including the reserves) total 120.8 t (3.9 Moz) of gold and inferred resources amount to a further 169.4 t (5.5 Moz) of gold.

### Sadiola - statistics

	2001 Actual	2002 <sup>f</sup>
Gold Production (oz)	536,047	547,000
Cash Cost of Production (US\$/oz)	119	138
Total Cost of Production (US\$/oz)	143	158
Reserves (Moz)	3.4	
Measured & Indicated (t)	120.8 [3.9]	
Resources* (Moz)		
Inferred Resources (t) [Moz]	169.4 [5.5]	
Exploration Expenditure (US\$ m)	5.4	6.6

<sup>f</sup> forecast

\* Includes reserves

The US\$6.6 million budget for exploration around Sadiola includes pit-contiguous drilling for additional oxide reserves, further testing of the sulphide mineralisation beneath the oxide pit and continued exploration for satellite oxide deposits close to the plant.

Some 25 km to the north of Sadiola is Mali's newest mine, Yatela. The mine is jointly owned by AngloGold (40%), IAMGOLD (40%) and the Government of Mali (20%). The mine was constructed under budget and ahead of time. This heap-leach operation came into commercial production in July 2001 and from then until the end of the year the mine produced 130,948 oz of gold at a cash operating cost of US\$138/oz and a total cash cost of US\$158/oz. Reserves at Yatela at December 31, 2001 (at a US\$300/oz gold price) were 43.6 t (1.4 Moz) of gold contained in 12.3 t of ore at an average grade of 3.6 g/t. There is 50.3 t (1.6 Moz) of gold in measured and indicated resources (including the reserves) and an additional 13.0 t (0.4 Moz) of gold in inferred resources.

### Yatela - statistics

	2001 Actual	2002 <sup>f</sup>
Gold Production (oz)	130,948	270,000
Cash Cost of Production (US\$/oz)	138	152
Total Cost of Production (US\$/oz)	158	173
Reserves (Moz)	1.4	-
Measured & Indicated	50.3 [1.6]	-
Resources* (t) [Moz]		
Inferred Resources (t), [Moz]	13.0 [0.4]	-
Exploration Expenditure (US\$ m)	0	1.1

<sup>f</sup> forecast

\* Includes reserves

In addition to gold production from the above operating mines, there were 2.1 t (67,000 oz) of gold reported from the Syama mine. This mine, 75% owned by Randgold Resources Ltd, was placed on care-and-maintenance in late 2000. Production in 2001 came from the treatment of stockpiled ore. The reserve at Syama was reclassified as a resource and at December 31, 2000 was 51.6 Mt at a grade of 3.2 g/t giving a gold content of 165.1 t (5.2 Moz).

Gold was also produced by local, small-scale miners but the amount is unknown.

On the development and exploration front, companies are still being driven on by the promise of finding rich deposits as good as, or better, than the presently operating mines. Nevertheless, the level of activity is less than it was a few years ago, perhaps having more to do with the general state of the gold-mining industry rather than with the lack of attractiveness of Mali as a country in which to explore.

Randgold continues to explore on its Loulo and Yalea properties in western Mali. Resources are said to be 4.2 Moz contained in a number of deposits, and the company expects to complete a feasibility study by mid-2002. Randgold is also carrying out early stage exploration on some of its properties in southern Mali.

Immediately north of Loulo, Axmin Inc. has reported results from a 7,000 m reverse

circulation drill programme on its 65%-owned Kofi permit. Three separate mineralised zones have been encountered. Two of the better intersections that were reported averaged 5.5 g/t over 40 m and 3.1 g/t over 40 m.

Nevsun Resources completed an infill drill programme at its Tabakoto project, east of Yalea, in 2001. A final feasibility study is being prepared for the project by MDM of South Africa. A mining licence was granted for Tabakoto in 1999 and a positive feasibility study would allow mining to commence in early 2003. A previous third party study proposed a 70,000 oz/y operation with an eight-year mine life from the current 1.8 Moz resource.

Lying just to the north of Tabakoto is the Segala deposit where the indicated resource is 915,000 t of oxides averaging 2.5 g/t and 3.3 Mt of sulphides averaging 6.2 g/t for a total gold content of 22.5 t (0.7 Moz) of gold. Inferred resources add a further 6.8 t (0.2 Moz) of gold. In January 2000, SEMAFO acquired a 75% interest in Segala Mining Co. which owns the Segala deposit.

South of the Sadiola mine, a number of junior exploration companies were active in 2001. Robex Resources Inc. carried out pitting and sampling of an alluvial placer on its Diangounte property. The company is planning to process bulk samples on site starting by mid-2002.

Orezone Resources Inc. signed a joint venture agreement with a Malian that holds the Kantela permit just to the south of Sadiola. Geochemical soil sampling, pitting and rotary air blast (RAB) drilling (2,000 m in 39 holes) were carried out.

An exploration arm of the South Korean company Hyundai has been active in western

Mali for a number of years. In 2001, it released a resource number for its Barani East prospect, which was immediately disputed. Subsequently, little information has surfaced.

Etruscan Resources Inc. has three exploration permits in western Mali but little work on them was reported in 2001. Great Quest Metals Ltd also has a permit in western Mali on which little work has been carried out.

In southern Mali, a number of companies are active in exploration. AngloGold is working on a number of properties and has flown airborne geophysical surveys over selected areas.

Newmont has an option to earn in to the Mininko permit held by Geo Services Resources, some 40 km southeast of Morila. To-date, 20,000 m of RAB and air core drilling has been completed.

In August 2001, the Malian Government arranged a tender on the old Kalana mine, a past gold producer. It was awarded to MEMEC SARL, a Malian company that is a joint venture between a South African, a US and a Canadian company. Once a convention with the government is signed, the joint venture should invest in the order of US\$10 million on the Kalana underground workings and on exploration over the mining licence.

An airborne geophysical survey conducted in 2001 should result in a further stimulus to exploration in Mali. The survey consisted of total field magnetics and gamma spectrometry at 400 m line spacing and 70 m elevation over a total area of 73,500 km<sup>2</sup>. The regions covered were the Kayes 'window' and part of the Kenieba 'window' of Birimian rocks in western Mali and the Bougouni and Douentza regions in southern Mali. Completion of data processing and interpretation is expected by May 2002.