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Extractive Industries and Sustainable Job Creation

**Artisanal Mining in Sudan - Opportunities, Challenges
and Impacts**

By

Mohamed Suliman Ibrahim,
Geologist, Ministry of Minerals, Republic of the Sudan

The views expressed are those of the author and do not necessarily reflect
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Republic of Sudan Ministry of Minerals

ARTISANAL MINING IN SUDAN- OPPORTUNITIES, CHALLENGES AND IMPACTS

Mohamed Suliman Ibrahim



Cubic Globe



OUTLINES

- **Artisanal mining activities in Sudan: history, geographical distribution**
- **Gold production**
- **Current challenges facing artisanal mining sub-sector**
- **Impact of artisanal gold production on the socio-economic life in Sudan**
- **Contribution of artisanal scale mining to job creation and growth**
- **Interventions and way forward**

Historically, Sudan experienced at least 5 major episodes of mining boom:

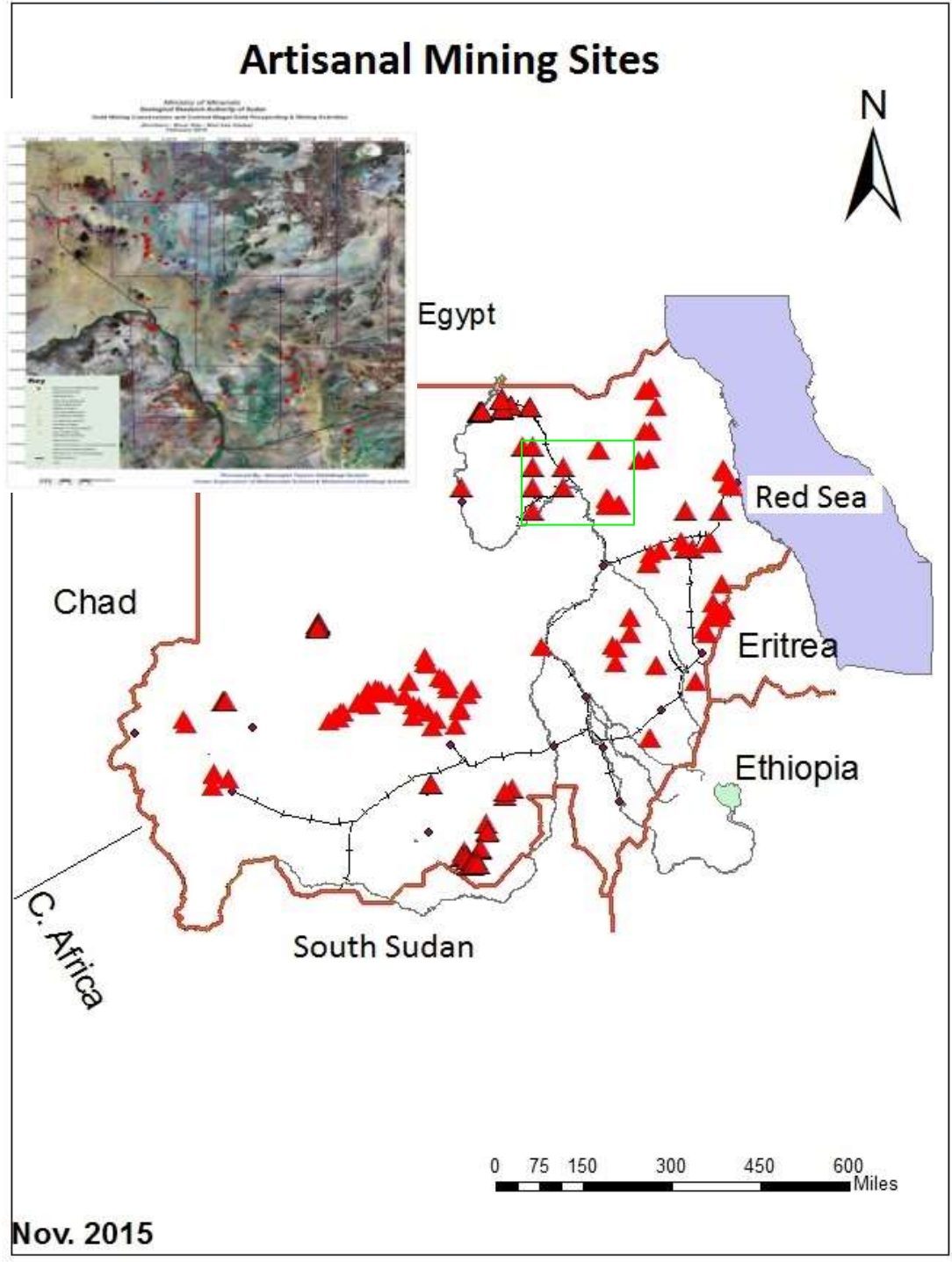
- **3000-1500 BC:** The ancient gold, iron ore and copper mining activities in Nubia in northern and central Sudan
- **Around 10th Century:** Nuba, Beja, Arab and other tribes produced substantial gold in the Red Sea hills, Nubian desert, south Blue Nile, and Nuba mountains
- **19th Century:** The Ottoman Empire gold quest in Sudan
- **1900-1953:** The colonial gold mining in the Red Sea Hills, northeastern Sudan
- **2005 -present:** The recent gold mining boom in all Sudan



Figure 1: Geographical distribution of artisanal scale gold mining activities



Republic of the Sudan
Ministry of Minerals
Geological Research Authority of the Sudan





Definition of Artisanal Scale Mining (ASM)

- **Minerals Wealth Development & Mining Act (2015) , section 4 Article 14e defines *Traditional mining (artisanal scale mining) as an activity practised utilizing local traditional means within the specified area***
- **Other definitions cited elsewhere: labour intensive, use simple tools, poverty-driven activity, of migratory nature**
- **Artisanal scale mining is a gold-focused activity in Sudan**
- **Limited artisanal activities on chromite, limestone, and salt**



FACTS & STATISTICS

- **Over 1 million miners participate in gold mining and extraction**
- **About 4 million dependents directly benefit from the activities**
- **Activities cover 14 of the 18 Sudanese states**
- **Artisanal gold mining accounts for ~85% of the total gold extracted (2010-present)**
- **Total gold produced for the period 2010-2015Q3 reaches ~280 metric tons**



Statistics of Minerals Production in Sudan

Table 1: Operating Exploration and Mining Companies- 2015

Agreement Type	Exploration	Piloting	Producing	General Prospecting
Large scale	160	2	12	
Small scale	190	-	43	
Tailings Processing	(34)	6	15	
Other				370

Source: Ministry of Minerals Report- 2015

Figure 2: Mining Concessions Map- 2015

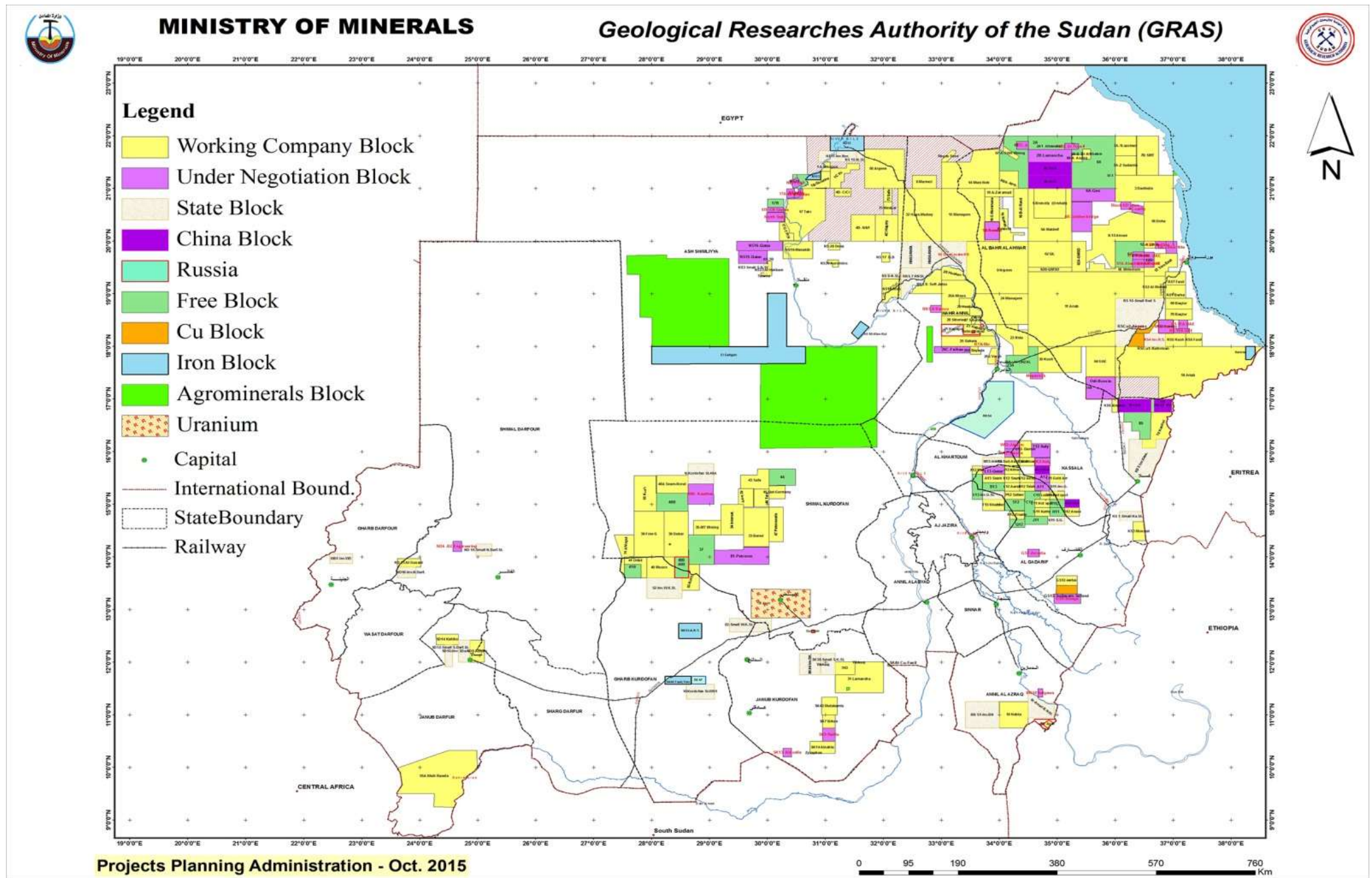


Table 2: Artisanal gold Production Licenses/Permits

Type of licensing	2014	2015
Gold mining	318	700
processing	741	4464
services	100,000	na

Source: Ministry of Minerals Reports 2014, 2015

Table 3: Gold Production in Sudan 2012-2015

Sub-sector	2012	2013	2014	2015 Q3
Formal		5,800	9,720	11,000
Artisanal		41,200	63,655	50,500
Total /Kg	50,000 (46,133 export)	47,000	73,375	61,500

Sources: Ministry of Minerals Reports 2012- 2015, Central Bank of Sudan Annual Reports

Challenges Facing Artisanal Scale Mining (ASM) Sub-sector in Sudan

Challenges are categorized into:

- **Legal and organizational**
- **Socio-economic**
- **Environmental protection**



Organization of the Artisanal Gold Mining in Sudan

Policy

- Overall policy of the Ministry of Minerals is to **boost the minerals production and productivity, diversify production of mineral commodities, promote investment, add value to minerals**
- Policy also caters for **organizing** artisanal mining and extraction sub-sector, **increase production, ensure safety and health of the miners, protect the environment, combat smuggling, maintain positive LSM-ASM interactions**
- Central bank of Sudan policy on **gold pricing, trade, exports, access to credit**



Organization of the Artisanal Gold Mining in Sudan – *Cont.*

The Law

- Legalization of the mining sector is governed by the **Mineral Wealth Development & Mining Act 2015** and regulations
- For artisanal scale mining the law provides for the **definition of the sub-sector, licensing requirements, the environment, and coordination with local mining councils in the States**
- **The Regulation of Traditional Gold Mining (2012)** sets conditions for practising artisanal mining such as registration, safeguarding the environment, stick to specified area of operation, sell gold produced to the bank of Sudan sale points



Organization of the Artisanal Gold Mining in Sudan – *Cont.*

Other relevant laws

- Labour Act (1997)
- Child Act (2010)
- Environmental Protection Act (2001)
- Environmental Health Act (2009)

Sudan Committed to international conventions relevant to ASM sub-sector:

Minimata Convention on Mercury, Basel Convention on Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal (1989), ILO Convention of Worst Forms of Child Labor (1999), Rotterdam Convention on environmental concerns, Bamako Convention on the environment

Mechanisms of Organization

- **A joint Federal-State coordination** body to remove any jurisdictional overlapping that jeopardize organizational efforts (Table 4)
- **A permanent committee** headed by the State Minister of Minerals to manage and solve problems associated with artisanal mining activities in the country
- **Organizational intervention campaign** bodies to regularly visit the States for supervising and registering active miners, service providers and dealers, provide IDs, practicing licenses, collect royalties on produced gold
- **Local authority** bodies responsible for camp/processing centres administration

Table 4: Joint ASM organizational Councils -2015

Council level	planned	Actual	Pending	Remarks
Fed-State JV	12	12		4 campaigns -85% of sub-sector organized
Locality	42	32	10	
Processing Centre	55	45	10	
Total	109	89	20	

Source: Ministry of Minerals Reports 2014, 2015

Table 5: Artisanal gold mining and extraction legalization -2015 Q3 (3rd campaign)

State	License	Contract	Miner ID	Mine site
Northern	44	218	1674	11
River Nile	-	343	1740	9+
N. Kordfan	-	3	37	7+
W.Kordfan	3	-	146	30
S.Kordfan	-	16	76	20+
N.Darfur	15	23	135	24
S.Darfur	-	1	12	5
W.Darfur	-	-	-	3+
Red Sea	-	2	462	30+
Kassala	-	2	45	19
Gedarif	1	2	162	6
Blue Nile	4	-	115	5+
Total	59	641	4464	221

Source: Ministry of Minerals Campaign Report 2014



Impact of the Artisanal Gold Mining on Socio-economic Life in Sudan

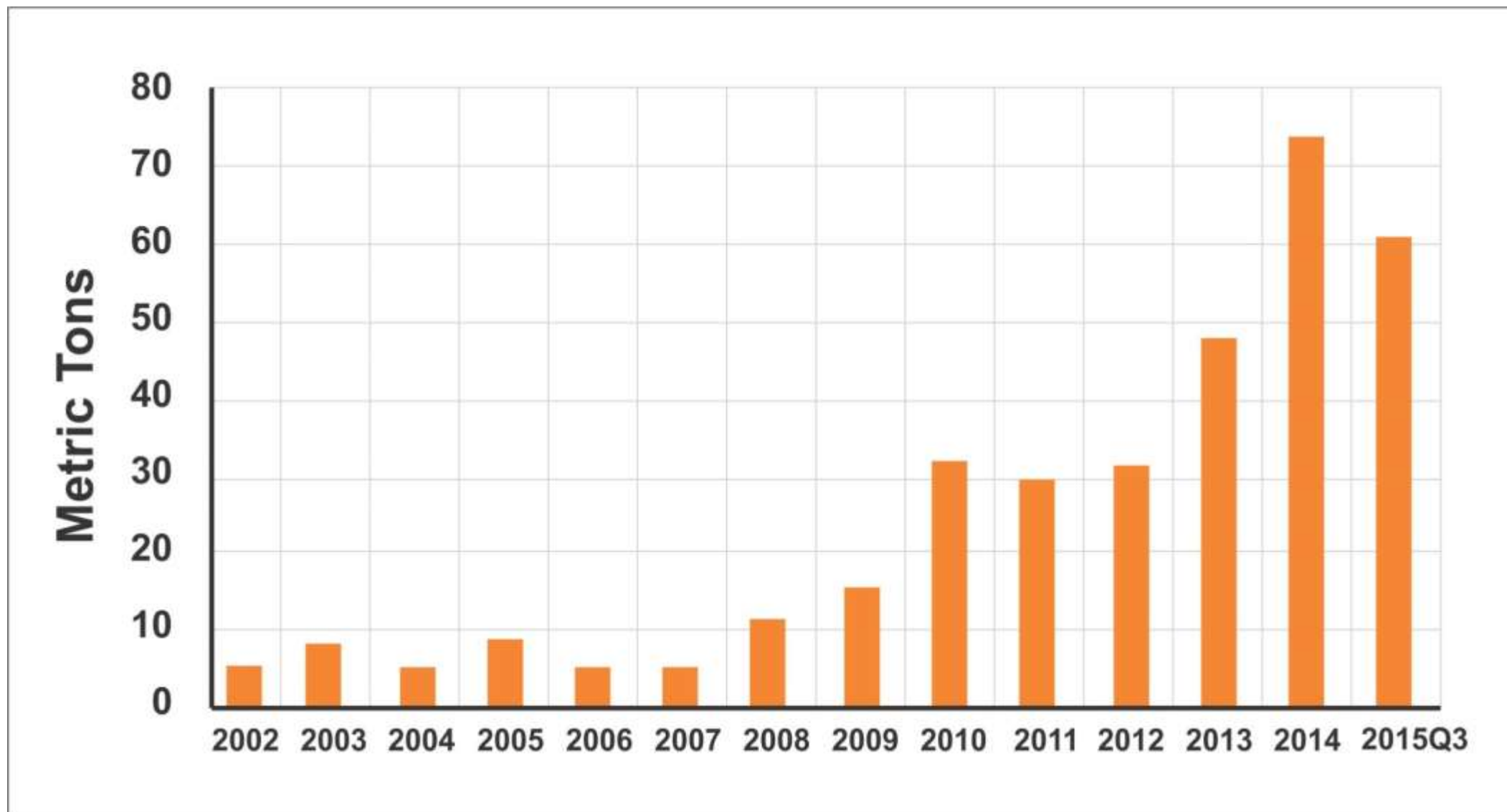
Recent Studies point to a number of **indicators** attributed to the impact of gold produced on **the national macro-economy** :

- **Boosted GDP and economic growth**
- **Enhanced balance of trade through exports**
- **Increased employment opportunities**

1- The Economic Indicators

- **Total gold production escalates with the advent of artisanal gold activities**
- **Artisanal gold mining operations currently contributing ~85% of the total national production**
- **12 to 15% of production comes from large- and small-scale mining and tailings CIL processing operations**
- **Prior to 2008, production solely come from the Sudanese-French JV **Ariab Mining Co. (6 MT in 2005)****

Figure 3: Gold production in Sudan,2002-2014



Sources: Central Bank of Sudan Annual Reports 2002-2014, GEO Services Int. Co Report on Artisanal Mining Impacts prepared for Ministry of Finance 2015, Ministry of Minerals reports 2014-2015

- In 2014 Sudan ranked 3rd in gold production among African countries
- Gold exports make an average of 33% of total national exports for the period 2012-2014

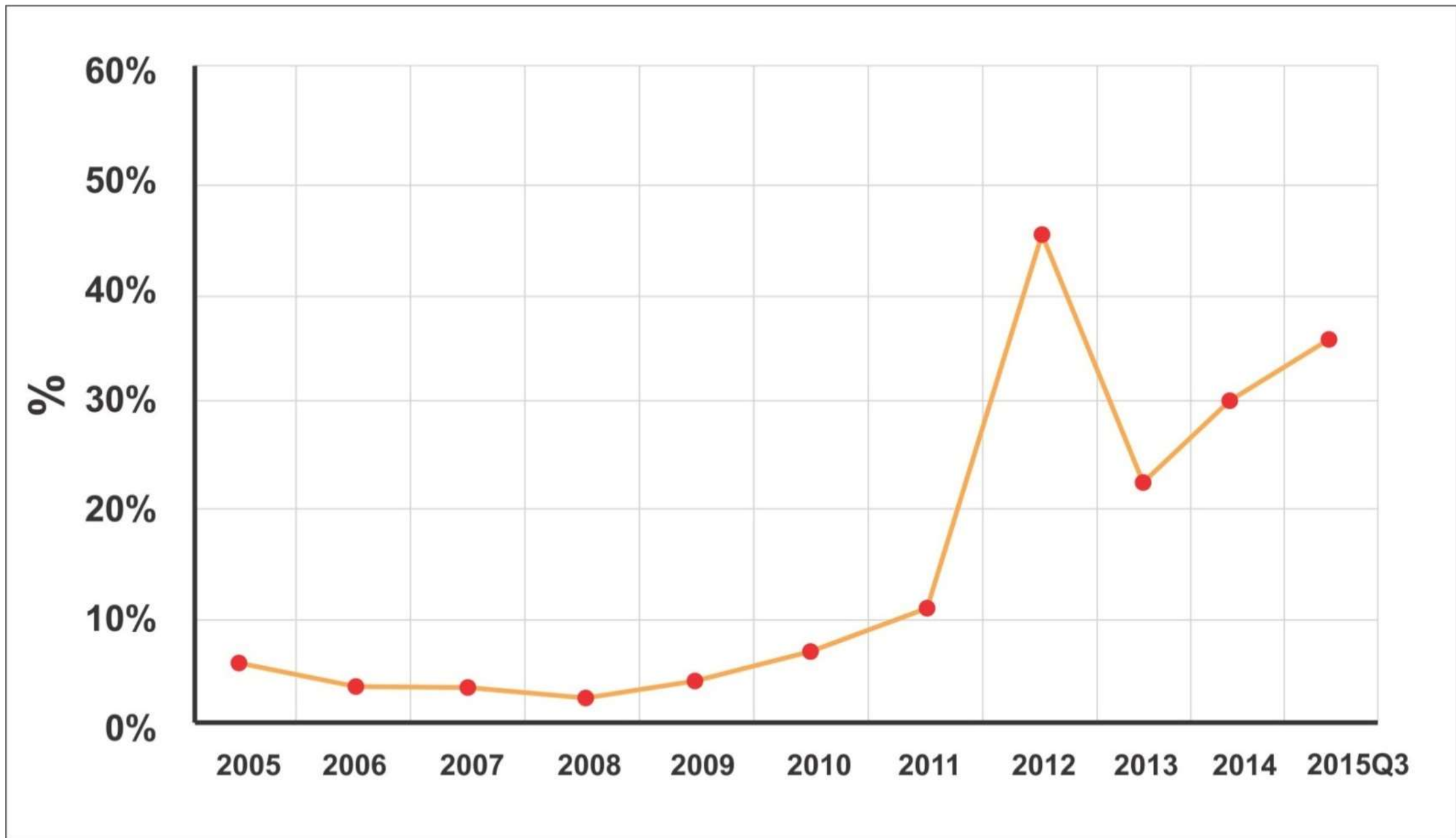
2- Contribution of total gold production to growth/GDP

- Table 6 below summarizes contribution of mining and quarrying in GDP

Indicator	2009	2010	2011	2012	2013	2014
GDP growth%	5.9	5.2	1.9	1.4	3.6	na
Gold mining growth rate %	0.3	9.3	66.7	215	14	na
Contrib. m&Q in GDP %	0.2	0.3	0.2	<u>1.5</u>	<u>2.3</u>	<u>2.5</u>

Sources: Central Bureau of Statistics data-2015, GEO Services Int. Co Report on Artisanal Mining Impacts prepared for Ministry of Finance 2015

Figure 4: Gold exports as % of total exports (2005-present)



Source: Central Bank of Sudan. Data on 2015 incomplete

***2012 total gold export proceeds US\$2.2 billions**

3- Contribution of artisanal gold mining activities to employment

- **A one million** individuals involved in artisanal-small scale gold mining and extraction
- Another **4 million** of family dependents benefit from mined gold revenues
- The total ASM activity-dependents (5 millions) translate to **~14% of the total population**
- Over **30 types of occupations** are practised within the ASM gold mining and processing centres
- **Open opportunities**

Table 7: General statistics on different types of platforms that contribute to job creation in the ASM sub-sector

State	sites	pits	machin- ery	mills	washin g centre	amalgm. centre	other facilitie s
Northern	47	6140	107	268	62	123	
R.Nile	23	90	270	35	60	83	
Nkordfan	19	7562	-	436	503	191	
SKordfan	34	na	27	na	na	na	
WKordfan	20	6343	7	150	200	40	
NDarfur	9	13000	100	700	1000	400	
SDarfur	3	1278	-	81	224	25	
WDarfur	5	150	-	na	na	na	
Red Sea	24	441	254	350	408	65	
Kassala	8	285	1	15	100	10	
Gedarif	18	2247	71	150	117	79	
Blue Nile	11	200	-	33	na	24	
Total	221	37736	837	2218	2674+	822	

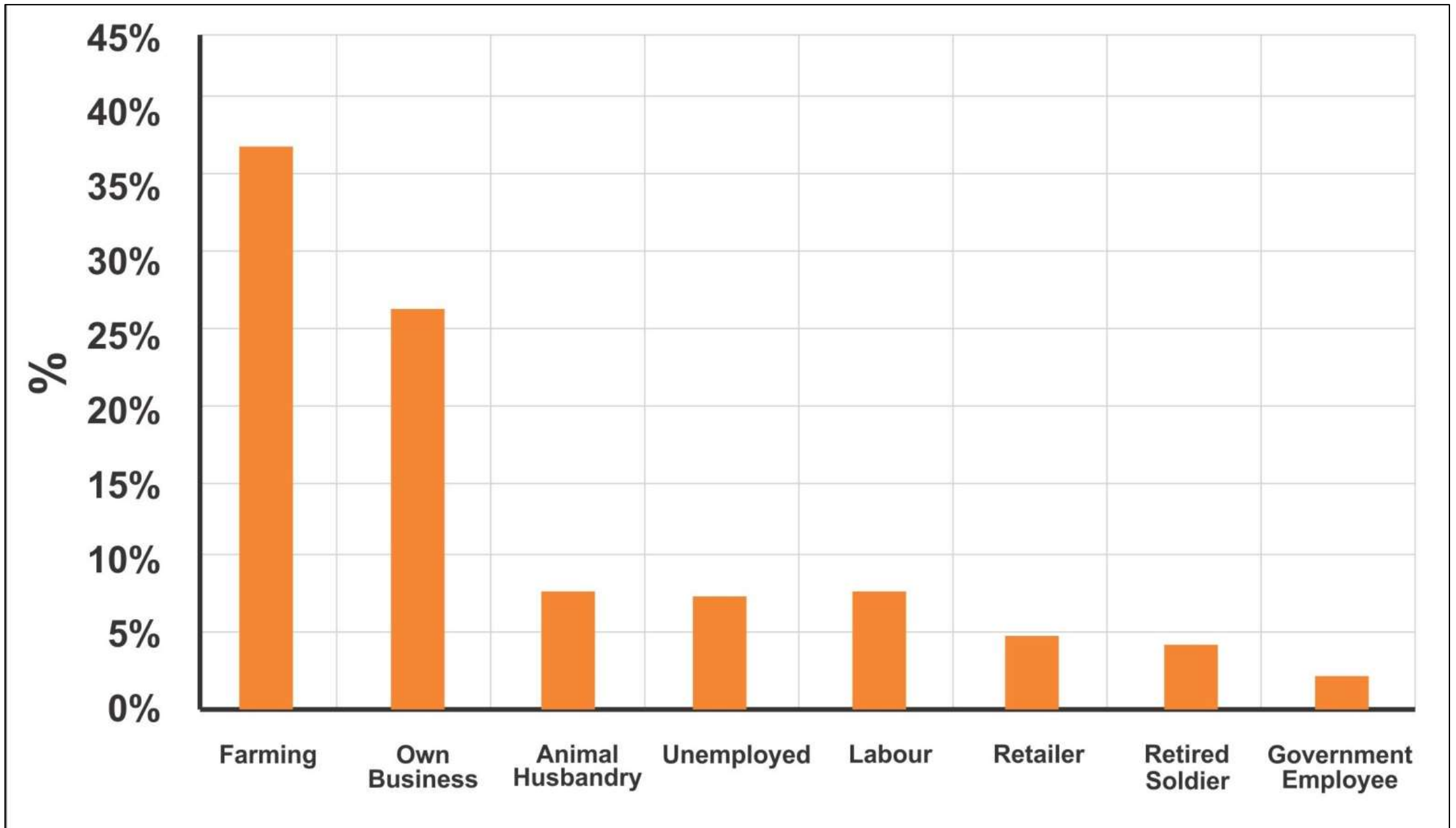
4- Social Impact Indicators of Artisanal Gold mining Activities

- Recent surveys indicate that **majority of the miners sample are young (below 45)**- constitutes **~93%** of the community
- **Child labour** is diminishing (**<1%**)- in some sites **children under 15 and women** are visible minorities
- Participating artisanal gold miners dwell in 2 types of settlements:
 - Mining camps located around pits- transient
 - In or around processing centres established at outskirts of towns- semi-permanent
- **Processing centres (suq) provide over 30 type services** ranging from gold extraction techniques to food, health care, entertainment ...
- **Low level hygiene, occupational health problems** and different ailments reported (?%)
- **Security and crime** cases among the miners communities generally **low**- vary from vice encounters to serious offenses. Theft, cheating, and drug abuse make **>90%** of cases
- ASM mining sites provide **social melting platform**-neutralize political tension

5- Micro-economic Impacts of Artisanal Gold Mining and Extraction

- Surveys of artisanal gold mining community depict the **majority have previous occupations** and a source of income.
- The study shows that only **7.5%** of sampled were previously **unemployed** (Figure 5)
- Average **daily wages** of farming labour **increased** from SDG32 (2011) to SDG80 (2013). Hike could be attributed to migration of workforce from traditional agriculture sector to artisanal mining sub-sector
- Consequences of sectorial migration: less land cultivated, lower crop yield, shortages, less exports
- Gold sales proceed-sharing is dominant labor relation set up among facility owners and hand labor.
- Earnings from artisanal gold production jobs vary. **48% of miners make SDG1000-2000/month (US\$100-200)**. Survey indicates 4% only earn over SDG3000/month

Figure 5 : Artisanal gold miners previous income source



Source: GEO Services Int. Co Report on Artisanal Mining Impacts prepared for Ministry of Finance 2015

Contribution of Artisanal gold production to Revenues

- No business tax is imposed on the artisanal gold extracted
- An annual 10% royalty is collected from gold sale proceed per license/contract
- States levy **local taxes** and fees per type of operation or service
- Local economies **boost indicators**: boom towns – high cash flow- stimulate trade- better life quality- lower poverty rates- savings investment

Gold Smuggling

- Hard to find statistics
- Indicators-
- Hard currency demands
- **Gold trade policies**



Environmental Impacts of Artisanal Gold Mining

- ASM often has **serious environmental impacts**- physical, chemical and organic pollution of waters, damage to landscape, deforestation, wildlife disturbance, poor hygiene, health hazards, mercury release into the environment
- Direct negative impacts on the miners—occupational health hazards-exposure to dangerous substances- exposure to dust and gases

Mercury

- Field observation indicate that ASM gold is extracted from ore through amalgamation (Hg^0 – Au^0 /amalgam)
- Gold extracted through burning off mercury. Hg vapour released in the atmosphere and ultimately into the environment
- Released Hg poses serious health issues-vapour inhalation or consumption of contaminated water, animal and crop products contamination
- Research and development work carried out on Hg use provide two options:
 - reduced and safer use of mercury, or
 - elimination of mercury from ASM gold extraction process



ASM Intervention and On GoingTackles

- **Maintain supportive policy**
- **Organization** of ASM sub-sector- legal titles- licensing- IDs, -partnership- large-Artisanal scale (LSM-ASM) co-existence
- **Technical support**- Intermediate technology transfer supply
- **Capacity building**- training on best operational practises-
- **Awareness raising**-health- hygiene -environmental
- protection- behaviour change
- **Incorporation in the national economic cycle**: trade- micro- credit access- job creation- rural development plans- taxation- social plans
- **Establish capacities** for both **monitoring and law enforcement**

**Artisanal Gold Mining
Contributes ~85% of current
national gold production**



ASM contributes livelihood to rural Sudan





Thank you!