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Pilot Study on Scientific Knowledge Enhancement in Angola

Report IRIS - 2012/061

Project number: 730.2914
Project title: Pilot study on Scientific Knowledge Enhancement in Angola
Client(s): NPD – «Oil for Development»
ISBN: 978-82-490-0775-2
Distribution restriction: Open

Stavanger, 24.1.2012



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Preface

Objective

The objective of the pilot study was to map actual position, assess feasibility of tools and actions, and to propose a road map for enhancement and diffusion of scientific knowledge amongst Angolan institutions and industry sectors.

This report reflects on status today in Angola in areas relevant to higher education, related to economic growth and social development as a consequence of more industrial activity, based on Angolan skilled enterprises' participation in the value creating sectors in all regions of the country.

Scope

The objective of the study is presented by through the topics;

- a) Angola's position – Comparative review
- b) Current situation for Angolan institutions
- c) Barriers and prerequisites for national institutions

Thanks to contributors.

We acknowledge the useful information provided by the individuals who participated in meetings, those who gave the project team guided tours at various industry and HEI sites, as well as all documentation and other material provided.

Special thanks to Ms. Sandra Dias dos Santos (Directora, RKK Luanda Office) who organised our meetings and access to key documents and informants.

The pilot study took place during 2010-2011.

Stavanger, 24.1.2012

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Summary

The hinterland

In 1975 the Angolan petroleum industry accounted for some 2000 workers, and in year 2000 this number had grown to some 15000. Even though the petroleum employees accounted just for a negligible percentage of the total labour force, this period had seen a new industrial sector slowly emerge with a workforce that was formed partly by movement of experienced and trained personnel from other sectors and occupations, and partly from the training and education of new entrants. Such mobility from other sectors has now tapped off, and a high share of the current 65000 workers in the Angolan oil industry (2009) possesses specific skills. It is foreseen that the expected further expansion of this industry will be even more dependent on domestic training and education.

While there is heavy dependence on oil revenue, Angola's non-oil sector has been growing faster than the oil sector for the last two years. Until recently growth in the non-oil sector was driven mainly by public investment in construction and infrastructure, but private investment has increased markedly, especially in the construction of office buildings in Luanda. Luanda remains the economic and political hub of the country, accounting for 70-75% of economic activity and consumption.

Comparative studies have shown that the spillover effects vary largely between petroleum producing nations. Newly industrialised countries such as Malaysia and Brazil have chosen strategies for the petroleum sector and a role for their national oil companies with much commonality to the Angolan strategy, and have been quite successful. In Africa, Nigeria and Angola are parts of the same region and face similar conditions in many respects. Lessons can be drawn from these and other countries' (including Norway) experience and be adopted for the Angolan context.

The petroleum industry in itself is not an engine for nationwide job creation and poverty reduction. To benefit from the unparalleled opportunity to prosper from its oil wealth, Angola faces major challenges that need to be managed to avoid damaging and counterproductive effects of the oil driven economy. Thus, with the Angolan petroleum activity as a foundation and provider of opportunities, the scientific knowledge sector addressed in this framework should encompass the higher education system and associated research facilities and their roles in an industrial innovation system with a view to regional development and enhanced social welfare.

The study

A study into the potential for scientific knowledge enhancement should ideally cover the whole chain of causes and actions that might impact growth and diffusion. However, within the project scope it was not considered realistic to initiate in-depth activity to address the complex array of issues which may impact educational and training development; e.g. communication and infrastructure, legal and fiscal framework, incentive schemes, cultural and historic barriers, maturity of institutions, dominant economic factors, etc.

This pre-feasibility study was carried out with a view to document the current position of Angola, assess the feasibility of relevant tools and actions, and to identify some key areas that need to be addressed to enable enhancement and diffusion of scientific knowledge within Angolan institutions, as well as knowledge based activity growth in adjacent industry sectors and the society at large.

To supplement desktop research on matters relevant to the study topics, meetings and interviews were conducted with 19 individuals representing Angolan universities and research institutions, training providers, the petroleum industry and other industries, ministries and state institutions. The meetings took place in Luanda in June 2011.

The picture

Since 2007 Angola has seen a significant and rapid increase in number of Higher Education Institutions (HEI). The public university Universidade Agostinho Neto (UAN) used to have campuses in ten of Angola's 18 provinces. After a reorganisation of the higher education system in 2010 the UAN now holds campuses in Luanda and the Bengo province, while the regional campuses became seven autonomous public universities. Recently UAN opened the modern Camama campus in the *Kilamba University City* at the outskirts of Luanda where the science and engineering faculties are the first to move in. This campus has planned capacity for 40000 students and the first 5000 will be enrolled early 2012. In addition to the public universities, there are now 13 approved private universities, mainly located in the vicinity of Luanda.

However these developments witness of major expansion in the HEI sector, there are admittedly challenges in relation to sufficient infrastructure (equipment, facilities) and qualified teachers. These are key issues that will need high attention in the further process.

The expansion in the university sector is one indicator of an active Angolan national and local content policy which also includes the knowledge sector, leading to a higher proportion of students who take their education in Angola and more Angolan nationals to fill academic HEI positions. The increased number of academic and support staff, research projects and construction of campus buildings and facilities, also contribute to local employment opportunities. Further, this growth in the HEI sector should be fundamental to positive spillover effects into most societal sectors in the short and long term perspective.

The implications

Some key observations and policy implications with relevance to higher education and knowledge in Angola:

- Unnoticeable 10 year progress for Angola on the education component of the global knowledge economy index.
 - Angola's effort for modernisation and growth, driven by the petroleum economy, has hardly had effect on the national level of education. In order to depart from the bottom layer amongst nations on this aspect, Angola's inveterate approach to public policy planning and implementation should be seriously examined.
- An unfavourable environment for starting up new enterprises hampers the climate for lasting knowledge based technological, economic and social advancements.
 - Skills are a prerequisite for higher value added activities and dynamic growth, and a diversified industry and trade structure will provide opportunities for educated youth. To increase the probability for a successful nation development, the root causes for Angola's low "ease of doing business" rating should be genuinely addressed.
- Lack of inter-ministry policy coordination.
 - At state level, there could be more joint-working arrangements across ministry borders to ensure coherent policy design for development of skills and an environment that sustain productivity, employment and poverty reduction.

- Unreliable / unavailable HEI, industry and society statistics.
 - Verified, ample statistics are considered vital in order to prioritise effort and to measure progress of strategic national programmes, including investments in the higher education sector. Planning and monitoring of national development efforts in Angola seem to suffer from lack of such statistics. Significant upgrading of the commitment, framework and processes is deemed necessary in this area.
- The push for fast track expansion in primary (and secondary) education through massive site developments leaves a large gap to the availability of qualified teachers.
 - While the state allocates funds to construction of buildings for necessary primary and secondary education, the attention to corresponding teaching capacity is underrated. There should be balance between construction logistics and education of proficient teachers.
- Low teacher salaries, hence low recognition and attractiveness, also contributes to slow increase in available and proficient teaching capacity, especially in the primary and secondary education system.
 - To stimulate the interest for the teaching profession, basic salary level in addition to supplementary sources such as grants and continuing education for instructors and teachers should be improved.
- Mismatch between the quality provided through secondary education and the expected standards at university enrolment, leads to a high drop-out rate at natural sciences and engineering studies.
 - Relations between the secondary and tertiary education level should be formalised in order to align secondary curricula with university needs. Further, the opportunities for admission to university for the 'wrong' reasons should be limited.
- Lack of staff in the higher education sector solicits multiple job situations where lecturers share their capacity between several universities, leading to even less time for individual student tuition.
 - The need for contract work and time allocated to different universities should be addressed by offering more permanent positions in the universities.

Although all good intents for Angola to undertake a diversified and balanced development of the nation, including the higher education sector, there are inherent mechanisms that are not always conducive to these processes. Manpower development with successful capacity and knowledge growth depends on strengthened indigenous institutions as well as generation of new activity. This in turn requires an enabling environment with genuine opportunities also for new companies and stakeholders to participate in the new Angolan economic domain. Thus the development is saddled with subtle issues. However there is growing awareness of these, and for Angola to break out of the group of least developed countries¹, it is critical that such aspects are being addressed.

¹ The least developed countries (LDCs) are a group of countries that have been identified by the United Nations as 'least developed' in terms of their low gross national income, their weak human assets and their high degree of economic vulnerability.

Contents

1	STUDY BACKGROUND AND APPROACH	1
1.1	Background.....	1
1.2	Conceptual study model	1
1.3	Methods and data	2
2	ANGOLA COMPARED TO OTHER PETROLEUM EXPORTING NATIONS	3
2.1	The Angolan petroleum trail.....	3
2.2	Economic indicators.....	4
2.3	Spillover effects to other sectors.....	4
2.4	Ease of doing business.....	6
2.5	Education and knowledge economics indicators.....	6
3	THE ANGOLAN PETROLEUM ENVIRONMENT	9
3.1	The roles of Ministry of Petroleum - MINPET	9
3.2	The roles of Sonangol.....	9
3.3	Petroleum sourced fast track rebuilding	10
4	THE PETROLEUM LABOUR MARKET	12
4.1	Manpower Demand.....	12
4.2	Specific skill requirements for the petroleum industry	13
4.3	Training Needs.....	13
4.4	Angolanisation in the petroleum sector.....	14
4.4.1	Hiring of personnel	15
4.4.2	Funding for training.....	15
4.4.3	The Contrato Programa.....	16
5	EDUCATION INFRASTRUCTURE.....	17
5.1	Rebuilding after the civil war.....	17
5.2	Capacity building and reforms	17
5.3	Angola education system.....	17
6	HIGHER EDUCATION AND RESEARCH	19
6.1	History	19
6.2	Angolan higher education institutions.....	19
6.3	Financing of higher education.....	22
6.4	Challenges	23
6.5	Research institutions	25
7	OTHER SECONDARY EDUCATION	26
7.1	Vocational education and training.....	26
7.1.1	INP - National Petroleum Institute	26
7.1.2	CINFOTEC - Integrated Centre for Technological Training	27
7.2	Corporate Education and Training.....	28

8	PERSPECTIVES AHEAD	30
8.1	Angola's potential.....	30
8.2	Skills for improved productivity and employment growth.....	30
8.3	Balanced and coordinated development strategies.....	31
8.3.1	Upgrading technology and diversify production structure	32
8.3.2	Build knowledge, individual competence and social capabilities	32
8.3.3	Collect and utilise information on skills requirements and supply of skills	32
9	CHALLENGES AND BARRIERS.....	33
9.1	Substandard HEI infrastructure	33
9.1.1	Physical infrastructure	33
9.1.2	Academic infrastructure	34
9.1.3	Accreditation and quality	35
9.1.4	Limited entrance capacity	35
9.2	Excessive drop-out rate	35
9.3	Weak coupling between HEI and industry and society demands.....	37
9.3.1	Industry and trade.....	37
9.3.2	Regional development.....	38
9.3.3	Unreliable / unavailable HEI, industry and society statistics	38
10	THE FUTURE OF HEIS IN ANGOLA	40
10.1	An emerging university model for Angola	40
10.2	Concluding remarks	41
11	REFERENCES	43

1 Study background and approach

1.1 Background

The civil war left Angola's education system in a state of disarray: very few investments were done in education during the war, thousands of schools were damaged or destroyed, and children were sent to military training. With the end of the civil war in 2002 the Angolan government started the process of rebuilding the education infrastructures.

Over the last five years Angola has seen a positive change of direction in many areas, including education. An education reform started in 2004 with the goal of making the schooling system more efficient in correspondence with the nation's development aspirations. This should include strengthening at all education levels in all provinces.

Angola is a key member of the Association of Portuguese Language Universities (AULP), where close ties are developed between universities in Angola and other countries. Liaison and agreements have been entered into with e.g. Portugal, Cuba, Russia and Brazil for provision of teachers to Angola, for studies abroad as well as technological cooperation. A Norwegian vocational training institute has been strongly involved in vocational and technical training programmes under a contract with Angolan authorities.

Arguably, Sonangol's major role in the petroleum sector already represents a large influence on Angola's competence base. However, in order to strengthen the petroleum industry's contribution to the benefit of the nation and its population, further knowledge sector development with basis in the petroleum sector's requirements as well as its financial and technological muscle, is essential.

1.2 Conceptual study model

The objective of the study has been to review and map the structure of the Angolan higher education and research community with the view to highlight areas deemed critical to successful enhancement of the scientific environment in Angola, hereunder to identify and assess:

- Current practices and bottlenecks for establishing new or growing knowledge areas
- Technical, organisational and educational gaps that need to be closed to realise the national development potential

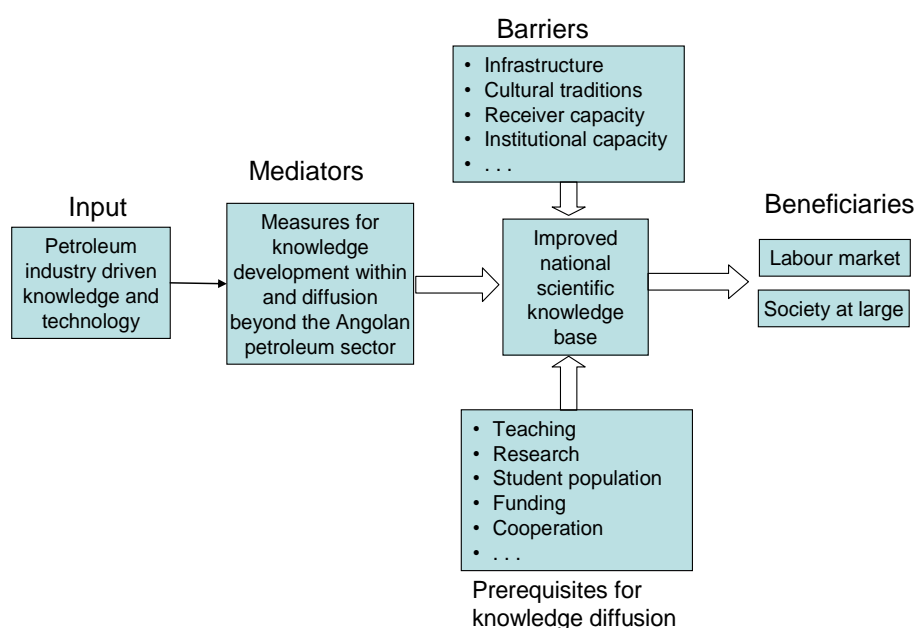


Figure 1-1 Conceptual study model

A conceptual model describing input and output, as well as mediators, prerequisites and barriers to scientific knowledge enhancement and diffusion, is depicted in Figure 1-1.

A major assumption embedded in this model, is that the petroleum industry has the capability of being a primary driver for knowledge enhancement in research and higher education in Angola. A successful outcome from this approach however, depends on a number of factors as this report has endeavoured to address.

1.3 Methods and data

This pre-feasibility study was carried out with a view to document the current position of Angola, assess the feasibility of relevant tools and actions, and to identify some key areas that need to be addressed to enable enhancement and diffusion of scientific knowledge within Angolan institutions, as well as knowledge based activity growth in adjacent industry sectors and the society at large.

To supplement desktop research on matters relevant to the study topics, meetings and interviews were conducted with 19 individuals representing Angolan universities and research institutions, training providers, the petroleum industry and other industries, ministries and state institutions. The meetings took place in Luanda in June 2011. The interviews were semi-structured (cf. Appendix iii). Notes were taken, however according to agreement the respondents' identity has not been listed in this report.

The analysis also draws on documentary sources collected during the process, both during the meetings and from open sources, to complement the information provided by the interview data. It has not been easy to get an updated overview of relevant information on the Angolan higher educational system. One reason for this is the rapid expansion in the number of HEIs since 2007 (cf. Section 6.2) which has increased the diversity of information sources, not always harmonised according to a common national reporting framework.

2 Angola compared to other petroleum exporting nations

2.1 The Angolan petroleum trail

Through periods of colonialism and varying regimes, the Angolan petroleum sector went through stages influenced by international oil companies. Prospecting for hydrocarbons in Angola started in 1910, however what can be characterised as a petroleum industry expanded in the 1960's when oil was discovered offshore Cabinda. By 1973 oil had become the country's largest source of export earnings, *overtaking coffee*.

The national oil company *Sonangol* was set up in 1976 and according to the guidelines in Decree 13/78 in 1978 (the Petroleum Law), all hydrocarbon deposits and mining rights were granted to Sonangol. Sonangol was permitted to enter into joint ventures with the oil companies already producing oil in Angola. Cabinda Gulf Oil Company (a subsidiary of Chevron from 1984), Petrofina and Texaco were the most prominent joint venture partners.

During the 1980s and 1990s, successful *shallow water* exploration led to new developments and a steady rise in production. By 2000 Angola's production had approached 800000 barrels per day and Angola had positioned itself as by far the largest oil producer in Sub-Saharan Africa, apart from Nigeria. In the early 1990s, the Angolan oil industry entered a new stage when a series of successful large *deep water discoveries* further off the Angolan coast were made by major international oil companies. Application of new deep water technology, pioneered in oil provinces like the North Sea, has allowed development of these resources and brought a new surge in Angola's oil production. Foreign companies participate through joint ventures and production sharing contracts and the nation is still highly dependent on foreign personnel and technology.

Angola became a *member of OPEC* in late 2006 and in late 2007 was assigned a production quota of 1.9 million barrels per day. The oil and gas sector is the real engine in the Angolan economy and accounts for 55% of GDP and 80% of government revenue. As the sole concessionaire in Angola, *Sonangol dominates the oil sector and the nation's economy at large*. Since the end of the civil war in 2002, oil has also acquired a quite exceptional significance in the political economy of Angola, affecting the course and outcome of the civil war, the quality of governance, the country's international relations and even its culture.

In spite of its resource wealth, which is not limited to oil, Angola still ranks 146 out of 168 countries in human development and receives the largest portion of foreign direct investment provided to least-developed countries (LDCs)². A distinctive characteristic of the LDC countries is a generally low level of education. The good news is that average growth in productivity was high among the LDCs, 31% from 1995 to 2005. However, with a narrow education base and only 12% of children in Angola entering secondary education³, only a small proportion of the potential workforce will have prospects to take advantage of opportunities for higher productive work in newer technologies or service sectors.

Angola's initiatives to support economic diversification and improve the general business climate are often not broad based or well coordinated. The revenues earned from oil and gas sales have made *Sonangol the second largest company in Africa* and it largely acts as a Sovereign Wealth Fund, including large global investments. Yet it does *not have a well-developed policy to guide the use of its funds for sustainable diversification* of the economy, nor has it been part of broader

2 UNCTAD: Foreign Direct Investment in LDCs - Lessons learned from the decade 2001-2010 and the way forward

3 Net enrolment rate; <http://data.worldbank.org/indicator>

efforts to improve Angola’s business climate, with the exception of the creation of the BDA and FND⁴. Moreover, these institutions’ activities could be further improved.

2.2 Economic indicators

Angola’s high growth rate is driven by the oil and gas sector, which also has taken advantage of high international oil and gas prices. As can be seen from the left-hand tableau Figure 2-1 Angola has had a steady increase in its petroleum production since the 1970s. In particular, a steep rise in production volumes emerged after the civil war, at the beginning of the 2000s. The production is now approximately half the level of Mexico and Norway, approaching the level of Indonesia, two thirds of the levels of Brazil and Nigeria, however higher than in Malaysia.

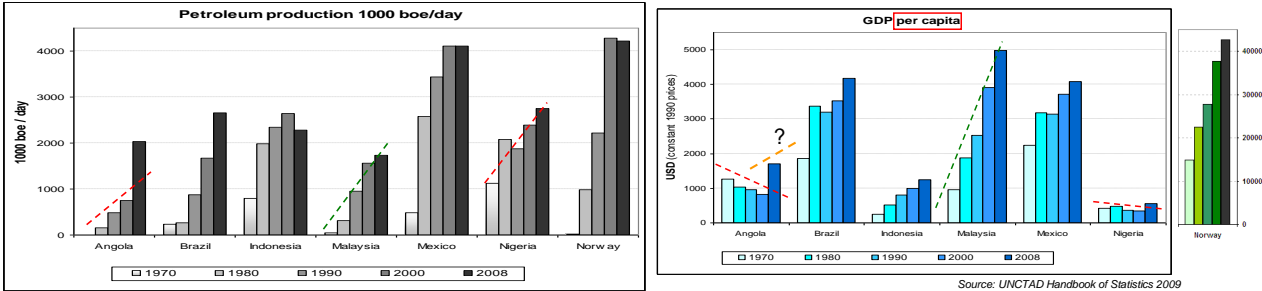


Figure 2-1 Petroleum production and GDP in selected countries

Oil and gas production and its supporting activities contribute approximately 55% of GDP and more than 80% of the country’s total foreign exchange revenues. In terms of GDP per capita Angola is in somewhat better position than the *heavily populated* nations Nigeria and Indonesia. However, Angola lags behind both Brazil (high population) and Malaysia when it comes to GDP per capita.

In 2003 the central bank implemented a currency exchange rate stabilisation programme by buying kwanzas out of circulation with national foreign currency reserves. This policy significantly reduced inflation rates (cf. Figure 2-2). However, the stabilisation policy also put pressure on international net liquidity and inflation signalled an upward trend in 2009 (from 12% in 2008 to 14% in 2010), reinforced by continued strong domestic demand and the kwanza devaluation.



Figure 2-2 Angola inflation rate

During 2011 the inflation rate decreased to 11.3% and it is expected to remain in double digits⁵.

2.3 Spillover effects to other sectors

While there is heavy dependence on oil revenue, Angola’s non-oil sector has been growing faster than the oil sector for the last two years. Until recently growth in the non-oil sector was driven mainly by public investment in construction and infrastructure, but private investment has increased markedly, especially in the construction of office buildings in Luanda. Luanda remains

4 In a bid to improve the use of its natural resources, the Angolan Government in late 2006 created the Angolan Development Bank (BDA) and soon thereafter the National Development Fund (FND) administered by the BDA, to which 5% (initially 3%) of annual oil revenues and 2% of annual diamond revenues shall be channelled.

5 AfDB / OECD report on Angola (2011)

the economic and political hub of the country, accounting for 70-75% of economic activity and consumption⁶.

However, many projects have been of poor quality, with massive resources drained off through corrupt and inefficient procurement, and better management of Angola’s public resources is deemed necessary.

Also, there are indications that work for major construction and infrastructure investments are awarded to international contractors or to a closed circle of Angolan companies and affiliates. This practice leaves out a number of indigenous small and medium sized Angolan firms with limited opportunities to develop their capacity and technical skills, hence hampering a potential organic growth and distribution of wealth through broader Angolan employment and knowledge enhancement.

Resettlement has added to growth in agriculture, fisheries and farming. In 2009 the central government began disbursing directly to the provincial and municipal levels. However, inefficiency, weak absorptive capacity, and corruption severely impact the effectiveness, and the decentralisation process is running out of steam. This in part is due to *limitations in human capacity* which constrain the effectiveness of using funds, even once allocated.

Comparative studies have shown that the spillover effects vary largely between petroleum producing nations. European countries have employed various regimes which have resulted in technologically successful industries and scientific enhancements in related areas. Newly industrialised countries such as Malaysia and Brazil have chosen strategies for the petroleum sector and a role for their national oil companies with many commonalities to the Angolan strategy, and have been quite successful. In Africa, Nigeria and Angola are parts of the same region and face similar conditions in many respects. Lessons can be drawn from these and other countries’ (including Norway) experience and be adopted for the Angolan context.

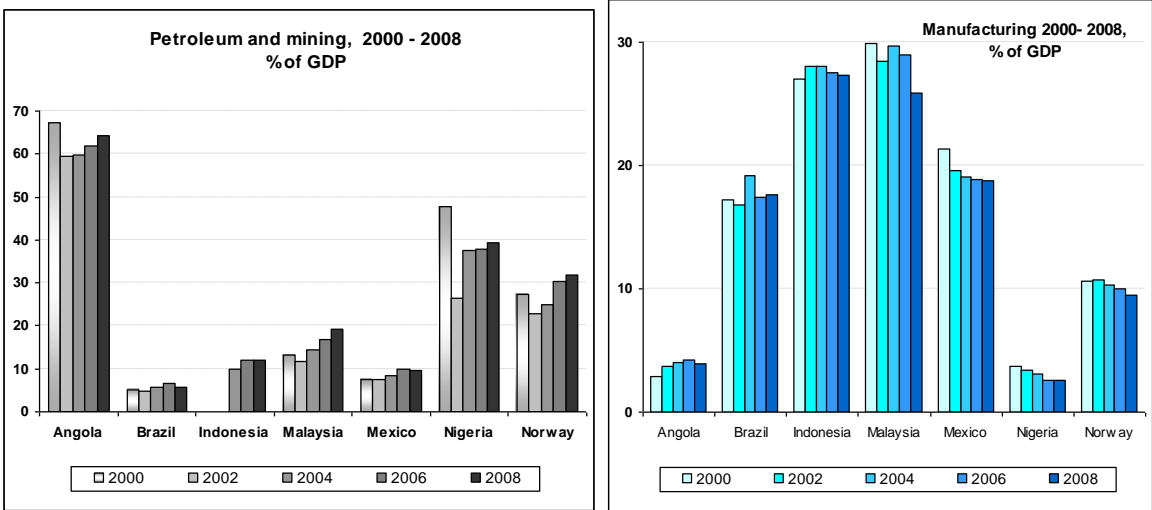


Figure 2-3 Dominance of the petroleum sector on GDP in selected countries

Supported by demand for goods used in construction and infrastructure rehabilitation the manufacturing sector in Angola has grown rapidly, although its share in GDP remains quite small.

6 In terms of employment the Luanda area accounts for some 75% of the nations industry work places, 75% within trade, 92% in finance and 90% in the university sector.

Some reasons for the differences between the countries are due to deregulation, industry promotion programmes, competence building (education, research and development, training, etc.) as well as stimulating tax regimes and supportive financial incentives. The process depends in turn on enhancement of existing indigenous institutions as well as generation of new activity. For this the availability of or potential for *expertise and receiver capacity* as well as *genuine openings for local companies* to participate in tendering (also outside the petroleum sector), are critical success factors, for which the current business environment in Angola is not conducive.

2.4 Ease of doing business

In the World Bank’s “Ease of Doing Business” ranking Angola dropped by one position from 2011 to 2012, from place 171 to 172, out of 183 economies. As the table below shows, this decline was despite improvement in some sub-categories.

Topic Rankings	2011 Rank	2010 Rank	Change in Rank
Starting a Business	167	164	↓ -3
Dealing with Construction Permits	115	119	↑ 4
Getting Electricity	120	125	↑ 5
Registering Property	129	174	↑ 45
Getting Credit	126	130	↑ 4
Protecting Investors	65	60	↓ -5
Paying Taxes	149	145	↓ -4
Trading Across Borders	163	162	↓ -1
Enforcing Contracts	181	181	No change
Resolving Insolvency	160	155	↓ -5

Table 2-1 Ease of doing business in Angola (IFC, World Bank, 2012)

The economy has a structure of core networks where influence and economic benefits are traded. Priority should be given to creating a healthy business environment for domestic and foreign investors, implementing structural reforms, continuing to rehabilitate infrastructure and improving public expenditure management by decentralising public investment to the local level. To date, efforts in this direction have been insufficient, and doing business in Angola remains difficult.

The less favourable characteristics of the Angolan business environment, how industries and other stakeholders must adapt to conform to unwritten rules, and how it in turn adversely affects the implementation of local content, are subjects for a number of recent studies and publications, and are not elaborated upon in this report. However, these patterns also influence the efficiency of the organisations that shall foster national development and prosperity with basis in education, equality, participation in working life and broad involvement in the building of a prosperous Angolan future. Quality higher education and sustainable angolanisation will depend on transparent and consistent institutions.

2.5 Education and knowledge economics indicators

A useful set of indicators is the World Bank’s Knowledge Assessment Methodology (KAM), designed to facilitate comparisons across nations and economies⁷. It captures key aspects that are conducive to social development and economic growth, and allows comparison between selected countries or regions.

7 www.worldbank.org/kam

Box 2-1 Knowledge Index

The Knowledge Economy Index (KEI) is a composite index compiled as the average of 12 indicators relating to four pillars considered critical for the knowledge economy:

- i) the economic and institutional regime,
- ii) the levels of the educated and skilled population,
- iii) the information infrastructure, and
- iv) the innovation system of firms, universities and public research institutes.

The KEI measures how conducive the environment is for effective use of knowledge for economic development and represents the overall level of development of a country towards the knowledge economy.

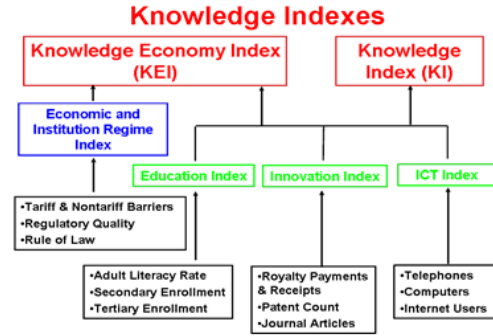


Figure 2-4 below shows the KEI scores for some petroleum producing nations as well as 8 SADC Sub-Saharan African countries normalised to the 'rest of the world'. The average score for Sub-Saharan Africa relative to the rest of the world is a low 2.7, while Angola scores significantly lower than the Sub-Saharan average.

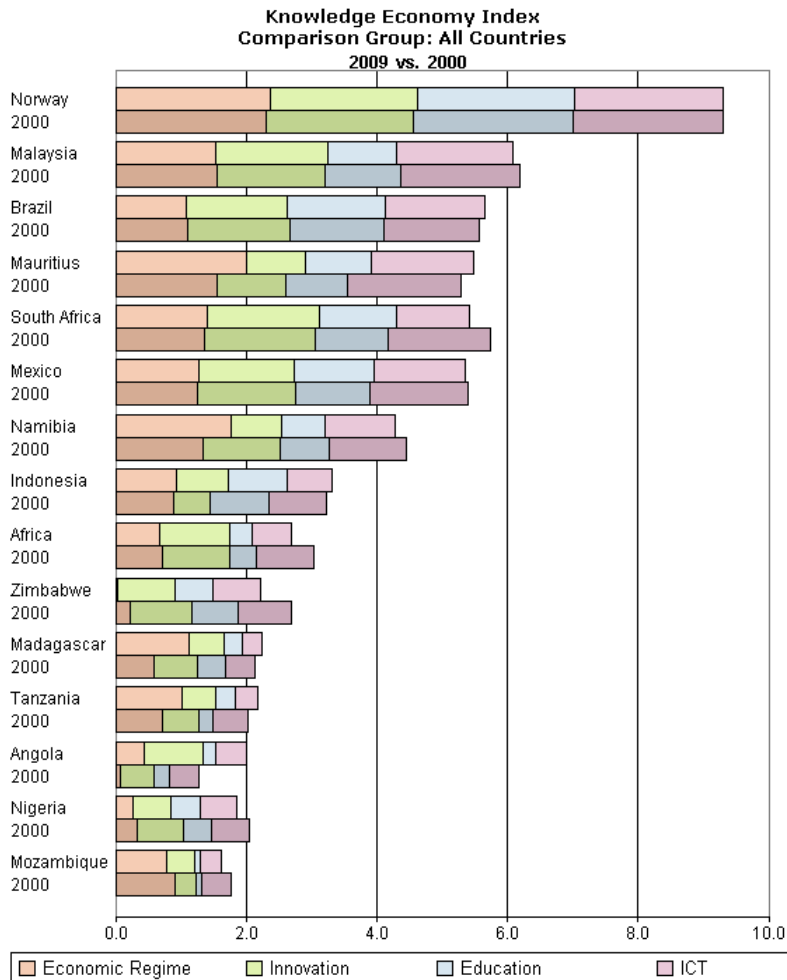


Figure 2-4 World Bank Knowledge Economy Index - Country comparison

Figure 2-5 below indicates that in the last 10 year period, where Angola has experienced modernisation and growth driven by the petroleum sector, there has been little effect on the level of skills and education level as measured by the KAM methodology.

The figure illustrates progress in education and skill levels over the period 2000 to 2009. The countries that are plotted below the 45 degree line indicate a regression in their performance throughout time. The countries or regions that are marked above the line signify improvement. The regression may be due to two reasons: the country either actually has lost ground in absolute terms over time, or improved slower than the comparative group.

"Inadequate education and skills development keep economies trapped in a vicious circle of low education, low productivity and low income"

Ref: ILO report "Skills for improved productivity, employment, growth and development" (2008)

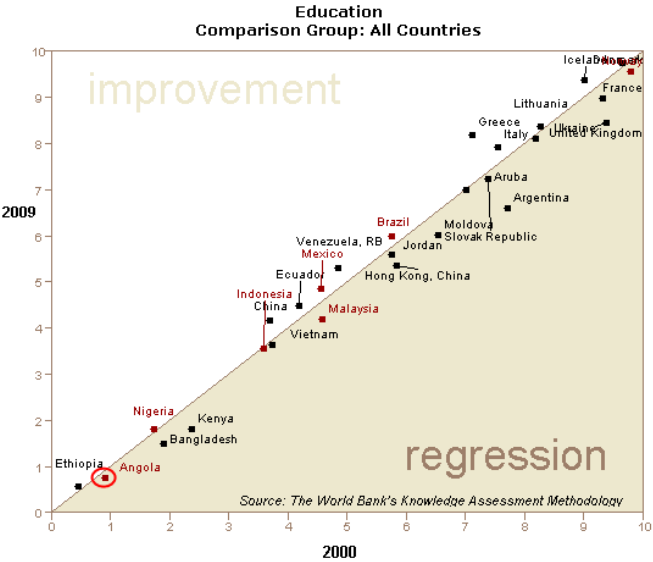


Figure 2-5 World Bank Knowledge Economy Index- The education component

Widespread general education and occupational competences are the foundation of social capabilities to innovate, transfer and absorb new technologies, foster creativity and innovations, diversify the production structure into higher value added activities, attract more knowledge-intensive domestic and foreign investment and take advantage of global opportunities.

3 The Angolan petroleum environment

3.1 The roles of Ministry of Petroleum - MINPET

MINPET is the organ of the Central Administration of the State authority that is responsible for the implementation of national policy and for coordinating, monitoring and control of all oil activities. Relevant to this study this includes the responsibilities to:

- study and propose legislation regulating the activities of the petroleum sector
- propose and ensure the implementation of measures that fall within the policy of the Government for their industries, focusing on strategy and activity of the sector and encouragement of entrepreneurship
- study and propose measures to achieve the national objectives related knowledge, appreciation, rational use and renewal of the oil reserves of the country
- promote the structuring of the petroleum sector
- coordinate, supervise, monitor and control the activities in the field of petroleum
- target the policy of management and training of staff at all levels, for the efficient functioning of the sector, controlling their behaviour and results

3.2 The roles of Sonangol

Sonangol is the sole *owner of hydrocarbon rights* on behalf of the state. In addition to being an oil company Sonangol is the concessionaire and the tax collector.

The scope of the concessionary's activities includes *negotiation* of offshore and onshore oil concessions and the post-contract signature *supervision of the economics* related to the concession.

Angola has awarded its most important areas to technically proficient companies under structured contracts to maximise production incentives and government take. International as well as national oil companies have in recent years offered massive signature bonuses. The awards of new production sharing contracts (PSC) are becoming more transparent.

Key characteristics of the PSCs are that each development area is ring fenced for tax purposes, and the contractor assumes the risk and pays for the entire investment. When production begins, the government takes royalty based on gross revenues. Then the contractor is allocated "Cost oil" to cover his investment costs. Finally, the remaining production, the "Profit oil" is split between the partner oil companies, Sonangol and to the government.

Sonangol takes on a growing role in the *development of deepwater resources* and is the operator of block 4 which was commissioned in 2009.

Sonangol also *influences awards of contracts with service companies*. At the same time it operates joint ventures with multinational oilfield services and fabrication, engineering, logistics and marketing companies. The intentions are that some of its interests will be sold to private Angolan investors.

Sonangol is the *driver for local content policies*. There is a push towards capacity building and technology transfer through serious application of the local content legislation and regulations. Sonangol is aware of the risk of counterproductive effects on businesses if this process is driven too far or too rapidly.

Sonangol's activities are operated through more than 30 *subsidiaries* which are independent business units with their own management structure. They compete against independent companies for projects in the petroleum sector as well as operations in other industries and service sectors. The subsidiaries report to the Administration Council which is the body responsible for decisions regarding overall strategy and authorisation for Group investment expenditures.

Sonangol has been under the political control of the Angolan presidency as a trustworthy instrument of its interests and has constituted a key instrument in the comprehensive system of parallel finances that has included up to half of Angola's yearly oil revenues. Sonangol has *invested directly in all parts of the Angolan economy*, also those quite unrelated to the petroleum sector, e.g. luxury housing and hotels. This may have led to less favourable conditions for other local actors with less muscle in terms of capital and skilled personnel.

Sonangol has been behaving like a sovereign wealth fund (SWF), using oil-based funds for investments in various sectors in other countries. This includes growing interests in foreign oil exploration and production, through acquisition of exploration rights in Iraq, Ecuador and Iran, as well as a stake in a private Brazilian oil company.

Thus oil wealth is being used to *strengthen the concentration of Angola's economic activity in the oil industry rather than to diversify the economy*⁸. It also illustrates the extent of the Angolan Government's presence in the economy and its *potential to take action to boost economic growth and development*.

Sonangol is set to go public in 2012. The company will list its exploration, production and aviation divisions on the Johannesburg and New York stock exchanges, as well as the Luanda stock exchange, if it is up and running by then.

3.3 Petroleum sourced fast track rebuilding

The petroleum sector, which in itself provides few direct jobs, will not raise the Angolan economic and social indicators from its current levels. Sustainable employment creation and poverty reduction rely on broad economic developments that go beyond the petroleum sector. Significant numbers of new jobs can most effectively be generated through the government's programmes aimed at rebuilding the country's infrastructure and in the agriculture sector.

The situation today is that, as part of the state's ambition to build a modern society with base in its oil wealth, Angola has taken on an approach similar to oil rich Middle East nations by importing huge volumes of capacity, technology and workforce. *While there is strong focus on local content and capacity building within the petroleum sector, there seems to be less attention to these aspects in other large scale project areas* such as construction and infrastructure developments.

Portuguese companies with significant Angolan interests dominate the building sites in Luanda, while China has become Angola's largest trading partner and reconstruction entrepreneur. While Angolan staff is gradually entering the petroleum sector, there are relatively few locals to be seen on Portuguese and Chinese operated work sites.

The bulk of Angola's trade with China is made up of oil exports, while imports remain low, consisting mostly of food products and consumer goods. In 2007 China overtook USA as the largest importer of Angolan oil and in 2010 Angola overtook Saudi Arabia to become China's largest supplier of oil. According to Chinese officials around 50 state-owned and 400 private

8 Economic diversification in Africa: A review of selected countries, OECD 2011

Chinese firms with around 70000 Chinese workers operate in Angola⁹. Independent estimates claim that there are more than 100000 Chinese workers in Angola today.

Angolan infrastructure rehabilitation projects undertaken by China include electricity generation and power lines, railways, ring roads, telecomm expansion and water supply in addition to large scale social housing projects.

Massive import of technology, engineers, planners, workers, materials and warehouses is a fast option to improve critical infrastructure by “rebuilding the whole country in record time”. However the limited access for Angolan enterprises to contribute in these developments is counter-productive in light of a national policy to enhance scientific and workforce capacity driven by the opportunities provided by the petroleum wealth.

9 www.ipim.gov.mo/group_detail.php?tid=20408

4 The petroleum labour market

4.1 Manpower Demand

The petroleum industry is not a heavy user of manpower. On the contrary, it is highly capital intensive and thus a labour extensive industry, although a perfect match is required between technical competence and capital equipment to develop the petroleum reservoirs. In fact, for operations of the oil fields the industry has adopted processes that do *not* imply strong absorption of labour, but rather massive layoffs motivated by use of new technologies, one result of which has been the major mergers that have occurred amongst the operator companies in recent times.

After five years of massive growth the Angolan petroleum industry as a whole in 2009 had some 65000 employees. Although this is a large number, it represents only 0.8% of the working population. This is typical for the oil industry and while the indirect impact of this employment is far reaching, it would be unrealistic to expect petroleum to single-handedly solve unemployment in Angola.

On the other hand the large-scale investments in the petroleum sector means a long period with increasing demand for labour in the construction and subsequent maintenance of installations, which in turn could provide stable and high employment opportunities of significant proportions. This trend is reflected by the rapid growth seen in the service sector which had an increase of 35000 staff in the period between 2005 and 2009 (cf. Table 4-1). In the same period the operator companies increased staff by a modest 2000 to a level of 15000, where it seems to have stabilised.

It is worth noting that the manpower demanding disciplines originating from the needs of the oil industry itself, in the next phase have potential for supply of experienced workers and growth in the non-oil manufacturing industries.

Year	OpCo staff	Service sector staff	Total
1975	2 006		
1990	5 064		
2000	10 944		
2001	10 385		
2002	10 818		
2003			
2004	12 296	12 866	25 182
2005	13 069	14 104	27 173
2006	12 834	35 984	48 818
2007	14 533	40 528	55 061
2008	14 956	49 852	64 808
2009	15 399	49 278	64 677

Table 4-1 Total employment in Angolan oil and gas sector (Teka 2011, MINPET 2009/2010)

Of the 64 677 employed in the petroleum sector in 2009, 24% worked in MINPET, Sonangol and the operating companies, while 76% were occupied in the service and supply sector (cf. Table 4-2)

EMPRESAS	2005	2006	2007	2008	2009	T.C.M.A.
MINPET	234	227	234	249	330	8,97
SONANGOL	7.506	7.326	8.041	7947	8.013	1,65
CABGOC	2.837	2.871	3.084	3.347	3.399	4,62
TOTAL	1.031	921	1.221	1.188	1.297	5,91
ESSO	654	644	706	648	755	3,66
BP	312	312	613	737	608	18,15
SOMOIL	100	133	154	333	215	21,09
ENI	73	70	119	136	152	20,12
MAERSK	16	16	18	24	149	74,69
ROC OIL	--	--	29	25	25	--
VAALCO	--	--	--	--	9	--
PETROBRAS	--	--	--	--	110	--
REFINARIA	306	314	314	322	328	1,75
TULLOW	--	--	--	--	9	--
SUB-TOTAL	13.069	12.834	14.533	14.956	15.399	4,19
PRESTAÇÃO DE SERVIÇOS	14.104	35.984	40.528	49.852	49.278	36,72
TOTAL GERAL	27.173	48.818	55.061	64.808	64.677	24,21

Table 4-2 Petroleum sector staff by employer category (MINPET 2010)

4.2 Specific skill requirements for the petroleum industry

Manpower requirements tend not to be a limiting factor for the global petroleum activities, but temporary shortages of certain specialised and highly educated personnel are not uncommon. It applies to every start-up of petroleum provinces in new producer nations, also for Angola. Typically can petroleum geologists, geophysicists and drilling personnel be in short supply, categories for which the possibility of substituting personnel from other industries is small. Before a critical mass is reached, these categories are recruited from abroad or trained within companies or in new educational facilities.

The pace of the Angolan petroleum development is to some extent governed by the availability of training capacity for specialised personnel. By and large, petroleum development does not require of its personnel a unique kind of educational or training background, if one excludes this relatively small group of specialists in geological surveying and drilling operations. But relevant education, training and refresher courses will always be vital to safety, efficiency and competence, and the industry places emphasis upon personal competence and experience gained from the petroleum sector or related activity.

With new generations of complex petroleum installations, new groups of operating personnel are in demand. The installations which came on stream from mid 2000s have a higher proportion of employees with higher- and medium-level education than do the older offshore installations. Thus there is trend towards a shift in technical equipment (towards more electronic devices and more automation) as well as in skill requirements. This also seems to be the trend for onshore activities (base operations, administration, maintenance, transportation, refinery processing, etc.).

This means that the possibility of recruiting “ready” personnel from other industries is reduced, and that there will be limited demand for unskilled and semi-skilled labour while demand for skilled and professional labour is increased.

4.3 Training Needs

The growth of the Angolan petroleum sector increased the need for qualified manpower which was unknown to industry and the educational system. As the oil companies’ operations expanded in the 1970-1980’s and shifted from exploration to production, the demand for domestic petroleum-specific education emerged.

In their planning for offshore exploration and production activities the oil companies put forward conflicting skills requirements for similar categories of personnel and jobs, and this tendency was seen to affect adversely both the competence of Angolan personnel and offshore safety. The need for a nationally approved education programme, adapted to industrial standards and to the national educational systems, was deeply felt for a long period.

The Angolan petroleum skills development would be simplified and coordinated with clear and homogeneous norms governing the qualifications required for various categories of personnel. A curriculum covering all positions on board a drilling platform (drilling, maritime and technical crew, platform supervisors and catering), as well as a curriculum pertaining to most other skilled work areas (mechanics, electricians, welders, fitters, operators, maintenance staff, safety (HSE) officers), must be purposed. In addition to the technical skills the petroleum industry needs qualifications within human resources, procurement, project management, finance and other certified skills.

Thus, the sector has demand for university educated staff within a number of disciplines, technical as well as others, and further there are strong needs for vocational training where quality is assured by certification and accreditation.

The key point about these curricula is that what previously has been the proprietary information of the oil and drilling companies will come within reach of the Angolan companies and authorities. As the training efforts mostly will be scheduled to take place on land, in certified universities, schools and training facilities, Angola must have the option of adapting the programme to its domestic needs, as experience is gained. Training and educating expertise at all levels, including the academic professionals, will thus cease to belong solely to the international petroleum industry and become a window through which Angolan interests can evaluate the oil companies' operations and also benefit from these skills and experience in other industry sectors.

MINPET has now the authority to stipulate the qualification requirements for petroleum staff at all levels. The requirements should imply a common job structure for equivalent positions within various companies, which in turn will lay ground for homogeneous training and education. The immediate needs of the petroleum sector - much driven by the local content requirements - take priority. A series of considerations necessitates specific competence requirements and corresponding training and education options.

Higher education in Angola has until now largely benefited from monetary contributions from oil companies to formal education (scholarships). More might be achieved through actual participation of oil company personnel in local education and training, and through extended use of temporary internships for students.

4.4 Angolanisation in the petroleum sector

Provisions for the transfer of petroleum technology and for the training and employment of local staff have become decisive parts of the contractual arrangements governing exploration and production in most producer nations.

At the outset in the 1960-70s very few Angolan companies and workers took part in the petroleum activity; the oil companies used own international staff or drew on their vast network of contractor companies. Most activities were confined to exploration and drilling offshore, competence areas which were beyond the reach of Angolan enterprises, and expatriates made up for most of the requirement for skilled workers. Since then their numbers have gradually declined as Angolan workers obtained the proper skills.

This gradual substitution of expatriates is referred to as *Angolanisation*, representing a local capacity building process which is common in most new petroleum producing nations. This

process has particular focus in the petroleum sector, but occurs also in other sectors. The laws governing Angolanisation are designed to allow skills transfer. Initially this is from experienced and certified expatriates to Angolans within the country. Later, certified Angolans will take over in training younger staff. This skills transfer needs to be supported by training.

The actual training of staff may take place on-site with external experts providing the training, or it is conducted abroad. Behavioural training such as in management and corporate culture is mostly undertaken in Angola, while technical training is often conducted abroad.

4.4.1 Hiring of personnel

In 1979 the law on foreign investments (10/79) established that companies should employ Angolan workers, guaranteeing them the necessary technical and professional education, and that foreign workers can only be hired when qualified Angolan workers are not available. The law was followed up with the implementation Decree 20/82 in 1982. It took into account the technological developments in the oil industry as well as new policy options for human resources, obliging foreign companies to hire 100% Angolan nationals in unskilled positions, 80% in semi-skilled roles and 70% in managerial positions by 1990. The law was in turn implemented in 1998.

MINPET statistics for 2009 shows the split between Angolans and expatriates by category as:

2009	Operators		Service companies	
	Angolans %	Expats %	Angolans %	Expats %
Directors	30	70	71	29
Sector managers	17	83	75	25
Middle managers	23	77	82	18
Supervisors	43	57	40	60
Technical specialists	78	22	64	36
Technicians	93	7	78	22
Administrative staff	100	0	100	0
Assistants	100	0	100	0

Table 4-3 Petroleum sector staff by category in 2009 (MINPET 2010)

In the organisation of Esso Angola, Angolans held around 45 per cent of the overall leadership positions in 2009. By year end 2010, a total of 49 Angolans had supervisory and management roles¹⁰.

4.4.2 Funding for training

Decree 20/82 also introduced the requirement that for every barrel of oil produced in Angola, USD 0.15 shall be earmarked for human resource development. Of these 15 cents, nine typically go to MINPET and six are used by the oil majors for staff training¹¹. Out of the nine cents that go to MINPET, three are earmarked for university funding. One cent of every barrel goes to the state university UAN (Universidade Agostinho Neto) and one per cent of the university funding has been transferred to the Catholic University of Angola (UCAN) to develop courses relevant for the petroleum industry. It is not always clear what happens to the money transferred once it reaches the universities. There is no transparency and no accountability regarding these funds and there seems to be no mechanism or effort from MINPET to control the effectiveness or monitor the results of its investment¹².

10 Universo Sonangol – March 2011

11 The six cents per barrel is a minimum amount for staff training by oil companies. Often the training needs and costs mean that oil majors spend more than the stipulated minimum on human resource development.

12 Gomes and Weimer 2011

4.4.3 The Contrato Programa

One result of a review of the Angolanisation process in 2009 was Decree 17/09. This decree defines the rules and procedures to be followed in recruitment, integration, training and development of Angolan personnel and for the hiring of foreign personnel to the petroleum sector. The system was enacted on in February 2011 by the 'Contrato Programa' (programme contract) between MINPET and the oil companies. The oil companies shall submit to MINPET for approval individual training and development plans for each staff member, every year. Further the companies half way into the period shall submit a detailed report on the implementation of their plan presented in the prior year. The companies themselves can choose training providers and type of training.

Creating, maintaining and reporting on detailed, long term career plans for every employee on half yearly basis is seen as a cumbersome process. It is not given that a certain type of training will result in the intended or wanted development, and the value of this extensive planning and reporting effort is uncertain.

Also, the proclaimed ambition for fast track Angolanisation which is inherent in this arrangement, has been seen to create unrealistic expectations amongst Angolan staff, and may have an adverse effect when facing the true picture of current training capacity.

Another setup related to the programme is the "Training Levy" the service companies pay 0.5% of contract value into a MINPET HR-fund for training and development of Angolans for the petroleum sector. Service companies may reclaim this fee against the value of documented own training efforts for local staff.

5 Education Infrastructure

5.1 Rebuilding after the civil war

After the end of the 27 year civil war the Angolan plan to reconstruct the education system has gone through three phases: the emergency phase (2003-2005), the establishment phase (2006-2010) and the development phase (2011-2015). The underlying objectives are the *rehabilitation of physical infrastructure, human resources and institutional capacity*.

Some important actors have been involved, such as UNICEF, the German National Committee for UNICEF, the Nelson Mandela Foundation, and private donors. All these actors were united under the regional Schools for Africa (SFA) initiative with the aim to build or repair 1500 schools by 2008, the number of schools destroyed between 1992 and 1996 alone¹³.

5.2 Capacity building and reforms

Institutional and systemic strengthening of the education sector and related capacity building are a pre-requisite to take on these challenges. Currently, strategic medium and long-term planning for the sector is seriously constrained by the lack of valid quantitative and qualitative information and integrated programming by all actors working in the sector. A functional Education Management Information System is not yet in place, qualitative research has been very limited during recent years, and co-ordination mechanisms are emerging but still need to be more inclusive of all partners.

A study conducted by SARUA (the Southern African Regional Universities) and presented in a Handbook in 2009 shows that the Angolan curriculum documents mention the new challenges and opportunities of today's globalised world and make many references to the world of work and illustrations of different occupations, but they focus only on traditional agriculture and handicrafts, without presenting the new competencies and occupation that the Angolan job market is developing.

5.3 Angola education system

The Education Act of 2001¹⁴ has established a 6+3+3/4 education structure meaning that primary education lasts 6 years, while lower secondary lasts 3 years, with basic education comprising a total of 9 years (ref. overview in Appendix i). Given the high level of illiteracy in the country, adult education is part of the education system along with the so-called 'regular' classes.

The new Curriculum Frameworks for *Primary* and *Lower Secondary* Education emphasise an outcomes-based approach around three main categories of competencies: Saber (to know); Saberfazer (to do) and Saber-ser (to be).

The *secondary* education system is divided into two cycles of three years each culminating in the *Habilitações Literárias*. Parallel there is a technical education system divided into three years of vocational education (after primary school) and four years of middle technical education lasting for four years (after class 9). Some basic professional training starts in lower secondary.

The *Ministry of Education* (MED) is responsible for defining, coordinating, implementing and evaluating national policy on the pre-primary, primary and secondary education, as well as to

13 UNICEF web on Angola - http://www.unicef.org/infobycountry/angola_27832.html

14 Lei de Bases do Sistema de Educação / Lei Nº 13/01 de 31 de Dezembro de 2001 (Fundamental Law of the Education System / Law no. 13 of 31 December 2001)

promote the qualification of the population, the national education policy and national policy on vocational training in the context of national policies.

The *tertiary* education system comprises generally three years, after which the students obtain the title of Bacharel. They can continue to study other two years in order to obtain the Licenciatura. Medicine requires six years of studies.

In 2007, the Government implemented the State Department for Higher Education with the task to improve the higher education system with policies, management and suggestions. In 2010 the new *Ministry of Higher Education, Science and Technology* (MESCT) was created resulting from the merger of the former Ministry of Science and Technology and the State Department for Higher Education.

For tertiary education, in 2008 there were 70000 students enrolled in universities, 80% of that being in public universities. Overall, the education sector employed 162000 people in 2008. Central government manages less than 20% of the total education budget. The rest is managed by provincial government¹⁵.

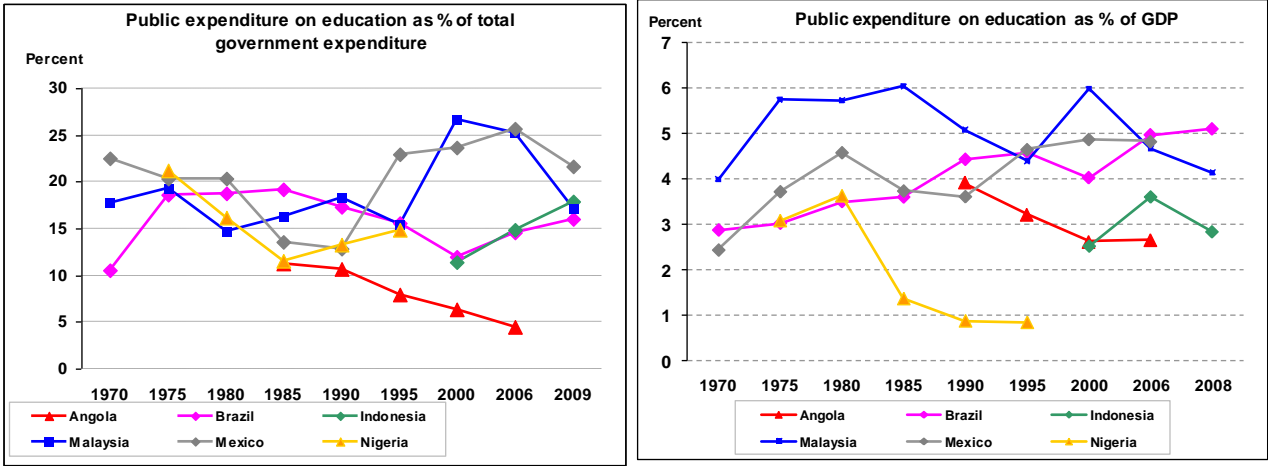


Figure 5-1: Public expenditure on education (UNESCO Institute for Statistics)

In 2006 only 4.4% of government spending went to education in Angola. In the 2011 budget¹⁶ this share was increased to 8.2%, while countries as Malaysia, Mexico and Brazil allocate between 16 and 26% of government spending to education. The share of GDP spent on education has been constant at around 2.6% from 2000 to 2006 (cf. rightmost graph in Figure 5-1) and remained at that level also in 2010.

15 AfDB / OECD report on Angola (2010)
 16 www.minfin.gv.ao/fsys/resumo_da_despesa_por_funo2011.pdf

6 Higher education and research

6.1 History

Higher education in Angola started to develop in late 50s, almost at the end of the colonial period. This is a general phenomenon in many of the former European colonies in Africa: the colonial states did not have any interest in educating the local population and very few investments were done during the colonisation period in order to sustain local education in general. Another general tendency during the colonial period was the intervention of religious organisations in helping the local population to achieve at least minimum standards of education.

In the case of Angola, Catholic organisations were deeply involved in the birth of a school for future priests in Luanda in 1958, whereas in 1962 the Portuguese government founded the *Estudios Gerais Universitarios de Angola* in Luanda, as part of the Portuguese university system that offered a range of degrees from medicine to engineering. It became the **Universidade de Luanda** in 1968, with new study programmes in natural sciences, history, geography and literature. In 1975, the year of Angolan independence from Portugal, the Universidade de Luanda was able to offer twenty MA study programmes distributed among six faculties: agriculture (in Huambo), arts/education (in Huila), economics, engineering, medicine and science (in Luanda). In 1979, the University was renamed **Universidade de Angola** and the Faculty of Arts and Education was organised in the *Instituto Superior de Ciencias da Educaçãõ* (ISCED), with main focus on the preparation of secondary school teachers, due to the high levels of illiteracy.

In 1981, a five years plan was prepared with a strong focus on the establishment of ties with other universities (especially in the communist countries) and on the fields that were important for the development of the nation. In 1985, the University acquired the title of **Universidade Agostinho Neto (UAN)**, in honour of the first president of independent Angola, who was also rector. The University had to implement three main goals: guarantee the development of the country, prepare and educate the elite and support the political system and the national sovereignty.

In 2009 the Angolan government approved re-organisation of the higher education system. The move involved the creation of seven academic regions and at the same time introduced measures to ensure good and consistent standards in higher education. The demands for quality should be the same for the private and the public universities. Key areas considered in this respect were finances, students and teachers. A climate of combined regulation and competition between the institutions should be encouraged.

As part of this re-organisation of the system the UAN was in 2010 split up so that its faculties in Benguela, Cabinda, Huambo, Lubango, Uíge and Malange became autonomous public universities. The “new” UAN remains with campuses in Luanda and the Bengo province.

The number of students in the public university sector increased from some 8000 in 1998 to 45000 in 2007 when UAN was transformed into a number of new entities. Today’s UAN has 25000 students, with growth projected to 50000 students by 2028.

6.2 Angolan higher education institutions

Provision for higher education is expanding rapidly, notably through the establishment of private universities. The new private universities have emerged in response to a growing demand for higher education. As of 2007 and 2009 the State Department for Higher Education had recognised 13 private and 7 public universities respectively. In 2009 Angola became divided into 7 academic regions. Some of the public universities have campuses in more than one region.

Table 6-1: Public and private universities in Angola

Public higher education institutions, approved by decree no 7 of 12 May 2009:
UAN - Universidade Agostinho Neto. Previously UAN had campuses in 10 of Angola's 18 provinces. UAN now holds campuses in Luanda and the Bengo province. In Luanda UAN has 7 faculties: humanities, social sciences, sciences, law, medical sciences, economics and engineering (civil, informatics, electro-technical, mechanics, mining, telecommunication, chemical), and one Higher Institute (Health Sciences).
UKB - Universidade Katyavala Buila (Benguela). Law, business, informatics, humanities, educational sciences, agronomics.
UON - Universidade 11 de Novembro (Cabinda). Medicine, Law, Business and finance, Economics, Mathematics, Psychology
ULAN - Universidade Lueji A'Nkonde (Malange). Biology, Physics, Chemistry, Mathematics, Educational sciences, Civil engineering
UJES - Universidade José Eduardo dos Santos (Huambo). Law, Economics, Business, finance and accounting, Agronomics, Medicine, Engineering (Information technology, telecoms), Veterinary medicine, Teacher education.
UMN - Universidade Mandume Ya Ndemofayo (Lubango). Law, Economics, Business and finance, Teacher education, Environmental engineering.
UKV - Universidade Kimpa Vita (Uíge).
Private higher education institutions, year of approval in brackets:
UCAN - Universidade Católica de Angola (1992). UCAN started to function officially in 1999 in Luanda with strong focus on programmes in law, economics, business, and computer sciences. It is an Institution of the Church and was created by Catholic Bishops' Conference of Angola and S. Tomé (CEAST) in 1997 to help the education of the Angolan people. UCAN is open to all students, but it seeks to ensure an integral formation, that is not only technical and scientific, but also Christian.
UniPiaget - Universidade Jean Piaget de Angola (2001). Opened in 2000 as extension of an institution with the same name in Portugal. It offers programmes mainly in engineering (electromechanics, civil and urban planning), petroleum, architecture, law, economics, nursing and medicine, social sciences.
ULA - Universidade Lusíadas de Angola (2002). Founded in 1999 as an extension of the private Universidade Lusíadas in Lisbon, offers programmes in law, economics, business and accounting.
UnIA - Universidade Independente de Angola (2005). Law, Communication, Engineering (Informatics, civil, electrical and telecoms, Environmental and natural resources)
UPRA - Universidade Privada de Angola (2007). Tourist management, Civil engineering and urban planning, Information Engineering, Health Sciences
UGS - Universidade Gregorio Semedo (2007). Business, Information technology, Human resources management
UniBelas - Universidade de Belas (2007). Law, International relations, Petroleum, Administration and marketing, Health Sciences
UOR - Universidade Oscar Ribas (2007). Law, Business and industrial development, Information and Comms. Engineering, Engineering, International relations
UMA - Universidade Metodista de Angola (2007). Banking and finance, Business, Urban architecture, Engineering (civil, industrial, mechatronics, electrical)
UTANGA - Universidade Técnica de Angola (2007). Business, marketing and human resources, Engineering (informatics, environment, mining), Languages, Architecture and urban planning
ISTA - Instituto Superior Técnico de Angola (2007). Accounting and administration, Engineering (Information and computing, telecommunication and electronics)
CIS - Instituto Superior de Ciências Sociais e Relações Internacionais (2007). International relations, public administration, economics, social sciences.
ESAKS - Escola Superior Agrária do Kwanza-Sul (2007). Higher Education in Agrarian Sciences.

UAN is regarded as the "mother of all Angolan universities". It is still considered the best in the country in terms of education and organisation, and competition to enter UAN is high, particularly

for engineering places. Every year as many as 2000 candidates undergo an entrance exam and the university accepts only 10% of them¹⁷. Many leading executives in Angola have graduated from UAN.

Over the last years the engineering faculty at UAN has offered special petroleum oriented courses¹⁸ and UAN graduates are preferred by the oil companies' HR-departments. International oil companies operating in Angola recruit staff directly from the course, often sending them on further training abroad, and graduates from UAN make up a core among professional staff in the Angolan petroleum sector.

Box 6-1: UAN – NTNU collaboration

In 2007 a formal collaboration agreement was established between UAN and NTNU (the Norwegian University of Science and Technology). Through this scheme, which involves scholarship support, NTNU offers an MSc Program in Petroleum Engineering and Petroleum Geoscience for bachelor level graduates from UAN. On average five students have each year (eight in 2011) been selected on academic criteria for a sandwich year in Norway followed by the final year at UAN under supervision by NTNU, combined with close industry participation. The graduates have been attractive and entered local positions in international companies as well as in Sonangol and MINPET. The near term plan is to open a Petroleum Engineering Faculty by 2015 at the new UAN campus in Kilamba, where NTNU has a key role in the planning of curricula and facilities.

Amongst the private universities the Catholic University, UCAN, is well established and the most recognised. Its attractiveness is reflected in the high number of applicants (~4000 per year, of which about 1/4 are admitted). To ensure academic quality UCAN in 2010 also introduced access tests / exams for their courses. 20-25% of the students have scholarships, which are offered mainly by Sonangol and some also by the Catholic Church. Scholarships are granted to students based on a combination of qualifications and need for economic support.

Another representative of the private universities is the Methodist University with 6000 students split into three groups - morning, day and evening classes. This schedule demands high utilisation of resources. Already limited spaced chemistry and physics laboratories are crowded from 06:30 to 23:00 all days, and individual contracts are arranged with teachers from the public university, UAN. Lecturing is also provided by guest teachers from Portugal and Brazil, which should contribute to the university's quality.

Traditionally the studies in business, management, economics and law at the larger universities have attracted more students than natural sciences and engineering subjects. One reason has been that the latter require more investments in terms of facilities and equipment, but it is also believed that the natural sciences have been considered less attractive by students.

The situation at ISCED, the institution specialising in teacher education for secondary schools, illustrates the challenge of attracting candidates to the science and engineering subjects. ISCED receives some 200 applications for their maths / physics curriculum, while psychology typically has 600-700 applicants.

Several of the new private universities do offer engineering courses, however so far no graduates have come of these and it is still too early to judge on how they will compare in terms of output quality. Also, some upspring private universities are relatively small, which has been commented upon as "one classroom unis".

17 Universo Sonangol – June 2010

18 In 2002 UAN launched a post-graduate degree in Petroleum Engineering in conjunction with IFP in France. See also Box 6-1, UAN – NTNU collaboration.

6.3 Financing of higher education

The public universities depend largely on the state budget. Almost all the finances go to personnel (about 80%), and little is left for research, investments in facilities and other services.

The main source of funding for private universities is student fees, although not much information on the financial situation of universities is made publicly available. The public universities and some private universities also benefit from contributions by sponsors operating within the country, such as the oil and diamond companies as well as diverse international entities.

The new legislation aims to regulate fees paid to private higher education institutions, which range between USD 200 - 400 per month. This legislation also regulates how a higher education institution must be set up and organised, as well as the penalties for those institutions that are operating illegally.

Some universities cater for three student groups in parallel (morning, day and evening). This benefits i) the utilisation of scarce HEI facilities in meeting the growing demand for study places, ii) the opportunity for students to combine studies and iii) the economy of the institutions. It is more uncertain whether the three shifts model is beneficial to the quality of the education.

With the improved economic situation in Angola the situation for funding of higher education is expected to improve. However there is still a long distance to go and a lot to catch up with (cf. Figure 6-1).

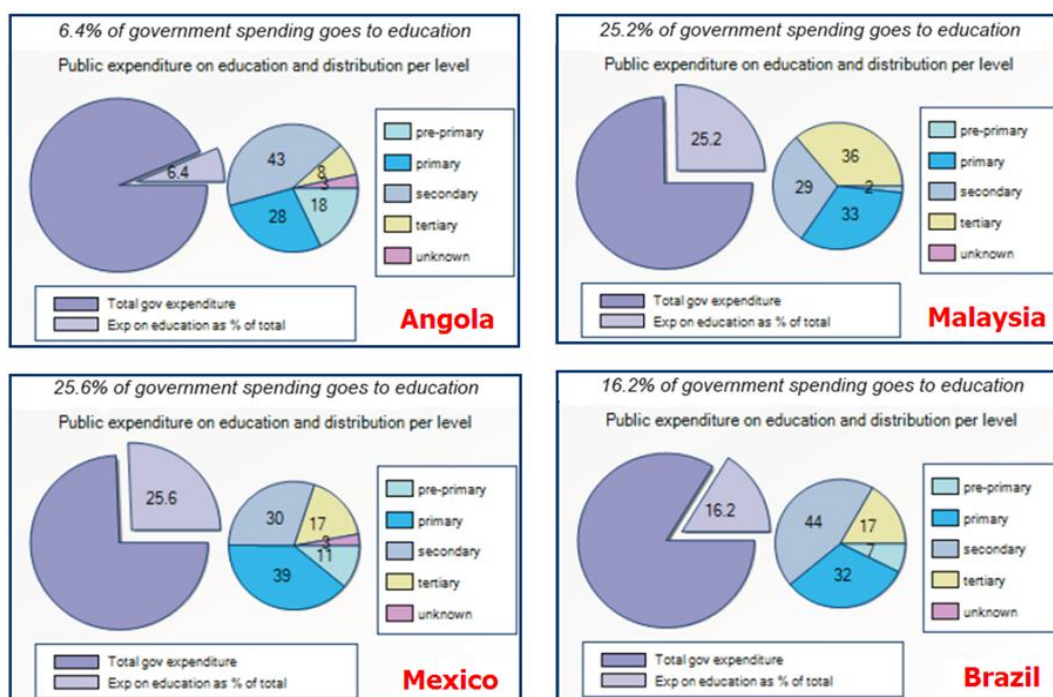


Figure 6-1: Four countries' allocation of government spending into education sectors (UNESCO Institute for Statistics - UIS – 2009)

Only 6.4% of Angolan government spending was allocated to education in 2006. Of this as little as 8% was for tertiary (higher) education. Countries as Malaysia, Mexico and Brazil allocated between 16 and 26% of government spending to education, of which the share to higher education was between 17 and 36%, as compared to Angola's 8%. Also in comparison to other African nations the Angola score is low (cf. Figure 6-2 below).

Public Expenditure on Higher Education and the Form of the Education Pyramid in African Countries, 2006 (or Closest Year)



Sources: Authors' calculations based on national data, UIS, World Bank, and country sector study data. UNESCO, BREDA 2007 for the completion rates. **Financing Higher Education in Africa, World Bank (2010)**

Figure 6-2: Government spending on higher education in African countries

With Angola's effort to strengthen education during the recent years, the spending on education was 8.2% of the 2011 state budget¹⁹. This increase from 6.4% in 2006, however, seems to have favoured solely the primary education sector. While secondary and higher education together had 47% of the education budget in 2006, this share dropped to 22% in the state budget for 2011. Primary and pre-primary education has 68% of the budget, i.e. around three times as much funding as secondary and higher education combined.

This trend, however, is in line with a strategy for countries that are far from universal school enrolment at the primary level. A balanced policy would here recommend prioritising the primary level and channelling a smaller share of public resources to higher education, which sits at the top of the education pyramid. This implies that there is much ground to be covered on primary and secondary level before significant results can be expected in the HEI sector.

For enhancement of the scientific level in Angola, there lies a considerable potential within pure redistribution of state budgets.

University studies in Angola are still judged to be for the privileged. The cost of studying is a barrier in a nation where minimum wages are less than 200 USD /month and fees at private universities are in the range of USD 200 – 400 /month. Even in the public universities the cost of books and transport, plus mentioned unofficial 'sign on fees', can become a significant hurdle. This pattern is also reported to exist for primary education where resourceful private schools take on pupils based on relationships. Thus, although there are new entrants of providers in the education system, there are signs of reproduction of inequality.

6.4 Challenges

A problem that the university system has faced is the *shortcomings in scientific and pedagogical quality*. The cause of this has mainly been *poor salaries* and *working conditions* of the teaching staff. Furthermore, *corruption* has played a role in the relationship between teachers and

19 www.minfin.gv.ao/fsys/resumo_da_despesa_por_funco2011.pdf

students, and for admission to universities. A third problem, linked to the first two, is the *low level of research*. The National Centre for Scientific Research was placed under the Ministry of Sciences and Technology in 1997 and further became part of the MESCT, Ministry of Higher Education, Science and Technology, in 2010.

In general, progress in higher education is slow in spite of investments and international cooperation to improve access and widen the choice of specialisations.

Although the new universities need approval according to set criteria, there is currently no nationwide scheme for evaluation of the universities' adherence to the standards. It is also easier to gain a place at some of the newer universities because fewer students apply and there are no entrance exams, just the requirement of a high school.

The quality challenges in the university sector appear to have been recognised by Sonangol. However, rather than improving and strengthening existing universities, Sonangol decided to construct its own, known as UTEC²⁰ (cf. Box 6.2). UTEC is still regarded as a development project which is seeking approval by MESCT and has not officially started operations. In parallel MINPET signals ambitions that INP shall be transformed from its current mission as a technical college to become a university.

It is worth noting that UTEC has no specific focus on typical petroleum industry topics. UTEC will rather address the broader scope of technology / engineering subjects, with the comprehension that production facilities in the petroleum industry consist of technological components and hence skills, in a number of areas. This approach will also benefit the wider development of Angolan technology based sectors, including suppliers of technology to the petroleum industry, and not solely the core petroleum industry areas which, in terms of labour, constitute limited headcount.

Box 6-2: Case UTEC – Private polytechnic university under development

An interesting initiative from Sonangol is the establishing of UTEC, the University of Technologies and Sciences (UTEC), whose classes were set to start in the second quarter of 2007 with 480 students in eight courses for a four year curriculum. This establishment is now planned to come into operation concurrent with the enactment of the new Education Law which has just recently been passed, and the acknowledgement of UTEC is still pending.

The new institution started in 2011 to register potential applicant admission in March 2012, when they expect to have been acknowledged as a private university. Despite the fully funded sponsorship by Sonangol, UTEC will not be addressing the specific needs of the petroleum sector, rather it will offer technology and science programmes in a much broader field. The same goes with the applied social sciences program offered.

UTEC is to initially provide Bachelor studies in engineering and applied social sciences, i.e. courses of, Civil Engineering, Computer Engineering, Electric Engineering, Mechanic Engineering, Production Engineering and Chemical Engineering and in Management and Economics. Each course is planned to accept 120 students, i.e. 960 new students per annual cohort. In addition two more educational programmes are planned; Health (nursing, physical therapy, clinical psychology and Education (physical, pedagogy). Master programmes will be offered in due time. Hence, UTEC is planning to accommodate in excess of 5000 students in its 5th year of operation.

Currently UTEC employs 13 professors within technology and sciences, contracted on a full time payroll. Further acquisition of professors for vacancies is ongoing. Professors will be obliged to cooperate with industry within their special fields of interest, thus representing one way to close the science and industry joint development gap.

The university campus is from the start equipped with modern facilities in all technology and science areas, both general laboratories for engineering education and specialised laboratories and equipment for research.

20 Sonangol has now renamed the UTEC establishment to *Instituto Superior Politécnico de Tecnologia e Ciências*, considered as a company training unit along with ESSA and Sonangol's corporate university (Universidade Corporativa)

6.5 Research institutions

Angola has a certain number of research institutes, some of them established even before the independence.

Sector	Name of Research institute
Agriculture	<ul style="list-style-type: none"> - Agronomic Research Institute in Huambo (founded in 1962) - Institute for Veterinary Research in Lubango (founded in 1965) - Secretaria de Estado do Café: Instituto do Café de Angola (INCA) - Institute du Développement Forestier - Cotton Scientific Research Centre in Catete
Health	<ul style="list-style-type: none"> - Angola Medical Research Institute in Luanda (Founded in 1955)
Marine	<ul style="list-style-type: none"> - INIP, National Research Institute of Fisheries (and marine environment)
Mining	<ul style="list-style-type: none"> - Angolan Directorate of Geological and Mining Services in Luanda (founded in 1914)
Other	<ul style="list-style-type: none"> - Instituto Angolano de Normalização e Qualidade - Programa Nacional de Mandioca (PNM)

In addition UAN has research centres in the following areas: Botany, Genetics, Demography, Engineering, Medicine and Law.

Box 6-3: Research case INIP - Instituto de Investigação e Pescas

INIP is located on Ilha de Luanda in the harbour area of Luanda. Their main scope is to undertake technological and biological research related to marine biodiversity, ecosystem, health and coastal pollution.

The Angolan coastal area is 1650 km long and is chiefly characterised by the interaction between hot waters (Angola's Current flowing southwards) and cold waters (Benguela Current, which northwards). This coastal area is exposed to anthropogenic threats, namely: uncontrolled recreational activities, exploitation of living and non-living resources, construction, and pollution. The open sea area is subject to the exploitation of living resources (semi-industrial and industrial fishing); non-living (petroleum, gas, and minerals).

Presently INIP has 60 research scientists in Luanda and two other research centres along the coast. The institute has governmental funding and the institute itself is in position to decide and allocate research budgets according to own priorities within their total budget frame.

In addition to education at national institutes (UAN and UOR), their scientific personnel have also been educated in Norway (mainly University of Bergen) and South Africa (Cape Town). INIP has limited laboratory facilities at their sites.

The institute currently has three PhD students outside Angola. They undertake monitoring projects on commercial marine species, environmental oceanography, biological audits and pollution surveys at the oil installations.

Although they do applied research on several themes, there is limited number of publications, mostly due to the lack of a national marine science journal. This situation will be improved with the new Angolan STI journal that recently was inaugurated by the Ministry of Higher Education, Science and Technology²¹.

INIP has regular contact with MINPET's department for environmental protection on particular themes like eco systems of the fisheries, ecological risk analysis and environmental monitoring programmes.

INIP plan to expand on their scientific staff to monitor increasing pollution from the fisheries themselves and from the petroleum activities. They are in competition with the oil companies for marine research scientists, mainly due to salary discrepancies.

Their main university collaboration partner in Angola is UAN who offers courses in biology and coastal management. Next year UAN will start courses also in marine biology with contribution from INIP and a Portuguese university.

21 In 2011 a second Angolan scientific journal was initiated by UAN

7 Other secondary education

7.1 Vocational education and training

With the evolving job market in Angola it is critical that the actors involved in the improvement of the education system implement adequate secondary and technical training facilities to meet future labour market needs and to accommodate the rising number of students.

The development of vocational training is under the overall mandate of the Ministry of Public Administration, Employment and Social Security (MAPESS), with sector ministries being charged with the training institutes related to their specific areas²². With a variety of progression routes for the growing number of children now benefiting from primary education, this shall ensure close linkage between sector needs and training provision.

Angola has 304 vocational training centres, of which 36 are the responsibility of the National Institute of Vocational Training (INEFOP), 245 are private and 23 belong to other organisations²³. Their total capacity of 24564 students can accommodate only a fraction of the potential demand since every year some 300000 new job seekers enter the labour market. Despite all the promising training initiatives that are in operation or being planned, the capacity is still low in terms of quantity and quality, and one challenge is to include wider groups of the population. According to data from the African Development Bank less than 3% of rural and 6% of urban youth undergo vocational training²⁴.

Aligning the offerings to the nation's needs has been recognised as a challenge. The Minister of MAPESS "urged the vocational training centres to run courses in demand in job market"²⁵ and stated that the training centres should adopt policies in accordance with the country's reality.

Two significant institutions with focus on technical training are Instituto Nacional de Petróleo (INP), established in 1983 by MINPET and MED (Ministry of Education), and Centro Integrado de Formação Tecnológica (CINFOTEC), established by MAPESS in 2008.

7.1.1 INP - National Petroleum Institute

INP is an important institution. It was established through a merger of two institutions specialised in training for the oil sector, the Instituto Medio de Petroleos (IMP) and the Escuela Central de Petroleos (ECP). INP collaborates with companies in the petroleum sector as well as international organisations and educational institutions. Since 2002 this has included cooperation with RKK (Rogaland Training & Education Centre - a Norwegian resource centre for vocational secondary) and the SOTS (Stavanger Offshore Technical College), mainly in the training of instructors for the INP itself.

Students at INP follow a four-year study programme of which the first year is a general introduction to the basic disciplines. During the next two years, students can choose their specialisation in three areas: Mining and geology, Production and drilling and Mechanics. INP has educated 2059 candidates at intermediate technician and since 2004 INP has educated more than 70 students as subsea technicians.

22 UNCTAD 2008

23 AfDB / OECD 2008. In 2010 the total number of training centres had increased to 450, c.f. www.formpro-angola.org

24 African Development Bank, African Development Fund. Angola Country Strategy Paper Update 2008 - 2009.

25 Angop, May 2011

Candidates trained at INP are attractive for the oil industry and in particular amongst the service and supply companies. In addition a large proportion (~50 %) of INP students on their own initiative proceeds to higher level education in universities.

An INTSOK evaluation of INP in 2007 concluded that INP had a staff of qualified teachers. Most of the teachers had a higher degree in engineering or similar and practical experience within their subjects. However, it also concluded that the teachers were not continuously updated on procedures, tools and equipment that are used in different areas of the industry. The study found that INP was well equipped with basic machinery and tools but not with the newer equipment used in the industry.

In 2011 RKK signed a cooperation agreement with INP. The new agreement makes the cooperation between the institutions even more binding and has a long term perspective on capacity building and delivery of quality courses for the oil and gas industry in Angola.

MINPET has an expressed target that INP should become the best petroleum training centre in Sub-Saharan Africa. Further, INP should develop into an engineering school, with ambitious even to become a university. However, this may not be an effective step to enhance Angola's university sector capacity, as the bottleneck seems to be qualified HEI teaching resources rather than number of universities. Also, it would seem counterproductive to dilute INP's existing focus and good reputation for highly valued and critical vocational and technical training for the petroleum sector. At present the best option for official Angolan university level education in petroleum subjects seems to be concentrated efforts to further strengthen UAN's established capability (cf. Section 6.2 and Box 6.1).

7.1.2 CINFOTEC - Integrated Centre for Technological Training

CINFOTEC has focus on technical training and technology. It is located in the south of Luanda and occupies an area of 12.000 square meters, including 16 classrooms and 22 laboratories equipped with high-end features: 15 for education and 7 for technological services. It also houses a library with five thousand titles.

CINFOTEC offers training in four areas: mechanical and manufacturing, electrical and mechatronics, information and communication technology and meteorology. The aim is to provide all segments including the petroleum, information technology, mining and metal industries, with the highest levels of technological upgrading and qualification of human resources by offering integrated training, technology transfer, consultancy and technical assistance and a range of products and services that contribute to raising productivity and competitiveness. CINFOTEC has an expressed list of sound challenges. Amongst them are

- Implementation of a Quality Systems Centre
- Assessment of training needs related to the technological level of the provinces, where there is potential for growth and development in technologies
- Training and certification of internal trainers

The latter of these challenges addresses the overall Angolan aim to invest in teacher training and establishment of teacher training institutes, however the demand for teachers is still far beyond the supply (cf. 9.1.2 Academic infrastructure).

A recent example of training undertaken at CINFOTEC is the joint RKK and MAPESS course for hydraulics and welding.

7.2 Corporate Education and Training

The petroleum (and the mineral) sectors can be considered enclaves dominated by foreign direct investments with high level of science and technology content but limited potential for national learning. The task is to leverage as much learning benefits as possible from the foreign investments made in these sectors. This is achieved through involvement in value chains, employment at managerial level, joint ventures and on-site and in-house training programmes. Sonangol and international oil and service companies already do support extensive professional training and education in Angola.

Most international oil companies have sponsored social projects as a part of their Corporate Social Responsibility programmes, but these have traditionally been ad hoc, geographically and institutionally fragmented initiatives. In recent years the oil companies have formed partnerships with the Government, NGOs, and other organisations, including Sonangol, that have enabled better targeting and coordination of initiatives. In particular the Ministry of Petroleum, Sonangol and the other oil companies have dialogue to discuss ways to increase local content in the industry.

Part of the international companies' motivation for investing in training for local professional and managerial staff is to create skills and technology transfer between the company and its affiliates. Also, when local suppliers form value chains, the international companies have an interest in having local supplier networks at the competitive frontier and thus have an incentive to support on- and off-the-job training for suppliers, subcontractors and customers. This is provided as higher education through collaboration with universities as well as vocational training in local institutions as well as establishment of their own training centres.

Such practice is actively undertaken by operating companies and the larger service companies with activity in Angola²⁶.

One current example where corporate training is carried out in collaboration with Angolan and international institutions is the drillers' course where Seadrill in collaboration with the Stavanger Offshore Technical College (SOTS) educates Angolans under the slogan "Setting a standard in drilling education in Angola". The training is taking place at the CINFOTEC premises south of Luanda. The participants are trained both in topics within oil and gas as well as mechanical disciplines. The Seadrill / SOTS effort also targets a train-the-trainers program at INP, where INP and SOTS already have cooperated for 6 years in various projects to build INP as a strong institution. The goal of this project is to train INP lecturers to be qualified educators within the area of drilling at a technical college level.

Another example is the Sonamet²⁷ Professional Training Centre in Lobito which opened in 2010 to train personnel for the manufacture of pipes and boilers and for welding. The centre is equipped with sophisticated equipment and laboratories and has the capacity to train 160 welders and 120 boilermakers. Sonamet's target is to have its staff fully composed of nationals by 2015.

26 Skills shortages in the global oil and gas industry, CERES December 2008

27 Sonamet (Oil Activity Metallic Structures Company), set up in 1998, is owned by Sonangol, Subsea 7 (Acergy) and WAPO

Box 7-1 In-house Training Programmes – FMC Technologies

FMC Technologies Angola is one major subsea technology company covering all areas of project deliveries, i.e. assembly, testing and commissioning as well as maintenance and repair of subsea and wellhead equipment. FMC is engaged in five major Angolan offshore projects including some 200 well developments. The onshore base is at the SONILS base north of Luanda. The total workforce in 2011 is 275 onshore and 116 offshore, out of which 71% are Angolan nationals.

The company estimates a 50% increase in staff during the coming 4-5 years, with a target to increase the proportion of local employees to 74%.

The FMC in-house training centre opened in 2008 offering training capacity both for FMC employees and customer staff. The scope of the training programmes includes open training on subsea processes and products and internal training covering several certificate qualifying courses as well as for specific FMC equipment. Facilitators from FMC global sites contribute to the training effort.

The programme provides structured training during the first 9 months of employment for all new entrants, customising the staff to company equipment, tools, procedures, etc. The company claims to run the best in-house training programme in the subsea industry. The three first months gives introduction to all equipment and services provided by FMC in Angola as well as HSE and base courses in hydraulics, etc. During the next six months the new employees are trained in the specific areas of their future job, i.e. drilling, completions, integration or controls.

The training package combines on-the-job training under close supervision with team leaders as mentors and class room training.

This in-house training ensures both a high level capability of staff as well as very low turnover (less than one percent) amongst the workforce, and contributes to enhance the level of the Angolan skilled staff.

8 Perspectives ahead

8.1 Angola's potential

While Angola owns Sonangol, one of the largest companies in Africa, and hosts a number of foreign firms with interest in the petroleum resources, Angola faces a key challenge in attracting investment and promoting business in non-oil sectors. Some of the promising sectors that could be developed to a more significant level include agriculture, fisheries and livestock, and forestry. However, only 3% of Angola's arable land is utilised at present²⁸. At the same time, a variety of mining activities, including improved management of the diamond sector, could be further expanded. Tourism and services are other key sectors with potential.

As part of a strategy to improve diversification, Angola needs to work on strengthening its business climate on a variety of fronts. For example, Angola is ranked 169th out of 183 countries on the 2010 Doing Business Index (cf. section 2.4). It performs particularly poorly in terms of starting a business, enforcing contracts and resolving insolvency.

The Angolan government works on the target to partially privatise some of the country's largest companies, arguing that "it is the most capable and daring companies that are the driving force behind the country's economic reconstruction and the modernisation of national production under the State's leadership"²⁹. It is not clear how this process is being conducted and how new ownerships are arranged, and the implications of the privatisation effort may not necessarily turn out as positive.

An ongoing challenge, in spite of a huge level of investment, is improving infrastructure by reforming the public procurement process so that only quality projects are approved. Also, in order to increase participation and distributed share of the economic wealth, the procurement process must open up for fair bidding conditions and contract awards to small and medium size private firms that do not belong to the 'inner circle' (cf. section 2.3 - Spillover effects).

While all good intents are for Angola to undertake a broad and balanced development of the nation and its society, there *are* inherent mechanisms that not always are conducive to these processes. These are subtle issues. However there is growing awareness and it is deemed critical that such aspects are being addressed. Targeted seminars focusing on key areas for success is one measure which can contribute in this respect. The effect or impact of such seminars will depend on the participation of locals. However experience shows that key people *do* turn up and thereby obtain pieces of information and inspiration which in turn may influence mindsets, policy and practice.

8.2 Skills for improved productivity and employment growth

Investment in education and skills helps to "pivot" an economy towards higher value added activities and dynamic growth sectors. A low-skill, low-wage development strategy, on the other hand, is unsustainable in the long term and incompatible with poverty reduction. With the prospects of harmonic development and high revenues from its petroleum export, Angola now has the opportunity to pursue the dynamic growth option, which implies a diversified economy.

The Government of Angola recognises the need for a scientific-technical component in the education system where professional and vocational training is considered a prerequisite to

²⁸ Economic diversification in Africa: A review of selected countries, OECD 2011

²⁹ Economy minister, Abraão Gourgel at the presentation of the *Programme to Support Angolan Business*, May 2011

building technological capacity. In Angola a general shortfall in human resource development at these levels, particularly in the sciences and engineering, is observed. The reason for this may be twofold in that a) science and engineering studies depend on labs and other costly facilities which have not been prioritised by the universities, and b) science and engineering degrees are not as popular with students as, for example, law and business.

However, skills development policies should not be pursued in isolation. Skills are an integral part of orchestrated national development strategies *along with* policies for technology, labour market, macroeconomics, trade and other areas, cf. Figure 8-1. The three side bars represent critical processes in a development that can provide the skills demanded to sustain dynamic development processes. Through balanced policies with attention to all three areas the results should come in terms of entrepreneurship, innovation and organic growth through participation and paid work.

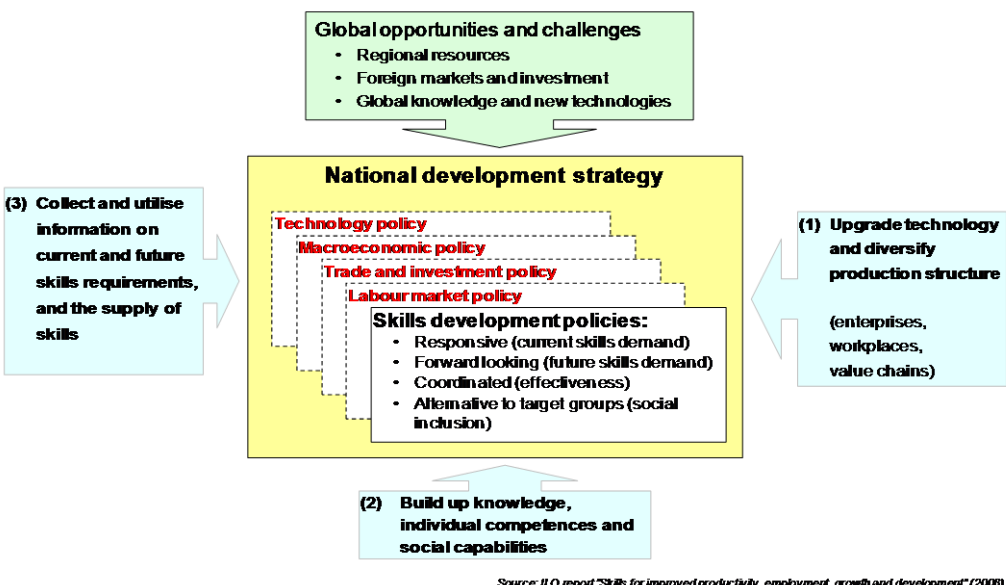


Figure 8-1: Skills development for productivity, employment and sustainable development ³⁰

8.3 Balanced and coordinated development strategies

The key is to develop and foster institutional arrangements that establish and maintain the capacity of governments, employers, workers, schools, training institutions and universities to respond effectively to initial and changing skill and training needs. Together they should play a strategic and forward-looking role in facilitating, and sustaining, technological, economic and social advancement.

For Angola this *also* means alignment of the requirements for capacity development in the non-oil sector with a coordinated effort in the education sector. The challenge will be to execute such policy with genuine involvement and coordination of views and needs in all areas, i.e. collaboration and alignment of strategies for all relevant ministries (Education, Labour, Higher education, science and technology, Petroleum, Industry, Trade).

Angola today suffers from lacking coordination and communication at ministry level with a view to design plans and budgets for a balanced national development strategy. Policies and measures

30 ILO Conference, 97th Session 2008, Report V

to build human capital within technology and engineering are largely the responsibility of the new the Ministry of Higher Education, Science and Technology, MESCT, while in parallel MINPET and Sonangol possess own strategies, schemes and resources for higher education development.

Lack of transparency of needs across sectors also hampers potential involvement from external sources, as was reflected in a report on Angola - EU collaboration, which commented "The lack of sound sector policies and overarching developing strategies make it more difficult for donors to frame their interventions into Government driven initiatives."

8.3.1 Upgrading technology and diversify production structure

At the core of a wanted diversified economy and production structure is a capable workforce, a modern procurement system which ensures fair conditions, as well as an operational legal system. Failure to improve the business climate outside the oil sector will continue to result in urban unemployment and poverty. This may in turn lead to more frustration, especially amongst youth, with consequential negative effects, e.g. unrest, violence and crime.

Sections 2.3 and 2.4 address some inherent effects that are considered counterproductive to sound Angolan development of industry and businesses that in turn can benefit larger groups of the population, hence contribute to poverty reduction. Obstacles relate to difficult access to the domestic markets and construction opportunities, lack of transparency in bidding processes and contract awards, weak regional support mechanisms for start-up entrepreneurs, and higher education offerings that not always are aligned to the needs in the regional cities and rural areas.

8.3.2 Build knowledge, individual competence and social capabilities

Education per se provides the ability to learn and adapt, which are among the critical social capabilities that influence competitiveness, productivity growth and employment. While massive investments have been made over the last years in infrastructure (buildings) for primary education, there have not been corresponding attention and priority into increasing teaching skills and capacity. One reason for this may be that central players see more opportunities arising from funds allocated to (school) construction projects in the regions than investment in more intangible areas such as human resources for teacher education.

Thus, despite the advances made in the highly profiled and economic lucrative areas of petroleum exploitation and massive domestic construction, the Angolan society at large still suffers from bottlenecks and meagre supply of primary and secondary education that can sustain the development of national knowledge, individual competence and social capabilities.

8.3.3 Collect and utilise information on skills requirements and supply of skills

The capability to collect and disseminate relevant statistics and socio-economic data is one prerequisite for data sharing and coordination between government departments. The European Commission's review on Angola - EC collaboration in 2007 reported that "the statistical system in Angola is still weak". Although improvements have been made with some new statistics and indicators being introduced, the institutional framework is hardly perceptible. The National Institute of Statistics (INE) lacks qualified staff and their geographical and functional cover is limited. In addition the responsibility for collection of primary data is distributed between ministry departments, which dilutes commitment, slows down data flow and opens up for data filtration. The current setup makes it impossible to compile the integrated, harmonised and continuous statistics required to inform and provide more qualitative direction for Angola's economic and social development, and serious effort is still required in this area (also see section 9.3.3).

9 Challenges and barriers

The weaknesses of the Angolan education system have contributed to a situation where graduates are not adequately prepared and the quality of their education cannot be assured.

In the implementation plans for a new structure for higher education in Angola³¹ the State Department for Higher Education in 2005 launched six major bottlenecks to be addressed. The bottlenecks were described in the areas of:

- design of a higher education institution
- management subsystem of higher education
- financing of higher education institutions
- curricula in place in higher education institutions
- staff employed by higher education institutions
- student body in the existing institutions of higher education

These *bottlenecks* were discussed in 2005, prior to the arrival of the major bulk of new private universities, which accelerated from 2007 onwards. This pilot study, based on observations and interviews conducted in 2011, supplements the above concerns with challenges as summarised below.

Short term challenges that act as barriers for Angola in its endeavour for an enhanced level and presence of scientific knowledge can be grouped into three main areas:

- Substandard higher education institutions (HEI) infrastructure
- Excessive drop-out rate from higher education
- Weak coupling between HEI and industry and society needs

Certain aspects within these areas are interrelated and thus dependent on each other, however they need to and can be addressed with a wide range of measures specifically linked to each area.

9.1 Substandard HEI infrastructure

Over time the technical orientated university curricula have suffered from limited subsidies and state support, which has resulted in a large proportion of graduates in the softer sciences. With the establishment of many new technical institutions and university studies during the last four years, this imbalance is now changing, at least in number terms. However, for these new and positive initiatives to be useful and effective, new resources are in demand, and some of these are in serious shortage.

9.1.1 Physical infrastructure

At the outset, after the civil war, investments in facilities in the Angolan universities had stagnated. With the renewed focus on education, increased number of students and ambitious plans for further expansion in HEIs, the challenge will be firstly to catch up with the backlog (shortages of classrooms, labs, offices and research facilities) and then to keep up with continued investments in physical university facilities and infrastructure. Included in the physical infrastructure should also be the provision of facilities for physical education and recreation to encourage healthy student life and learning environment.

31 Linhas Mestras para a melhoria gestão do Subsistema do Ensino Superior, Luanda 15.12.2005

Still there is a severe lack of support and structures, including access to resources, textbooks, libraries and non-academic support staff. One example of a key area which suffers from lack of computer facilities is the educational *supply chain* where students at ISCED, preparing to become secondary school teachers, may obtain a bachelor degree without having gained the skills to operate a computer.

Even UAN, the flagship state university, has poor lab facilities, and other sciences oriented institutions have no lab at all. UAN, however, expects this situation to improve when the science and engineering faculties, as the first faculties, will move to a new university campus in the newly established *Kilamba City* at the outskirt of Luanda.

For financing of infrastructure the private universities depend on high number of fee paying students and possible sponsorships from industry and other sources, while the public universities rely on state allocated funds. Specifically a major lift is required at the new regional public universities, who all should be treated equally budget wise.

9.1.2 Academic infrastructure

In a study made in 2009 UAN reported critical staff shortages across all areas and on all its campuses at the time. Shortages were particularly apparent in the rural centres, and this indicates that the new public UAN spin-offs in the regions outside Luanda today are the most vulnerable in this respect.

Major field of study	% of Total staff requirements filled	% of Total Senior staff requirements filled
Science, Engineering & Technology	14.7	20.9
Business, Management & Law	6.7	7.9
Humanities and Social sciences	12.9	16.6
Health sciences	12.0	7.3
TOTAL	29.0	35.8

Source: Universidade Agostinho Neto Planning & Statistics Directorate (2008)

Table 9-1: Universidade Agostinho Neto: Percentage of Staff Requirements Fulfilled (Actual data, 2007) ³²

As shown in Table 9-1 there is a high level of absenteeism among academic faculty staff members. One reason for this is the serious mismatch between the number of qualified lecturers available in Angola and the high number of positions to be filled in the Angolan HEI sector, significantly spurred by the many new universities. A consequence of this situation is that lecturers often hold multiple jobs, sometimes at competing universities. In addition to an unsustainable situation for the individual lecturer, such fragmented work pattern is counterproductive to the quality of the institutions. This includes the lack of teachers being present to provide personal advice and follow-up of students.

Although there are relations on an individual and personal level, there is no established forum where all universities can meet for experience sharing, collaboration on common challenges and in a collective and coordinated manner to put forward issues and requirements into national planning and budgeting processes.

The shortage of lecturers is a consequence of low HEI capacity over long time. Low salaries, and thereby low status, combined with the increased cost of living (in urban areas) have also contributed to relative stagnation in the supply of new teacher resources over the last years.

32 Source: Towards a Common Future: Higher Education in the SADC Region" (SARUA, 2009)

One remedy for the short term is to accelerate the train-the-trainer approach, as applied by vocational training institutions, which has become a pronounced strategy also in the higher education sector.

There are also signs of an aspiring trend where more skilled Angolan citizens, many with PhD from abroad, return to Angola to participate in the nation's development. If the state takes this window of opportunity and encourage this trend through fair and realistic incentives, this may contribute to strengthening the universities' lecturing and research capacity.

At present state scholarships (~USD 1500 / month) are offered for PhD studies abroad, while no arrangement is in place for PhD work within Angola.

9.1.3 Accreditation and quality

There is a national strategy for 20-30 private universities, of which more than half should be in the Luanda area. For some private universities the main motivation may be the business element of the operation rather than academic ambitions. With the fast mushrooming of private establishments, the authorities through accreditation and audit measures, have a responsibility to assure that youth, hungry for education, will not be excessively exposed to high-fee, sub quality education.

The authorities need information in order to govern the HEIs so that universities shall not divert into their own defined curricula which may be designed for other reasons than relevance and quality education. One effect of weak governance can be an abundance of easily sold 'posh' studies that are least intensive in terms of delivery cost and students' effort, which may result in education for unemployment.

Information that can aid balancing of skills demand and education supply will reduce uncertainties and improve the efficiency of Angola's efforts to develop a coherent education system (cf. 8.3). Such information needs to be obtained and passed on to decision makers. Identification of the skills that will be in demand by particular growth sectors and regions is essential for informed policy decisions. This will, in turn, give incentives and motivation for investment in both new technologies and skills.

9.1.4 Limited entrance capacity

The reported increase in primary education capacity over the last decennium has resulted in higher number of young people aspiring for higher education. Also the rapidly expanding business environment and the perceived willingness to pay high tuition fees to the private universities, add to the demand for higher education. In sum this has put pressure on the HEI sector.

Despite the capacity growth in the public universities and an increased number of private universities, the issues on physical and academic infrastructure and the tendency of 'commercially' minded private universities, has led to a growing discrepancy between the demand for *adequate* university places and the offered, available HEI capacity.

9.2 Excessive drop-out rate

A high proportion of the students being admitted to Angolan universities do not finish their studies. Reasons for this pattern are of both personal and institutional character. This can be attributed to both student quality and institutional quality, which in many respects can be seen as interconnected cause / effect matters.

The government of Angola spends 2.6% of GDP on education. Although this is a low share by most standards, there has been a significant development in the primary education sector during

the last 5 years. In the state budget for 2011 primary and pre-primary education receives around three times as much funding as secondary and higher education combined (cf. section 6.3), which means that strengthening of secondary and higher education has suffered in this same period. One effect is that youth finishing secondary education are generally weak in mathematics, physics and other 'exact' sciences, hence not being sufficiently prepared for the demands of a university curriculum.

One cause for such mismatch is the lack of a formal communication line between secondary education and universities. Neither at ministry or teacher level has the secondary system a formal channel where for dialogue about the skills level expected from students when they enter studies within engineering or natural sciences. Hence, the total, uncoordinated budgets and effort going into the primary and secondary schooling may have been skewed in favour of the primary level, with imbalanced capacity at the secondary level as a result. The 50% no-pass rate during the first study year at the university is a direct consequence of this.

Another contributing factor to the high early drop-out rate is the group of students that have obtained university admittance for the 'wrong' reasons. Student scholarships awarded solely based on needs, as are 1500 UAN scholarships tendered by the Ministry (MESCT), do not necessarily facilitate entry of capable students to UAN. Also, a student who gets a university place on the merits of being a solid fee payer rather than school records will find it hard to cope with challenging maths and physics topics during the first university year.

Other less dramatic reasons for students leaving can be that the chosen area of study was not suitable after all, and a lucrative job market which makes it tempting to take up work rather than finishing a degree.

To ensure a reasonable student mass for graduation it has become common practice amongst the universities to accept an excessive number of new students at each intake, knowing that a significant proportion will not proceed into the second term or year. This practice of crowded corridors during the first year may have a self-reinforcing effect in that an already strained teaching capacity gets even more diluted in terms of staff to student ratio.

A study made at UAN in 2009 showed that the majority of their students were enrolled in undergraduate programmes, with high enrolment reported for Humanities and Social Science, Business, Management and Law, while figures for the engineering and natural sciences directions were low (cf. Table 9-2).

Further, only a fraction of the students proceeded into post graduate or further studies. Some expressed reasons for this pattern are

- Limited capacity to offer advanced studies, particularly in the natural science areas where laboratories and other resource intensive facilities (support personnel and equipment) are required (cf. 9.1.1).
- Undergraduate students do not satisfy the academic criteria to proceed to postgraduate / master degree studies, which may be a symptom of lacking teaching and follow-up capacity within the institutions, e.g. low share of committed, permanent teaching staff (cf. 9.1.2).

Major field of study	Total number of students (Headcount)	Number of students enrolled per level of study			
		Under-graduate degree / diploma	Post-graduate degree / diploma	Masters degree	Doctoral degree
Natural science, Engineering & Technology	6,740	6,566	30	142	2
Business, Management & Law	10,467	10,037	160	270	0
Humanities and Social sciences	28,753	28,557	0	196	0
Health sciences	1,418	1,394	0	24	0
TOTALS	47,378	46,554	190	632	2

Source: Universidade Agostinho Neto questionnaire response (2007)

Table 9-2: Universidade Agostinho Neto: Summary of Enrolment Numbers (actual data, 2007) ³³

Other reasons for low number of post graduate students have been lack student funding which requires that students take up part time work, and the need to travel abroad for higher level studies. These issues have been addressed (cf. Table 9-3) and improvements are observed.

Main challenges	Initiatives taken to address challenge
Placement of students	UAN has asked the government to implement a policy of internal scholarship, which is now being implemented. This policy is designed to combat the common practice of students converting from full-time to part-time students which is detrimental to the quality of their studies.
Funding for Post-graduate work	Graduates who needed to study further often went overseas to do their studies and often failed to return. Now there is some control as loans are offered. The university faculties identify staff that would benefit from such study, and where most of this study / research are funded by the petrochemical companies.

Source: Universidade Agostinho Neto questionnaire response (2007)

Table 9-3: Challenges for retaining graduates.

9.3 Weak coupling between HEI and industry and society demands

A prerequisite for successful development and deployment of higher education and science is interaction with the world around. A two-way information flow is important to cohere with the society's needs and expectations and to influence its development through knowledge diffusion.

In many developing countries the link between HEIs and a growing private sector is strengthened in order to provide adequate professional and management skills. Such coordination between prospective employers and education providers is an effective way to reduce mismatch between education outcomes and employment opportunities.

Thus, in addition to constitute a core foundation of the modern society, the HEI sector must be institutionalised and equipped as a 'fit for purpose' contributor (cf. 8.2).

In Angola there are still only loose relations between higher education and the needs of the nation's development project. The situation can be depicted in three areas; industry and trade, regional development, and unreliable / unavailable statistics on key education and society parameters.

9.3.1 Industry and trade

Study respondents expressed that there were hardly any links between the higher education system (supply side) and needs for professional staff in the industry (demand side). In particular this was valid for the private universities, whose offering tended to be driven more by 'popularity amongst students' than by actual and future needs of the society and the labour market. Also,

33 Source: Towards a Common Future: Higher Education in the SADC Region" (SARUA, 2009)

when present, the universities' focus tends to be skewed towards the petroleum sector, in disfavour of other industries and trades.

Dialogue and contact between industry and HEIs is important to keep institutions abreast of changing technologies and which technical equipment that is actually used at the workplace, and which industries and skills that represent declining or rising demands. Employers can further aid the learning process by accepting interns or apprentices that enhance the systematic and classroom-based knowledge learning through practical application.

Research and development activities in universities should also be linked more closely with private sector needs. Until recently the university sector in Angola did not prepare graduates for technical oriented work in the industry. The university mindset has not been prepared for industry work and made the industry reluctant to employ graduates without industrial experience or understanding, hence extensive utilisation of expatriates in many fields.

Angola still depends on a large amount of international workers at all levels to cater for the high volume of work. In Angola there is and will be high demand for skilled labour (welders, electrician, pipe fitters, etc.), and the vocational training in such disciplines should have backing in the higher education sector, with corresponding institutes for research and education.

Some universities in Angola, including UAN and UMA now make effort both in order to assign students to industry projects during their last study year and to utilise industry staff for lecturing at the university. For the petroleum sector INP was early established to provide targeted technical training. Similar initiatives have been developed for other sectors, however mainly on vocational training level (cf. 7.1).

9.3.2 Regional development

Relative to the petroleum sector, traditional industry and trade suffers in terms of access to qualified graduates, since the oil and gas boom has attracted nearly all technical university graduates in Angola. On the other hand the petroleum industry requires and develops high qualifications level and certified workers, and in turn other sectors will benefit from these improved standards, both in their pursuit to build capacity to become (sub) suppliers to the oil and gas industry, and through spin-offs from personnel that eventually will diffuse from oil and gas into other sectors.

The new Angolan economy does provide opportunities for those who will take initiative to leave poverty by setting up own business. However, the environment that can stimulate new enterprises need to be improved. In addition to the obstacles that makes it for start-ups (cf. 2.4), there are still limited structural support mechanisms in the regions (by regional governments) to assist entrepreneurs, and organic prosperity increase outside Luanda remains slow.

9.3.3 Unreliable / unavailable HEI, industry and society statistics

Verified, ample statistics are considered vital in order to prioritise effort and to measure progress of strategic national programmes. Coordinated planning and monitoring of national development efforts in Angola seem to suffer from lack of such statistics, both as a fact basis and for forecasting purposes. Discrepancy between anticipated education coverage and the actual situation makes it difficult to adjust the measures to the challenges encountered along the way.

There is only scattered data for Angola in publications from UNESCO and other international organisations that provide country statistics on development and education³⁴. Most recent figures are typically from 2006 / 2007. Not only does this give an unfavourable impression of Angola to the outside world, but the absence of consistent and up-to-date national statistics can hamper the planning and follow-up of developments in the educational sector.

The higher education sector lacks figures on demands for relevant education, thus it is difficult for central and regional authorities to plan a meaningful allocation of curricula between institutions and regions, aligned with regional needs.

An attempt was made to map the broader market needs for higher education through an industry survey. However the state sponsored questionnaire was overly ambitious and comprehensive, with a detail level that did not solicit immediate response. The response rate turned out low and the survey was considered to be of no use. Industry representatives look forward to a new survey for the same purpose, however with a revised, simpler approach.

At present Angola's central capacity for compilation of national statistics is weak, and there appear discrepancies between key figures in areas that should correlate³⁵. Some key causes for the lack of overall and reliable statistics on national parameters are incomplete time series, non-comparable and arbitrary selection of primary data. Illustrative for the situation is that Angola has not had a census since the early 1970s³⁶. INE, the Angolan National Institute of Statistics, has to deal with methodological weaknesses in the gathering of primary data and there seems to be limited genuine interest and support to establish and fulfil the processes required to collect and assemble such data.

34 When searching for statistical data on Angola, wordings like "*Measuring progress on Millennium Development Goals is difficult, as statistics on Angola are rare and unreliable*" typically appears.

35 CMI 2011

36 A population census is due to be carried out in 2013, cf. Angolan Minister for Planning, April 2011.

10 The future of HEIs in Angola

10.1 An emerging university model for Angola

All over the world universities experience a swift changing landscape. Demographical changes in the Western world indicate that the university sector no longer may be seen as a growth sector. The need for adjustments should be analysed in the context of aging in many countries, including the African continent. Reforms in public sector show that universities have to meet the demands from a modernised public sector. The role given to science and technological research to create knowledge society is growingly important. Such changes may be seen as exogenous in the sense that they impact on the university sector, however the sector cannot steer away or neglect them. On the contrary, this requires response from the universities on at least five core areas:

1. Financial patterns and cost structures
2. Human resources
3. Academic deliverables
4. The third mission; value creation
5. Governance, management, leadership

All these challenges are well known and point to the observation that HEIs in principle are granted a higher degree of autonomy, and that they must obtain sufficient funding to approach world class. It is a challenge to attract the best students, teachers and research scientists. The balance between education and research is in the process of shifting in favour of research, partly due to public funding schemes and partly due to increasing volume of and competition for research funding. The PhD education is part of the academic contract representing educational requirements, it gives a contribution to the total research output of the university and it is a substantial part of the financing of the university. Many universities obtain closer relationships to their environment and must govern the restructuring of their work and operational modus giving due attention to a lot more stakeholders than in previous times³⁷.

With such a global hinterland the new university model of Angola is gradually finding its major shape, as depicted in Figure 10-1 below. The new model is an image of an entrepreneurial university, advocating research, education and value creation on an equal footing. The idea that HEIs are predominantly educational institutions has been left, introducing a more ambitious model in which both intra- and extramural obligations and challenges are to be met by the new universities. As indicated in the figure such a concept presupposes a more transparent network of stakeholders and at the same time allowing the HEIs to cope with stakeholder pressures, but also introducing a more offensive application of policy measures to gain tempo or overcome bottlenecks in the change processes of the institutions and their surrounding environment.

37 Karlsen & Karlsen 2011

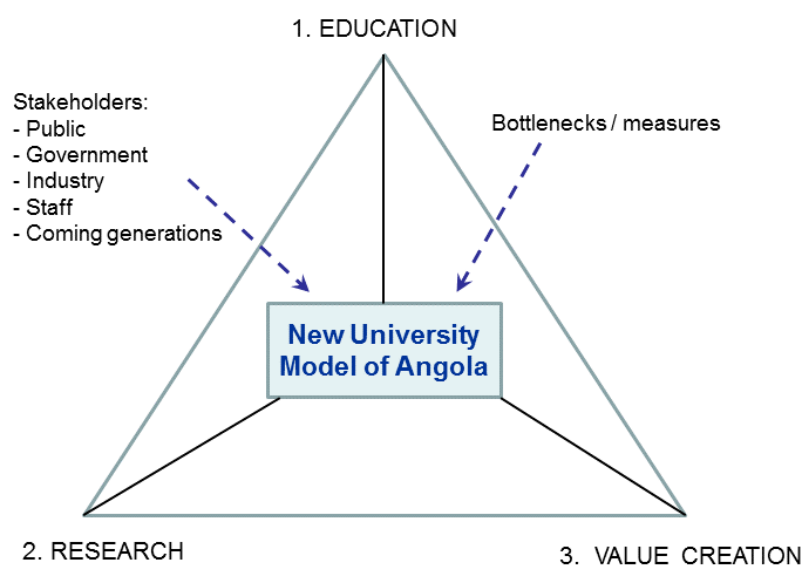


Figure 10-1: New university model of Angola

The framework of this reshaping of the Angolan HEI sector rests on three pillars:

1. The new legislation as of 2009, which states approval procedures for an HE institution
2. The acknowledgement of the three leg model of a modern HE, encompassing both traditional knowledge production (by research) and dissemination (by teaching and conferring degrees), and the entrepreneurial application of the knowledge into the larger society. Such a model also introduces the idea of HEIs competing or cooperating on equal terms, thus offering a more optimal national division of labour in the knowledge sector.
3. New governmental instruments, including firstly budget approvals of HEI operations, secondly extensive use of quality audits to assess curricula, academic credentials and student proficiency, and thirdly applying long term planning of demand and supply of an academic and scientifically educated workforce.

In brief, such a vision differs from previous ideas of the Angolan HEI sector. However it is not enough to dissent from conventional wisdom to create a preferred future. The transformation will take political decisiveness as well as extensive support from the various stakeholders, amongst which the petroleum business obviously will play a significant role.

10.2 Concluding remarks

There is a striking feature of the recent Angolan HEI policy, particularly after 2007; The strong dedication - both by political and educational players - to strengthen the HEI sector's capacity, capability and quality is prominent and frequently expressed. However several gaps have to be filled to meet the ambitious plans and hopes for the aspiring HEIs and research and science institutions.

Firstly, there is a need for a tight vertical integration in the overall education system. As depicted in Appendix i there is presently an observed cleavage between the secondary and the superior educational level. Many students are entering university education with poor or insufficient qualifications, i.e. not fully prepared to meet the university level requirements.

Secondly, there is a deficit of qualified university teachers within most disciplines. This must be dealt with in a long term perspective, including exchange agreements with universities abroad,

expansion of PhD programmes and post doc schemes, e.g. the goodwill agreements³⁸ practiced in the early days of the Norwegian petroleum development. Career opportunities, including secondments in industry and government services, must be defined and funded to attract talented individuals into the HEI workforce. Also wage levels and systems have to be adjusted to secure full attention to knowledge production and dissemination which are seen as core functions in the creation of a science community.

Thirdly, a number of university teachers describe being captured by a system by precarious work and employment conditions. Most universities offer limited number of full time and tenured positions, which results in a large group of part time teachers revolving between different HEIs. This lack of in-house permanence of the academic staff is seen as a threat to sustain relevance and quality.

Fourthly, higher education is costly. Equality of opportunity to enter the higher educational system is presently uneven. Private universities charge fees not affordable for every talented young person, while some of the public universities have limited enrolment capacity to meet the demand. Since most of the university capacity still is located in the Luanda region, the cost of student accommodation can be very high, which may exclude several candidates with background in rural areas.

Fifthly, a high proportion of students who start their university education do not continue into their final year. This is not conducive to increase the quality of the educational programmes and curricula. Besides, this drop-out of candidates implies a loss to the society as lack of formal degrees means that certain positions in the labour market may remain vacant.

The gaps mentioned above have impact on the realism of current university expansion plans and pace. One basic requirement concerns the authorisation of new universities and their educational programmes, and such governmental processes obviously take time. In addition developing the physical and academic infrastructure of the new campuses requires proper funding, including long term sponsorship from industry and sufficient governmental budgets. Also, there is a need for intersectoral strategy of knowledge development, in which the role of the petroleum industry has to be defined and legitimised. Finally, the HEI sector must develop a unified system of quality assurance comprising both the educational programmes, the administrative system and logic, and the academic proficiency.

38 By means of the 'goodwill agreements', the international oil companies were informed they would acquire 'goodwill points' by contracting oil and gas related research and development to Norwegian research institutions. The goodwill agreements gave the institutional research sector a significant boost.

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ii) The Angolan primary education system

Angola faced a 27 year civil war. The MPLA (the Popular Movement for the Liberation of Angola - backed by the Soviet Union and Cuba) and the UNITA (National Union for the Total Independence of Angola - backed by the United States and South Africa) fought for the control of the state and the territory, causing the country high human losses, material damages and a deteriorated education system.

The education system has been through a series of major reforms since the independence of the country, in 1975. It is important to note that the ruling party, MPLA, based these reforms on Marxist-Leninist principles. Indeed, in 1978 the state implemented a system that had a strong focus on general education for all based on social equality and national development goals (mainly in agriculture and industry) and the aim to guarantee that all children could completed at least the first level, called basic education, which consisted in four years plus an introductory year. Then there were a second and third level of basic education that lasted two years each. The intermediate level was divided in two: three years to access to Universities and four years to enter the labour market. Especially at University level, high priority was given to technical and agricultural studies rather than to social and human sciences. All these levels were free of charge and all the institutions offering education had to be state owned.

Today the authorities and the international actors have to tackle not only the material reconstruction of schools, but also the huge challenge of raising the number of children in primary school from an estimated 2.1 million in 2003 to 5 million by 2015, in order to achieve universal primary education, according to the National Plan of Action on Education for All (EFA), while keeping up with the rapid growth of the school-age population.

Enrolment to primary education – Discrepancies and uncertainties

Gender inequalities in schools are another vast issue. Even if gender equality is mentioned as a principle in the national curricula, the 2001 UNICEF Multiple Indicator Cluster Survey (MICS) showed that only 56 per cent of children of primary school age attend the first level of basic education (Grades 1 - 4) with clear disparities by gender and socio-economic groups. Although enrolment figures for 2002 and 2003 suggest a trend of increase in enrolment, a large number of Angolan children are still deprived of their right to quality education. At present, it is estimated that at least one million primary school age children are out of school, the majority of them being girls. In 2006, one source indicates that only 47% of girls were enrolled in primary school nationwide, compared to 53% of boys. In the rural areas the percentages were even worse³⁹.

In April 2009, an agreement was signed by Vice-Minister of Education Pinda Simao, Head of the European Commission delegation Joao Gabriel Ferreira and UNICEF Angola Officer-in-Charge Geoff Wiffin. This agreement should provide education by training 8750 primary teachers for three years. The budget for this plan is about 6 million US dollars⁴⁰. In August 2009, Simao launched the project Support Primary Education (PAEP). This project aims at improving primary education in seven provinces in South-Western Angola, involving over 70000 primary school pupils. PAEP will focus on large-scale teacher training and decentralization of school management. This programme dovetails with Angola's ongoing process to bring education management closer to the communities⁴¹.

39 Source: UNICEF website on Angola www.unicef.org/infobycountry/angola_34422.html

40 Source: UNICEF website on Angola www.unicef.org/infobycountry/angola_49203.html

41 Source: UNICEF website on Angola www.unicef.org/infobycountry/angola_50774.html

Discrepancies and uncertainties in enrolment figures

Another source claims that, in spite of Angola's efforts to improve access to education, primary school enrolment remains among the lowest in Sub-Saharan Africa with only 25% of school age children enrolled in primary school⁴².

The source also informs that only 27% of students entering primary school complete grade four. Gender inequalities also persist, as women have fewer opportunities for literacy and education.

The difference in estimated primary school enrolment figures, ~50% (UNICEF) vs. 25% (ADB) is symptomatic for the lack of consistent and reliable national statistics in Angola (cf. section 9.3.3).

There is still underinvestment in the teaching profession and sources wonder how under-qualified and low paid teachers will be able to provide quality education to millions of young people. The current situation hampers education reforms and exposes teachers to unconventional methods to survive.

Curriculum focus

The Angolan education system tends to emphasise continuity between primary and lower secondary education by reinforcing the presence of 'carrier-subjects' in both levels, and introducing additional life and work-related learning experiences in lower secondary thus building on, and expanding acquisitions in primary education. 'Carrier-subjects' are developed with the specific purpose of ensuring life and work-related competencies and skills are incorporated into the curriculum. Cross-cutting aspects and dimensions are also considered, at least as an intention of the official / written curriculum. Several 'carrier-subjects' provide more specifically for life and work preparation, such as Moral and Civic Education and Practical and Plastic Education (primary schools); and Moral and Civic Education and Education for Work in lower secondary schools. Key competencies and sub-competencies for life and work are mentioned in both the new Curriculum Frameworks and syllabuses. It is however crucial that these new carrier-subjects and cross-cutting approaches benefit of appropriate teaching and learning materials, and that teachers are able to teach them effectively.

The pitfall of private primary education

A challenge may be that major public education initiatives being organised and financed by petroleum companies, will have a counterproductive effect for the Angolan institutions and the people's appreciation of the government:

"With our partners, Chevron supports educational initiatives in areas where we operate. One example is the competitive quiz Aprenda Brincando ("Learn Through Playing"). In 2010, the interactive program, which promotes learning outside the classroom, organized 16 educational sessions that involved teachers and reached more than 340 students from 15 schools in Cabinda province. Chevron, in partnership with the Discovery Channel and the Ministry of Education, has helped improve the quality of teaching in Angola's elementary and secondary schools through the use of video technology. The Discovery Channel Global Education Partnership has reached more than 66,000 pupils since it launched in 2004. In addition, we joined our partners in awarding 60 scholarships to Cabinda-based university students."

42 African Development Bank, African Development Fund. Angola Country Strategy Paper Update 2008 – 2009

iii) Interview guide

Overview of national HEI structure

- Sufficiently strong national legislation; Independent, autonomous
- Human capital development plans 2015
- Collaboration schemes for education and research; within Angola and abroad
- Time perspectives, experiences

Bottlenecks and barriers in the educational system and institutions

- Funding of institutions
- Demand for higher educated individuals / Supply from HEI
- Student support: Scholarships, tuition fees, subsidies / assistance
- Is the bottleneck funding or human resources (academic staff as well as student feeder)
- How to fill vacancies in HEIs

Present drivers, measures and barriers for knowledge diffusion – from HEI into society, for the benefit of national development

- Drivers, e.g.: ICT, Knowledge level in society, Media
- Measures, e.g.: educational promotional programs, student exchange
- Barriers, e.g.: lack of funding, inadequate / insufficient recruitment / feeder to HEI, including teaching staff, substandard infrastructure / lab facilities, equipment, etc. ?

Spillover effects and beneficiaries, e.g. from petroleum to other sectors

- Positive externalities today
- Petroleum Technology has in itself limited use, however generic (project, ICT, safety) skills are applicable in other sectors; Any signs of this.
- Expats vs. locals; Present situation, balance / imbalance
- Angolisation policy implications; Connection to education system
- Public vs. companies' organised education institutions; Who should lead

Views on future prospects for education and research

- Long term objectives and planning; Government, Companies, HEIs
- Funding objectives and plans
- Long term view on Angolanisation