



Case Study : Opportunities in Capacity Creation - Western India versus Coastal Africa

Soumen Karkun



Holtec Consulting, India

At which location should we invest ?



We wish to invest a maximum of US \$ 350 mio in creating cement capacity in either **Western India** or in **Coastal Africa**

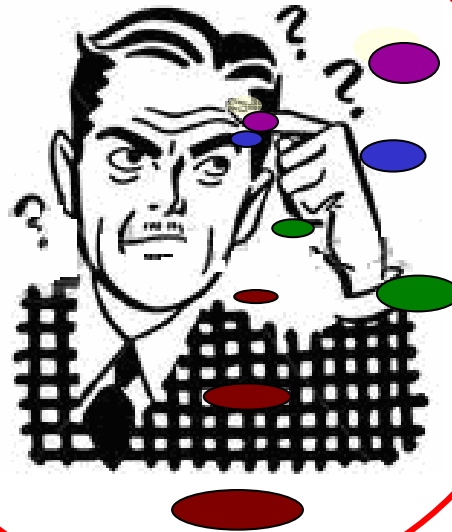
Decision Criteria

Market Analysis

Financial Returns

Soft Factors

Final Option



An Integrated Unit in India servicing Indian markets with some exports?

Split locations in India servicing Indian markets?

A Clinker Unit in India feeding a Grinding Unit in Africa servicing African markets?

An Integrated Unit in Africa servicing African markets?



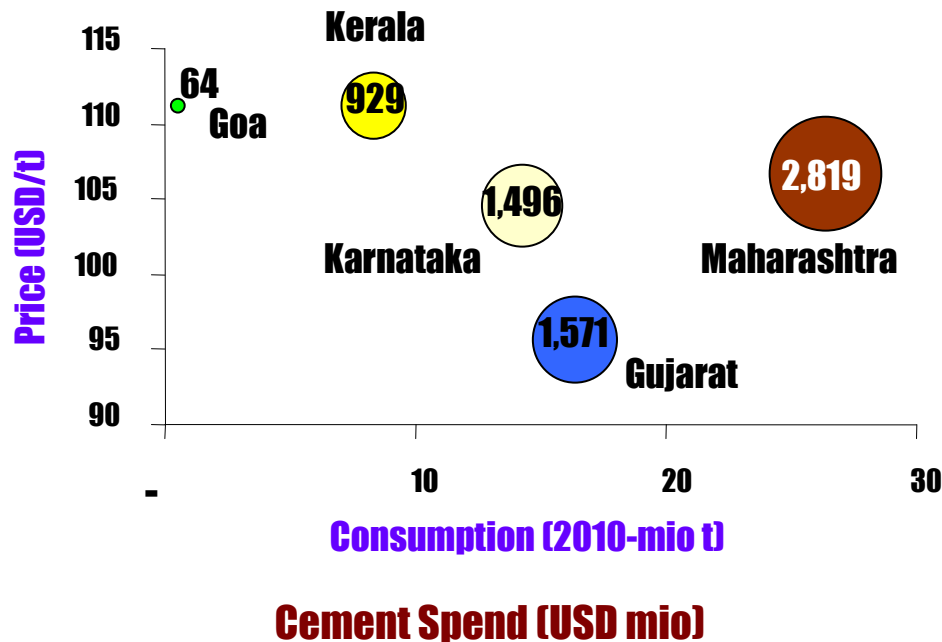
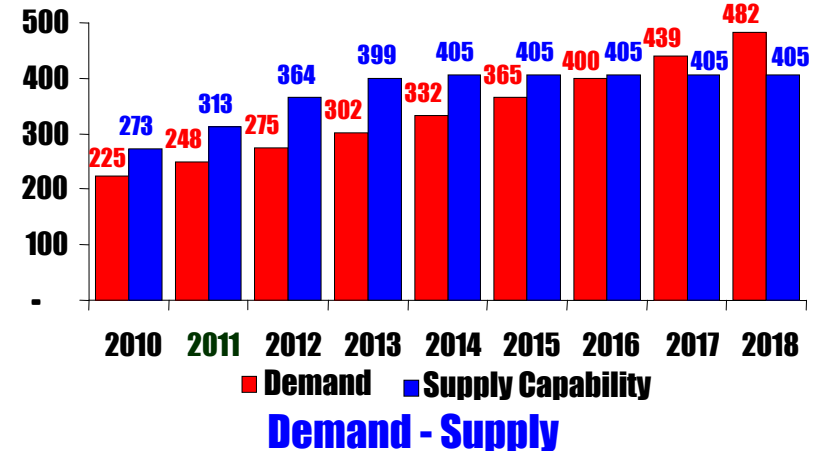
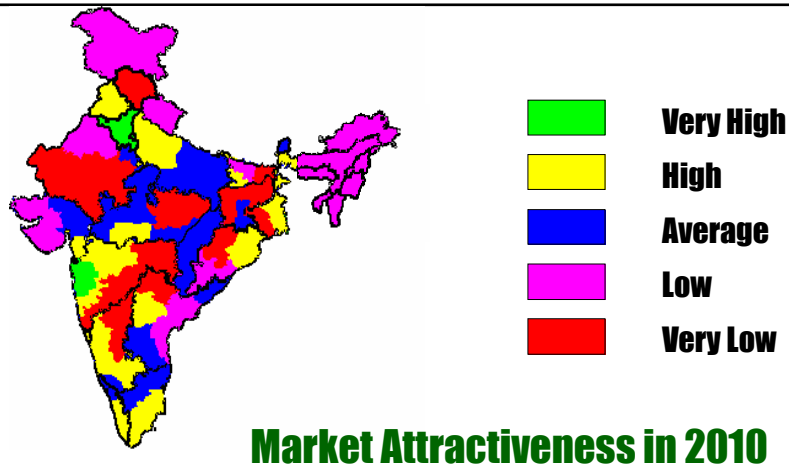
HOLTEC

INTERNATIONAL CEMENT CONFERENCE

Cemtech
PRODUCTION EXPERTISE - MANAGEMENT SKILLS

Dubai 2011

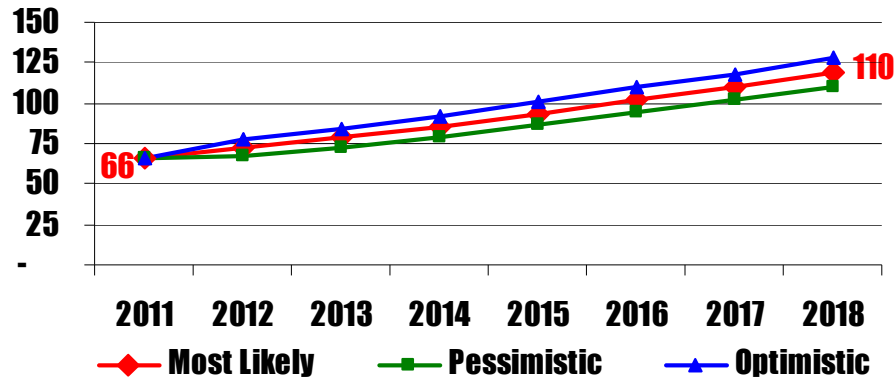
An Overview of India



- 2011 demand was around 225 mio t. This is expected to grow at around 10 % pa taking demand to ~ 365 mio t by 2015 and over 480 mio t by 2018.
- **Current PCC of around 187 kgs is expected to grow to 260 kgs by 2015 and over 330 kgs by 2018**
- **Current capacity of around 275 mio tpa is expected to exceed 400 mio tpa by 2015. Subsequent capacity additions are still to be frozen.**
- **Current price around of USD 104/ t indicates an annual cement spend of ~ USD 23.4 bn. This is expected to grow by over 15 % pa.**
- **Fragmented market. However, top 3 companies hold around 30-35 % market share. Consolidation unlikely in short term.**
- **Higher opportunities to service coastal markets due to paucity of limestone.**

Why Western India (Kutch in Gujarat)?

- Available limestone lease in Kutch, Gujarat which can support a 6,000 tpd clinkerisation unit.



- Western India growing at 8-11% pa, taking cement demand from 66 mio t in 2011 to ~93 mio t in 2015 and ~ 110 mio t in 2018.
- Gujarat government offering to support creation of cement capacities.
- Low cost of production – limestone raising cost and fuel (lignite/ imported coal).
- Being port based, can dispatch clinker/ cement to the western coast of India that has negligible cement capacities. Can also export to other countries.



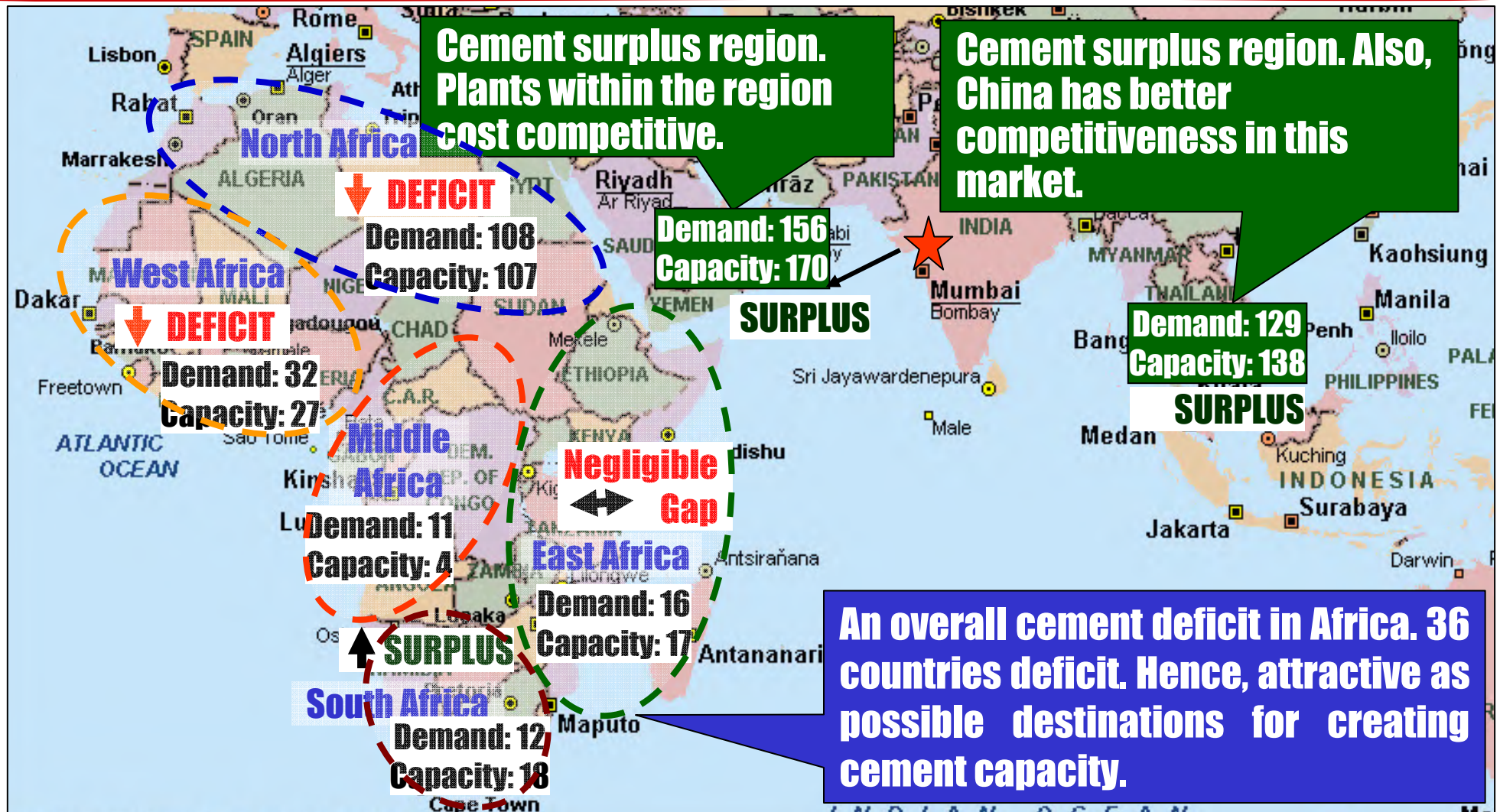
HOLTEC

INTERNATIONAL CEMENT CONFERENCE

Cemtech
PRODUCTION EXPERTISE - MANAGEMENT SKILLS

Dubai 2011

Why Africa?



Clinkerization Unit in Gujarat, India

(Figures in mio t for 2010)

INTERNATIONAL CEMENT CONFERENCE

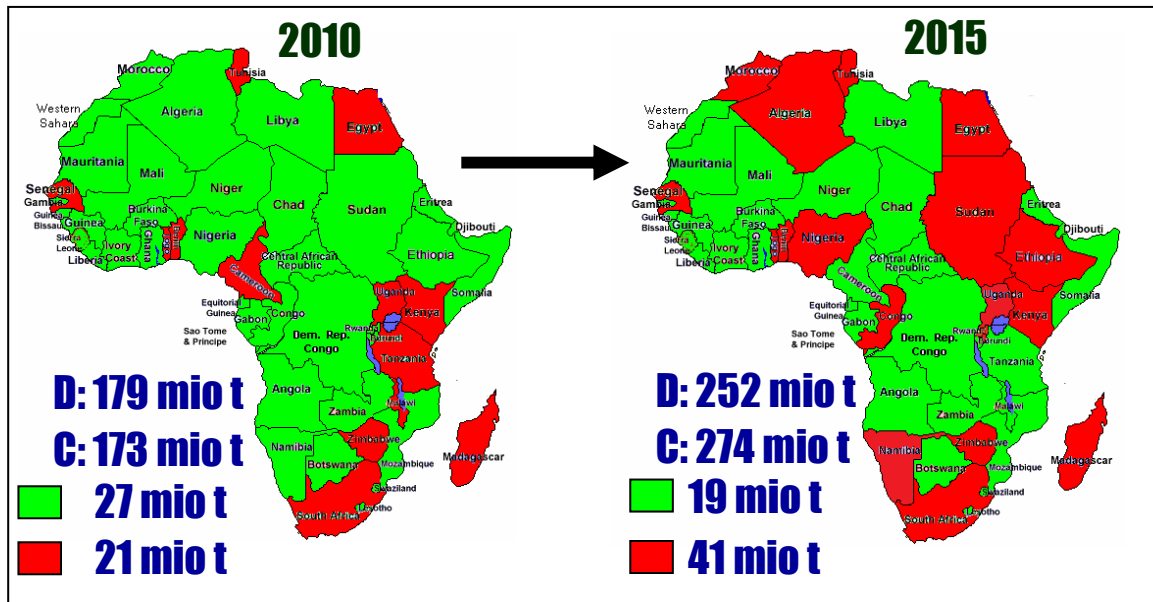
Cemtech

PRODUCTION EXPERTISE - MANAGEMENT SKILLS

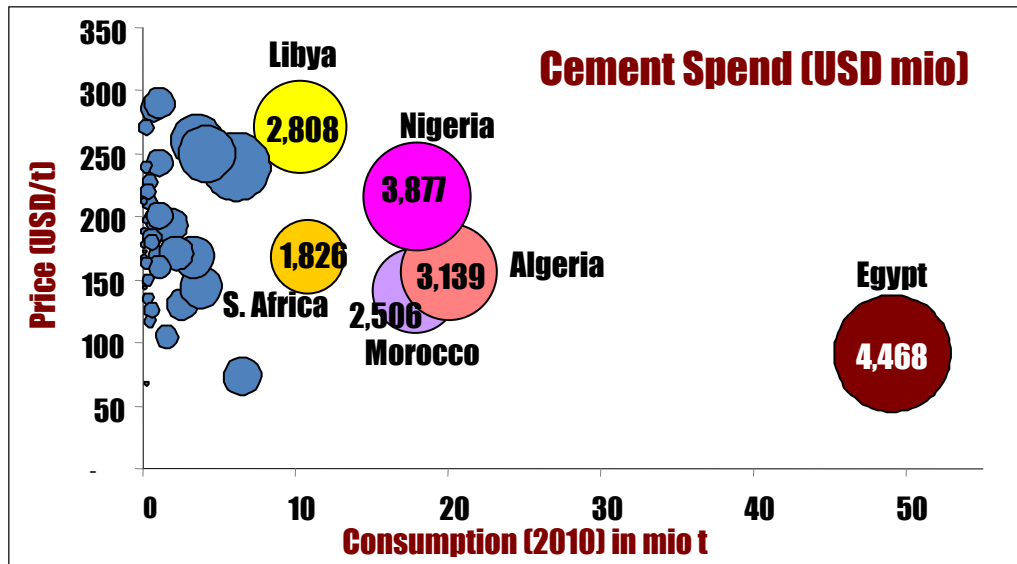
Dubai 2011

HOLTEC

An Overview of Africa

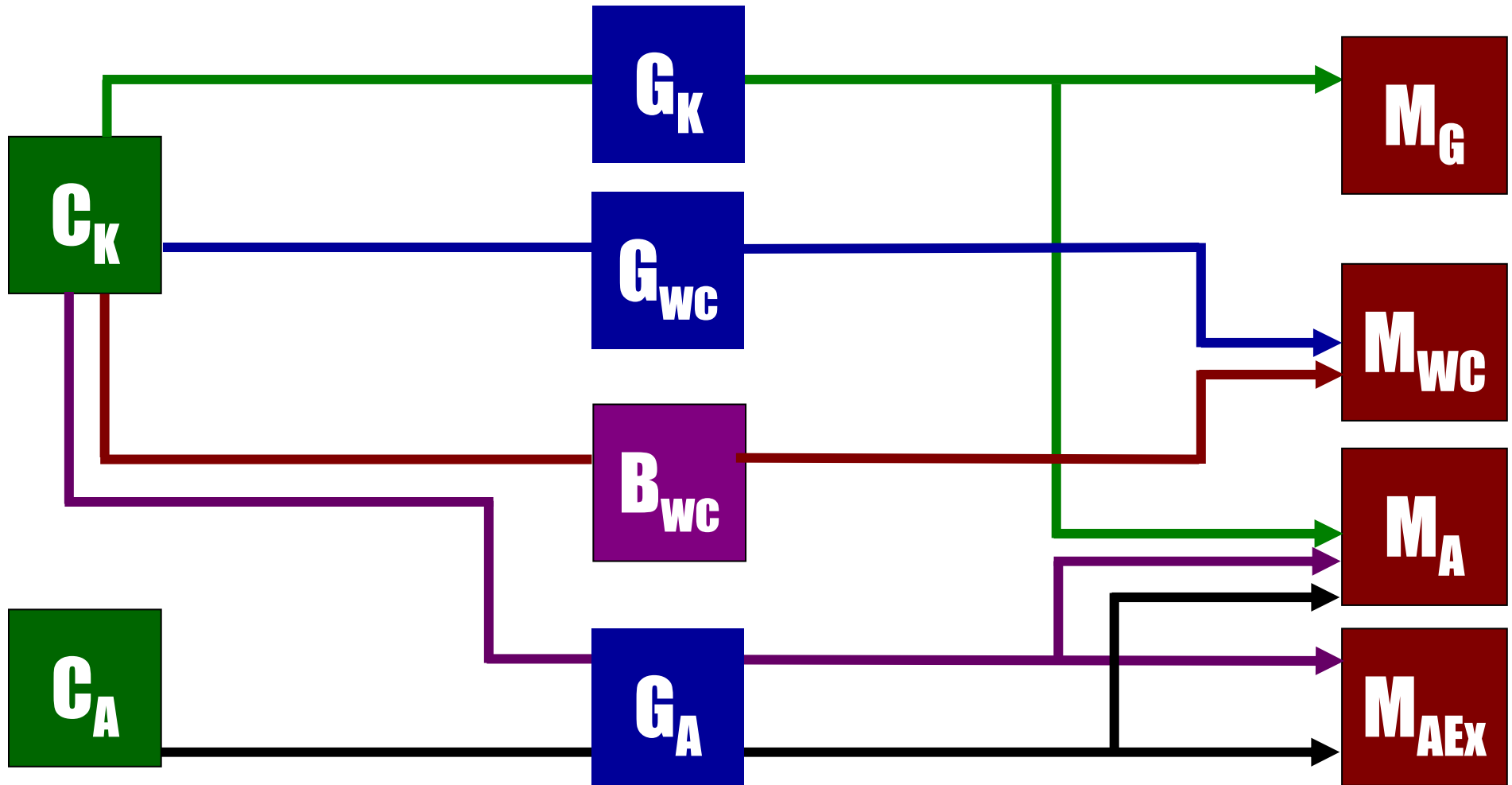


Attractive Markets



- Currently around 70 % of Africa's demand (126 mio t) and 67 % of cement spend is consumed by 6 countries, viz., Egypt, Algeria, Nigeria, Morocco, South Africa, and Libya. The balance (53 mio t) is consumed by the remaining 46 countries.
- Estimated to grow by 7-8 % pa, Africa's demand would reach 252 mio t by 2015. The top 6 countries will retain their dominant positions.
- The current PCC of ~ 175 kgs (4-1,610 kgs) is expected to grow to 222 kgs (5-2,371 kgs) by 2015.
- The current capacity of ~ 173 mio tpa is expected to exceed 270 mio tpa by 2015.
- The average current price of ~ USD 157/ t gives a current cement spend of ~ USD 28bn. This is expected to grow at 8-12 % pa.
- The number of players are generally restricted to single digits in most markets. Consolidation unlikely. Some countries exhibit access restricting player.
- Higher opportunities in deficit markets due to logistical issues.

What are the possible Options ?

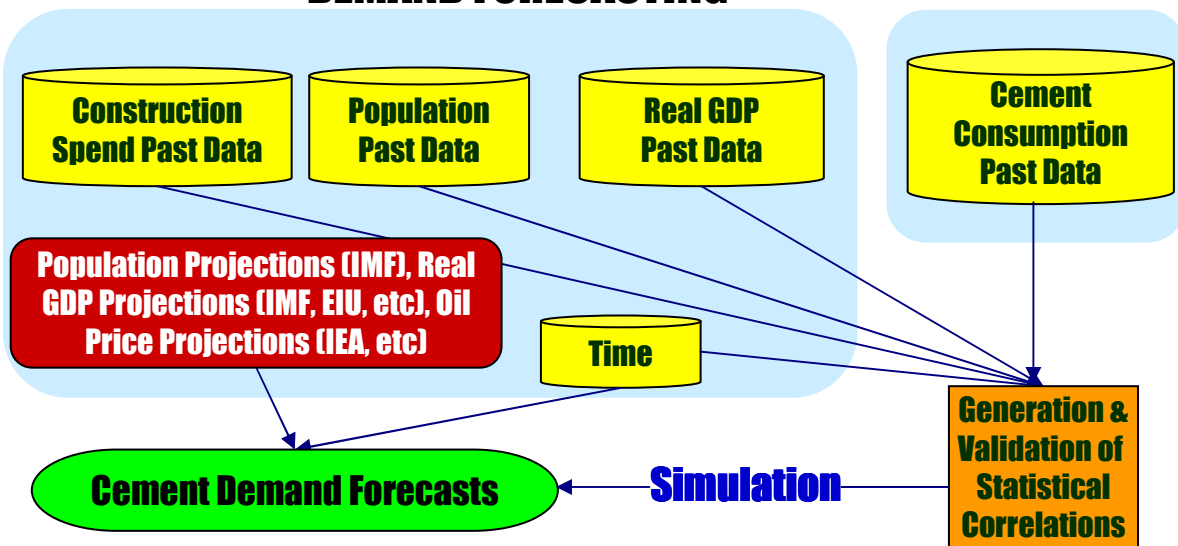


Legend

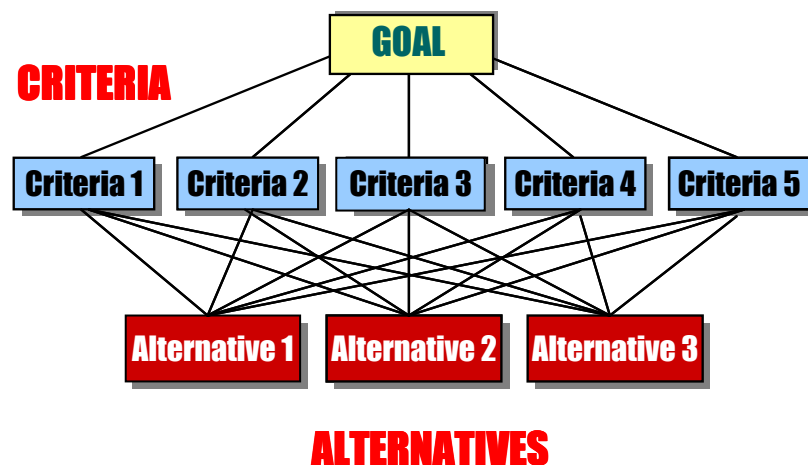
C = Clinkerisation Unit, G = Grinding Unit, B = Blending Unit, M = Markets
K = Kutch, WC = West Coast (India), CA = Coastal Africa, Ex = Exports

Tools and Databases

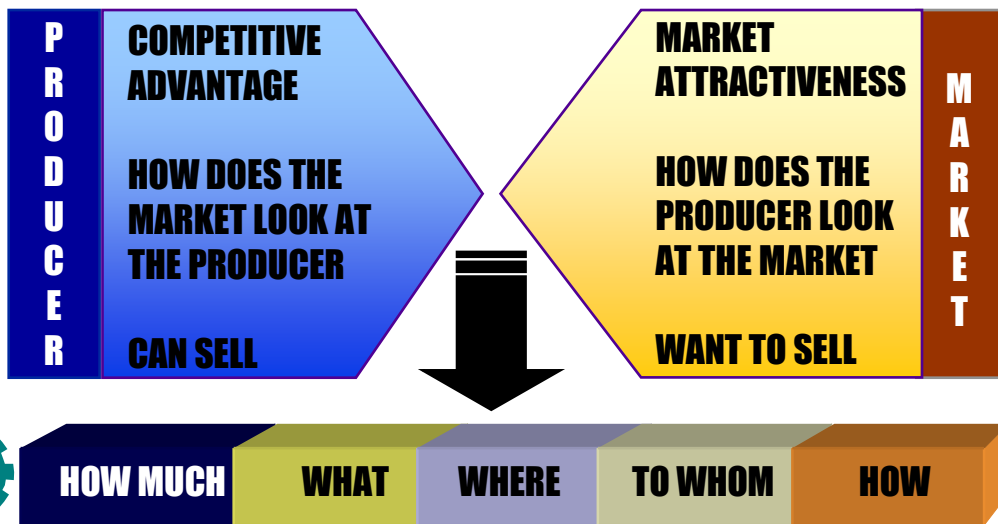
DEMAND FORECASTING



ANALYTIC HIERARCHY PROCESS (AHP)



COMPETITIVE ANALYSIS



DATABASES

Markets
Limestone
Blending Materials
Fuel
Land
Ports
Capex, Opex

Supply InCem Prices Demand
Deposits LDSS
Sources
Availability Source
Acquirability
Ports Influence
Supplier Equipment Conditions

An Overview of Western India

2011

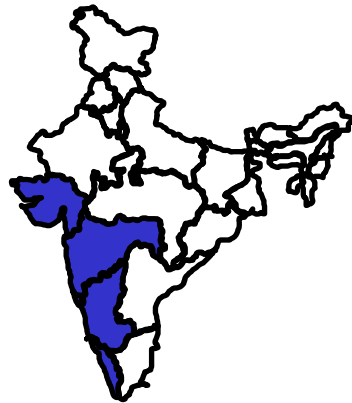
Demand : 16

Supply : 25

2015

Demand : 24

Supply : 35



2011

Demand : 26

Supply : 20

2015

Demand : 36

Supply : 34

2011

Demand : 14

Supply : 23

2015

Demand : 21

Supply : 41

2011

Demand : 9

Supply : <1

2015

Demand : 12

Supply : <1



HOLTEC

 **Supply Clusters**

 **Grinding Unit**

 **Blending Unit**



Presently, Gujarat and Karnataka are surplus whereas the other states are deficit. Considered as an entity, the region is marginally surplus, a situation likely to perpetuate.



But with supply clusters being distant, market share can be captured by a grinding or blending unit on the coast, serviced by clinker shipped from Gujarat.



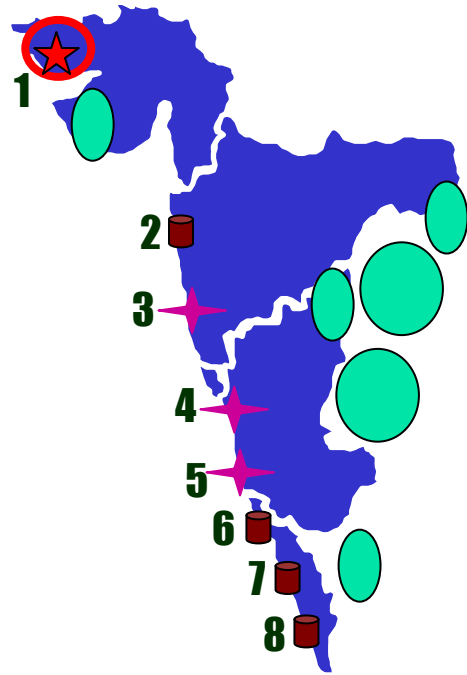
INTERNATIONAL CEMENT CONFERENCE

Cemtech

PRODUCTION EXPERTISE - MANAGEMENT SKILLS

Dubai 2011

Competitiveness of Downstream Locations



Code	Options	Competitive Index	Achievable Volumes (2015-mio t)	Ex-Factory Realisation (USD/ t)	Profit (USD/ t)
1	Kutch (IU)	0.7-1.2	1.2	66.0	30.2
2	Mumbai (BU)	1.0-1.1	1.0	87.9	23.9
3	Jaigarh (GU)	0.9-1.0	1.1	87.1	27.1
4	Karwar (GU)	0.5-0.8	0.7	87.3	24.2
5	Udupi (GU)	0.4-0.8	1.0	87.6	20.4
6	Kannur (BU)	0.3-0.5	0.7	88.9	15.5
7	Calicut (BU)	0.3-0.5	0.8	89.5	15.2
8	Kochi (BU)	0.3-0.5	0.7	91.3	15.9

- The IU is competitive in Kutch; beyond that it's competitiveness decreases. It can export 0.2-0.3 mio t annually to the East Coast of Africa.
- Mumbai BU has an above average realisation as other players' lead distance/ freight to Mumbai region is also high.
- The Jaigarh GU is seen to be competitive and can sell high volumes due to its reach to attractive markets.
- The GU's at Karwar and Udupi are less competitive due to higher competition from Andhra.
- The BU's in Kerala are less competitive due to high freight and no proximate blending source.



HOLTEC

INTERNATIONAL CEMENT CONFERENCE

Cemtech
PRODUCTION EXPERTISE - MANAGEMENT SKILLS

Dubai 2011

Short listing in India using AHP

Options	Inputs	Markets	Utilities & Logistics	Land & Clearances	Profitability	Risks	Final Score using AHP	Ranks
Kutch (IU)	27%	17%	23%	25%	19%	20%	20.8%	1
Mumbai (BU)	10%	19%	10%	6%	14%	11%	13.1%	3
Jaigarh (GU)	17%	20%	17%	17%	16%	14%	17.2%	2
Karwar (GU)	12%	8%	12%	14%	14%	13%	12.0%	5
Udupi (GU)	16%	10%	15%	17%	12%	13%	13.0%	4
Kannur (BU)	7%	7%	5%	8%	8%	10%	7.5%	7
Calicut (BU)	6%	8%	8%	7%	7%	10%	7.4%	8
Kochi (BU)	5%	11%	10%	6%	10%	9%	9.0%	6

Better locations

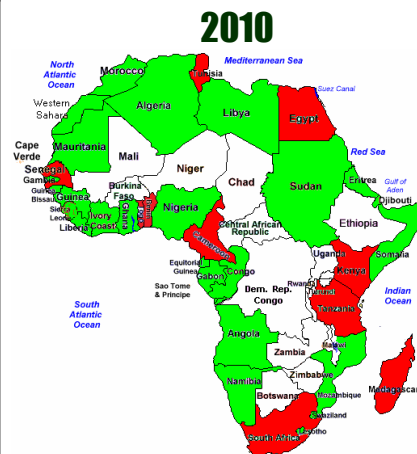
CRITERIA	Inputs	Inputs include Limestone, Blending Material , Fuel and Human Resources
	Markets	Market Reach, Capacity Realization, Demand- Supply Scenario, Sales Volumes
	Utilities & Logistics	Power, Transport Infrastructure
	Land & Clearances	Land Availability & Ease of Acquisition, Statutory Clearances
	Profitability	Net Realization, Cost of Production
	Risks	Insurgency/ Law & Order, Subsidy withdrawal, Project Overruns (Time & Cost), Other Bottlenecks



HOLTEC

Demand in Coastal Africa

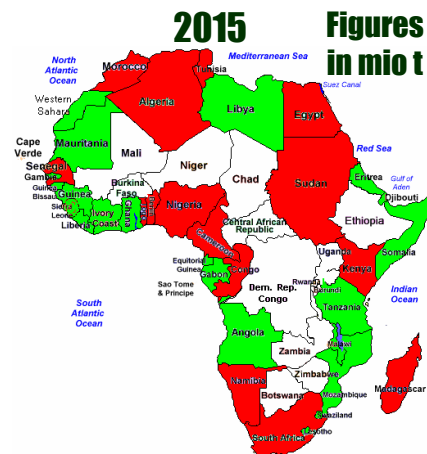
2010	Country	2015
6.6	Tunisia	8.9
20.1	Algeria	26.9
17.9	Morocco	25.7
0.2	W. Sahara	0.3
0.9	Mauritania	1.2
2.7	Senegal	3.9
0.1	Gambia	0.2
0.1	G. Bissau	0.2
0.8	Guinea	0.9
0.4	S. Leone	0.5
0.5	Liberia	0.8
3.9	Ghana	5.1
0.6	Togo	0.9
1.1	Benin	1.2
18.0	Nigeria	24.7
1.6	Cameroon	2.2
0.4	E. Guinea	0.6
0.4	Gabon	0.5
0.4	Rep of Congo	0.6
6.2	Angola	12.4
0.5	Namibia	0.7
83.4	Total	118.4



☞ **Total 22 west coast based countries.**

☞ **Most high consumption markets expected to become surplus in future.**

☞ **Countries within the region better placed to cater the deficit markets in the region. Thus, not a very attractive market for creating new capacity or receiving exports from India**



☞ **Total 11 east coast based countries.**

☞ **Overall a deficit market. Egypt, Kenya, Tanzania, South Africa and Madagascar are surplus whereas all other countries are deficit.**

☞ **In future, Sudan also expected to become surplus.**

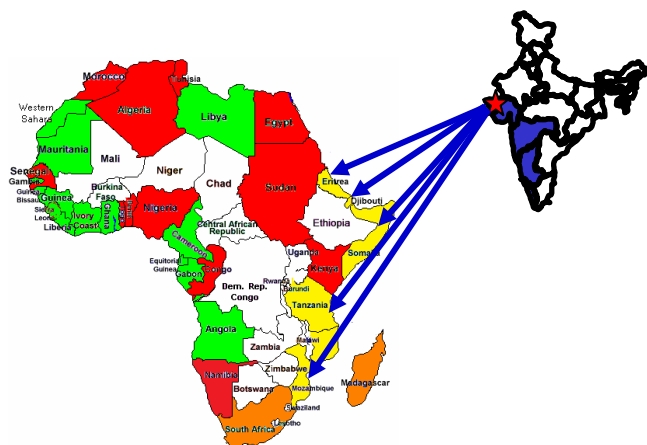
☞ **However, Tanzania likely to turn deficit.**

2010	Country	2015
10.4	Libya	16.8
49.1	Egypt	65.3
3.6	Sudan	5.3
0.2	Eritrea	0.3
0.2	Djibouti	0.4
0.1	Somalia	0.2
3.7	Kenya	5.9
2.5	Tanzania	4.6
1.1	Mozambique	2.4
10.9	South Africa	14.0
0.7	Madagascar	0.8
82.5	Total	116.0

Export from India and setting up of Grinding Units to be restricted to deficit markets on East Coast of Africa.

Setting up of an Integrated Unit to be governed by limestone availability and access to deficit markets.

Competitiveness & Sales Volumes



GU Locations	Competitiveness	Achievable Volumes: Year 2 (mio t)
Eritrea	0.5-0.7	0.5
Djibouti	0.6-0.9	0.5
Somalia	0.6-0.9	0.6
Tanzania	0.6-0.9	0.7
Mozambique	0.6-0.9	0.7

IU Locations	Limestone Resources (mio t)	Competitiveness in export and home markets	Achievable Volumes: Year 2 (mio t)
Djibouti	> 250	0.7 - 1.1	0.7
Tanzania	> 2,000	0.8 - 1.1	1.0
Mozambique	> 4,000	0.8 - 1.1	0.9
Madagascar	> 500	0.7 - 1.0	0.8
South Africa	> 12,000	0.7 - 1.1	1.5

Will face competition from local players as well as exports from **Oman, South Africa, Yemen, KSA, Pakistan, Jordan, UAE, China, etc**, in order of their respective competitiveness.

However, countries like **KSA** are again likely to become deficit by 2015 and may not pose a threat.



HOLTEC

The proposed cement plants (IU and GU) in Africa are envisaged to sell not only in their domestic markets but also to proximate deficit markets.

Short listing in Coastal Africa using AHP

CRITERIA	Inputs	Limestone, Correctives, Blending Material, Fuel, Human Resources
	Markets	Market Reach, Capacity Realization, Demand- Supply Scenario, Import Threats, Export Dependence & Opportunities, Net Realization
	Utilities & Logistics	Power, Transport Infrastructure
	Risks	Political, Commercial, Investment risks, including civil unrest, unfavorable local laws, etc

GU Options with Clinker from India	Inputs	Markets	Utilities & Logistics	Risks	Final Score using AHP	Ranks
Eritrea	25%	13%	16%	4%	16%	4
Djibouti	25%	18%	22%	27%	22%	3
Somalia	13%	15%	8%	3%	12%	5
Tanzania	19%	30%	27%	33%	27%	1
Mozambique	18%	24%	27%	33%	24%	2

Preferred locations for GU

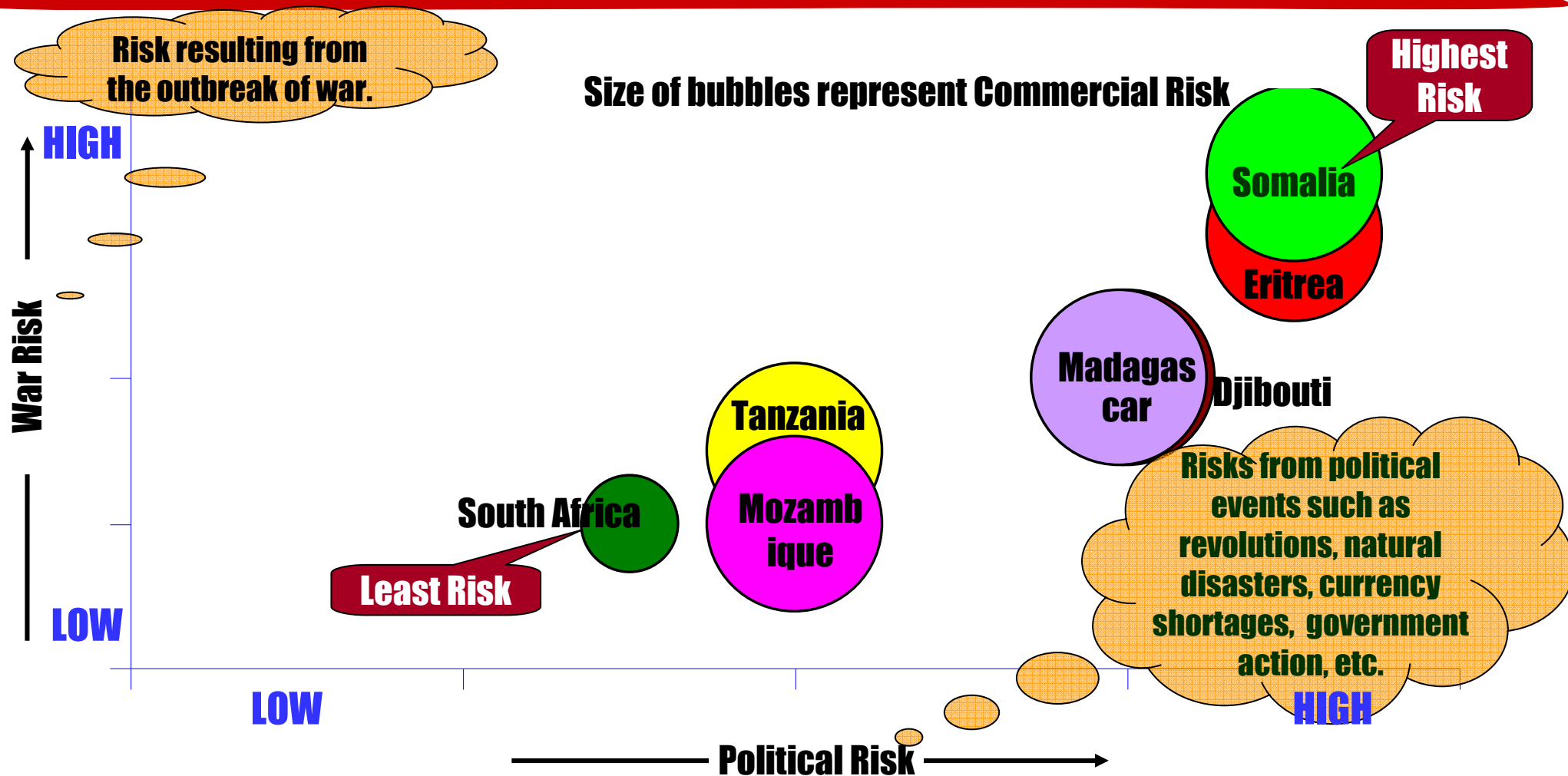
IU Options	Input Materials	Markets	Utilities & Logistics	Risks	Final Score using AHP	Ranks
Djibouti	15%	12%	17%	11%	14%	4
Tanzania	20%	33%	20%	27%	27%	1
Mozambique	20%	20%	20%	27%	21%	3
Madagascar	15%	13%	13%	11%	13%	5
South Africa	30%	22%	30%	24%	26%	2

Preferred locations for IU



HOLTEC

Risk Profile



Commercial Risk

The risk of default by a foreign private buyer. Depends also on macroeconomic and systemic factors impacting the repayment capacity of all the buyers in a country.



HOLTEC

Source: ONDD (Office national du dueroire), <http://www.ondd.be>

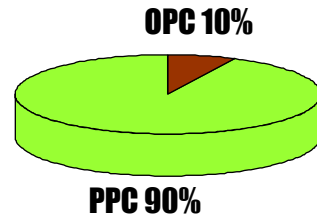
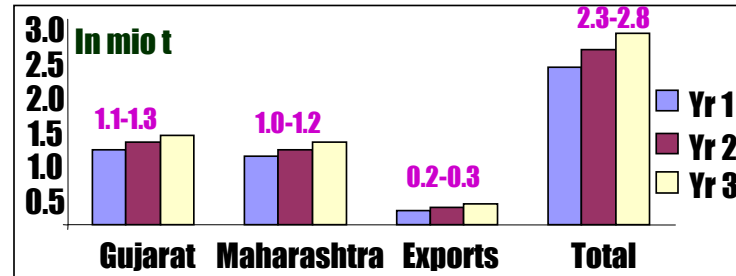
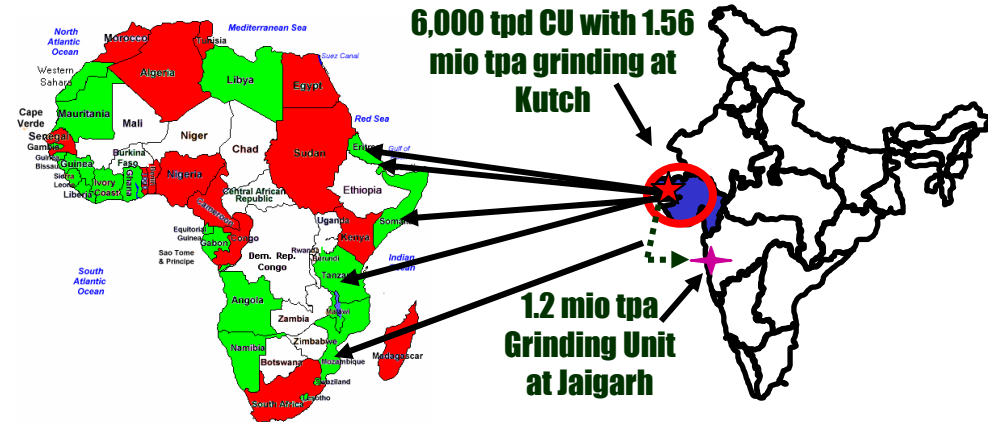
INTERNATIONAL CEMENT CONFERENCE

Cemtech

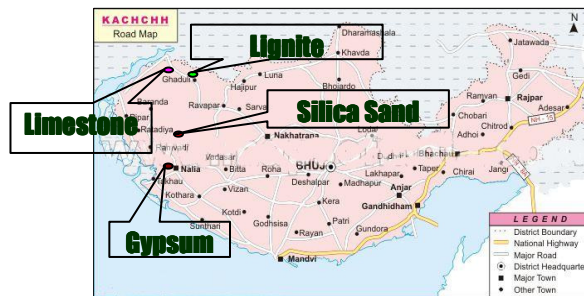
PRODUCTION EXPERTISE - MANAGEMENT SKILLS

Dubai 2011

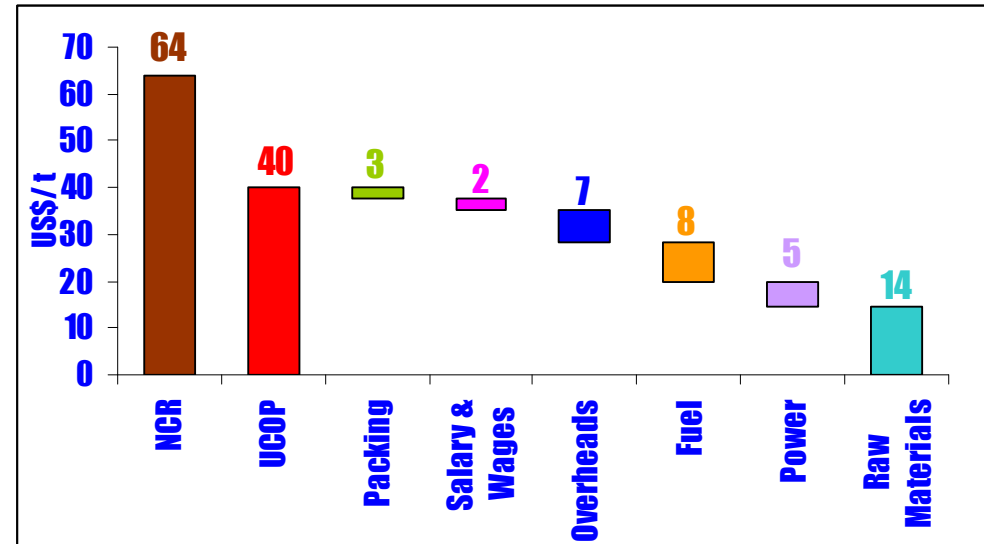
Option 1: Features & Outcomes



Plant achieves 100 % utilisation in year 3 (2016)



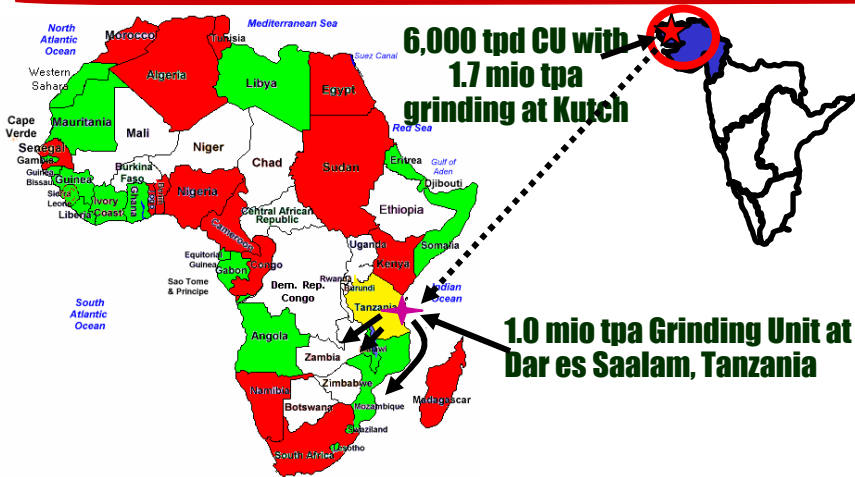
- **Plant Location:** 40 Km from port. Jetty to be built.
- **Limestone Quantity:** 118.5 mio t. **Plant Life:** 37-38 years.
- **Limestone Quality:** CaO : 43 to 50 %. Siliceous and argillaceous correctives required. Limestone high in chlorides, thus requiring a bypass.
- **Fuel:** Locally available Lignite with imported coal (50:50).
- **Power:** Coal/ Lignite based Captive Power Plant.
- **Fly Ash Source:** Near Mundra at a distance of 220 km.
- **Gypsum:** 120 km. **Silica Sand:** 70 km.
- **Laterite and Clay (owned).**



Investment	USD 322 million
IRR	14.7%
NPV @ 12%	USD 60 mio
Pay back	6 Years 1 Months
DSCR	1.46



Option 2: Features & Outcomes

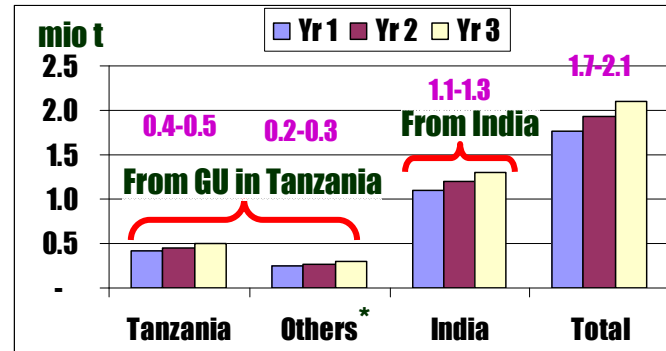


Clinkerization+Grinding Unit at Kutch

- **Plant Location:** 40 Km from port. Jetty to be built.
- **Limestone Quantity:** 118.5 mio t. **Plant Life:** 37-38 years.
- **Fuel:** Locally available Lignite with imported coal (50:50).
- **Power:** Coal based Captive Power Plant.
- **Fly Ash Source:** Near Mundra at a distance of 220 km.

Grinding Unit in Tanzania

- **Plant Location:** 15 km from Dar es Salaam port
- **Limestone Source (for Cem II):** 50 km from Dar es Salaam
- **Power:** Grid
- **Gypsum:** Locally purchased (quarry at Kilwa district of Lindi)

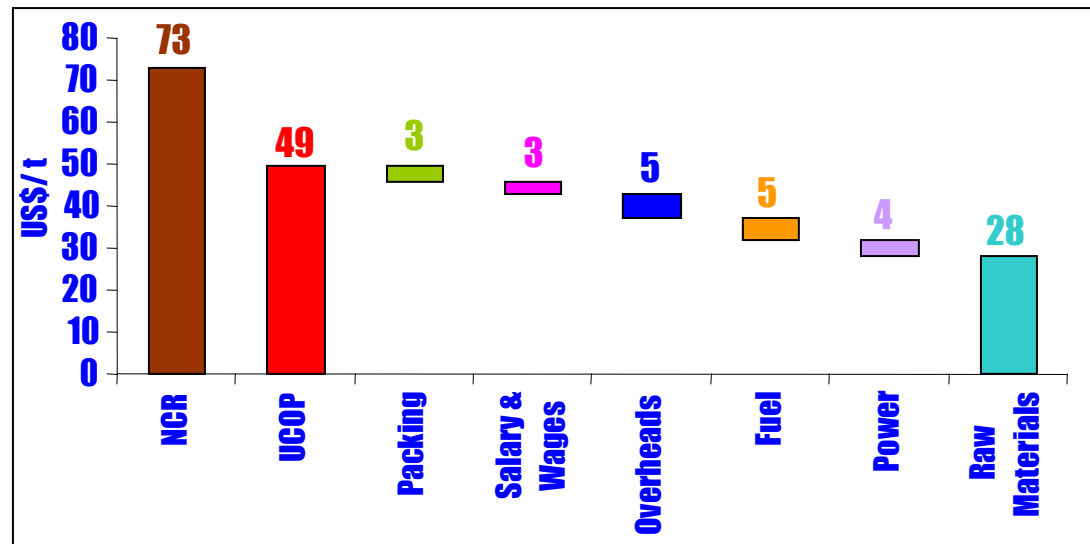


Product Mix

100% PPC in India
100% CEM II in Tanzania

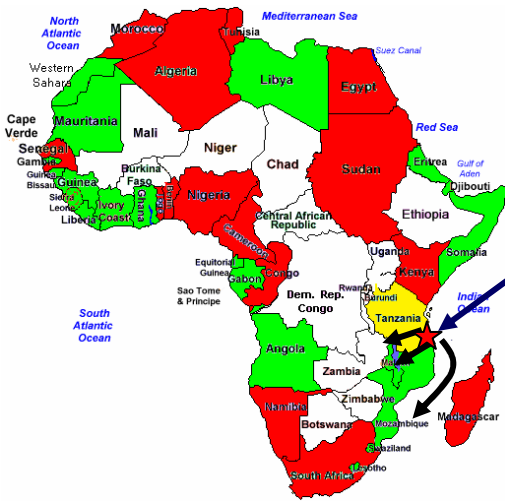
Capacity Utilization
Overall 100% in Yr 6

*Others include Mozambique, Malawi & Zambia

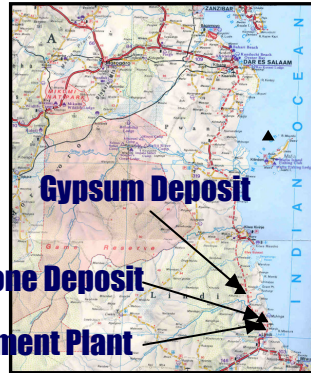


Investment	USD 334million
IRR	13.4%
NPV @ 12%	USD 35 mio
Pay back	7 Years 2 Months
DSCR	1.31

Option 3: Features & Outcomes

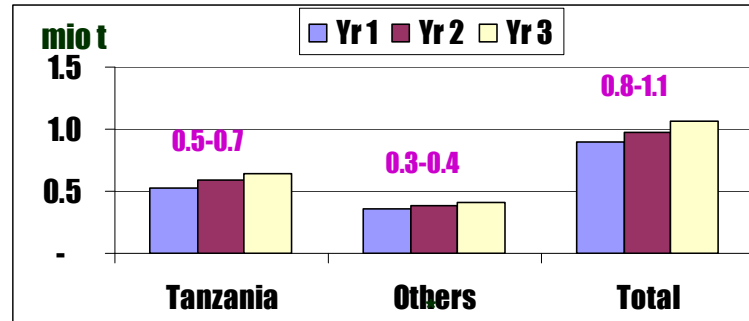


**3,000 tpd CU with
1.24 mio tpa
grinding at Lindi
(Tanzania)**



Gypsum Deposit
Limestone Deposit
Cement Plant

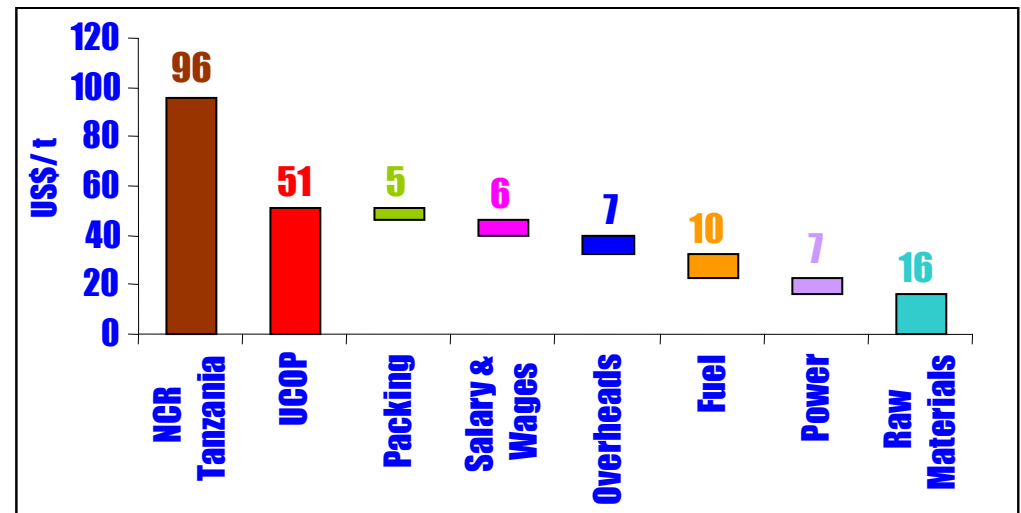
- **Plant Location:** ~130 Km from Mtwara port
- **Limestone Quantity:** >100 mio t. 64 years life.
- **Limestone Quality:** CaO : 52%. As the limestone is high in CaO and low in SiO₂, Al₂O₃ and Fe₂O₃, suitable correctives are required
- **Fuel:** South African Coal
- **Power:** Grid
- **Gypsum Source:** Purchased from Lindi (85 km from plant site)



Product Mix
100% CEM II

Capacity Utilization
100% in Yr 5

*Others include Mozambique, Malawi & Zambia



Investment	USD 203million
IRR	17.7%
NPV @ 12%	USD 96 mio
Pay back	5 Years 3 Month
DSCR	2.12

Financial Comparison of Options

Items	Option 1 (IU + GU in India)	Option 2 (IU in India + GU in Tanzania)	Option 3 (IU Tanzania)
Clinker Capacity (tpd)	6,000	6,000	3,000
Cement Capacity (mio tpa)	2.8	2.7	1.2
Investment (USD mio)	322	334	203
Net Realization (USD/ t)	65	75	96
IRR (%)	14.7	13.4	17.7
NPV @ 12% (USD mio)	60	35	96
Pay back (yy – mm)	06 - 01	07 - 02	05 - 03
DSCR	1.46	1.31	2.12

**BEST
OPTION**

OPTION 3 ranks as the best option :

- It has the highest net realization (30 – 45% better than the other options)
- Although the specific investment cost under Option 3 is the highest, it has better results primarily due to its substantially higher EBITDA margin (47% against 32-37% for the other options).



HOLTEC

Overall Comparison of Options

CRITERIA	Inputs	Limestone, Correctives, Blending Material, Fuel, Power, Human Resources
	Markets	Market Reach, Capacity Realization, Demand- Supply Scenario, Import Threats, Export Dependence & Opportunities, Net Realization
	Financials	Financial results including IRR, NPV, etc
	Logistics	Transport Infrastructure
	Ease of Doing Business	Starting a business, dealing with construction permits, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts, etc
	Risks	Political, Commercial, Investment risks, including civil unrest, unfavorable local laws, etc

Options	Inputs	Markets	Financials	Logistics	Ease of Doing Business	Risks	Final Score	Ranks
IU at Kutch, GU at Jaigarh	39%	42%	31%	31%	38%	44%	37%	2
IU at Kutch, GU in Tanzania	25%	21%	22%	21%	26%	31%	25%	3
IU in Tanzania	36%	37%	47%	48%	36%	25%	38%	1

Conclusions

- ✎ **Exporting cement to Africa, from a plant in Western India, not an attractive proposition. Such dispatches are less competitive as compared to local plants. Thus, only a marginal market share, in deficit markets alone, can be captured.**
- ✎ **A grinding unit in Africa, sourcing clinker from India, is also not very competitive on account of the high clinker freight.**
- ✎ **An integrated unit in Africa makes it a local player, thereby increasing its competitiveness in the market. It can capture a higher market share and achieve higher penetration in the domestic market.**
- ✎ **As compared to India, risks are possibly higher in Africa. However, so too are the returns. Risk mitigation can possibly be achieved through local partnerships.**

Contact Information

Web: www.holtecnet.com

E-Mail : ska@holtecnet.com

Address: **Holtec Centre, A Block Sushant Lok Phase I,
Gurgaon 122 001, India**

Telephone : **+91 - 124 - 2385095, 2392940, Extension 554**

Mobile : **+91 - 9810139149**

Thank you for your attention !



HOLTEC

INTERNATIONAL CEMENT CONFERENCE
Cemtech
PRODUCTION EXPERTISE - MANAGEMENT SKILLS
Dubai 2011