A Strategic Study on the Egyptian Ceramic Tiles and Sanitary Ware Industry
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July 2005
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Abbreviations

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<tr>
<td>ACIMAC</td>
<td>Association of Italian manufacturers of machinery and equipment for ceramics</td>
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<td>ANFACER</td>
<td>Brazilian Association of Wall Ceramic Manufacturers</td>
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<td>ASCER</td>
<td>Association of Ceramic Tile manufacturers of Spain</td>
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<tr>
<td>CAPMAS</td>
<td>Central Agency for Public Mobilization and Statistics (Egypt)</td>
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<tr>
<td>CEN</td>
<td>Comité Européen de Normalisation</td>
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<td>COMESA</td>
<td>Common Market for Eastern and Southern Africa</td>
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<td>DIY</td>
<td>“Do It Yourself”, big store chains</td>
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<td>EBITDA</td>
<td>“Earning Before Interest, Taxes, Depreciation and Amortization”</td>
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<td>EFTA</td>
<td>European Fair Trade Association</td>
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<td>EGP</td>
<td>Egyptian Pound</td>
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<td>EGSMA</td>
<td>Egyptian Geological Survey and Mining Authority</td>
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<tr>
<td>EMUWA</td>
<td>Economic and Monetary Union of West Africa</td>
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<td>EU</td>
<td>European Union</td>
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<tr>
<td>EU15</td>
<td>Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Sweden, Spain, UK</td>
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<td>FDI</td>
<td>Foreign Direct Investments</td>
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<td>FECS</td>
<td>European Federation of Sanitary Ware Manufacturers</td>
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<td>GAFI</td>
<td>General Authority for Investment (Egypt)</td>
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A Strategic Study on the Egyptian Ceramic Tiles and Sanitary Ware Industry

Executive Summary

July 2005

IPI – Institute for Industrial Promotion
Executive Summary

1. Present and future of the world sector

The ceramic tiles and sanitary ware productions start to be industrially organized from the first seventies with a major role played by some European countries, the present leaders in marketing the final product and supplying equipments. Nowadays, the sector is mature, technologies and raw materials are available in the markets and the physical productions are more and more integrated in the global foreign trade system.

Whilst the delocalization of the production capacities from the most developed countries to the emerging economies is important and continuous, the competitive advantages are no more only based on lower labor costs or easier access to natural inputs but rather include the innovation capabilities, the supply chain integration and the capacity to quickly innovate and stay on the trend, building brand images and taking advantage of international networks.

1.1. Flows in production, consumption and foreign trade

The world ceramic tiles industry grew in 2003 by 5%, accounting for a total output of more 6,000 million sq. m., a consistent rate if compared to the world GDP growth of 2.6%. In other words, every year the market potentially receives 350 million sq. m., more or less four times the yearly Egyptian production. Both ceramic tiles and sanitary ware world markets are expected to grow yearly by about 7% in the next five years.

During the three-year period 2005-2008, the ceramic tiles market will increase in Western Europe area, with a total production of 600 million sq. m. over the period, thanks to building sector growth. In the Eastern European market, in the next four years the main results will come from Russia, which will achieve an estimated total production major to 130 million sq. m. China will remain the main producer whereas Brazil is likely to become the third top player, after Spain and before Italy. Among the top exporters, Italy and Spain are far from losing their global leadership, although their dynamic is slowing down.

Also in the sanitary ware sector, China and Russia are the countries that will show the most rapid growth in quantitative terms over the four-year period 2005-2008. The Chinese giant production at the present time is 60 million pieces, of which 18 million pieces are exported, and it is expected to increase by about 20 million pieces in the next years (while the expected

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1 According to recent forecasts by ASSOPIASTRELLE (Association of Ceramic Tile manufacturers of Italy).
growth of other countries is all well under 5 million pieces). The sanitary ware production of Russia, Turkey and India will continue to increase within a range of 1.5 to 3 million pieces, while the production volume of Italy, Great Britain and United States will find an equilibrium point around 1 million pieces.

From a global point of view, like in many other sectors, Asian countries are expanding their economic weight while consolidated industrial systems are losing market shares (for the first time in their history, Italian and Spanish performances both in production and export are worsening) and some countries definitely succeeded in accessing the most profitable markets. It is the case of Brazil, which is the fourth world exporter with a consolidate presence in the north American market, while Turkey developed an export production for the European market and got to build a productive capacity in Eastern Europe to better approach the market. These are, without any doubts, case of success.

At a regional level, if Asia is the most dynamic area, the Mediterranean and Middle East is becoming a region of great importance in terms of:

- Consumption, because of both rich markets (i.e. Saudi Arabia is the fourth importing country in the world) and fast growing populations (North Africa);
- Production and export, thanks to the rise of successful competitors such as Turkey and UAE but also in sight of new regional players like Iran and Morocco (both of them are building important production capacities).

A consolidated world trend is the specialization in either the sanitary segment or the tile segment: the main international players tend to focus on one production and the relevant industrial organization appears very different. The sanitary ware production is dominated by a dozen of world leading groups that in 2004 accounted for about 43% of total world production (the giant producers American Standard and Roca control 10.2 and 9.7 respectively). These large international networks can allocate different shares of their global production among the different companies that belong to the group taking into account important factors such as the competitive advantages of each company in terms of internal costs, the costs of transport, the barriers to trade that force the group to control a local installed capacity to sell in specific markets, the national fiscal policies. All these elements can make profitable to expand production in one country and reduce it in another, depending on the corporate strategies.

Many developing countries completed the phase of acquiring the “state of the art” technologies, built a surplus of production capacity with regards to the domestic demand and are now to start exporting towards neighboring markets, sometimes through the network of large companies. A remarkable exception is China, which is exporting both the final product

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2 According to forecasts by BSRIA, an independent research and consulting institute.
and the technologies it has been developing in the last years. This is going to restrict the market shares of the two global players Italy and Spain, also in the technology and glazes supplying.

1.2. Market evolution and consumption patterns

For developed countries it is of course inconceivable to compete with emerging countries on lower market segments where consumers’ choice is mainly driven by price; the extremely low labor cost of these countries provides them with a strong competitive asset. So, for developed countries it has been necessary in the latest years to shift production towards higher quality ranges with more remunerative prices. If the most profitable companies are those that succeeded in achieving high-segment product ranges, this strategy cannot be pursued by all companies.

Another strongly characterizing aspect of the ceramic and sanitary ware market is its limited exportability: these products are really heavy and bulky, requiring high transportation costs. In addition to that, storage room required for these products is really much. Finally, there is the cultural aspect, sanitary ware and ceramics reflects the taste and local habits, so producing for foreign markets means to study and customize products for different cultures.

For manufactures in every country, in order to operate in the most advanced and remunerative markets it will be increasingly important to establish a loyal sales network and a brand name that is recognized and respected by industry professionals. The cost of maintaining a market presence is gradually increasing, and it is an advantage for larger companies and groups.

Another important component to be considered when analyzing the ceramics and sanitary ware market is the link with other sectors, in particular with the building market. A really explanatory example is offered by China where in the next years 1 billion square meters of new real estate is expected to be built, with another 1.6 billion square meters needing renovation.

In many markets the wholesale channel is the most important channel. Being oriented to the professional customer (the installers), it requires a deep respect of quality standards (both national and international). Foreign producers can find difficult to enter such a market, because of the strong and well established links between producers and national distributors that control the sales network. Special conditions (discounts and credits) are normally agreed with the small installer.

The DIY\(^3\) channel is becoming more and more popular in Europe and in other markets, even though in many countries the sales are traditionally influenced by the installer and the final user is still to become familiar with buying tiles and WCs by himself in large stores at the outskirt of the town. For manufacturers that try to enter a foreign national market, the DIY

\(^3\) “Do It Yourself”, big store chains.
channel can offer more opportunities. For these resellers the national quality certificates are of less importance, since the individual buyer is more cost-driven, while the quality marks are strongly expected by the wholesale dealers that sell to professional customers and building companies. Also the required level of service is bigger among the wholesale market. This means fewer barriers to trade for new and less renowned producers with a small appeal for the world of architects and “bathroom boutiques”.

The presentation of sanitary equipments completed by furniture and coordinated accessories, initially developed to support the corporate image and the products, gradually it has been transformed in a specific business. The success of these modalities of offer (“total concept”) requires an improvement of the logistic aspects, with particular reference to the coordination of the delivery times through the entire supply chain of productions and outsourcings.

In ceramic tiles two different kinds of trends are generally spreading, dimensional increase of tiles and imitation of natural stones, whereas the evolution in sanitary ware ceramic products is almost fully trained by trends in design. When the bath environment is considered as a whole, the combination of ceramic, synthetic materials, wood and metals leads to innumerable variations that make the entire sector supply chain more complex and changeable.

1.3. Technology and quality

The technology for producing tiles and sanitary ware can be considered mature and available on the market, with the main innovations due to the expansion of ICT applications. Nonetheless, a decisive role in the ceramic tiles production cycle is still played by the quality of raw materials. The actual trade-off is between the characteristics of raw materials for bodies:

- “Red body” – it can generally be realized in most of the countries with local raw materials, requires lower investments in fixed assets and other productive factors but it does not support the larger formats, technical top performances and the more sophisticated color treatments;
- “White body” – few lucky countries (i.e. China and Turkey) have the local raw materials to produce it whereas the rest of the manufacturers must import; it allows to make any format and reproduce any esthetic effect, with an average better quality (stability); by contrast, the white body is more demanding in terms of fixed assets and consumptions (i.e. energy).

The manufacturers willing to offer a quality suitable to approach the medium-high price segments have no choice: they must produce white body and start to control changeable elements such as trends and fashion. In facts, it is a question of entering the most profitable markets segments taking up the challenge of bearing higher investments and costs. Some countries adopted this strategy some years ago and are nowadays top quality leaders (Italy). Others are in a transition phase, realizing different levels of quality according to different
destination markets (i.e. a better quality for export) and improving the “perceived value” of their offer in the global market. Finally, other countries are completely tied to a low quality production, mainly for a domestic demand, that excludes them from the global market.

As regards the sanitary ware production, the main trade-off concerns the automation level, rather than choices in raw materials: labor intensive processes leverage on the cost advantages of developing countries but, in all the production phases, manual activities prevent from reaching the higher levels of quality need to respect the international standards. Developing an export quality generally requires adopting more automated systems.

1.4. Supply chain integration: raw materials and feeding industries

The world best practices identify in the integration of the industrial system a key factor for the success of the ceramic sector, where the most innovative countries are those that have a production chain that embraces tile and sanitary ware producers and suppliers of technologies, glazes and other materials. Countries with a system capable of producing all or part of the necessary expertise are capable of independently generating product and process innovation and have the potential to become product leaders and therefore market leaders. Despite a stable internal production, Italy remains the world leader in terms of innovation and trend setting. This is partially due to the extension and depth of the Italian ceramic production chain, with a district based industrial structure where innovation quickly spread among manufacturers and technology and materials suppliers and distributors. If Spain too has built-up another integrated supply chain, the Chinese industrial system seems to have the most comprehensive approach, including a competitive manufacturing process as well as an increasing supply in technology and other inputs. For example, the suppliers of glazes and frits are ready to export, and they can be already found among global suppliers in Egypt, too.

Improving the local supplies of raw materials in terms of quality (stability) is a factor of success for any country, allowing savings in production costs and providing a better control of the technological cycles and final quality. On the other hand, developing local supplies of non natural inputs (i.e. glazes for tiles or dies for sanitary ware) is vital to provide a local industry with the needed complementary services which the suppliers offer, such as product development, support in defining the product range and a constant monitoring of the latest achievement in technologies and materials for ceramics.

2. The Egyptian Ceramic Tiles and Sanitary Ware Industry in the international context

Background

The sector development came to an overall satisfaction of the internal demand (a complete satisfaction for the sanitary ware) and in the late 1980s Egypt stopped to be a net importer,
building a little presence in the international markets. This is without any doubt a tangible case of success for the Egyptian industry. The production started in the late 1950s with public investments and consolidated by the efforts of private local investors, formerly ceramic tiles importers or traders, attracted by a fast growing internal market, good levels of profitability and a certain availability of raw materials.

2.1. The importance of the sector
The sector contribution to the Egyptian macroeconomic indicators is important as regards the total turnover (about 300 million $ in 2004 which account for 0.4% of country GDP) and the export turnover (about 60 million $, 20% of the total sector turnover and 0.35% of total Egyptian exports). Concerning the labor force, the sector directly employs around 25,000 persons distributed over 17 companies, accounting for about 0.5% of the total industrial manpower in Egypt (about 5 million). With the current expansions in the factories, about 10,000,000 m² per year between 2005 and 2006, an expected 1000 employees will join this sector. The average gross wage (considering both ceramic tiles and sanitary ware sub-sectors) is 12,000 EGP per year per employee, with total amount of 300 Million EGP per year. Concerning the intra-industry impact, the indirect employees working in related fields such as natural raw materials, packaging, transportation, trading and installation are considered by 75,000 employees (three times the labor force directly involved in final manufacturing) with approximate total gross wages of 500 million EGP per year. The consumption amount of internal raw materials is approximately 20 Million EGP per year.

2.2. Main issues for the sector and findings from the international benchmarking
Industrial organization, productivity and costs of factors
The Egyptian industry appears very concentrated as regards other countries, with 10-12 companies controlling each sub-sector (ceramic tiles and sanitary ware). The corresponding average production per company is only lower to UAE (where there are only three active manufacturers), while Brazil and Turkey present a more differentiated structure with companies only focused on the internal market and others deeply export oriented.

4 According to International Monetary Fund, Egyptian GDP in 2004 was 77,032 million (current $), while the exports of good and services were about 17,000 million (current $).
5 The benchmarking exercise considered the following countries: Turkey, Brazil, UAE, Iran and Morocco. Data about productivity and profitability are also referred to Italian and Spanish industries.
Concerning the integration in the global supply chain and international flows, Turkey has well established links with foreign producers and distributors and focus actively in installing production capacities in the target markets (especially East Europe) in order to better control them. The collaboration of Egyptian manufacturers with international groups is limited to the sanitary ware sector (where the barriers to entry the richest markets are higher and networks are essential to access sales organization) and this is a serious issue for the industry.

The low level of automation makes the Egyptian industrial productivity (the output per industrial worker) for tiles the lowest among the benchmarked countries (8,000 sq. m./year, similar to Iran but almost half the Turkish value and even lower than the Moroccan industrial productivity). The productivity gap between Egypt and the other countries in sanitary ware is lower, due to the general higher labor intensity of the sector (the Egyptian productivity account for less than 1/5 and more than 1/3 of the Spanish productivity respectively in tiles and sanitary ware). The global per capita productivity, which includes all the companies employees (in administration, logistics, sales and marketing etc.) reflects a bad performance also in areas other than direct production. The lack of productivity is partially balanced by the lowest cost among the relevant countries: compared to Turkey, the Egyptian full cost is almost half in tiles and even 1/3 in sanitary ware (for instance, Egyptian salaries and wages are the lowest in the region, only slightly higher than in Iran).

Technology, quality and raw materials

The best performer in the technological field is UAE, where the investment flow in upgrading the production facilities is continuous and, sometimes, the manufacturers adopted the latest innovations even before the Italian world leaders, strongly investing in automated systems and robot machines both in lines and in other areas, such as packaging. Turkey is at the moment more focused in replacing old equipments than expanding production, also by using highly capital efficient technologies (i.e. in the sanitary ware production) in order to achieve savings in the depreciation costs. Iran is installing an important production through high capacity plants.

Compared to other countries, the Egyptian production shows a good technological endowment, even though the dominant technology in the Egyptian tiles factories seems not to be fully focused on cost reductions: experiences from other countries clearly show that the latest technology may not be the most effective one, when the global cost structure is considered. Egyptian manufacturers could further reduce their costs through a combination of latest and “old” technologies. In such a framework, the dry cycle in manufacturing tiles represents a valid choice to contain the energy, water and capital costs, following the example

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6 Spanish production shows the highest outputs per worker, both in tiles and sanitary ware, and can be considered a “productivity benchmark” for the industry.
of Brazilian manufacturers which maintain a consistent production capacity base on this kind of process. Particularly interesting for the Egyptian applications, is the use of dry grinding to minimize the poor quality (in terms of constancy) of the raw materials: it could be a contribution to overcome one of the main concerns the local manufacturers complain about.

Higher levels of automation are required in the Egyptian sanitary ware production to maintain higher quality standard and, in general, increase the productivity per worker.

**Prices and profitability**

Egyptian prices are the lowest in the region: a little more than 3 $ per sq. m. for tiles and around 6.5 per piece in sanitary ware (where the gap with the other countries is higher). This clearly affects the profitability in both sectors but stands for a way of protecting the internal market against potential competitors and, in the medium-long term, could be the basis to enter the richest markets positioning in the lower cost price segments.

**Access to foreign market**

Compared to countries such as Turkey, Brazil or UAE, Egypt has the lowest share of export on the total output and the lowest selling price. Apart from figures, the access to foreign markets is one of the most serious issues for the sector. The local manufacturers did not developed a clear and coherent strategy to export: low quality sales to neighboring countries are common, no strong link with international dealers and operator exist, no clear orientation towards the retail market or other channels. This makes the perceived value of the Egyptian product very low among the world trader and manufacturers: Egypt cannot be considered a global player in the ceramic market.

However, lessons learned from the international context are important. Successful experiences from Brazil (a long period of self-making growth to penetrate the USA market) and Turkey (a fast growing in volumes through low cost sales organization) show that achieving strong export performances is possible and there is not an only possible strategy.

**3. SWOT Analysis**

The main elements of the SWOT (strengths, weaknesses, opportunities, threats) analysis result from the assessment of the Egyptian industry compared with the other country experiences.

**Strengths:**

- The sector shows low labor costs, compared to regional and developed countries;
The other production costs are generally lower than in regional competitors;

Availability of local raw materials at reasonable prices (more important for sanitary ware);

Important installed capacity, as a basis for diversifying production and sustain development;

Overall satisfaction of a growing domestic market.

Weaknesses:

- Low productivity, both in industrial processes and other business activities;
- Low automation (especially in sanitary ware);
- The internal raw materials supply suffers from inconsistency and, in general, the raw materials management need consistent improvement in quality;
- Low supply chain integration, with a lack of an effective internal sub-sector providing glazes to the tiles industry and other non natural materials to the sanitary ware sector;
- Low overall quality of final products and customer relationship (constancy, packaging, respect of international quality targets, lack of “culture” for services, etc.);
- Deep dependency on the local market and little international experience;
- Shortage in some categories of skilled people (the sector needs a middle management and expert technicians);
- Low diffusion of information about the sector.

Opportunities:

- Delocalization of global production (many developing countries succeeded in attracting industrial investments from the international players);
- Closeness to European markets;
- Sourcing globalization (i.e. the DIY organizations are more and more competing on cost bases and their procurement departments are continuously looking for reliable foreign vendors);
- Adoption of low cost production processes;

Threats

- Reducing barriers to entry the local market;
• Aggressive new competitors;
• Strong increase of the regional installed capacity (i.e. Iran, but also other North-African countries);
• Global trend towards improvement of the overall products quality.

4 Strategy and Action Plan

4.1. Vision and strategic areas for the period 2005-2010

The important results achieved by the sector over the last decades have been compliant with the general trend of the Egyptian economic development towards the private sector growth and the industrial modernization. The sector can rely on a promising production capacity, a good technological endowment and diffused technical skills. Less important outcomes have been obtained in the field of export and exposition to international competition, where the local output cannot boast a strong international reputation and an appreciated value in the most developed markets. As a matter of fact, a long period of protection consolidated the internal market and offer, taking away the international competition and favoring a general bias of the Egyptian manufacturers for the domestic demand. The result has been a "consumption driven" production capacity, with new investments and growth strategies mainly focused on the (captive) local market development to seize economies of scale.

With the continuous progression of trade liberalization, regional integration and tariff and non-tariff cutting, the inputs which favored the sector growth are now becoming elements of threat. The ceramic industry is very crowded of developed and emerging competitors aiming at expanding their international presence and taking advantages of the global market. According to the Association Agreement with the EU (ratified by the Egyptian Parliament in April 2003), Egypt will have to gradually phase out all tariff and non-tariff barriers against manufactured imports from the EU within a transitional period which will end on 2015 but many sectors will start feeling the effects of liberalization before. The beginning of next decade appears an appropriate deadline to make the ceramic tiles and sanitary ware industry ready to fully compete in the new integrated context.

The vision of the Egyptian sector should consider the following few objectives to achieve a competitive positioning by 2010 and get ready to stay on the market with no protection levels.
a) Strategic area: **Upgrade production**

**Specific actions:**
- Adopt low cost cycles
- Improve quality

The individual companies can improve their competitiveness by making the best of the technologies available on the market, strengthening the undeniable competitive advantages based on the labor cost. It means that each investment decision in new equipments should be taken considering the quality target segment to reach by the final product. The local market could be served with lower costs and a better quality, strengthening the competitiveness of the Egyptian companies against low cost foreign producers. The world industry is rich in examples of further reduction in the overall production costs by adopting different technologies for different levels of final quality (i.e. using dry cycle processes for the ceramic tiles manufacturing, also to dramatically improve the efficiency and first choice yield). For the sanitary ware sub-sector, particularly needed is an increase in the automation level.

b) Strategic area: **Access European markets**

**Specific actions:**
- Export marketing
- Product development

External markets should be considered as a resource and not only as an outlet market for residual production or a source for foreign currency to feed the raw materials procurement. At least for the most dynamic Egyptian players, reducing the dependency from the local market is an option for diversifying risks and increase profits. Moreover, a general diversification the export increasing the presence in the European market is required, by implementing integrated actions in the production field as well as in the marketing and sales approach. In fact, the Egyptian manufacturers have the potential to better perform in both areas: on the whole, the technological endowment allow to develop new and more profitable products, while accessing the richest markets is mainly a problem of organization, commitment and investment in human resources.

For the sanitary ware manufacturers, the main objective is to collaborate with the international groups which control the world market: only three of them are represented in Egypt and there is room to attract other important operators by the local competitive advantages as well as providing a better environment for the investment (the third strategic area deals with this issue).
Entering European markets will be easier by approaching innovative channels such as the “Do It Yourself” sales organizations, more willing to source from new emerging actors (this channel accounts for 50% of the market in France, 55% in Germany, 40% in UK). This requires a set of prerequisites well known to the successful players (i.e. Turkey):

- Develop an “export” production, according to the European consumption patterns: larger formats, natural stone effects (marble-like, granite-like etc.) for tiles, “total concept” solutions including an integrated offer for sanitary ware and tiles, “western” modern design for sanitary ware pieces;
- Improve the quality of the final product reducing the manual phases (especially for sanitary ware);
- Improve the packaging phases, by a higher use of automated activities;
- Respect delivery times.
- Access the marketing channels managed by the multinational groups in the sanitary ware sector.

c) Strategic area: Improve and modernize the sector

Specific actions:

- Improve the domestic raw materials production
- Build an effective local sector for glazes and other non natural materials feeding the final product industry
- Improve the availability of skilled people
- Establish a Ceramic Industry Development Center
- Promote FDI approaching international groups

A set of actions affecting the overall sector must be considered in order to reduce the cost of factors, provide better inputs for the industry, develop complementary segments along the supply chain, provide an institutional guidance to maintain the focus on strategy, provide the public support and monitor results. This part of the vision requires a strong commitment by the public authorities as well as by the private actors and it could be the most difficult to achieve. On the other hand, it is likely to produce the most important effect with regard to FDI attractiveness (that is vital especially for the internationalization of the sanitary ware production) and promises important outcomes for the Egyptian economy, including an increased and more qualified employment and a more diversified production.

Specific programs for FDI attraction can also be considered a benefit for the entire sector, although the study suggests an action in this field mainly to allow Egyptian companies to
enter the most developed markets (i.e. Europe). FDI are an essential way of international growth especially in the sanitary ware sub-sector, where the global market is dominated by a small number of big players which build (or “buy”) production capacities all over the world in order to get market shares in growing markets as well as to re-export outputs leveraging on the cost advantages that many developing countries can offer. If the tiles producers have the potential to find their own way to the richest foreign markets by increasing the quality and implementing effective export strategies, the sanitary ware manufacturers are prevented to enter the developed markets by the absolute market power of the giant corporations (the main international groups in the sub-sector are analyzed above, in chapter one). These companies have a deep link with national sales organizations (retailers and large distributors) and their brands often represent an insurmountable barrier for standing alone foreign producers to entry local markets. Therefore, establishing a durable relationship with the big players is the main way to enter the sanitary ware global market.

4.2. Achievable results

At the end of the period 2005-2010, the proposed strategic approach could draw the following scenario for the ceramic tiles and sanitary ware industry:

• Total output: + 60% (from about 300 to about 450 million $)
• Export: + 100%
• % of export on total output: 25% (the current percentage is around 20% whereas the corresponding share for Turkey is around 40%)
• Employment in the sector: + 50%
• Employment along the supply chain (intra-industry sectors concerning raw materials, glazes and other materials, transports, packaging, trade etc): + 50%

Among the other cautious assumptions that feed the above forecasts, the following should be highlighted: the internal sales grow at 7% rate per year (compliant with past growth in Egypt and forecasts for the world sector) but the export progressively performs better; the export price will not increase in the period; direct employment and intra-industry employment will grow to sustain the increased output but less than proportionally, considering improvements in productivity.

4.3. Action Plan

The study includes a detailed action plan to progressively implement the strategy considering the relevant stakeholders, the key success factors, the period when each action will give the
first effective results (short/long term and priorities) and how to protect the internal market in the next few years, waiting for the positive effects of the overall integrated strategy.

**First phase: short-term (1-2 years)**

- Adopt low cost cycles (defensive action);
- Improve the quality (defensive action);
- Start proactive export marketing;
- Develop specific products for the export.

The above actions are mainly in charge of the individual manufacturers, affecting their internal operations and investments decisions. Moreover, the defensive actions are likely to produce effective results in terms of better positioning the local industry against potential competitors from abroad and, therefore, these actions should be implemented as soon as possible in order to prevent the local manufacturers from losing shares within the internal market. On the other hand, starting activities to increase the export both in marketing and in production fields is a necessary step to achieve better export performances in the second phase.

**Second phase: long-term (3 years and after)**

- Create a Center for the ceramic industry development and deliver institutional support to local manufacturers;
- Promote FDI approaching international groups
- Improve the local raw materials production;
- Build an effective local sector for glazes and other material feeding the industry;
- Improve the availability of skilled people.

Although the long-term actions should be planned in the first phase of the strategy, their complete implementation will take more time than the short-term activities and the practical outcomes will be appreciated in the second phase.
INTRODUCTION

The Industrial Modernisation Center Egypt (IMC) has commissioned the Italian Institute for Industrial Promotion (IPI) to execute a strategic study about the Egyptian ceramic tiles and sanitary ware sector, within the framework of a series of studies aimed at supporting the development of an overall Egyptian industrial strategy.

The main objective of the study is the formulation of a strategy and a consequent action plan for the upgrade and the new global competitive positioning of the Egyptian ceramic tiles and sanitary ware industry.

This report contains the findings of the study and is divided in different chapters:

- Chapter one introduces to the world sector;
- Chapter two assesses the present condition of the ceramic tiles and sanitary ware industry in Egypt;
- Chapter three executes a benchmarking exercise between the Egyptian sector and the corresponding industries in different countries;
- Chapter four summarizes the elements of a SWOT analysis of the Egyptian sector;
- Chapter five identifies a development strategy and formulates a plan of action.

The main comments made during the study final presentation by the stakeholders have been included into the sixth chapter.

7 The study was presented on 30th June 2005, during a conference at IMC in Cairo.
1. CERAMICS TILES AND SANITARY WARE IN THE WORLD

1.1. Objective and methodology

Like many other industries, also the ceramic sector is currently affected by the important and changeable forces of globalization. Therefore, an assessment of the world industry is needed in order to identify the global framework any competitor has to face and most of the issues this section includes will be the necessary basis for discussing the competitive positioning of the Egyptian sector and defining an adequate development strategy.

After a brief introduction to the products analyzed by the study, the first part of the chapter deals with national aggregates in order to analyze the current sector situation and investigate possible developments trends for macro-categories such as production and consumption.

Then, the chapter goes on with an analysis of the key elements any producer has to deal with to seize and maintain competitive advantages. Issues related to marketing and sales as well as to operations and production are discussed, aiming at highlighting some factors that will be focused when designing strategies for Egyptian industry. For this reason, special attention is paid to elements affecting export performances.

The data collection considered as the most reliable source the main sectoral associations, such as the Italian ASSOPIASTRELLE (including the ceramics manufacturers) and ACIMAC (which involve the technology suppliers for the sector) and the Spanish ASCER⁸. Other important repositories of data and analysis are the most recent studies about the industry which are published by sectoral magazines, national and international agencies for industrial development, institutions to support

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⁸ See the Bibliography section.
the export etc. At the moment, the latest official data about the global sector concern year 2003. When available, anticipations about years 2004 and 2005 have been included, together with forecasts for next years (see below: “Latest results and forecasts for ceramic tiles and sanitary ware sector”).

Usually, data on production, consumption and foreign trade are scattered across resources and sometimes contradictory. This limit affect more the sanitary ware sector than the ceramic tiles, because of the general use of measures of weight that make comparison across years and country uncertain. Dealing with “pieces” (of basins, WCs and so on) replicates the same difficulty. For ceramic tiles, the European industry has an excellent control of its internal market and traditionally provides reliable data and prospects.

1.2. Main product types

An analysis of the ceramic tiles and sanitary ware sector cannot do without an introduction to some fundamental market and technical classifications. Deepest technological issues will be discussed in the rest of the study.

Ceramic tiles

Tiles are today one of the most used material for flooring and covering. Normally the applications are relevant for the bath and the kitchen spaces, but the adequate floor tile can be placed also outside, like street pavements or the covering of buildings.

The first great differentiation is between glazed and unglazed tiles. Glazing consists in a complex layer of one or more glasses, variously colored and decorated, that allow creating a huge range of colors, designs and shadings. The unglazed tiles normally have an aesthetic uniformity in their entire surface.

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9 Centre for the promotion of imports from developing countries (2001)
The mixture of the materials that are involved in the production cycles is very varied and usually depends on the availability of natural resources where the production takes place, first of all, for the clay. We distinguish between red body and clear or white body. The clay, important part of the support, is responsible of the characteristic color of the bottom.

All tiles are available in various shapes and measures, with the square shape as the most frequent, followed by the rectangular one. But there are octagonal or hexagonal tiles and many other types. The dimensions vary from small squared tiles for mosaic (1 cm of surface), until slabs of more than one meter. On the other hand, the thickness can vary from 4 millimeters until 30 millimeters.

The “gres porcellanato”

It is one of the most used materials for paving. The gres porcellanato is composed by a mixture of raw materials similar to those employed for the sanitary ware. It is extremely resistant, hygienic and aesthetically similar to marble products or to the granite, because of its vitrified surface that makes the tile completely water-repellent, smoothable and with high characteristics of mechanical resistance. This vitrification becomes part of the tile structure so that it that does not need to be glazed. This makes the gres porcellanato suitable to pavements of every type, in particular those much trampled (i.e. in hotels, restaurants and other business locations).

The gres porcellanato is available both in polished and opaque version. The more common formats are medium-large, 30x30, 40x40, 45x45 cm. For heavy-duty applications, with high thickness and small format, dimensions are 10x10, 15x15 and 20x20 cm. The porcelain gres is also indicated for external pavements, obviously in a not polished version.
Tiles in single or double firing

When the production process is performed with the contemporary firing of the support and the glaze, we talk about “single firing”. In this way the superficial part of the tile is fired and tied to the support.

The “double firing” is characterized by a separate firing of the single not glazed support and by a separate phase of glazing. The process can use a more resistant support or cheaper raw materials. These tiles differ for the typologies of used support, that can be more or less porous and can be of red body (clay with iron oxide) or of clear body with tonalities that vary from the gray to the beige (clay lacking in iron). The effects are infinite: marble-like, country style, opaque, polished etc.

Sanitary ware

A standard product classification in sanitary ware is as follows:

- Main pieces: WC, basin, lavatory;
- Larger bathroom pieces: shower tray, bathtub;
- Other pieces: bidet, pedestals, washbasins and WCs for communities and for disabled people, etc.

The material employed for the realization of the sanitary products in ceramics (vitreous china, fire-Clay, fine fire-clay) determines the characteristics and the final destination of the product. The vitreous-china is the ceramic material similar to the china used for the production of the four classic bathroom pieces (WCs, bidet, washbasin, and pedestal). The fire-clay, a porous material, is used for the production of pieces of greater dimensions and weight, such as the shower tray, the countertops, the lavatories for the kitchen, the public washhouses for communities, etc. For these products, the acrylic components are an important alternative raw material.
1.3. Production

Ceramic tiles
Again in 2003 the ceramic tile industry achieved positive results at a world level with increases in both production (6,030 million sq. m., up 5% on 2002) and consumption (up 5.5% on 2002). Latest forecasts for the next years suggest a global market growth of 7%, both for tiles and sanitary ware (see below: “Latest results and forecasts for ceramic tiles and sanitary ware sector”).

Figure 1.1: Total world production in ceramic tiles.

![Graph showing total world production in ceramic tiles from 1999 to 2003.](graph.png)

Source: Authors’ elaboration on ACIMAC data

The two leading countries Italy and Spain went against the general trend and experienced a decreasing trend in both production and exports for the first time in their history.
The geographic distribution of the world production underlines – once again in 2003 – an apparent predominance of the Asian area in relation to other productive areas among which the European Union stands out with 23.6% of world production followed by the Center-Southern America with 10.8%.

**Figure 1.2: World manufacturing areas in ceramic tiles (2003)**

![Pie chart showing percentage distribution of world production across different areas.](image)

*Source: Authors’ elaboration on ACIMAC data*

Analyzing the data referring to the productive trend of the single/individual countries concerning the period 1999-2003, the excellent performance of the Chinese giant’s can be observed. Chinese production increased from 1,600 million of sq. m. in 1999 to 1,950 million of sq. m. in 2003, accounting for over 32% of the world production of ceramic tiles.
In the same year, Italy saw a fall in production for the third year running (from 632 million sq. m. in 2001 to 606 million sq. m. in 2002 and 603 million sq. m. in 2003) and a fall in sales for the second year running (from 620.1 million sq. m. in 2001 to 608.4 million sq. m. in 2002 and 588 million sq. m. in 2003). Again in 2003, Italian sales were lower than those of Spain (for the third year running).

Spain’s production totaled 624 million sq. m. (compared to 651 million sq. m. in 2002), while total sales reached 661 million sq. m. compared to 677 in 2002.

The domestic market continued to expand and Spanish companies reported domestic sales of 335 million sq. m. (315 million sq. m. in 2001).
Box 1: Italy and Spain in ceramic tiles

Spanish production and sales remain higher than those of Italy, while the average price is lower (5.8 euro/sq. m. compared to Italy’s 8.83 euro/sq. m.).

Differences between the two countries remain in terms of:

- Application type (in Spain wall tiles account for 40% of production compared to 19.5% in Italy);
- Product type (in Spain porcelain tile accounts for about 10% of total production compared to just under 60% in Italy);
- Sales destinations (Spain exports 50.8% of its total sales, Italy 71%);
- Breakdown of foreign markets (Spain exports 32% to the European Union, Italy 49%).

<table>
<thead>
<tr>
<th>Top export markets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Italy</strong></td>
</tr>
<tr>
<td><strong>2002</strong></td>
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<tr>
<td><strong>million sq. m.</strong></td>
</tr>
<tr>
<td>1. USA</td>
</tr>
<tr>
<td>2. Germany</td>
</tr>
<tr>
<td>3. France</td>
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<tr>
<td>4. Greece</td>
</tr>
<tr>
<td>5. Austria</td>
</tr>
<tr>
<td>6. Belgium + Lux.</td>
</tr>
<tr>
<td>7. UK</td>
</tr>
<tr>
<td>8. Hungary</td>
</tr>
<tr>
<td>9. Canada</td>
</tr>
<tr>
<td>10. Switzerland</td>
</tr>
<tr>
<td>11. Netherlands</td>
</tr>
<tr>
<td>12. Australia</td>
</tr>
<tr>
<td>13. Croatia</td>
</tr>
<tr>
<td>14. Poland</td>
</tr>
<tr>
<td>15. Saudi Arabia</td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration on Ceramic World Review data

Turkey reached an output of 189 million sq. m. for the first time again breaking the 175 million sq. m record figure of the year 2000. Sales increased both for the domestic market and for exports, which account for almost 45% of the total. The
Turkish ceramic sector consist of a small number of companies, some of which are very large and have a strong presence in foreign markets, where they also have sales branches (KALE GROUP, TOPRAK, EGE, ECZACIBASI-VITRA).

Poland is showing substantial growth in production (from 49 million to 66 million sq. m). By refurbishing existing facilities and opening new companies, local producers have succeeded in entirely meeting the increases in consumption and replacing a portion of imports.

Table 1.1: Top manufacturing countries in ceramic tiles

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Production (million sq. m.)</th>
<th>% of world consumpt. 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1999</td>
<td>2000</td>
</tr>
<tr>
<td>1.</td>
<td>CHINA</td>
<td>1,600</td>
<td>1,807</td>
</tr>
<tr>
<td>2.</td>
<td>SPAIN</td>
<td>602</td>
<td>621</td>
</tr>
<tr>
<td>3.</td>
<td>ITALY</td>
<td>606</td>
<td>632</td>
</tr>
<tr>
<td>4.</td>
<td>BRASIL</td>
<td>428</td>
<td>453</td>
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<td>5.</td>
<td>INDONESIA</td>
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</tr>
<tr>
<td>6.</td>
<td>INDIA</td>
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</tr>
<tr>
<td>7.</td>
<td>TURKEY</td>
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<td>THAILAND</td>
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<td>10.</td>
<td>IRAN</td>
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<td>11.</td>
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<td>14.</td>
<td>PORTUGAL</td>
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<td>15.</td>
<td>RUSSIA</td>
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### Production (million sq. m.)

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<td>46</td>
<td>49</td>
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<td>60</td>
<td>55</td>
<td>58</td>
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<td>ARGENTINA</td>
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<td>ALGERIA</td>
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<td>SOUTH AFRICA</td>
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<td>15</td>
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<td>30</td>
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<td>COLOMBIA</td>
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<td>25</td>
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<tr>
<td>TOTAL</td>
<td></td>
<td>4,649</td>
<td>5,107</td>
<td>5,263</td>
<td>5,506</td>
<td>5,829</td>
<td>96.7</td>
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<td>TOTAL WORLD PRODUCTION</td>
<td>4,841</td>
<td>5,320</td>
<td>5,500</td>
<td>5,740</td>
<td>6,030</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

THE 30 MAJOR MANUFACTURING COUNTRIES COVER 96.7% OF WORLD PRODUCTION

Source: ACIMAC
Russia has confirmed its growth potential with a production of 70 million sq. m. in 2003 (in 1999 production was 25 million sq. m.). WELOR-KERAMA (an Italian-owned company) confirms its leadership position with a share of around 25%, followed by KERAMIN, a Belarus-based producer that sells a large part of its output in Russia. ESTIMA, a porcelain tile producer set up three years ago in the Moscow area, is currently building a new factory as a joint venture with the Italian firm MIRAGE. The MARAZZI Group has completed the construction of a new factory in Russia, while the one owned by the ATLAS CONCORDE Group (Italy) is at the start-up stage.

The EMILCERAMICA Group is building a factory in Ukraine as a joint venture with a local entrepreneur. In the Russian market, which is potentially very receptive and has a very large geographical range, a local production activity is proving to be the most suitable strategy for increasing sales.

After many years Germany’s production increased reaching 58 million sq. m. (from 57 million sq. m. in 2001 and 54 million sq. m. in 2002). Interestingly, the local producers have succeeded in recovering market share in the low market segment with product ranges specifically aimed at large-scale distribution.

The Southeast Asian countries (primarily Indonesia and Thailand) are going through a period of rapid growth. This is mainly due to demand from the domestic market, but also to effective penetration abroad by several large groups. The growth of Vietnam is slowing compared to past years, but nonetheless has reached an output of 110 million sq. m.

India shows an astounding performance with an output that increased from 85 million sq. m. in 1999 to 190 million sq. m. in 2003. From 1999 to 2003, production in Iran increased from 60 million to 120 million sq. m. and a few companies began to penetrate foreign markets.

A positive trend in this period has been registered also by Egypt which has doubled the production rising from 42 million of sq. m. in 1999 to 83 million of sq. m. in 2003.
Sanitary ware

Data about world production and consumption of sanitary ware are scarce and often conflicting among different sources. This section provides an overview on the global sanitary ware market according to data availability and consistency.

Figure 1.4: Total sanitary ware production

![Total sanitary ware production graph](image)

Source: Authors' elaboration on Tec Ref and BSRIA data

World production of sanitary ware amounts to more than 275 million pieces per year (2004) and from 1990 to 2004 it has increased at a 6.9% average annual growth rate.

The trend of sanitary ware production (in pieces) has not been steady in the last 15 years. In fact, three different periods can be approximately identified:

- From 1990 to 1994, when world production grew considerably (13.8% on average) even if at decreasing rates;
The second period, from 1995 to 1999, when the market grew at a 4.6% rate but following a very unsteady trend;

The third period, from 2000 to 2004 when the market has grown slightly on the whole (3.6% on average), with decreasing trend.

In 2004 more than the 39% of the total world production (pieces) was manufactured by the **six top producing countries** (see the below figure). Leader is undoubtedly China with 14.3% market share, followed by Brazil 6.3%, Mexico 5.1% and Turkey 5%. India and Italy have a 4.2% market share.

**Figure 1.5: Main sanitary ware manufacturing countries (2004)**

![Market share (pieces)](#)

**Source:** Authors’ elaboration on BSRIA data

In 2004 the **12 leading world groups**, accounted or about 43% of total world production (see table 1.2).
The most important group is *American Standard Companies Inc.* from USA with a production capacity of about 28 million pieces per year.

This group can be considered a real intercontinental player: it operates in 26 countries through 60 production units. In both 2003 and 2004 the company has registered a strong increase in the values of sales. In the Americas the group operates with the brands AMERICAN STANDARD, IDEAL STANDARD and PORCHER. In Europe it operates with IDEAL STANDARD, CERAMICA DOLOMITE, PORCHER, ARMITAGE SHANKS, VIDIMA, SANGRÀ brands. Finally it operates in the Far East under the brands AMERICAN STANDARD and IDEAL STANDARD.

The second most important producer is the *Roca Group*, from Spain, with a production capacity of about 26.5 million pieces per year and a workforce of 15,000 employees. Roca Group has 50 production sites located in Europe, Asia, North and South America and Africa and exports the 49% of total production. It has a 25% share in the German DURAVIT through the LAUFEN brand and is diversifying in other linked sectors (it acquired the ARISTON Brand name from the Italian MERLONI – household appliances).

Another important group is the *Sanitec Group*, from Finland, whose production in 2003 has reached 16.1 million pieces (5.9% of market share). The group has 29 production plants in Europe where about 7,300 employees operate. SANITEC has established a joint venture with the Egyptian company LECICO.

It is worth to mention also the *Duravit group* (it ranks 12 among the top sanitary ware manufacturers) which has a production of about 1.9 million pieces per year with an export share of 65%. The group has six “sister companies”: two in Germany, one in France, one in Turkey and two in Egypt, the DURAVIT EGYPT and the SANI ACRYLIC.
Table 1.2: Main companies in sanitary ware manufacturing (2004)

<table>
<thead>
<tr>
<th>Group</th>
<th>Nationality</th>
<th>Production</th>
<th>Market share</th>
</tr>
</thead>
<tbody>
<tr>
<td>American standard</td>
<td>USA</td>
<td>28,000,000</td>
<td>10.2</td>
</tr>
<tr>
<td>Roca Group</td>
<td>Spain</td>
<td>26,500,000</td>
<td>9.7</td>
</tr>
<tr>
<td>Sanitec group</td>
<td>Finland</td>
<td>16,100,000</td>
<td>5.9</td>
</tr>
<tr>
<td>Toto Corporation</td>
<td>Japan</td>
<td>11,500,000</td>
<td>4.2</td>
</tr>
<tr>
<td>Kohler Group</td>
<td>USA</td>
<td>9,500,000</td>
<td>3.5</td>
</tr>
<tr>
<td>Villeroy &amp; Boch</td>
<td>Germany</td>
<td>5,500,000</td>
<td>2.0</td>
</tr>
<tr>
<td>Cisa</td>
<td>Chile</td>
<td>5,500,000</td>
<td>2.0</td>
</tr>
<tr>
<td>Vitra-Eczacibasi</td>
<td>Turkey</td>
<td>4,250,000</td>
<td>1.6</td>
</tr>
<tr>
<td>Civita Castellana</td>
<td>Italy - district</td>
<td>4,000,000</td>
<td>1.5</td>
</tr>
<tr>
<td>Rak Ceramics</td>
<td>United Arab Emirates</td>
<td>2,900,000</td>
<td>1.1</td>
</tr>
<tr>
<td>Hindustan Sanitaryware</td>
<td>India</td>
<td>2,024,300</td>
<td>0.7</td>
</tr>
<tr>
<td>Duravit</td>
<td>Germany</td>
<td>1,960,000</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Total Leading Groups</strong></td>
<td><strong>117,734,300</strong></td>
<td></td>
<td><strong>43.0</strong></td>
</tr>
</tbody>
</table>

*Source: Authors’ elaboration on Ceramic World Review data*
1.4. Global Consumption

Ceramic tiles
During 2003, the world consumption reached 5,724 million sq. m. (+5.5%). The increases concerned almost all areas in the world with the exception of the European Union which reported a slight fall compared to previous years.

Figure 1.6: World consumption areas in ceramic tiles (2003)

![Pie chart showing world consumption areas in ceramic tiles (2003)]

Source: Authors’ elaboration on ACIMAC data

Even for what concerns consumption it can be observed how China came to play a fundamental role in the sector: China increased from 1,300 million sq. m. in 1999 to 1,700 in 2003, accounting for the 30% of the world demand of tiles.
Consumption continue to increase in the **United States** (267 million sq. m. in 2003, +9%) due to a better quality-to-price ratio than alternative materials.

A positive trend in the same period has been registered for top consumers Brazil, Spain and India (which doubled its consumption), whereas Italy and France seem to have reached the top.

In Far East, South Korea and Thailand also doubled their levels.

The strongest growth in demand belongs to Russia which is approaching the 100 million sq. m.

In **Middle East**, Saudi Arabia and Egypt (from 35 million of sq. m. in 1999 to 66 million of sq. m. in 2003) showed important increases.
<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Consumption (million sq. m.)</th>
<th>% of world consumpt. 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1999</td>
<td>2000</td>
</tr>
<tr>
<td>1.</td>
<td>CHINA</td>
<td>1,300</td>
<td>1,400</td>
</tr>
<tr>
<td>2.</td>
<td>BRAZIL</td>
<td>383</td>
<td>395</td>
</tr>
<tr>
<td>3.</td>
<td>SPAIN</td>
<td>273</td>
<td>290</td>
</tr>
<tr>
<td>4.</td>
<td>USA</td>
<td>195</td>
<td>212</td>
</tr>
<tr>
<td>5.</td>
<td>ITALY</td>
<td>192</td>
<td>200</td>
</tr>
<tr>
<td>6.</td>
<td>INDIA</td>
<td>85</td>
<td>97</td>
</tr>
<tr>
<td>7.</td>
<td>GERMANY</td>
<td>192</td>
<td>184</td>
</tr>
<tr>
<td>8.</td>
<td>MEXICO</td>
<td>87</td>
<td>100</td>
</tr>
<tr>
<td>9.</td>
<td>INDONESIA</td>
<td>95</td>
<td>164</td>
</tr>
<tr>
<td>10.</td>
<td>FRANCE</td>
<td>114</td>
<td>122</td>
</tr>
<tr>
<td>11.</td>
<td>VIETNAM</td>
<td>29</td>
<td>55</td>
</tr>
<tr>
<td>12.</td>
<td>TURKEY</td>
<td>100</td>
<td>114</td>
</tr>
<tr>
<td>13.</td>
<td>SOUTH KOREA</td>
<td>44</td>
<td>49</td>
</tr>
<tr>
<td>14.</td>
<td>THAILAND</td>
<td>50</td>
<td>54</td>
</tr>
<tr>
<td>15.</td>
<td>RUSSIA</td>
<td>31</td>
<td>38</td>
</tr>
<tr>
<td>16.</td>
<td>IRAN</td>
<td>54</td>
<td>65</td>
</tr>
<tr>
<td>17.</td>
<td>POLAND</td>
<td>57</td>
<td>67</td>
</tr>
<tr>
<td>18.</td>
<td>EGYPT</td>
<td>35</td>
<td>43</td>
</tr>
<tr>
<td>19.</td>
<td>SAUDI ARABIA</td>
<td>34</td>
<td>40</td>
</tr>
<tr>
<td>20.</td>
<td>UK</td>
<td>46</td>
<td>53</td>
</tr>
</tbody>
</table>
A Strategic Study on the Egyptian Ceramic Tiles and Sanitary Ware Industry

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Consumption (million sq. m.)</th>
<th>% of world consumpt. 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1999</td>
<td>2000</td>
</tr>
<tr>
<td>21.</td>
<td>PORTUGAL</td>
<td>56</td>
<td>68</td>
</tr>
<tr>
<td>22.</td>
<td>JAPAN</td>
<td>56</td>
<td>57</td>
</tr>
<tr>
<td>23.</td>
<td>TAIWAN</td>
<td>90</td>
<td>77</td>
</tr>
<tr>
<td>24.</td>
<td>MALAYSIA</td>
<td>41</td>
<td>48</td>
</tr>
<tr>
<td>25.</td>
<td>MOROCCO</td>
<td>26</td>
<td>30</td>
</tr>
<tr>
<td>26.</td>
<td>ALGERIA</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>27.</td>
<td>SOUTH AFRICA</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>28.</td>
<td>GREECE</td>
<td>38</td>
<td>35</td>
</tr>
<tr>
<td>29.</td>
<td>UAE</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td>30.</td>
<td>AUSTRALIA</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td>31.</td>
<td>CANADA</td>
<td>20</td>
<td>23</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>3,815</td>
<td>4,190</td>
</tr>
<tr>
<td>TOTAL WORLD CONSUMPTION</td>
<td>4,485</td>
<td>4,735</td>
<td>5,142</td>
</tr>
</tbody>
</table>

The 31 major manufacturing countries cover 85.7% of world production

Source: ACIMAC
Sanitary ware

Asia is already the biggest consumption market for sanitary ware with almost 2/5 of the world consumption. Due to the current demographic trends, the importance of the Asian market is expected to increase over the next years.

Figure 1.8: Sanitary ware consumption by Region (2003)

(|% of total pieces| (% of total value|
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia 39%</td>
<td>Europe 33%</td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration on BSRIA data

In terms of value, proportions are different, with Europe accounting for 41% of world production value.

Table 1.4: Sanitary ware consumption in Europe

<table>
<thead>
<tr>
<th>Country</th>
<th>Volume</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2003</td>
<td>2003</td>
</tr>
<tr>
<td>('000 pieces)</td>
<td>% var. '03/'02</td>
<td>Avarage price on national market (euro/piece)</td>
</tr>
<tr>
<td>Italy</td>
<td>8,170</td>
<td>3.55</td>
</tr>
<tr>
<td>France</td>
<td>7,526</td>
<td>0.21</td>
</tr>
<tr>
<td>Great Britain</td>
<td>7,520</td>
<td>13.18</td>
</tr>
<tr>
<td>Germany</td>
<td>7,221</td>
<td>0.57</td>
</tr>
<tr>
<td>Spain</td>
<td>6,692</td>
<td>-0.57</td>
</tr>
<tr>
<td>Turkey</td>
<td>2,521</td>
<td>9.02</td>
</tr>
<tr>
<td>Portugal</td>
<td>2,476</td>
<td>-14.66</td>
</tr>
</tbody>
</table>

Source: FECS (European Federation of Sanitary ware Manufactures)
In Europe the most receptive markets are Italy (8.1 million pieces), France and Great Britain (7.5 million pieces each) and Germany (7.2 million pieces).

The largest increases over the previous year was that of Great Britain (+13%), while the worst figure was that of Portugal (-14.6%). As for segmentation, Germany is clearly the price leader (53.13 euro per piece), followed by Italy, whereas Spain, Portugal and Turkey are very far from top segments.

Over the next years, up to 2006, global production is expected to grow, combined with strong price erosion. The fastest growing market, in volume, will be China that, with more than 9% average annual growth rate, will confirm his role of leading world producer.\(^\text{10}\)

China is expected to be followed by Russia (with more than 6% growth rate) and Turkey (5%). Mexico, India and Poland will grow more than 4% on average. Smaller increases are expected in Italy as well, where production is forecasted to grow at a 3.5% average annual rate.

1.5. Foreign trade

Ceramic tiles

The world export of tiles highlights a strong increase of 40% during the period 1999-2003.

\(^{10}\) From the speech by Javier Castillo, (BSRIA market research consultant) at the third meeting on “Technological trends of the Sanitary ware sector”, Imola, Italy, 30th September 2004.
Data on world trade also show a clear orientation in favor of domestic sales, since only 26.3% of the production is exported. This share is controlled by UE (14.5% of total export) and, particularly, by Italy (7.3%) and Spain (5.9%). These two countries represent 50% of world total export and 13.2% of total consumption. In more details, Italian export in 2003 was 418 million sq. m. (-4.6% from 2002), while Spanish sales abroad decreased from 357 in 2002 to 336 in 2003.

Asian countries follow with 6.6%. Among the other European countries, Turkey is the main exporter.
In recent years China has seen a staggering increase in exports with 206 million sq. m. exported in 2003. It should also be noted that 83.5% of this quantity consists of exports within Asia and that about 70 million sq. m. was exported to Hong Kong and re-exported.
Figure 1.11: Top 10 exporting countries in tiles (2003)

![Bar chart showing top 10 exporting countries in tiles (2003) with data from ACIMAC, elaborated by the authors.]

Source: Authors’ elaboration on ACIMAC data

Figure 1.12: Top 10 importing countries in tiles (2003)

![Bar chart showing top 10 importing countries in tiles (2003) with data from ACIMAC, elaborated by the authors.]

Source: Authors’ elaboration on ACIMAC data
During 2003, Brazil increased its exports, which exceeded 100 million sq. m. for the first time ever. Four companies account for about 70% of Brazil’s exports: ELIANE, CECRISA, INCEPA and PORTOBELLO.

In the United Arab Emirates, the major company RAK continues its growth with increased sales in all world markets through a very aggressive sales policy and high value-added products. RAK currently has a production capacity of more than 50 million sq. m. and owns production facilities in Slovakia, Bangladesh and China.

In the United States, the expansion in the market has almost entirely benefited imports, which have increased to 207.2 million sq. m. (9.5% up on the 189 million of 2002). The United States confirm themselves as the world’s leading importer country. Germany follows with 111 million and France with 104 million sq. m.

**Sanitary ware**

Sanitary ware sector, in terms of international trade is definitely not considerable, since just a small part of the global production is destined to enter international markets. In 2003 countries belonging to the European Ceramic Sanitary ware Manufacturers’ Federation (FECS) exported about 81,000 tons, 5.5% less than the previous year. Exports outside Europe represents the 25.6% of the total European export, it means that about 75% of the European countries’ exports remains within Europe. In 2003 export to Asia and Middle East plummeted respectively by 50% and 21%, while export to America grew by 31%.

In 2003, FECS Countries imported from non European countries roughly 155,000 tons of sanitary ware, about 47% of the total import, 33% more than 2002. The larger market share in Europe is held by the “new European Union member states” with 16.7%, followed by “Other eastern countries” with 14.6% and Asia 9.4%. Although Asia has not the highest market share, since 2002, it has increased its export to Europe by more than 80%.
Table 1.5: European sanitary ware export/import outside Europe (2003)

<table>
<thead>
<tr>
<th></th>
<th>Exports</th>
<th>Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tons 03/02</td>
<td>% 03/02</td>
</tr>
<tr>
<td>Total new members</td>
<td>80,914</td>
<td>-5.5</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>14,368</td>
<td>12.8</td>
</tr>
<tr>
<td>Other Eastern countries</td>
<td>12,115</td>
<td>-5.4</td>
</tr>
<tr>
<td>Middle east</td>
<td>15,309</td>
<td>-20.8</td>
</tr>
<tr>
<td>Africa</td>
<td>13,872</td>
<td>4.1</td>
</tr>
<tr>
<td>America</td>
<td>18,596</td>
<td>30.7</td>
</tr>
<tr>
<td>Asia</td>
<td>6,654</td>
<td>-49.6</td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration on Ceramic World Review data

Box 2: Sanitary ware in Asia

Sanitary ware production in Asia amounts to about 80 million pieces, of which 50% are made in China. China, India, Thailand and Indonesia account for about 87% of the total output and other major producers are Malaysia, Taiwan, Philippines and Vietnam. Asia is not fully utilizing the potential production capacity, in 2000 the capacity utilization rate was in fact 75% (in China it was 75% as well). The highest rate was in Australia (100%) while the lowest was in Sri Lanka (40%). Sanitary ware production in China is positioned on lower segments: just 15% is made of up-market manufacture mainly produced by foreign invested companies.

Also sanitary ware demand in Asia amounts to 80 million pieces. China represents 52%, India 21% Indonesia 6% and Taiwan 5%.

In China, about the 15% of the demand, is for high-quality products and this segment is usually targeted by foreign companies which either export or set up local plants through joint ventures. International companies sell high quality products at high prices for the new Chinese middle-class which is supposed will rapidly grow in the next years. Main foreign companies playing a role in China are American Standard, Roca Group, Toto Corporation (from Japan), Kohler. There are also some Asian companies offering high quality products in China like for example the Singapore-backed ASA Ceramic and Taiwan's Usana Nobel. In China the most important national brand is the Guangdong's Eagle which has anyway only 1% national market share.

From a global point of view, sanitary ware market in Asia can be divided into four country groups according to their development level:
Developed countries – Malaysia, Australia, Singapore, Taiwan, Brunei – where the industry has reached a mature and consolidated stage. In these countries the potential growth is limited but per-capita consumption is high.

Intermediate countries – Thailand, Philippines, Indonesia – where economies are characterized by volatility and strongly export oriented. Sanitary ware market, although consolidated and with large players, is volatile as well. Major potential is offered by joint ventures and acquisitions of local leading companies currently undervaluated on the stock market.

High growth countries – India, Bangladesh, Vietnam and China – countries that are experiencing a strong growth in most of the industrial sectors. Sanitary ware market, not yet fully consolidated, in these countries is expected to grow at a very high rate (analysts forecast a 10% on average per year) and it is supposed not to be deeply influenced by the general trend of the world economy. Market will be boosted by the construction/building sector boom, fed by the economic expansion. Market will consolidate in the next years, through merging and acquisition and small, unprofitable, not competitive companies, will exit the market.

Least developed countries – Laos, Cambodia, Myanmar – with very low per capita income, at present they don’t have a real sanitary ware industry and its development will be very slow. Also consumptions are low and the market is not expected to grow significantly in the next years.

1.6. Latest results and forecasts for ceramic tiles and sanitary ware sector

At the conclusion of this report, latest official data about the sector concern year 2003. The following pages show anticipations about the 2004 results and some recent forecasts for the next years, according to international reliable sources of information.

Ceramic tiles

Again in 2004 the ceramic tiles sector achieved positive results at a global level with increases in both production and consumption. The data analysis remarks the progression of production systems from highly specialized zones to new productive systems.

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11 Data about tiles are based on “Osservatorio previsionale” (“Forecast observatory”), updated to May 2005, ASSOPIASTRELLE

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zones, then shows continuous increase of the volume of production also in the next years.

**Europe**

In the Western Europe economic context the ceramic tiles market highlighted, during 2004, an increase of about 14 million sq. m. (571 million sq. m. total). The growth springs from the increase of countries domestic demand, while the value of export is negative, strongly conditioned from world economic growth deceleration and euro appreciation.

During the three-year period **2005-2008**, the ceramic tiles market will increase in Western Europe Area, with a total production of 600 million sq. m. over the period in question, thanks to building sector growth.

In the Central Eastern Europe Area, during the 2004, the ceramic tiles market exceeded 470 million sq. m., showing an increase of 8% in comparison to previous year.

The forecast on ceramic sector, in the next four years, shows a further increase with a volume of production similar to Western European level. In this contest Russia will represents the main reference market with a total production major to 130 million sq. m.

**North America**

In 2004 the US economy has kept a good growth rate (4.3%) with positive effects also on the tiles market which has increased of 30 million of sq. m. attaining about 350 million sq. m.

While on the one hand the causes of growth can be ascribed to either the internal demand or the families’ consumptions, sustained by the good trend of investments in building constructions which benefited from fiscal incentives by the end of 2004, on the other hand, the deficit of the balance of payments did not show signs of improvement, partly due to the high internal demand.
For what concerns the tiles sector, further improvements are expected, although on a smaller scale because of the progressive slowing down of the building construction industry which in 2006-7 should bring an increase of the demand of more that 370 million. of sq. m.

The economic dynamics in the rest of the world

An analysis of the performance of the tiles’ industry in the rest of the world includes the developing countries with low labor cost and a contestable tiles’ market (Brazil, China, India and the majority of the South-East Asian and Middle Eastern countries).

Latin America

The development of Southern American economy in 2004 showed an expansion particularly strong which has been caused by the good performance of the both foreign and internal demand. In particular, the growth has been pulled by the recovery of the Argentineans and Venezuelan economies and by the good performance of the Brazilian economy.

The forecast show a deceleration of the industrial sector, caused by rigid monetary politics in some of the countries of the Area (Brazil, Mexico and Peru).

Asian Area

The developing economies of this area confirmed, during 2004, a trend among the most positive in the world. The GDP increase has been sustained especially by a strong growth of the export and by the expansion of the internal demand. The Chinese economy, the main country of the Area has continued to develop at a pace higher than 9%, in spite of the deceleration of the investments, facilitating the expansion of the commercial exchanges in the Area.

The forecast framework for the next years confirms a positive trend characterized by a growth larger than the one expected for the world GDP.
North Africa, Middle East and Oceania

The first two areas, during 2004, show a similar economic growth near 6% with some differences between groups of countries. Specifically, the oil countries such as Algeria, Saudi Arabia, United Emirates, Iran and Libya have benefited from the excellent trend of the oil market in terms of shares and production volumes. The forecast of these economies underline a moderate deceleration of the growth pace, caused by a measured readjustment of the oil shares starting from 2006. Increases in other good exports and direct foreign investments are expected.

The Australian economy, finally, underlines a modest development during 2004, pulled by the internal demand, which benefit from the improvement of the labor market, while the exports haven’t favored in any way the economic growth.

The growth forecast in this area, in the next years, will be characterized by a gradual slowing of the development pace arising from principally a reduction of the internal demand.

Sanitary ware

It is common opinion that in the next years sanitary ware market will be characterized by merging and acquisition deals, joint ventures and strategic alliances.

Market trends will focus on new bathroom concepts and a more important role of the brand image. Consumers will rise their requirements and a growing value will be attributed to the immaterial content, like the design.

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12 Data about sanitary ware are based on the results of the third meeting on “Technological trends of the Sanitary ware sector”, Imola, Italy, 30th September 2004.

13 From the speech by Javier Castillo, (BSRIA market research consultant) at the third meeting on “Technological trends of the Sanitary ware sector”, Imola, Italy, 30th September 2004.
Most advanced companies will move toward new integrated product lines which will include not only sanitary ware but also accessories, furniture, towels and other bathroom items.

**New players**, especially from emerging countries, will enlarge their role in the global market, thus contributing to the redefinition of both the productive and the distribution structure.

On point of view of production, the forecasts shows a displacement of markets towards new developing areas causing the loss of competitiveness of the highly specialized countries in the ceramic sector.

In the following figure it’s showed the forecast on value and volume production of the main competitors in the next years (2003-2007).

**China** and **Russia** are the country that will show the most rapid growth in quantitative terms over the four-year period 2003-2007.

**Figure 1.13: Forecast on sanitary ware production for 2003-2007**

Source: Authors’ elaboration on BSRIA data
The Chinese giant production at the present time is 60 million pieces, of which 18 million pieces are exported. According to BSRIA\textsuperscript{14} analysis, the Chinese production is expected to increase at about 20 million pieces in the next years, while the expected growth of other countries is all well under 5 million pieces.

As regards the production of Russia, Turkey and India will continue to increase within a range of 1.5 to 3 million pieces, while the production volume of Italy, Great Britain and United States will find equilibrium point around 1 million pieces.

If we consider value of production rather than quantities, the fastest-growing country is Russia with an increase beyond $120 million over the period in question.

China has an important role too, with more than $110 million, followed by the United States and Turkey respectively third and fourth. These are the only four countries that will see a more than $50 million increase in value of production.

\textbf{1.7. Market & technological drivers}

\textbf{1.7.1. Market evolution and access to market}

After the first sign of a slowdown last year, the end of the growth of Italian and Spanish production in quantity terms was confirmed. The lack of increase in consumption in European markets, which account for three quarters of the sales of Italy and Spain, and the increasingly fierce competition in all other markets have made it necessary to shift production towards higher quality ranges with more remunerative prices (unglazed and glazed porcelain tile).

For developed countries it is of course inconceivable to compete with emerging countries on lower market segments where consumers’ choice is mainly driven by price; the extremely low labor cost of these countries provides them with a strong competitive asset. So, for developed countries it has been necessary in the latest

\textsuperscript{14} Ibidem
years to shift production towards higher quality ranges with more remunerative prices. The balance sheet figures for 2003 show that the most profitable companies were those that succeeded in achieving high-segment product ranges. However, this strategy cannot be pursued by all companies, so it appears possible that some will be forced out of the market.

This kind of **market segmentation** reflects in part also a geographical segmentation; Western Europe, USA and more in general customers living in developed countries are closer to the first segment, whereas customers from developing countries are closer to the second. Developed countries markets are almost stable and increases in production driven by domestic market growth are now limited almost exclusively to developing countries with large populations (China, Brazil, Indonesia, India, Vietnam, Iran, Russia, etc.).

Another strongly characterizing aspect of the ceramic and sanitary ware market is its **limited exportability**; these products are really heavy and bulky, it implies high transportation costs. In addition to that, storage room required for these products is really much. Finally, there is the cultural aspect, sanitary ware and ceramics reflects the taste and local habits, so producing for foreign markets means to study and customize products for different cultures. Countries with a higher propensity to export are mainly Spain and Italy which account together for more than a half of the total world export in the sector.

Developing countries, anyway, after acquiring the state of the art technologies, are opening up export flows, facilitated by the presence of large companies. In the case of China we are also seeing the autonomous development of production technologies for the first time. Exports by the above-mentioned countries restrict the potential markets of Italy and Spain, whose exports are falling as a percentage of the total. Exports from other countries are limited to a small number of large companies with a strongly identifiable brand. A partial exception is China, where more importance is given to exported product types than to the brand name of individual companies.
As in many other industries, also in ceramics the global trend towards the reduction of barriers to trade is designing a new framework of opportunities and threats. We will have to become more accustomed to thinking of integrated areas without obstacles to the free movement of goods as domestic markets (the enlarged European Union is the most important example of this). In these areas it is becoming increasingly meaningless to talk of imports and exports.

Outside integrated areas, imports can account for a high percentage of consumption only in countries where local producers have a very small presence, such as the United States, Canada, Australia and Saudi Arabia. In spite of high domestic consumption, in these cases initiatives to expand local production are not considered worthwhile. An interesting case is that of the United States, where the growth in consumption was met by imports and the majority of new investments in production capacity are generated by foreign producers aiming to increase their market penetration.

Although to a much lesser extent than in other sectors, many groups are stepping up their presence in foreign markets in terms of production and distribution. A production presence is mainly driven by a need to be close to areas of consumption (United States, Russia, etc.), whereas a distribution presence is a direct consequence of the need to establish the brand name.

For manufactures in every country, in order to operate in the most advanced and remunerative markets it will be increasingly important to establish a loyal sales network and a brand name that is recognized and respected by industry professionals. The cost of maintaining a market presence is gradually increasing, and it is an advantage for larger companies and groups. In the past years market approach has been top-down; main companies have focused their efforts in promoting the brand on the resellers rather than on the final customer, in order to induce them to promote consequently the product on the final customer. The above mentioned approach is effective for companies operating in lower market segments;
for those companies operating in higher market segments a bottom-up approach is considered as more effective. In this case companies should promote the brand on the final customers in order to induce them to go to the reseller and ask for the specific product they are looking for.

Another important component to be considered when analyzing the ceramics and sanitary ware market is the link with other sectors, in particular with the building market. A really explanatory example is offered by China where in the next years 1 billion square meters of new real estate is expected to be built, with another 1.6 billion square meters needing renovation; monitoring the trend of the building market means to anticipate the future trends of the ceramics and sanitary ware sectors.

Key players and main business relationships in the sector are represented in the figure 1.14. This is a “complete” access to market picture and the relevance of the channels to approach the final customer differs from each other according to the structure of the single markets. While some operators such as “contractors” or “independent wholesalers” play an important role in every country, others are especially growing in some markets and missing in others. These differences are not always related to the “maturity” of the national context. For example, the “Do It Yourself” (DIY) segment is still weak in Italy, a very developed market, but has a considerable weight in some important Western European countries, such as Germany, France and United Kingdom.

In many markets the wholesale channel is the most important channel. Being oriented to the professional customer (the installers), it requires a deep respect of quality standards (both national and international). Foreign producers can find difficult to enter such a market, because of the strong and well established links between producers and national distributors that control the sales network. Special conditions (discounts and credits) are normally agreed with the small installer.

The DIY channel is becoming more and more popular in Europe and in other markets, even though, in many countries the sales are traditionally influenced by the
installer and the final user is still to become familiar with buying tiles and WCs by himself in large stores at the outskirt of the town. For other products, for example home furniture, this transition is more widely accepted.

The manufacturer will find many important differences in dealing with the distribution channels. First of all, the multiple levels of the wholesale market will increase the cost to the final customer. On the other hand, the DIY stores sell at a lower price because of the lower costs of structure and the higher price consciousness of the purchaser.
Figure 1.14: Access to market map in ceramic sector
For manufacturers that try to enter a foreign national market, the DIY channel can offer more opportunities. For these resellers the national quality certificates are of less importance, since the individual buyer is more cost-driven, while the quality marks are strongly expected by the wholesale dealers that sell to professional customers and building companies. Also the required level of service is bigger among the wholesale market. This means fewer barriers to trade for new and less renowned producers with a small appeal for the world of architects and “bathroom boutiques”,

The relationships between players and business channels in the sanitary ware market are first of all influenced by the role played by the building sector. Particularly in less developed countries, the consumption of the sanitary ceramics is closely connected to the cyclical course of the constructions: in parallel with a favorable evolution of demographic trends and the expansion of both public and private sector, the industrial total turnover is expected to increase.

Moreover, in the most developed markets the emerging of big groups of purchase forms with an elevated contractual ability has emphasized the importance of the factor price and the choices of trade marketing.

Beyond to the factor price, other characteristics that affect the competitiveness of the sector are tied to the aesthetic-functional quality of the products and to a series of aspects such as the delivery time, the technical assistance, the training of the sales force, the planning of the exposition spaces. The offer of complete solutions of furniture for the bath involves an increasing number of enterprises and appears decisive to satisfy the needs of those customers asking for “solutions” instead of single products.

The presentation of sanitary equipments completed by furniture and coordinated accessories, initially developed to support the corporate image and the products; gradually it has been transformed in a specific business. The success of these modalities of offer requires an improvement of the logistic aspects, with particular
reference to the coordination of the delivery times through the entire supply chain of productions and outsourcings.

The advising to the planning of the area bath and the pre-sale attendance become key factors to success, also in terms of coordination between complementary products realized by different companies of the furnish-bath enlarged sector.

Techniques of building and tiling
Manufacturers have to more and more adapt their products range to the final consumers preferences as well as to the needs of building companies and professional workers.

Tiling procedures are mainly executed by skilled craftsmen but two important trends have to be highlighted:

- For the housing segment, the “Do It Yourself” approach is already very popular in North Europe and USA;
- For the industrial and public buildings segment, the automation is increasing.

The use for automated tiling systems is trained by the health issues and high cost of labor of tilers (in Europe and other developed economies, the unpopularity of craftsmanship is increasing). New tiling techniques and tiling robots and manipulators need top quality tiles with a high stability in dimension and a special accuracy for the packaging.

Sales of total concepts
As told before, selling “integrated solutions” is becoming a key factor in the sector and this trend is supported both by the private and professional demand.
The private consumers tend to collect more information and demand a more accurate pre-sales and post-sales service before completing their purchasing process. The total bathroom formula which includes sanitary ware pieces, tiles, special pieces for tiling, adhesives, furniture, etc. is a common example of total concept.

On the other hand, professionals working with personal housing (that is building directly for consumers) are required to fit special needs of the consumer. The suppliers showrooms are therefore often used to offer complete solutions to the final customer before or during building the houses. Also the virtual showrooms on the Internet or specific software can suggest the final picture of the environments.

Dedicated companies can develop selling formulas (including coherent products with pieces, instructions, fasteners etc.) the final consumer or the professional can buy as a package. Otherwise, the main manufacturer or the large distributor can develop the complete solution.

**Sustainable building**

The concept of sustainability considers the present costs and effects of the human activities, as well as the consequences for the next generations. In the building sector this means to adopt methods which minimize the materials consumption and the **impact on the environment**. While in the near past natural materials were generically considered “better” than artificial or synthetic materials, nowadays the modern approaches tend to calculate the environmental effects of choosing different techniques and materials, considering the entire life of the product: from its production (with the different production processes in the supply chain) to the actual use and consumption, until the demolition and possible recycling. Therefore, the popular image of the different materials can change when considering the overall “product life-cycle”: plastic is not always “bad” because it is often easier to recycle than other materials, whereas steel (a recyclable product) consumes a lot of energy and raw materials to be produced.
Although the environmental issues can determine the success or the decline of a complete product range, these changes generally require a long time to produce real effects in the markets. For the manufacturers willing to sell in the most developed markets, this means that monitoring the environmental controls these countries impose on production and consumption is a way to adapt product and process to the final demand and to get ready for future changes in market preferences.

From this point of view, ceramic tiles and sanitary ware are not expected to face decisive environmental issues since they have a lower index of environmental impact compared to alternative products and considering all the following issues:

- Direct and indirect (i.e. referred to intermediate products) consumption of factors during the production;
- The costs of the industrial waste disposal and the costs of the local environment restoration (i.e. marble quarry restoration), after the production cycle;
- Costs of the finished product waste disposal and actual costs and benefits from recycling at the end of the product cycle;
- Average durability of the finished product.

1.7.2. Consumption patterns in Europe

Since one of the main issues of the present study is about the export opportunities for the Egyptian industry, it is useful to focus on trends and purchasing patterns in Europe. In fact, Europe represents a kind of “benchmark market” for any manufacturer because the region contains the main producers and exporters as well as the main consumers (considering per capita consumption) in a very competitive and globalized context. In other words, Europe sets the trend both in production/technology (mainly through the
Italian and Spanish integrated supply chains) and in consumption (through a top quality demanding market where structured and huge sales organizations are a key factor to success). If this makes particularly challenging to export to Europe, playing this game means, without any doubts, “to stay in the trend”.

**General economic situation**

The European economy recovery is modest and it is not supported by an adequate level of domestic consumption. On the other hand, oil prices rising and the trend of euro exchange rate are affecting internal demand as well as export performances. Private consumption and business investments are expected to remain slack if consumer and investor confidence will not strengthen.

**European building industry**

According to the latest European Construction Industry report (2004), 2003 has been a year of stagnation for the EU building industry: + 0.1% with a generated business for 910 billion Euro (EU15). A moderate recovery was expected for 2004 (+0.8%).

After a more and more decreasing construction activity since 1999. 2003 registered a break: +0.1% when compared with 2002. A decrease in the private non-residential sector (-4.1% that can be explained by a postponement of investments by private enterprises due to the general economic stagnation) was not totally counterbalanced by increases in the public non-residential sector (+3.2%). Specific public incentives, mainly based on tax reductions, has not always produced clear effects in all the countries (Germany, Italy and Portugal seem to become less reactive to such a kind of fiscal policies) but the private housing sector increased in the whole with +3.6%.

The above steady situation results from many elements which influence the overall market in different proportion and direction. If the birth-rates of European “original” population are among the lowest in the world, in some countries the immigration flows counterbalance the trend. If the divorces-rate is increasing, the effect will be a
decreasing average number of inhabitants per house and this could eventually result in a rising of the demand for houses and apartments.

**Trends in fashion**

In ceramic tiles two different kinds of trends are generally spreading.

*Dimensional increase*

The average dimension increases and **bigger tiles** are preferred (i.e. 40x40 cm, instead of the usual sizes of 15x15 and 20x20).

Traditional formats of 20x20 are common for all technical applications (food industry and chemical plants, but also private garages). The needed mechanical characteristics require tiles 15 – 20 mm thick. In other environments (i.e. private and public rooms) the external looking plays a fundamental role and the larger formats are preferred.

The strategic positioning of the companies partially explains the dimensional increase and reflects different structures of industrial costs. Bigger formats generally require better quality standards during the production process and this means higher selling prices. Therefore, bigger sizes are mainly “pushed” by manufacturers that have to absorb higher costs for the raw materials purchasing (i.e. Italian companies) and tend to occupy the top price segments. On the other hand, the premium price for bigger formats is also an objective for those manufacturers that can rely on a large internal availability of good quality raw material (i.e. Chinese and Turkish manufacturers).

*Imitation of natural stones*

In the tiles market, the evolution of customers' preferences is dominated by the imitation of natural stones by the reproduction of the countless variations that can be found worldwide. The tile looks more and more like a natural stone and this modifies the structure itself of the product. The body has to have a single color because it must look like a slab of stone and not a combination of different materials by a mechanic press.
Moreover, the external surface requires a dry application of glazes instead of wet glazing. The following figures show some examples.

**Figure 1.15: Imitation of nature**

*Ochre: “Madras”*

![Ochre: “Madras”](source: www.ariostea-hightech.com)

*Yellow: “Yellow stone”*

![Yellow: “Yellow stone”](source: www.ariostea-hightech.com)

*White: “Albino light”*

Glazing technology supports this “return to nature”, by reproducing slabs of granite, quartzite or slate. The beauty and infinite variation of natural stones is suggested by irregular surfaces and various chromatic effects.

Top quality and flexibility inevitably require a strong involvement of Information and Technology, with new automated systems to apply glaze more and more accurately (on a single pixel of the tile). The electronic definition of quantity and color comes from a range of graphic programs that can be easily stored in disks. This reduces dramatically the manual intervention and seems to virtually eliminate the traditional trade off between repeatability/reproducibility of processes and flexibility in product design.

Both dimensional increase and evolution in glazing and colors push are inevitably linked to the adoption of “white body” instead of “red body” (the meaning of these distinction will be clarified in the next chapter, see below: “Inputs in manufacturing - Raw materials as a strategic factor”).

Evolution in sanitary ware ceramic products is almost fully trained by trends in design. When the bath environment is considered as a whole, the combination of ceramic, synthetic materials, wood and metals leads to innumerable variations that make the entire sectoral supply chain more complex and changeable.

In Europe, a general increase in the demanded quality is also caused by the increase in house ownership: people who live in their own house tend to spend more and to appreciate fashionable sanitary ware and ceramic tiles.

**EU market differences**

Despite the continuous political and economic integration process, Europe remains a region rich in cultural diversity and national characterizations. Then, historical, geographical and meteorological conditions are the basis for different consumers’ preferences in many markets and tiles and sanitary ware are no exceptions. This paragraph gives an example of some differences among the European countries and
suggests that an aspiring exporter should familiarize with a number of distinctions in order to get ready to satisfy such a complex market.

In Europe showers are more popular then in UK, where bathing is prevalent. Because of the average height, northern Europe demands larger baths then southern Europe. Siphonic (valve-less) flush is more common in UK whereas the rest of Europe generally prefers the valve-flush WC cisterns. The use of bidets is limited to South Europe (especially Italy) and is very rare in North Europe.

Concerning the combination of bowl and cisterns, three typologies can be identified in the European market:

- Cistern and bowl separate (single floor standing);
- Cistern on the rear platform of the bowl (floor WC / closed coupled WC suite)
- Cistern and bowl attached to the wall (wall-hung cisterns)

More in details, single floor standing can be also:

- “High level” WC, with the cistern wall mounted about 2 m above floor level and with a chain pull;
- “Low level” WC, with the cistern mounted about 20 cm above the pan, connected together with a flush pipe

As told before, ceramic tiles have many destinations and the consumers can decide to use alternative materials for floors and walls. For example, the lower per capita consumption of ceramic tiles in some countries (i.e. UK) compared to the rest of Europe can be explained by the lower use of these products inside the bathrooms. In some
northern countries is popular to tile the external surfaces of the buildings, whereas in other countries they rather use special kinds of bricks.

Concerning the colors in bathrooms and kitchens, two main inclinations can be identified:

- a preference for light natural colors (in Germany, Netherlands, Italy);
- a preference for romantic pastel decorated tiles and bathrooms pieces (France, Belgium, UK).

Moreover, many markets maintain a country specific taste for local designs and shape, coming from traditional productions that are not easily imported.

**1.7.3. Costs and prices in the global market**

The structure of industrial costs in the developed markets differs from the same structure in the developing countries.

For what concerns the tiles sector, if 100 is the total of costs of production, in the developed countries the industry is generally capital intensive and the main costs are labor, raw materials and energy. Developing countries (labor intensive) support higher percentages in depreciation and raw materials (especially for glazes and for not internally available raw materials).
In the sanitary ware industry, labor costs are the most important item both in developed and in developing countries, while differences concern the share represented by the costs of raw materials and energy\textsuperscript{15}.

\textsuperscript{15} The cost structure of developing markets is consistent with the industrial costs of the Egyptian sector.
Price comparisons will be a matter of importance during the benchmarking exercise. This section introduces this important issue in order to offer a general overview about the main regional differences. Prices for sanitary ware are very changeable, according to the kind of piece and quality but the top price of Italian production and the medium quality of Turkish goods provide an overall reference.

Table 1.8: Average world prices for tiles and sanitary ware

<table>
<thead>
<tr>
<th>Country/region</th>
<th>Wall tiles (euro)</th>
<th>Floor tiles (euro)</th>
<th>Sanitary ware piece “first choice” (euro)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy</td>
<td>10.50</td>
<td>8.50</td>
<td>45</td>
</tr>
<tr>
<td>Spain</td>
<td>9.50</td>
<td>6.50</td>
<td>30</td>
</tr>
<tr>
<td>Turkey</td>
<td>5.50</td>
<td>4.50</td>
<td>20</td>
</tr>
<tr>
<td>UAE</td>
<td>4.50</td>
<td>4.50</td>
<td>20</td>
</tr>
<tr>
<td>Brazil</td>
<td>4.50</td>
<td>4.00</td>
<td>20</td>
</tr>
<tr>
<td>Egypt</td>
<td>2.50</td>
<td>2.50</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration

The overall country industry positioning is defined by the price of the first choice and countries that base their success on export performance (first of all, Italy) strongly invest in the productive cycles to increase and stabilize the share of first choice on the total output.

Lower prices can be settled in order to sell the second and, sometimes, the third choice, both internally and abroad. Of course, difference between the “first” and the other groups vary from country to country and it is mainly linked to the characteristics of the
internal demand. This results in a complex price definition which often shows better than other business elements the internal strategy of each manufacturer.

1.7.4. Industrial systems

In the market of ceramic tiles the most innovative countries are those that have a production chain that embraces tile producers and suppliers of technologies, glazes and colors.

Countries with a system capable of producing all or part of the necessary expertise are capable of independently generating product and process innovation and have the potential to become product leaders and therefore market leaders.

On the other hand, those that do not possess the entire chain will be forced to take the role of followers in spite of the fact that the technology is now available in all markets.

We can now indicate three countries that have a ceramic production chain: Italy, Spain and China.

Italy and Spain represents a homogeneous system with both cost and profitability factors comparable.
Figure 1.16: Italian and Spanish systems in the ceramic tile industry

Italy total value 7,172 mln. euro
- Tiles 72%
- Ceramic machinery 20%
- Glazes and colours 8%

Spain total value 4,559 mln. euro
- Tiles 77%
- Ceramic machinery 5%
- Glazes and colours 18%

Source: ACIMAC

Figure 1.17: The Chinese system in the ceramic tile industry

China total value 7,050 mln. euro
- Tiles 89%
- Ceramic machinery 4%
- Glazes and colours 7%

Source: ACIMAC
The Chinese system – which will be the real competitor in the near future – displays some major differences. This is not so much due to its production volumes (which are in any case very high), as to its likely capacity for innovation, given that it has many links in the production chain (raw materials, technology, glazes).

The advantage of Italy over other countries is that it is home to the largest, most extensive and most comprehensive ceramic production chain, the most highly organized and specialized system that exists anywhere in the world, where the ceramic producers have the opportunity to work in close cooperation with a robust system of technological support; the technology suppliers are able to spur each other in increasingly advanced research. The main elements which affect the decision to locate plants, and therefore the possibility to build and foster and integrated supply chain, are listed in the following box.

<table>
<thead>
<tr>
<th><strong>Main factors</strong></th>
<th><strong>Main issues</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Procurement</strong></td>
<td>It’s important to concentrate the production near mining site of good quality (i.e. white body), with an extraction system highly automated including quality checks at each step of the production. Large stores are needed, where it is possible to mix the extracted elements, avoiding the inclusion of external materials. An careful cleaning of the sites is mandatory. The nearness to glazes and machineries ceramic industries it is important too, because suppliers of non natural materials such as glazes or dies generally offer complementary services: project design, consulting to new product development and quality control.</td>
</tr>
<tr>
<td>• Raw materials</td>
<td></td>
</tr>
<tr>
<td>• Other materials</td>
<td></td>
</tr>
<tr>
<td><strong>Logistics</strong></td>
<td>The ceramic products are heavy and bulky, than the nearness to integrated transport systems allows a better control on delivery times and better customer satisfaction. On the other hand, an easy access to ports, railways and road, can reduce the overall production cost.</td>
</tr>
<tr>
<td>• Ports</td>
<td></td>
</tr>
<tr>
<td>• Roads</td>
<td></td>
</tr>
<tr>
<td>• Railways</td>
<td></td>
</tr>
</tbody>
</table>
Box 3: Requirements and production constraints affecting the selection of an investment location in the sector

<table>
<thead>
<tr>
<th>Main factors</th>
<th>Main issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human resource</td>
<td>In the ceramic sector, despite the continuous technological evolution, manual operations keep to be an important phase of the production process. For this reason, low labor costs will be transformed into actual cost advantages. Technical skills are important as well as managerial capabilities. In particular, the availability of medium skilled people (from 3 to 5 years of experience) is vital to the sector development, especially within the industrial clusters or industrial zones where the production installations take place. In order to reduce pressures on the local labor market and wages, it is important to provide the zones and the whole sector with professional schools linked to both the industrial environment and the research centers and laboratories.</td>
</tr>
<tr>
<td>Labor costs</td>
<td></td>
</tr>
<tr>
<td>Skills</td>
<td></td>
</tr>
<tr>
<td>Incentives to localization</td>
<td>The establishment of “industrial zones” is now a common practice in many developing countries, following the cluster scheme which some economies have already successfully implemented. The public support to localization include fiscal incentives for local procurement, import, export and revenue taxes, as well as co-financing of projects and creation of modern infrastructures.</td>
</tr>
</tbody>
</table>

1.7.5. Production complexity

Characteristics of ceramic tiles
Tiles are slabs of different sizes and variable dimensions (length sides ranging from a few centimeters to a meter and even more, from 5 to more than 25 mm thick), obtained by blends of clay, sand and other natural substances fired at high temperature.

This blend of materials of different nature (“body”), defines the behavior of the tiles.

Very ancient manufacture, ceramic tiles nowadays are still used in the most advanced and modern applications.

The general properties of ceramic materials are as follows:

- Mechanical resistance;
- Surface hardness;
- Thermal and electrical insulation and inertia.

As a result of the reactions occurring during firing process, ceramic tiles provide a compact structure and an elevated inner cohesion, while the nature of the chemical ties gives the tile an excellent strength, which is capability to stand high level of stress. Able to sustain heavy loads, they do not distort or buckle: they therefore result to be rigid.

Another property related to the ceramics nature is brittleness, which sets out its reaction to hits. Moderately resistant to hits, the ceramic tile does not deform itself, contrary to pliable materials. Moreover, the elevated temperature of the ceramics production process generates a stable compound with quite an inexistent tendency to react with other substances.

The ceramic products are therefore inert, that is to say insoluble and unalterable if put into contact with water and most of the chemical substances, both salts and acids. The flames of a fire as well cannot modify their composition.

Finally, it must be remembered that the value of the undeniable qualities of the ceramics tiles, in particular its mechanical and chemical resistance, can be underlined only if the overall installation - the floor or the tiled wall - have been correctly planned and executed.

This operation can be realized through the laying methodologies (which are not part of this analysis).

**Manufacture**

Tiles are the result of a production process made up of various phases according to the type of product, glazed or not, that the manufacturer wishes to obtain.
1) Raw-materials - body

The bodies used to produce tiles are made up of different raw materials. They are:

- Clays, which supply the necessary plasticity to the successive manipulation of tiles;
- Quartz and sands, with structural functions necessary to limit the dimensional variations during drying and firing;
- Feldspars, able to produce a liquid phase of viscosity (vitrification), adequate during the firing.

The body is prepared by grinding, mixing, homogenizing and regulating the water content.

After grinding, the world most common technology uses spray-driers for preparation of homogeneous grains.

At the end of this first phase two different types of body can be obtained:

- Granulated, with 4-7% water content, appropriate for mold forming and pressing;
- Semi-liquid, with 15-20% water content for extrusion shaping.

2) Moulding-drying

Most of tiles are formed by pressing, where body, in the shape of a semi-dry powder, is compressed between two surfaces. This operation gives the wished shape as well as the right compactness and resistance.

Cotto and clinker are mostly formed by extrusion: the body is shaped taking the form of a continuous belt cut afterwards.
Through the use of fast heated air driers, the water still in the body goes practically to zero. This delicate operation needs a rigorous control, in order to prevent breakages.

3) **Glazing and glazes**

Glazes are made up of different minerals and mixtures milled together with water, which are applied on the surface of the tiles and fused.

4) **Firing and sorting**

Firing process of tiles is realized in continuous roller kilns, reaching high temperatures (from 900°C to 1,250°C). Inside the kiln tiles are first heated until the maximum temperature and, after a defined permanence with the same temperature, progressively cooled. During firing the product changes chemical-physical properties, with several reactions and transformations necessary to obtain a mechanically resistant structure. During the subsequent cooling process, the fused layer of glaze becomes solid, forming a kind of glass that gives the tiles particular aesthetic characteristics (brightness, color) and technical performances (water absorption, hardness).

5) **Selection**

The last phase of the production system is the selection, which has three objectives:

- Removal of scrap pieces;
- Division into classes (i.e. first and second choice);
- Grouping into homogeneous lots according to the nuance-shade (aesthetic effect) and caliber (dimension).
Structural features and regularity
The regularity of one lot of tiles is connected to the measure of the different sides and to the measure of planarity.

The different sides must not be curved and must be perpendicular one another. The planarity concerns the curving of the center, the curving of the edge, the warpage.

The feature of regularity concerns the dimensions as well as the aspect of the tiles which can present the following flaws:

- Fractures or crazing;
- Glaze shrinking, lack of uniformity, pinholes craters;
- Black points, de-vitrification;
- Decoration flaws, scaling, bubbles;
- Irregularity and enamel deposit on the edges.

Quality control and nature of the product: ISO regulations
These technical rules regulate with clarity and accuracy the relationships between producers and purchasers.

Every Country possesses a National Agency of Standardization issuing detailed rules operative within the territory, identified by acronyms varying from nation to nation.

In order to favor the international market, in the last few decades the necessity for international norms equal in the different Countries has been recognized.

Two International Agencies of Standardization have therefore been found: CEN (Comité Européen de Normalisation) issuing EN rules, recognized all over Europe, and ISO (International Organization Standardization), whose rules are operative all over the world.

These rules define:
Classification into groups;
- Technical characteristics;
- Specification of the methods of measurement of the different characteristics;
- Indication of acceptability requirements.

Together with a technical-commercial classification of the products, substantially between:
- Floors;
- Coverings

there is a world-wide classification according to EN ISO regulations including nine groups of tiles identified according only to two parameters:
- Forming methodology;
- Water absorption.

In this way, the choice of the more suitable tiles is supported by a quality certification, concerning the characteristics and the necessary requirements.

**Box 4: Properties of ceramic tiles**

The characteristic used to describe in a quantitative manner the structure of tiles is water absorption. Through the pores of the material that are connected to the external part, giving an immediate suggestion on the structure of the same material: porous when we face elevated water absorption, compact when the absorption is reduced.

*Massive and superficial mechanics characteristics*

One of the main massive mechanical characteristics of the floor tiles is the stress flexion resistance, characterized by the maximum tension that the material can sustain before breaking down.

This property can be connected to the material structure.
Besides the modulus, it is being measured, determined not only by the material structure but also by the tile dimensions (in particular by its thickness), that indicates the capacity of resistance to the breaking down of the tile tested.

Another important property is the resilience or resistance to the impact. Through this characteristic it is possible to measure the resistance of the floor materials to the breakage caused by the fall of other materials. Tiles, like all the ceramic materials, are not resilient but fragile, that is to say they prove to have a limited attitude to resist to hits.

The main surface characteristic is the abrasion resistance. We can have two effects: the material is progressively consumed and/or the surface shows alterations, with brightness changes, modifying in chromatic tonality, and so on.

**Thermo-hygrometric and chemical characteristics**

The water and frost proof behavior are required for some types of ceramics tiles.

Water absorption is favored by the presence and the dimension of the pores, and it is followed by a second phase, during which the water absorbed solidifies, in case the temperature falls under freezing.

Water becoming ice increases its volume. The water frosted in the tile pores can cause such great tensions to create breakings and detachments of parts.

**Resistance to thermal shock.**

Also the thermal excursion can damage tiles.

**Resistance to crazing (cavillo).**

Causes of crazing can be connected to a bad dilatometric synergy between enamel and its support.

The ceramic floor tiles belong to the class of the electric insulators: their electric conductance reaches very low levels. This property results to be very important for security reasons, in applications with particular requirements of antistatic characteristics, operating rooms, chemical plants or laboratories.

**Fire proof**

Ceramic products can be considered secure even in case of fire, thanks to the resistance to the destructive action of flames, the zero contribution that the material can give to the increase of flames and the emission of smoke or toxic substances.

**Chemical characteristics**

Among this type of features we can count the resistance to the attack of chemically aggressive agents which can corrode the surface and therefore alter the aesthetic aspect of the floor tile.

---

**Raw Material Assessment and Control as a Factor in Manufacturing Quality**

By appreciating the requirements placed on each raw material and the properties and oxides they impart, an insight into the performance of the production process and subsequent products can be gained.
Close control of raw material properties is important for automated production, loss reduction and higher quality as the products will possess certain features such as good dimensional stability and color.

The increasing competition in the global market is more and more demanding:

- More diverse product ranges
- More complex product shapes
- Higher product qualities
- Automated production methods
- Greater flexibility of production
- Shorter lead times
- Lower manufacturing losses.

These driving forces for change have certain implications for raw materials and supplier/manufacturer interaction.

In particular, the raw materials must possess tighter specifications, be consistent in terms of key properties and be competitively priced.

*Ceramic Whiteware Raw Materials*

The term raw materials usually refers to all the materials that are physically incorporated into the final product, and often comprise auxiliary materials such as binders, which affect the products intermediate properties e.g., unfired strength.

In order to appreciate the behavior of products during manufacture and to develop new products using the most appropriate materials, an understanding of the various raw materials is essential.

Raw materials can either be:
- Natural raw materials e.g., clays, feldspars, quartz or
- Materials that have been highly refined or produced synthetically e.g., frits, oxides, opacifiers, pigments.

**Natural Raw Materials**

Naturally occurring minerals may either be used "as mined" or in a pre-treated form e.g., calcined, ground, blended. Pre-treatment helps to reduce the natural variability of mineral deposits to give consistent supply when using raw materials, and is becoming increasingly commonplace, as processes are automated and require more consistent materials.

**Synthetic Raw Materials**

The highly refined or synthetically produced materials such as the frits and industrial chemicals which are often used are relatively expensive, but are employed for specific properties which they impart e.g., lower firing temperatures, low contamination.

**Criteria for the Choice of Materials**

Two basic criteria are used for choosing materials:

- Cost and availability
- Chemical and physical properties

**Cost and Availability**

Fortunately for ceramics, raw materials are plentiful and relatively cheap.
Silicon is the second most abundant element in the earth’s crust (after oxygen). Feldspars account for 60% of the earth’s crust, and clays occur worldwide.

Another element in cost reduction is to look increasingly at the use of indigenous raw materials instead of more expensive, imported raw materials.

Choosing raw materials on cost alone can however, be very dangerous and the following example, emphasizes the influence of careful materials choice on the economics of production.

The following table compares a raw sanitary ware glaze prepared using different raw materials. Only the cost of the materials, using current United Kingdom (U.K.) tonnage prices, has been considered and any extra processing or production problems which may be associated with lower grade materials has been ignored.

The "accountants" glaze has been prepared using the cheapest raw materials to give overall glaze composition. However, these materials may have high iron and titanium contents which would cause the glaze to be colored. They may also require more grinding than more expensive materials. This glaze works out three times cheaper than the "technicians" glaze, which uses the cleanest materials and replaces part of the quartz and calcium carbonate with wollastonite. This would give the whitest glaze with the lowest gas evolution.

Clearly the choice of raw materials lies somewhere between the two depending on the quality of fired product required.

**Table 1.9: Glaze cost comparisons**

<table>
<thead>
<tr>
<th>Material</th>
<th>Accountant’s Glaze</th>
<th>Technician’s Glaze</th>
</tr>
</thead>
<tbody>
<tr>
<td>30% Quartz (0.3% Iron)</td>
<td>0.06</td>
<td>0.2 19.5% Quartz (&lt;0.1% Iron)</td>
</tr>
<tr>
<td>20% Calcium Carbonate</td>
<td>0.03</td>
<td>0.34 25.5% Wollastonite</td>
</tr>
</tbody>
</table>
### Raw Glazes

<table>
<thead>
<tr>
<th>Material</th>
<th>Cost (£/kg/Ton)</th>
<th>Material</th>
<th>Cost (£/kg/Ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% China Clay (Coarse)</td>
<td>0.11</td>
<td>11% China Clay (Fine)</td>
<td>0.21</td>
</tr>
<tr>
<td>40% Feldspar (Coarse)</td>
<td>0.11</td>
<td>44% Feldspar (Fine)</td>
<td>0.21</td>
</tr>
<tr>
<td>Glaze Cost</td>
<td>0.07</td>
<td>Glaze Cost</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations

### Key Properties of Raw Materials

The Ceramic Business Community identified key material properties for both raw materials and prepared bodies, and recommended a suite of standard, in-house test methods.

The key properties of raw materials are defined as:

- Chemical composition and loss on ignition
- Particle size
- Mineralogical composition
- Soluble salts
- Moisture content

Bulk chemistry and particle size are particularly important as without these two characteristics, vitrification and densification at acceptable firing temperatures, in acceptable times, would not be possible.

This means that these two properties can only vary between narrow limits, otherwise it will lead to major differences in the way in which formulations interact with water and deflocculating chemicals.
It is often not practical to carry out chemical and mineralogical analysis of the materials at the factory site. However, it is feasible to measure moisture content and particle size and simple observations can be made on the state of the incoming raw materials.

*Chemical Composition and Loss on Ignition*

The materials primary functions are to supply the requisite oxides to produce the right product when fired, and so should be consistent chemically, otherwise they can create problems particularly where automated systems are used, or color matching is required.

The material supplier should provide up-to-date information concerning the materials and provide assurance of consistency of supply.

*Particle Size*

Along with the composition of the incoming materials, the particle size should be well known and controlled if any grinding operation takes place. Under or over ground materials may both have an adverse effect on the quality of the finished article.

Control of particle size in plastic materials such as clays can influence casting rates, deflocculation demand, packing density, viscosity on standing, cast firmness, mechanical strength.

Control of particle size distribution for non plastics e.g., flux and silica is crucial in ensuring that vitrification takes place at acceptable temperatures. Too fine (90% <10µm) a flux results in bloating in the body, crawling in a glaze or less intense, pale fired colors.

*Mineralogical Composition*

Identifies the crystalline materials present e.g., the level of flux and filler. Different clay mineral compositions can severely affect processing properties such as drying shrinkage, cracking and slip deflocculation characteristics.
Soluble Salts

Soluble salts e.g., sulphates and chlorides are also important as these can influence deflocculation demand and hence unfired properties such as strength, firmness, and plasticity.

Their presence may also promote glaze crawling.

Moisture Content

A regular moisture content is important and should be measured not only for slip calculations, but also to ensure that water is not being purchased in place of the material.

Other Key Properties

Other factors combine to determine the final choice of material, such as the shrinkage on drying and firing, suspension and binding properties, dry strength, and plasticity.

Vitrification characteristics, decomposition on firing, presence of coloring oxides, particle size and mineralogy also influence the choice of raw materials.

Often the requirement of one part of the process requires a material with a property that conflicts with that required for another. For example, the demands of a slip casting process are influenced by the plastic (clay) materials, while the vitrification process relies on the fineness and nature of the non-plastics. Compromise once again needs to be made and accepted.

The Advantages of Material Characterization

Material characterization plays a vital role in trouble shooting, and it ensures manufacturers become pro-active rather than reactive to loss reduction.

Specking faults for example are a constant problem in the Whiteware industry and can account for up to 10% of total faults. They may be caused by contaminants, which can
be introduced by raw materials. Identification prior to manufacture can reduce production losses.

Compensating for Raw Material Variations

Although suppliers are taking increasing care in the refining of materials, it is inevitable that the clays, in particular, will have variable properties.

It is therefore important to understand the effect that variations in the properties of the raw materials may have before they are used and to adjust the composition accordingly (± 2-3%).

The advantages of this approach are that problem batches are detected early and manufacturers have a flexible attitude to product reformulation, although it does require investment in acceptance test equipment and procedures.

1.7.6. Raw materials as a strategic factor

The most important issue about raw materials for ceramics concerns the trade-off between red body and white body. When building the industrial capacity, all countries start using the most available and least expensive raw materials.

The red body let to build a production process with tangible advantages:

- Faster firing cycles and at lower temperature, with consistent saving in costs for both electrical and thermal energy;
- Lower forming pressures, minimizing the initial investment to start the production.

The disadvantages in using the red body are mainly linked to the dimensional increase of tiles. When switching from classical 15x15 or 20x20 formats to larger dimensions, using red bodies cause problems of stability in the final product. To overcome this limitation it is important to improve the constancy of red raw materials blends. The needed improved homogeneity and stability of the supplies can be executed at two different phases in the supply chain:
During the raw material production, by realizing bigger lot sizes in the quarries (quality control in charge of the raw material supplier);

At the beginning of the production cycle, realizing blends by large supplies of materials (quality control in charge of the manufacturer).

If neither the supplier nor the manufacturer realizes investments in warehousing facilities, the production process has to fit to the inconstancy of the raw materials with consequent lower quality and increasing industrial costs.

Other issues concerning the red body come from “loss on ignition” (up to 10% of weight is lost in firing) and gases that can go through the glaze layer causing holes, cracks and other structural defects. The consequent loss in quality strongly affects the selling performances in the richest markets, such as Europe and North America.

Moreover, red body requires higher costs in the glazing phase, because expensive glaze based on zirconium are needed.

The industrial development experienced by countries in the tiles sector often includes a switching from red body to white body. The former is synonymous of low quality in the international markets, while the latter better satisfy the demand in terms of both functional and esthetic characteristics of the final product. Therefore, the choice in raw materials is a part of the strategic positioning of each manufacturer. The following table shows the main differences in the productive cycle when using the two types of raw materials.
Table 1.10: Red body vs. white body

<table>
<thead>
<tr>
<th>Elements in production</th>
<th>Red body</th>
<th>White body</th>
</tr>
</thead>
<tbody>
<tr>
<td>body components</td>
<td>from 2 to 4</td>
<td>from 5 to 7</td>
</tr>
<tr>
<td>clays percentage</td>
<td>from 60 to 100</td>
<td>from 30 to 40</td>
</tr>
<tr>
<td>feldspar percentage</td>
<td>from 0 to 30</td>
<td>from 30 to 40</td>
</tr>
<tr>
<td>sand percentage</td>
<td>from 0 to 10</td>
<td>from 10 to 20</td>
</tr>
<tr>
<td>number of grinding cycle per mill and per day</td>
<td>from 3 up to 5</td>
<td>from 1 up to 1.5-2</td>
</tr>
<tr>
<td>number of mills per 1.5 million sq. m./year</td>
<td>about 1</td>
<td>from 2 up to 3</td>
</tr>
<tr>
<td>grinding energy rate</td>
<td>about 0.5 kwh/sq. m.</td>
<td>about 1.5 kwh/sq. m.</td>
</tr>
<tr>
<td>grinding media (silica) consumption rate</td>
<td>1.2-1.4 kg/ton</td>
<td>3-5 kg/ton</td>
</tr>
<tr>
<td>forming pressure</td>
<td>250 kg/sq. cm.</td>
<td>350 kg/sq. cm.</td>
</tr>
<tr>
<td>press size</td>
<td>2,000 ton</td>
<td>&gt;4,000 ton</td>
</tr>
<tr>
<td>press production</td>
<td>&lt; 5 sq. m./min</td>
<td>&gt;8 sq. m./min</td>
</tr>
<tr>
<td>average daily production per line</td>
<td>5,000 sq. m.</td>
<td>8,000</td>
</tr>
<tr>
<td>number of press per 1.5 million sq. m./y</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>firing temperature</td>
<td>slightly higher than 1,150°C</td>
<td>near 1,200°C</td>
</tr>
<tr>
<td>firing consumption (gas)</td>
<td>1 scm/sq. m.</td>
<td>higher than 1.5 scm/sq. m.</td>
</tr>
<tr>
<td>storage, automation</td>
<td>almost not present</td>
<td>heavy</td>
</tr>
<tr>
<td>kiln daily production</td>
<td>6,000/8,000</td>
<td>10,000/12,000</td>
</tr>
<tr>
<td>number of kilns per 1.5-2 million sq. m./Year</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>manpower productivity</td>
<td>5,000-10,000 sq. m./man/year</td>
<td>25,000-50,000 sq. m./man/year</td>
</tr>
</tbody>
</table>

**Functional characteristics**

| Water absorption                             | high/medium | low/zero |
| Technical performance level                  | low         | high     |

**Industrial costs**

<table>
<thead>
<tr>
<th></th>
<th>Red body</th>
<th>Non European producers (i.e. Brazil, Turkey, China)</th>
<th>White body</th>
<th>European manufacturers (i.e. Italy and Spain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor cost per capita per year</td>
<td>2,000 $/year</td>
<td>8,000 $/year</td>
<td>60,000 $/year</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>&lt;0.5 $/sq. m.</td>
<td>&lt;1 $/sq. m.</td>
<td>&gt; 1.5 $/sq. m.</td>
<td></td>
</tr>
<tr>
<td>Energy costs</td>
<td>0.35 $/sq. m.</td>
<td>1 $/sq. m.</td>
<td>&gt;1.5 $/sq. m.</td>
<td></td>
</tr>
</tbody>
</table>
The figures clearly show that a production based on the white body requires a different combination of labor, capitals, energy and raw materials, with a specific organizational planning in terms of procedures, coordination and quality of human resources. This inevitably comes to a deep change in the structure of industrial costs with higher costs per unit of final product in exchange for an average better quality and productivity (the “first choice” percentage is at least 20% with the white body). Moreover, it is a matter of importance that the white body can be produced with consistent savings when some factors, i.e. labor and energy, are available at lower prices. This means that countries such as Brazil, Turkey and China can rely on important competitive advantages when exporting their good quality tiles at prices that are near to many “local” red body productions in the world.

However, it is not only a question of choosing between two models of production and cost allocation: producing for more demanding markets, in larger formats, following the latest fashions and satisfying the most advanced technical requirements, involve the adoption of the white body.

### 1.7.7. Technology suppliers

The technology for the ceramic industry is under control of four Italian companies (SACMI, SITI, BARBIERI & TAROZZI, SYSTEM) that surpassed German, French and British manufacturers. Due to the increasing competition of emerging economies with a lower cost of labor, Italian suppliers started to exit the less profitable market segments in order to focus on the products characterized by a higher content in automation,
software, complexity, innovation (presses, glazing machines, packaging systems). Consequently, Chinese producers play now an important role in the heavier products such as mills and spray-dryer. The rest of the market belongs to Turkish companies and to local manufacturers.

Concerning the interaction between the technology supplier and the ceramic manufacturer, two models can be identified:

- “Exclusivity”, when the manufacturer establish a relationship with only one supplier (a general contractor) in a logical framework of partnership;
- “Picking”, when the manufacturer buys different pieces from different vendors.

The first relationship is preferred by companies with few levels of management and where the decision power is very concentrated.

1.7.8. Key factors to success in the global market

The following table synthesizes the level of attention the manufacturers should pay to all the elements of the integrated supply chain, from procurement to production and distribution (highest scores mean more importance factors).

Table 1.11: Key success factors

<table>
<thead>
<tr>
<th>PRODUCTION</th>
<th>Relative importance of the factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For tiles</td>
</tr>
<tr>
<td>Costs</td>
<td>8</td>
</tr>
<tr>
<td>Economy scale</td>
<td>7</td>
</tr>
<tr>
<td>Economic lot size definition</td>
<td>7</td>
</tr>
<tr>
<td>Production decentralization</td>
<td>8</td>
</tr>
<tr>
<td>Procurement management</td>
<td>8</td>
</tr>
<tr>
<td>Process innovation</td>
<td>For tiles</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Productive cycle automation</td>
<td>8</td>
</tr>
<tr>
<td>Flexibility</td>
<td>8</td>
</tr>
<tr>
<td>Logistics</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MARKETING AND SALES</th>
<th>For tiles</th>
<th>For sanitary ware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product image</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Product innovation</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Design</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Performances</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Price</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Discounts</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Conditions</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Quality</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Certification</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Adaptation to international quality standards</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Raw materials quality</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Standard constancy</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Product range</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Distribution</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Capillarity of the distribution network</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Point of sales selection</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Sales force training</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Logistics (order management, warehouse, connection with point of sales)</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Advertising and promotion</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Advertising investments</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Sponsorship</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Participation to fairs and exhibitions</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Service</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Speed and respect of delivery time</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Pre sales assistance</td>
<td>7</td>
<td>6</td>
</tr>
</tbody>
</table>
Factors concerning the costs seem to be more critical for ceramic tiles, whereas the sanitary ware market will more and more depend on global brand policies (sometimes getting away from the actual production in a continuous process of production decentralization).

1.8. Conclusions

The world industry grew in 2003 by 5%, a consistent rate if compared to the world GDP growth of 2.6%. For the ceramic tiles segment, this means that every year the market potentially receives 350 million sq. m., more or less four times the yearly Egyptian production. The latest forecasts indicate a 7% growth for the next five years in the two sub-sectors.

Like in many other sectors, Asian countries are expanding their economic weight while consolidated industrial systems are losing market shares: for the first time in their history, Italian and Spanish performances both in production and export are worsening.

If China accounts by now for almost a third of the world production of ceramic tiles, other competitors are growing at important rates (Brazil, Indonesia, India) even though the export shares of Italy and Spain are far to be approached.

Despite a stable internal production, Italy remains the world leader in terms of innovation and trend setting. This is partially due to the extension and depth of the Italian ceramic production chain, with a district based industrial structure where innovation quickly spread among manufacturers and technology and materials suppliers
and distributors. If Spain has also built and integrated supply chain, the Chinese industrial systems seem to have the most comprehensive ceramic industrial system, including a competitive manufacturing process as well as an increasing supply in technology and glazes.

Some countries succeeded in the last years in entering the most profitable markets. It is the case of Brazil, which is the fourth world exporter with a consolidate presence in the north American market, while Turkey developed an export production for the European market and got to build a productive capacity in Eastern Europe to better approach the market. These are, without any doubts, case of success.

On the demand side, China is again almost a third of the world market. Other important growths in internal consumption support an increasing national production: it is the case of populous countries such as India, Mexico or Indonesia. Sometimes, the domestic production is fuelled by joint ventures with foreign manufacturers (i.e. Italian companies in Russia).

USA remains the biggest importer, an open market with a positive trend in consumption satisfied by foreign manufacturers. The main world markets like Germany and France have quite steady and show a ration between internal production and domestic consumption similar to USA).

At a regional level, if Asia is the most dynamic area, the Mediterranean and Middle East is becoming a region of great importance in terms of:

- Consumption, because of both rich markets (i.e. Saudi Arabia is the fourth importing country in the world) and fast growing populations (North Africa);

- Production and export, thanks to the rise of successful competitors such as Turkey and UAE but also in sight of new regional players like Iran and Morocco (both of them are building important production capacities).
Compared to other manufacturing sectors, ceramic and sanitary ware market is characterized by a limited exportability. This is due to many reasons:

- The physical output is relatively heavy and bulky and generate high transportation and storage costs;
- Producing for the most developed foreign markets means to study and customize products for different cultures, tastes, habits; the consumption patterns are a matter of importance for the aspiring exporters, in order to distinguish between fashions and trends and choose a profitable and sustainable positioning in the market.
- The access to market frameworks can become barriers to enter for the foreign producer, especially where the sales organizations are a critical factor to success in the market; participating to fairs and exhibitions may not be the most suitable approach to interact with rich and complex markets.

The above factors may only slow down a general production capacity reallocation from the most developed countries to the emerging economies. The ceramic production can survive in Europe and USA only if the manufacturers succeed in compensating higher production costs with higher selling prices for the top quality market segments.

Many developing countries completed the phase of acquiring the “state of the art” technologies, built a surplus of production capacity with regards to the domestic demand and are now to start exporting towards neighboring markets, sometimes through the network of large companies. A remarkable exception is China, which is exporting both the final product and the technologies it has been developing in the last years. This is going to restrict the market shares of the two global players Italy and Spain, also in the technology and glazes supplying.
The technology for producing tiles and sanitary ware can be considered mature and available on the market, with the main innovations due to the expansion of ICT applications. Nonetheless, a decisive role in the ceramic tiles production cycle is still played by the quality of raw materials. The actual trade-off is between the characteristics of raw materials for bodies:

- “red body” – it can generally be realized in most of the countries with local raw materials, requires lower investments in fixed assets and other productive factors but it does not support the larger formats, technical top performances and the more sophisticated color treatments;

- “white body” – few lucky countries (i.e. China and Turkey) have the local raw materials to produce it whereas the rest of the manufacturers must import; it allows to make any format and reproduce any esthetic effect, with an average better quality (stability); by contrast, the white body is more demanding in terms of fixed assets and consumptions (i.e. energy).

The manufacturers willing to offer a quality suitable to approach the medium-high price segments have no choice: they must produce white body and start to control changeable elements such as trends and fashion. In facts, it is a question of entering the most profitable markets segments taking up the challenge of bearing higher investments and costs. Some countries adopted this strategy some years ago and are nowadays top quality leaders (Italy). Others are in a transition phase, realizing different levels of quality according to different destination markets (i.e. a better quality for export) and improving the “perceived value” of their offer in the global market. Finally, other countries are completely tied to a low quality production, mainly for a domestic demand, that excludes them from the global market.
2. CERAMIC TILES AND SANITARY WARE IN EGYPT

2.1. Objective and methodology

This chapter wants to provide a picture of the Egyptian sector in terms of market structure, main players and industrial processes, taking into account that this study should mainly focus on the export prospects and the possible ways to improve the competitive positioning of the Egyptian industry. The analysis does not go through the business performances of the individual companies because the objective is to identify the main forces affecting the export performances in the ceramic tiles and sanitary ware industry. The considerations about the production processes and the perceived value of the Egyptian product will be the basis for identifying adequate development strategies for the sector.

Different sources have been considered to gather information about the Egyptian industry.

First of all, a company survey has taken place among Egyptian business operators. Manufacturers have been questioned about the used technology, available assets and the production cycles, as well as the sales and export performances and internal organization. When figures and opinions concern an individual manufacturer, the company has been indicated by the anonymous nicknames “Manufacturer 1, manufacturer 2....”

The international experts who have been involved in the study, collected data about Egyptian sector also accessing their personal relationship network, in order to draw the most accurate picture of the current sector conditions. This second important source provided accurate data about the technological equipments and the industrial processes of the companies.
The use of Egyptian official statistics has been limited because, like for many other countries, data about the ceramic sector are not always reliable. Different sources can provide **contradictory figures** and official data are sometimes very far from the business community perception (for an example, see CAPMAS data about import and export that show an important underestimation of Egyptian imports for year 2004). Moreover, also when the figures can be considered realistic, they may be useless or have a limited value: productions and international flows are often expressed only in quantity rather than in value, exports are expressed in weight (for sanitary ware), etc.

### 2.2. Background

The most important reasons for the start of the ceramic tiles industry in Egypt is the correspondence of the Egyptian consumption patterns with the ceramic tiles properties (easy to clean, easy maintenance, reasonable cost, products suitable to hot weather). As result of the population growth, the increase of the domestic consumption and the availability of the body raw materials (feldspar, kaolin, clay and quartz), the Egyptian investors, formerly ceramic tiles importers or traders, started to invest in ceramic tiles sector to satisfy the domestic needs. Recently, they entered the sanitary ware industry to follow the emerging consumption trained by the population growth and the tourist sector consolidation.

Some dynamic phases can be identified for the ceramic tiles industry:

- **Late 50s**: Egypt started the first production step through a public sector company "SHINI" which started by ceramic tiles, sanitary wares and pottery;
- **Late 60s**: LECICO as first private company started to produce ceramic tiles and sanitary ware;
IPI – Italian Institute for Industrial Promotion
A Strategic Study on the Egyptian Ceramic Tiles and Sanitary Ware Industry

- **Late 70s:** A joint venture company (ARACEMCO) and private companies (ALAHLIA for tiles and GRAVENA for sanitary wares) followed into the same filed;

- **Late '80s:** Egypt stops to be a net importer and becomes a player in the international markets with the introduction of new private companies (CERAMICA CLEOPATRA was established in 1987); the per capita consumption takes off and the internal sector tries to satisfy this development);

- **Late years '90:** new investments of some companies extend the production capacity, still focused on the internal market, whereas LECICO starts to export sanitary ware to Europe thru a European multi brand group (SANITEC);

- **Present phase:** the last months (years 2004/2005) have been characterized by acquisitions, spin off and start-ups that should support a new growth of production in the next years.

On the whole, the Egyptian industrial development in this sector can be considered an actual success story: in the last two decades the national production achieved the important goal of satisfying the internal demand, substituting imports with a product that generally fits the local expectations. Moreover, a certain international presence has been built, even though Egypt seems to be far from playing an active role in the global market.
Although in the period 2002-2003 the ACIMAC data show no growth for the Egyptian production (see above, chapter one), in the last five years the sector has been growing more than the average in the rest of the world.

Table 2.1: Egyptian and world production.

<table>
<thead>
<tr>
<th>Year</th>
<th>World production</th>
<th>Egyptian production</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity (millions sq. m.)</td>
<td>Growth</td>
</tr>
<tr>
<td>2005</td>
<td>around 100</td>
<td>10.0%</td>
</tr>
<tr>
<td>2004</td>
<td>around 6,500</td>
<td>7.6%</td>
</tr>
<tr>
<td>2003</td>
<td>6,030</td>
<td>5.1%</td>
</tr>
<tr>
<td>2002</td>
<td>5,740</td>
<td>4.4%</td>
</tr>
<tr>
<td>2001</td>
<td>5,500</td>
<td>3.4%</td>
</tr>
<tr>
<td>2000</td>
<td>5,320</td>
<td>9.9%</td>
</tr>
<tr>
<td>1999</td>
<td>4,841</td>
<td></td>
</tr>
</tbody>
</table>

Source: ACIMAC
This shows the **confidence of the Egyptian producers** and investors in this sector and their capability to increase the volume of production to satisfy the expected domestic growth rate and the regional exports demand.

### 2.2.1. Quality Specifications

All the Egyptian productions are following the Egyptian standards No.3168-1, 2, 3, 4, 5, 6/2000. These standards are based on ISO 13006 standards for dry-pressed ceramic tiles with various water absorption.

### 2.2.2. Key players

Looking at the key players of ceramic tiles and sanitary ware sector in Egypt we can notice that **17 producers** are in the market: 13 owned by Egyptian investors in ceramic tiles and sanitary ware production; one public owned (in sanitary ware production)\(^\text{16}\); the last 3 companies are international investments in sanitary ware production. The public company is located within an old industrial area near to Cairo. All the private companies (except two) are located in the new industrial cities. The major clients, traders and the public institutes are located in Cairo. The main ministry dealing with the producers is Ministry of Finance (taxes, custom duties and drawbacks). Recently, Ministry of Petrol is managing the mining affaires in Egypt thru EGSMA\(^\text{17}\).

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\(^{16}\) Another public operator is involved in terracotta production, based in the Cairo district.

\(^{17}\) During the local survey, the senior Egyptian consultant of the team started to establish a link between EGSMA and the Ceramic branch of the Building Materials Chamber (Federation of Egyptian industries) to study the treatment of the natural raw materials to satisfy the ceramic tiles and sanitary ware producers quality requirements. Such a kind of actions are expected to help the Egyptian producers to have constant raw materials which will impact on the industrial costs, the sorting yield of the final products, and the total performance.
2.2.3. Applied rules and legal framework

The majority of the companies in this sector have been established in the new industrial cities around Cairo and Alexandria. Consequently, they are founded according to the law No. 8 of 1997 concerning investment guarantees and incentives and also law No. 159 of 1981 concerning the new industrial cities (78% of the producers are located in the new industrial cities). All the products sold into the domestic market are taxed with 10% sales tax. The products sold to the export market are exempted from the sales taxes and also from the custom duties on the imported raw materials (drawbacks). Moreover, a new taxes law has been recently approved (June 2005) to decrease the upper limit of revenue taxes from 40% to 20%; among the other effects, the new taxation schema is expected to encourage foreign investors to start investments in the feeding industries sector (raw materials management, technological supplies, colors and glazes). In fact, such a kind of investments are long term based and deeply affected by revenue taxes.

2.3. The sector impact on the Egyptian economy

The Egyptian ceramic and sanitary wares sector total turnover per year has reached in year 2004 a value of 1.7 billion EGP approximately (about 300 million $, which account for 0.4% of the country GDP). The export turnover was about 60 million $, 20% of the total sector turnover and 0.35% of total Egyptian exports. The domestic consumption amount of ceramic tiles is approximately 1.4 billion EGP. This amount is covered by the local producers (95%). For sanitary wares the domestic consumption is approximately 350 million EGP totally, also almost fully covered by the local producers. Sales taxes on local products account for about 140 million EGP per

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18 According to International Monetary Fund, Egyptian GDP in 2004 was 77,032 million (current $), while the exports of goods and services were about 17,000 million (current $).
year. The consumption amount of internal raw materials is approximately 20 Million EGP per year.

The total number of direct employees in this sector is around 25,000 people distributed over 17 companies, accounting for about 0.5% of the total industrial manpower in Egypt (some 5 million). With the current expansions in the factories, about 10,000,000 m2 per year between 2005 and 2006, other 1,000 employees are expected to join the sector. The average gross wages is around 12,000 EGP per year per employee, with total amount of 300 Million EGP per year.

Concerning the intra-industry impact, the indirect employees working in related fields such as natural raw materials, packaging, transportation, trading and installation are considered by 75,000 employees (three times the labor force directly involved in final manufacturing) with approximate total gross wages of 500 million EGP per year.

2.4. **The current Egyptian market**

2.4.1. Production

Without the dramatic growths other countries experienced during the last years (see above chapter one for historical series about the world production), Egypt consolidated a production of almost 90 millions sq. m. in ceramic tiles in 2004. Considering an estimated increase of about 10% in 2005, the local sector is approaching the 100 millions sq. m. The per capita consumption is around 1 sq. m./year and is expected to grow although the growth rate cannot be estimated.

**Productive structure**

Both the ceramic tiles and the sanitary ware industries, Egypt shows an important level of concentration and the market belongs to 10-12 manufacturers. In terms of production capacity, the tiles total sector is estimated at around 140-160 million sq. m.
(including some new investments and start-ups)\textsuperscript{19}. In 2005 other new players are expected to enter the market.

The associated level of utilization stands between 65\% and 75\%.

While the tiles production is realized exclusively by local manufacturers, the sanitary ware market has already experienced the entry of big world networks, such as AMERICAN STANDARD, DURAVIT and SANITEC. This positively affects, in some cases, the export capability (see next paragraphs).

\textbf{Figure 2.2: Production capacity shares in ceramic tiles sector (2004)}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{production_capacity.png}
\caption{Production capacity shares in ceramic tiles sector (2004)}
\end{figure}

\textit{Source: Company survey}

\textsuperscript{19} Figures provided by the manufacturers during the direct interviews tend to slightly overestimate the production capacity at 161.5 million sq. m.
According to a total production of 161.5 million square meters, as declared by local manufacturers.
2.4.2. Pricing and segmentation

The Egyptian manufactures in the tiles market are focused on 3 main product categories:

- “Low price” with a price range of 16-18 EGP
- “Medium price” with a price varying from 19 to 24 EGP
- “High price”, for products sold at 25-30 EGP

If we consider the twelve main companies in the tiles sector, three manufacturers belong to the “high price” group even though only two of them can be considered as market leaders, because of the product quality and a certain international image.

It has to be noted that, the meaning of “low” and “high price” for the Egyptian market has a little connection with the relevant categories in the international markets. The price difference between the first and the third group is almost 1:2 and this proportion is valid
also for the sanitary ware ceramics but a tile of 30 EGP (high price/high quality) is still considered "cheap" in Europe and worldwide (see chapter one). On one hand, this difference can be considered an advantage to export but, on the other hand, it is a dramatic weakness because it can confine the Egyptian product to a “cheap” perception, a dangerous cage that may be difficult to exit.

**Figure 2.6: Distribution of manufacturers in the tiles price categories (year 2004, % on total number of manufacturers)**

![Figure 2.6: Distribution of manufacturers in the tiles price categories (year 2004, % on total number of manufacturers)](image)

This segmentation does not fully satisfy the local demand: there are customers willing to buy top quality tiles, spending more than 30 EGP. For this kind of products (i.e. the polished porcelain) the perceived value of “Made in Egypt” is around 45 EGP, too low to compensate for the higher costs of production (imported raw materials, process management and risks connected to currencies fluctuations, etc.) The Egyptian manufacturers seem to prefer to stay out from these products and, with the future
possible reductions in the trade barriers, the importance of foreign manufacturers will be higher.

The different positioning of the manufacturers is also highlighted by the different product range realized by the companies. The following table indicates “who does what” in the tiles market using the previous segmentation in three price groups (ten producers are considered). Only the “high price” companies offer all formats but only manufacturers 1” and “manufacturer 2 can be considered “market and price leaders” (“manufacturer 3” sells at lower prices in all product types compared to the rest of the group).

The other manufacturers (“medium price” and “low price” segments) are weaker in their offer, especially in smallest and biggest dimensions, focusing on more common formats at a lower quality and price.

In the local market, the spread between first and second choice seems to be around 15-20%, while in the European market is more common a difference higher than that. Significantly, the 15-20% spread addresses a very real local segment of demand which is willing to accept this grade at such a discount. This contributes to the sustainability of this spread and may reduce pressure to improve first choice yield.
Table 2.2: Tiles formats and Egyptian manufacturers

<table>
<thead>
<tr>
<th>Tiles Dimensions (cm)</th>
<th>Type</th>
<th>Tiles Manufacturers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High price (25 - 30 EGP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>10x10 Walls</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>20x20 Walls</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>20x30 Walls</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>25x35 Walls</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>30x44 Walls</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>30x30 Floors</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>35x35 Floors</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>42x42 Floors</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>50x50 Floors</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Source: Company survey

Facing a local market with a growing per capita consumption, the manufacturers seem to be focused on two different strategies of development:

- A part of them choose to leverage on economies of scale, reaching greater volumes and reducing the cost of production for low-medium price products;

- The manufacturers which already sell in the high price range (25-30 EGP) tend to improve quality, and consequently the selling prices, maintaining the control of costs and production cycles based on the available technologies and raw materials;

The second approach results in a low profile strategy that gives up entering the highest quality segment in the internal market and expanding their sales in the global market. An important part of the top internal market remains occupied by the foreign producers with an incomparable perceived value among the customers.
The main segmentation characterizes the sanitary ware sector too, with prices varying between 35-40 EGP per piece and 80-100 EGP through a middle price/quality of 55-60 EGP per piece.

Figure 2.7: Distribution of sanitary ware manufacturers in the sanitary ware price categories (year 2004, % on total number of manufacturers)

Source: Company survey

2.4.3. Distribution, internal demand and export

Ceramic tiles
The Egyptian ceramic production is mainly based on the internal demand satisfaction. This is the reason why just a minimum percentage (20-25%) of the product is sold on average to the foreign markets.

According to CAPMAS data, the import is decreasing, both in value and in quantity, except for the last year. On the other hand, the export shows an increasing trend and,
consequently, the proportion between imports and exports strongly decreased during the last years.

Table 2.3: Egyptian import and export of ceramics tiles

<table>
<thead>
<tr>
<th></th>
<th>Year 2000</th>
<th></th>
<th>Year 2001</th>
<th></th>
<th>Year 2002</th>
<th></th>
<th>Year 2003</th>
<th></th>
<th>Year 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity (1000 sq. m.)</td>
<td>Value (millions EGP)</td>
<td>Quantity (1000 sq. m.)</td>
<td>Value (millions EGP)</td>
<td>Quantity (1000 sq. m.)</td>
<td>Value (millions EGP)</td>
<td>Quantity (1000 sq. m.)</td>
<td>Value (millions EGP)</td>
<td>Quantity (1000 sq. m.)</td>
</tr>
<tr>
<td>Import</td>
<td>460</td>
<td>11.7</td>
<td>460</td>
<td>8.4</td>
<td>339</td>
<td>6.8</td>
<td>199</td>
<td>5.8</td>
<td>233</td>
</tr>
<tr>
<td>Export</td>
<td>1,116</td>
<td>20.2</td>
<td>1,423</td>
<td>69.3</td>
<td>2,659</td>
<td>59.0</td>
<td>3,409</td>
<td>83.6</td>
<td>5,658</td>
</tr>
<tr>
<td>% Import on Export</td>
<td>41.2%</td>
<td>57.9%</td>
<td>32.3%</td>
<td>12.1%</td>
<td>12.8%</td>
<td>11.5%</td>
<td>5.8%</td>
<td>7.0%</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

Source: CAPMAS

Let alone for the data reliability (during the company survey, an important trader suggested imports were about 800,000 sq. m. in 2004, instead of the official 233,000), the overall figures say nothing about the export attitudes among the companies. The export market shares of the individual companies result from different approaches. As the below figure shows, the different manufacturers group (high, medium and low price) have different export percentages on total production, increasing from 25% of the first group to 40% of the third group.

The final destination markets are mainly oriented to the neighboring markets. Only the two “market leaders” seem to be able to export in the European Area.\(^{21}\)

\(^{21}\) Especially in Greece and in Mediterranean Islands
Figure 2.8: Export share on total tiles production (2004)

Source: Company survey

Figure 2.9: Ceramic tiles flows between Egypt and Arabic Region

Source: CAPMAS
Figure 2.10: Ceramic tiles flows between Egypt and Africa

Source: CAPMAS

Figure 2.11: Ceramic tiles flows between Egypt and Europe

Source: CAPMAS
Figure 2.12: Average export prices for tiles (2004)

Average Export price For Egyptian Ceramic Tiles

<table>
<thead>
<tr>
<th>Region</th>
<th>Price (EGP/M2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arab Region</td>
<td>35.00</td>
</tr>
<tr>
<td>Europe</td>
<td>25.00</td>
</tr>
<tr>
<td>Africa</td>
<td>20.00</td>
</tr>
<tr>
<td>Asia</td>
<td>15.00</td>
</tr>
<tr>
<td>USA</td>
<td>20.00</td>
</tr>
</tbody>
</table>

Source: CAPMAS

Figure 2.13: Tiles export in value and quantity (2000-2004)

Ceramic Tiles Export in value
From 2000 to 2004
Egypt

- Arab Region: 74%
- Africa: 4%
- Europe: 20%
- Asia: 1%
- USA: 1%

Ceramic Tiles Export in Quantity
From 2000 to 2004
Egypt

- Arab Region: 68%
- Africa: 5%
- Europe: 25%
- Asia: 1%
- USA: 1%

Source: CAPMAS
Let alone for the official data reliability again, it is clear to say that the most important area for the Egyptian tiles export is the Arabic region. Also the perceived value of the Egyptian productions in these countries is considerably accepted.

Although the COMESA\textsuperscript{22} agreement is applied since year 2000 the export to Africa is still weak because of transportation cost and inexperience in the African market.

In spite of EU-Egypt association agreement, the export to European Area is small and need more experience to satisfy the clients requirements.

Moreover, export selling price is quite different from price for local distribution: only the two market leaders are able to obtain around the same price in both markets (average selling price is 27 EGP for foreign market and 25 EGP for domestic market). The other groups sell abroad at lower prices.

It means that just the two market leaders seem to be able to sell abroad the same (or the best) quality they sell internally, although the selling price can be still considered as “cheap” in the developed markets. The lower price group cannot export its best quality product: they rather export the residual stocks (second and third choice) at lower prices to African countries and Arabic region.

\textsuperscript{22} Common Market for Eastern and Southern Africa
Sanitary ware

In the sanitary-ware sector an important role is played by the international multinational corporations operating in the market. Large international networks, for example AMERICAN STANDARD, DURAVIT OR SANITEC (all of them produce in Egypt) can allocate different shares of their global production among the different companies that belong to the group taking into account important factors such as:

- Competitive advantages of each company in terms of internal costs;
- Costs of transport;
- Barriers to trade that force the group to control local manufacturers to sell in specific markets;

Source: Company survey
- National fiscal policies.

All these elements can make profitable expanding production in one country and reduce it in another, depending on the corporate strategies. Therefore, the export shares can be different inside the group and it can be profitable to realize productions of medium – low quality in developing countries to export them to the richest market under the international group brand. For the manufacturer, this may result in an improvement of the quality because it has to face international standards and can take the most advantage of the knowledge transfer inside the group. Also the industry itself can improve its positioning if the network promotes new investments in assets and in human resources.

On the other hand, the export selling price for the local manufacturer will hardly be higher than the price he can obtain in the domestic market.

The giant networks with productions in dozens and dozens of countries, will limit the use of inter-company exports and the manufacturers will mainly sell locally. The smaller networks and mainly based in the developed markets will make the most use of exporting from developing countries and selling in the richest ones, in order to make profit by lower production costs (first of all, labor costs).

The Egyptian sanitary ware industry seem to confirm this theoretical framework: the company which belongs to the biggest world multinational group exports only 20% of its production, while companies belonging to smaller networks, mainly concentrated in Europe, export up to 60%.

On the other hand, the local manufacturers without any connection with the international groups generally entered the sanitary ware after the tiles market, that they consider their core business. They can only export their residual production to neighboring countries, as it happens for tiles.
It has to be noted that also the opposite flow (from developed countries to developing countries) can take place for higher quality products. In the Egyptian context, the difference in selling price between the local market and the European one is so high that this approach is not implementable: the local demand seems not to bear the prices of the European producers and in the sanitary ware market Egypt shows no import.

**Figure 2.15: Access to market schema in Egypt**

The access to market schema show a simpler and less stratified business framework (if compared, for example, to the European markets), although some manufacturers already built their own way to market via internal outlets and franchising networks. The builders and contractors channel is estimated to represent around 20% of the market.
2.4.4. Issues concerning the supply chain and the customer satisfaction

Issues about raw materials
The consumption of the natural raw materials is around 2,000,000 tons. This quantity will be increased proportionally with the expansion of the sector production capacity.

The cost structure in the two sub-sectors (tiles and sanitary) is compliant with the schema presented in the previous chapter, concerning the “developing countries”23.

In particular, the industrial cost of ceramic tiles is divided into 60% raw materials, 15% labor cost, 15% fixed asset depreciation, 3% energy and the rest is miscellaneous.

For sanitary wares the industrial cost is divided into 30% raw materials, 50% labor cost, 5% energy, 5% fixed asset depreciation and the rest is miscellaneous.

The imported raw materials cost presents 74% of total raw materials cost for ceramic tiles and 82% for sanitary wares.

Particular constraints faced by Egyptian companies in the field of raw materials include:

- Lower value of Egyptian pound making refined imported raw materials very expensive;
- Transport costs both to and within Egypt;
- Poor continuity of supply of indigenous raw materials. Local Egyptian raw material suppliers are not very reliable in their attention to a "standard supply". It is probably not viable for mining companies to produce 5,000 tons per month of clay or feldspar.

23 See above, chapter one, “1.7.3. Costs and prices in the global market”
As result, the inconsistencies of the supplied raw materials are the main industrial problem facing the Egyptian producers which partially affect the final product sorting yield (the average in Egypt is low, about 65% first choice).

As told before (see chapter one, “Raw materials as a strategic factor”) the trade-off between red body and white body is the main distinction among the different kinds of productions. Adopting available and cheaper raw materials means, for Egypt, to use the red body coming from the internal quarries (the most important are in Red Sea, Sinai and Minia regions).

Overcoming the limitations of using red body seems to be particularly difficult in Egypt, since the local industry has not a consolidated culture of investing in materials inventory; interestingly, this is likely to be an indirect assessment of management decision support systems and costing systems. If professional systems were in place, the opportunity cost of lower choice yields would be held in stark contrast to the investments required to build material inventories: is it more profitable to invest in inventories and produce more “first choice” or the opposite? The local suppliers are used to a market which can and does absorb subfirst choice production; the local market makes internally sustainable to produce significant quantities of second and third choice.

If the choice between red and white body is a well known trade-off in the worldwide tiles industry, the sanitary ware production does not know such a kind of alternative: in accordance to a consolidated international standard, “vitreous china” is a “must” for the classical bathroom pieces and producing WCs by fire clay is unconceivable (use of this material is confined to bathtubs and shower trays). Actually, this is not a technical or functional need: it is rather a market orientation and Egyptian production is no exception. For the Egyptian companies, manufacturing vitreous china means to depend on expensive imports of supplies because the local production of the needed raw material would be even less profitable. The decision of producing vitreous china could be also an
effect of the multinational groups that tend to a certain standardization of the local productions among the companies.

Non natural inputs
Concerning the glazes, the lack in adequate sands and feldspars force Egyptian manufacturers to import glazes from other countries. Egyptian industry mainly buys glazes from European multinational (Italy, Spain and UK) with disadvantages in terms of price but positive effects concerning the technological know how transfer and the quality level.

There is only one Egyptian manufacturer of glazes and enamels. The production started on 1972 to reach the present 10,000 tons and will expand, within the year 2005, to 35,000 tons, using both local and imported raw materials. The need for imports, mainly from Turkey, is essentially due to the inconsistency of local supplies, i.e. feldspar. In the whole, this manufacturer accounts for 10% of the local market but there are consistent margins for development, since the price of local production is 30% lower than the corresponding imported products. Therefore, in spite of no local competitors and a competitive advantage on the base cost, the local production of glazes seems not to be integrated with the rest of the supply chain. A part from the constraints in the raw material quality, a need for more skilled technicians has been highlighted during the local survey. The same constraints in raw material management have been highlighted by the local company dealing in maintenance, adaptation and production of punches, liners, body and dies (again, the only Egyptian manufacturer in the segment).

For the ceramic tiles and sanitary ware sector, lacking in an integrated and effective feeding industry is a lost opportunity which mainly originates from a poor local offer in complementary services. Activities such as design are more and more an important share of the manufacturers’ integrated solutions. The Spanish experience is clearly a best practice for pushing and supporting sales by assisting the customers in key
production phases concerning the imitation processes, the product range definition, the product development. The collaboration between the supplier (of glazes) and the producers (of tiles) is so important that effective and long standing alliances play sometimes the most important role in determining the success in the market. The local survey highlighted that the lack of such a kind of inter-company collaboration is also due to inconsistent procurement strategies among the local manufacturers of the final product: they should be aware that focus on a local sourcing strategy, first of all by settling and sharing clear quality requirements with the suppliers, would strengthen the overall supply chain, increase the overall sector value added, reducing the industrial costs and improve the quality of the offered services.

Main issues on technology and production processes
For the Egyptian industry the choice among alternative suppliers of technology depends on which phase the equipment is used in (to appreciate the different phases see the charts below that show cycles of an Egyptian manufacturer: the charts are just an example of possible production flows, consistent with cycles common in the world industry).

For the body preparation, the Egyptian companies prefer to buy less expensive mills and spray dryers from Chinese, Turkish and local producers (see above chapter one, “Technology suppliers”). In this phase of the process, the technology is less complex and the engineering is more important than the equipment itself.

Pressing and glazing are instead usually assisted by the Italian technology, even though in the near future the Chinese suppliers could get an important share in the press market.

Intermediate solutions are sometimes adopted in Egypt for kilns, which can be designed by Italian manufacturers and produced by Chinese companies (due to the lower cost of labor in China).
The main local producer in tiles is a clear example of “exclusive” relationship with technology suppliers: from the very beginning the development of production lines has been decided with the support of the most important Italian supplier, looking for a continuous improvement in production control and final product quality. The “picking” model seems to be more attractive for low cost producers which tend to minimize the depreciation costs using less expensive solutions in the market.

In few cases, Egyptian manufacturers have modern (Italian) technologies for choosing and sorting, otherwise these phases are manually executed with a consequent lack of homogeneity of the boxes for delivery.

**Packaging** seems to be an important issue. The modern pallet packaging system is not used for the local sales, while it is used for the exports but with a low level of automation. The packaging does not fit the international standards (the cardboard is poor and the boxes are manually prepared). During the company survey, a trader highlighted that the sub-standard in packaging affects the overall Egyptian industry (special pieces breakage can reach 5%). All these elements influence the export capability, because the developed markets are particularly sensitive to the effectiveness in deliveries, breakages, homogeneity inside boxes, etc. For example, considering that the general market trend shows to appreciate special pieces and associated décor pieces, high percentages of breakage for this product types can destroy an opportunity for the Egyptian industry and compromise the image of the local manufacturers as producers able to control the entire value chain in the richest segments.

On the other hand, the problem is common to many developing industries because an automated packaging system generally requires investments in training, more skilled people, continuous technical assistance for software and hardware, so that the packaging phase can easily become a bottleneck within the entire cycle.
Main issues on customer satisfaction

Interviews with professional operators, such as dealers and contractors, provided the most detailed information about the level of satisfaction offered by the local output. In fact, these channels are aware about alternative productions from a number of countries and manufacturers and are in strong competition to reach the best procurement conditions. More than final consumers, dealers and contractors are particularly interested in the overall quality of the service provided by the companies and constantly include them in a sort of global comparison. Concerning the tiles market, the main issues highlighted during the company survey can be summarized as follows:

- No regular stock for some product typologies;
- An excessive interval time between the order and the delivery;
- Production problems cause sometimes delays in the delivery schedule;
- Lack of conformity for the same product type (inconstancy of the final product, mainly concerning colors); this problem is particularly frequent in case of tiles supplied in different deliveries, i.e. at end of a project;
- Gap between designs of imported and Egyptian tiles;
- Differences between the producer catalogue and the actual range and also between approved samples and delivered tiles
Figure 2.16: Example of production flow for tiles

Raw Materials from Bulk Storage
(Buffing + Kaolin + Lime Stone + Feldspar + Sand + Deflocculant + Soda ash + Ba-TP + Water)

Ball Milling

Screening

Storage Tank 3*100 Ton

Pumping

Hot Air

Spray Dryers 6% Residual Moisture

Storage Silos

Pressing

Inspection

2%

Dryers

1%

2%

4 hours 1400°C

Fire kiln

Quenching

Raw Materials + Water + CM C in Ball Mill

Inspection

Glazing and Printing

Gleat kilns 45-50 Min 1130°C

Inspection

To Client

Sorting (Inspection) and Packing

Source: ARACEMCO website (www.aracemco.fg2o.com)
Figure 2.17: Example of production flow for sanitary ware

Source: ARACEMCO website (www.aracemco.fg2o.com)
Human resources
Due to its strong development, Egyptian industry seems to face a certain pressure on some specific categories of labor force.

Technicians with 3 to 5 years of experience are very required and the competition to hire them is increasing among the companies, especially in industrial sites with high level of concentration (for example, 10th of Ramadan). Losing such a kind of workers, for the company which sustained the costs of training them, means to lose important investments in human resources and a delay in building an important layer of middle level technicians. The scarcity seems to concern the young workers that come from the secondary school (a specialized secondary school in ceramics does not exist in Egypt) rather than engineers with a long university curriculum.

2.5. General positioning of Egyptian industry
This section deals with the “image” of the overall Egyptian manufacturing in comparison to other main players in the most developed markets (Europe and USA).

Although important differences exist in each manufacturer product range, both in terms of quality and selling price, the “Made in Egypt” has an intrinsic value that originates from the past and is influenced by the present conditions of the local market: production background, cultural traditions, actual technological assets, real quality and many other tangible and intangible elements can suggest a global value of the country production: we can generally call it “perceived value”.

During the purchasing process, each customer (and any other buyer in the global supply chain) immediately compares this value with the relevant price in order to reach the best “bargain” he can afford. In very competitive and globalized sectors with many manufacturers and low barriers to enter the markets, the country origin of the products may be more important than the brand names: for customers, “ranking by countries” is an effective way to reduce the uncertainty in crowded markets.
The following maps compare the perceived value and the selling prices of different countries, suggesting the market position of each production as well as the importance of countries (areas represent the market shares). The direction and length of the arrows suggest orientation and intensity of future changes in global positioning.

Although the Egyptian product is well accepted in the neighboring countries, as regards Europe and USA the present positioning of the Egyptian industry is far from competitors: it shows neither a trend to the improvement of the perceived value, nor a trend to better and more profitable prices.

**Figure 2.18: Global positioning in ceramic tiles (within Europe and USA)**

*Source: Authors’ elaboration*
The international tiles market clearly recognizes a premium price to the leaders Italy and Spain but the former maintain the best position even though the total Italian turnover stopped increasing in the last years. For the two leaders but also for Turkey, the selling price is not expected to further increase, due to alternative competitors that are strongly improving their positioning in terms of perceived value. If UAE is trying to transform its increasing recognized value into higher prices, China seems to go on conquering market shares by offering an improving quality at low prices. At the moment, in many markets the Chinese product represents a good compromise between quality and price.

Figure 2.19: Global positioning in sanitary ware (within Europe and USA)

Source: Authors' elaboration
The competitive arena in the sanitary ware market appears more polarized, with many big producers (USA, Turkey and Spain) moving towards better perceived values for a medium price level. Again, China is rapidly gaining a better value among final customers and professional operators, although this improving is far from being transformed into higher prices. Italy and Germany maintain little market shares with an incomparable combination of value and price.

### 2.6. Main competitors for Egyptian manufacturers

In a competitive framework characterized by declining barriers to entry, the distinction between foreign competitors on the Egyptian market and foreign competitors on the other markets (that are the market where Egypt could export) is losing importance. In other words, Egyptian manufacturers have to face competitors that will try to expand their shares in the Egyptian market as well as in the European, Mediterranean and African areas.

We should rather differentiate between “present” and “future” competitors, taking into account that other countries in the region are building a strong productive capacity and that the export might become their first way of sectoral development.

Therefore, among the main present competitors for the local industry we can consider Turkey, China and UAE: they can export in the Mediterranean area (included Egypt) via shipping. In fact, imports from the Mediterranean and Middle East area are still limited, with the growing presence of **China**. On the other hand, Egyptian exports are mainly directed to **UAE**.

In the near future (from two to five years) Iran, Morocco and Saudi Arabia can become important regional players, because they are building huge production capacities and
The export will be the obvious channel to allocate their production surplus. Their productions could reach part of the region by truck.

Figure 2.20: Ceramic tiles flow between Egypt and regional producers

2.7. Conclusions

The sector development came to an overall satisfaction of the internal demand (a complete satisfaction for the sanitary ware) and this is without any doubt a tangible case of success for the Egyptian industry. The present production capacity has been built by private companies which aimed at selling locally and more and more catching economies of scale.

Two main characteristics are common to the current tiles and sanitary ceramics production:

- A “consumption driven” production capacity, with new investments and growth strategies mainly based on the local market development (a captive market);
Little attention to the richest export markets and, consequently, to the highest product and price standard levels.

Few companies tried to leverage also on “intangible” assets, such as the corporate image or the product design, strongly investing in advertising, sales organization, product development.

Most of the manufacturers do not seem to be ready to approach the international markets with the required typology (tiles that imitate natural stones, for example), product quality level (use of white body) and attention to other components of the supply chain (such as packaging).

Another important issue affecting the industry is the lack of information: the sector seems to be far from the high level of information control and dissemination about internal markets that characterizes other industries.

The North Africa and Middle East is with no doubts one of the most dynamic regions in the ceramic tiles and sanitary ware production. Combined with the competitive advantages of other regional players, the threat of new incoming exporters and the future reductions of the barriers to trade will increase the risks for the Egyptian manufacturers.
3. BENCHMARKING

3.1. Objective and methodology

The benchmarking section of the study proposes a comparison among the ceramic tiles and sanitary ware sectors located in different countries in order to assess their performances and suggest elements to define a development strategy for the Egyptian ceramic industry. The comparison relies on both qualitative and quantitative information and it is divided in two main sections.

The first part introduces the selected countries, focusing on the different industrial structures, the product segmentations and export capabilities, investigating issues such as quality, technology, procurement and approaches to foreign markets. Such a kind of analysis mainly refers to the tiles sub-segment, even though some considerations about the industrial localization, the perceived value of the final products and the general trend are common to both tiles and sanitary ware. As a matter of fact, the latter is dominated at worldwide level by few big companies which use their production capacities at local branches and joint-ventures to leverage on labor costs and other kinds of advantages. Therefore, comparing sanitary ware sectors in different countries is very close to compare that corporate strategies of these large multinational companies assign to each local subsidiary producer.

The second part compares industrial performance factors on a quantitative basis, in order to highlight the main differences in terms of productivity and profitability among the selected national industries. In this case, a detailed benchmarking has been executed for both sub-sectors because the differences in productivity and costs can show the actual competitive advantages of each national sector.

Compared to the previous chapters, the benchmarking exercise has presented the greatest difficulties in collecting data for the ceramic sector. Although the main
associations of manufacturers provide regularly aggregated data about the world production, consumption and trade, country studies and deep analysis for specific countries are few and not always reliable. The poor level of information mainly concerns countries less integrated in the global market, such as Iran and Morocco, for which the most important sources of knowledge remain the technological suppliers (manufacturers of plants and suppliers of materials).

3.1.1. Selected countries

Besides Egypt, five other countries have been considered in the benchmarking exercise: Brazil, United Arab Emirates (UAE), Turkey, Iran and Morocco. These countries represent a differentiated set including:

- **Experiences of best practices in approaching the global market.** Apart from Iran and Morocco, the other countries successfully reached a strong position among the world top exporters and, more important, adopted different strategies to impose their productions in the international arena.

- **Direct competitors for the Egyptian sector.** The UAE and Turkish strong export orientation and excellent capacity to market their productions represent a serious threat for Egyptian manufacturers aiming at maintaining a control of the local market and expanding exports.

- **Incoming new competitive industries.** Iran and Morocco do not rank among the top exporters but they are building the production capacity to face the global competition.

3.1.2. Country profiles

The first part of the chapter focuses on the ceramic sectors in the different countries dealing with three main dimensions:
The industrial structure, identifying the level of concentration and the main strategic trends inside the sector.

The production, paying particular attention to the role of raw materials and the adoption of alternative processes, with the aim at explaining the attitude to take advantage of local competitive strengths or facing specific elements of weakness (availability of raw materials and skilled people, financial constraints and so on). The composition of the output will suggest the correspondence between the industry and the main trends which nowadays dominate the global consumption.

The access to foreign markets, in order to identify best practices in approaching the international demand and explain pros and cons of each export strategy. Of course, in this case the main indications come from Brazil, Turkey and UAE, which successfully reached a position of global players in the world, while the alternative models have been compared to the current Egyptian access to foreign markets.

Concerning the product composition, the analysis considered the most renowned technical definitions which have the greatest importance in the sector:

- Distinction between red body and white body for raw materials;
- Tiles for wall and floor (product destination);
- Single fire, double fire, monoporosa, porcellanato as product categories.

The data for the sector comparison have been collected from a professional database providing information about single companies. The first phase of data processing
concerned therefore the selection of a sample of companies which for UAE, Turkey, Iran and Morocco represents on average 80% of the entire production. For Brazil, the relevant sample accounts for 40% of national production on the whole.

3.1.3. Productivity and profitability assessment

The benchmarking exercise is completed by a quantitative analysis on some relevant productivity and profitability indicators which aims at identifying competitiveness factors related to costs and production management. Data have been mainly collected by direct interviews among suppliers operating within the selected countries and the indicators refer to “medium enterprises” representing a reliable example for the whole country sector. Only data for the Egyptian industry are referred to the entire sector, using the average data resulting from the company survey\(^\text{24}\). In order to provide more detailed terms of comparison, this kind of exercise also considers Italy and Spain as examples of advanced systems in managing production issues and marketing dimensions.

Finally, the values have been transformed into graphs that help to highlight the differences and make the comparison more understandable.

The quantitative comparison is based on the following factors and distinctions:

- **Production**: the physical output produced by the average company is a major dimensional indicator (the units of measure for output are square meters for tiles and pieces for sanitary ware);

\(^{24}\) For the sanitary ware sector, the analysis only partially includes data about the main producer (nicknamed “Producer 6” in the previous chapter), which is linked to an international group. In fact, official data recently published by this manufacturer are deeply affected by corporate strategies: they show levels of prices and margins dramatically higher than the rest of local competitors and seem to be explained only by important inter-companies flows, so that these data do not reflect the actual production and sales capabilities of the Egyptian sanitary ware sector. Consequently, the benchmarking exercise shows absolute quantities of Egyptian production and employees smaller than the actual ones presented in the previous chapter.
- **Industrial employees**: it only includes the workers involved into the production phases;

- **Per-capita industrial productivity**: the physical output produced by each industrial employee suggests the level of automation although productivity is strongly affected by other issues such as the quality of raw materials (better inputs generally improve the productivity), outsourcing (buying intermediate products including higher added value increase costs for procurement as well as the output per employee);

- **Non industrial employees**: people operating in functional areas such as sales and marketing, distribution and administration;

- **Total employees**: all the employees working for the company;

- **Total per-capita productivity**: the physical output produced by each employee (both industrial and non industrial) reflects the company labor productivity in all its operations;

- **Average price**: price of the final product;

- **Per-capita turnover**: the value of sales per employee (both industrial and non industrial) results from the labor productivity as well as the capability to market the final product;

- **Per-capita labor cost**: besides Europe and Western countries, it is particularly difficult to define the average total cost per worker in the specific industry, due to the lack of official data (most official information for the sector concern output and sales), the fluctuations in the exchange rates (workers are paid in the national currency, even though the final product always has as international price in the global market), the differences in labor categories; the average cost per worker is well known in Italy and Spain and the company survey provided enough data for
the Egyptian industry, whereas for the rest of countries a reliable information has been collected from international operators working in the different countries;

- **Average industrial cost**: it includes the direct costs of production (labor, energy, materials etc);

- **Full cost**: it includes the industrial costs and other general costs (administration, distribution etc.);

- **EBITDA** (Earning Before Interest, Taxes, Depreciation and Amortization): the remaining revenue after paying the cost of labor and the purchased materials and services; EBITDA is a measure of the operational profitability which allows the company, after the compensation of depreciation, financial expenses and taxes, to realize a final profit; in the benchmarking exercise, this value has been expressed as a part of the selling price (i.e. 1 euro per sq. m. or 5 euro per piece) and as a percentage of the revenue (i.e. 20% of sales) in order to make the values more easily comparable\(^\text{25}\).

### 3.2. Industrial structure

In order to make an exhaustive analysis of the production systems, first it is important to know the nature of the sectors belonging to the different countries.

By collecting and merging data concerning a sample of companies in each country, it was possible to identify accurately the different production systems\(^\text{26}\). Figure 3.1 focuses

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\(^{25}\) EBITDA only suggests the value of the “industrial” profitability which mainly originates from costs of inputs directly used in the production phases (labor, energy, materials etc.), since an overall assessment of the companies profitability performances should also consider ratios such as ROI (Return on Investments) and ROE (Return on Equity). Such a kind of analysis is outside this study scope.

\(^{26}\) Data refer to year 2004 for the Egyptian sector and to 2003 for the other countries.
on two structural indicators: average production (output in volume) and average sales per company.

The relationship between these two parameters points out two different outcomes in the examined Countries.

- **Egypt** presents an elevated production per company, only lower to UAE sector, with an average medium-low annual turnover (higher than Iranian and Moroccan turnover per company). The Egyptian growth model is clearly oriented towards production expansion than profits increases. The lower average selling price makes increasing volumes a primary strategy for development.

**Figure 3.1: Average companies dimensions (years 2003, 2004)**

![Graph showing average production and output for different countries](image)

Source: Authors’ elaboration on data from Vilmy Montanari Publisher
- Iran is "a young" Country where the annual production per company is not currently very high. According to the investments programmed for the next 3-4 years, productive installations will strongly increase in volumes overcoming in a substantial way the Egyptian ones. Moreover, the corporate structure of companies, divided into a state and a private part, has allowed, through public financing, achieving a superior level of automation in comparison to other competing countries (i.e. Egypt).

- Brazilian sector is structured in two opposite ways: on the one hand some enterprises produce exclusively for the internal market and therefore with a local business approach; on the other hand, there are a few enterprises (4-5) of large dimensions, structured on a highly automated network systems, that allow the creation of products suitable to export (mainly to the United States).

- The ceramic sector in the UAE is essentially concentrated in the hands of a big company (RAK). The plan of business development, since the beginning, has been concentrated on the needs of international markets, rather than on the requirements of a limited internal demand. The company, in addition to satisfying more than 90% of the national market, has built its own production capacity in strategic geographic areas with elevated macro-economic rates of growth occupying directly the local markets. Of course, according to the different purchasing powers, different factories have been created in different countries with appropriated products ranges.

- The structural characteristics of Turkey include those of all the other countries. The sectoral structure is strongly polarized: cluster organizations of small and medium enterprise are located close to natural raw material deposits, whereas there are a few great companies that do not belong to any district, sited in very strategic areas from the logistic point of view (mainly close to ports).
Morocco, finally, has a productive structure based on small-sized enterprises with a low level of automation and operating in a local market that is not yet completely developed and addressed to foreign markets.

In brief, taking into account the just mentioned remarks, Countries can be divided into three main groups:

Table 3.1: Level of industrial concentration

<table>
<thead>
<tr>
<th>Level</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td>Brazil</td>
<td>UAE</td>
<td></td>
</tr>
<tr>
<td>Morocco</td>
<td>Turkey</td>
<td>Egypt</td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration on data from Vilmy Montanari Publisher

3.3. Production

Raw materials
Demands of new products, mostly from the major world-wide consumers (USA at first, Italy and Spain), are urging more and more to use **white body** instead of the red one.

This trend is confirmed by the example of Spain, top producer of red body ceramics, which in the last year has witnessed a decrease of 11% in “red” production, while production of white body, with raw materials mainly from the Eastern European countries, has increased by 27%.

In such a framework Egypt, mainly focusing on the internal demand, do not comply to the tendency of all the other countries trying to achieve new market shares within the international context and using more and more elevated percentages of white body.
Moreover, the quality of the red body raw materials is in Egypt affected by problems of inconsistency and dishomogeneity, increasing the gap with the high quality procurement that some competitors can rely on (i.e. Turkey).

**Alternative production processes**

Besides the choice of raw materials it is important to compare the different productive processes employed by the industries to understand the product nature and quality. As shown in the following figure, the development of the ceramics sector at industrial level begun with the birth of single firing. Until the beginning of the 70’s the most employed process was **double firing** that allowed obtaining a finished product with a high porosity ratio and a low degree of resistance.
The introduction of **single firing** in those years produced a technological jump with important consequences: a decrease in energy consumption, lower labor intensity processes due to greater process automation, and a qualitatively superior product (greater resistance due to a higher firing temperature).

Later on, with the introduction of better raw materials (white body) and thanks to the study of new glazes specifically realized to sustain walking, acids, wearing, abrasion and stains, it was possible to produce long-lasting and efficient floor tiles.

At the end of the 90’s, strong investments in research, mostly from Italian companies, have lead to the introduction on the market of glazed or full body **gres porcellanato**, with remarkable superior technological characteristics, in terms of hardness, resistance and durability with natural stones and marble-like esthetic effects, more and more used to floor large spaces such as squares, airports, pavements, supermarkets, hospitals and so on.
With the latest technologies and products, the double firing has progressively lost importance in all countries. Nowadays, this production is only used by industries with old equipments and plants. Concerning the selected countries, some differences are worth to be highlighted.

- Morocco maintains a huge share on double firing, even though the production is going towards single firing.
Brazil, where many manufacturers use poor raw materials for productions aimed at the local market, uses single firing to guarantee more constant qualitative standards by hiring a less skilled labor force, since double firing requires more controls in the production cycle. A continuous movement towards a quality improvement in the Brazilian sector started in the first '90s and is still alive, supported by both a certain segmentation of the internal market (increase of high quality consumption) and a continuous expansion of the export. As a consequence, the wet (more expensive) manufacturing process, at the moment accounting for less than half the total production, is expected to grow.

UAE, starting their production in the latest decades, have never used double firing and focused on high technological processes from the very beginning.

Turkey maintains double firing for more than one third of the production, as a consequence of the slacking production development of the years '90.

Iran includes different production areas: an older one focused on red body double firing productions for wall, whereas new industrial clusters (i.e. the Yazd district) are developing a high automated production of gres porcellanato.

Like in UAE, the double firing in Egypt has never been used, starting immediately with double firing cycles. It is interesting to note that, recently, two Egyptian manufacturers increased their productions by fast double firing processes, in order to maintain a better control on technologies using low cost raw materials.
This technological evolution deeply changed the production context and the related investment strategies. For many years, the new entrants used to choose a production process and then decided the product range.

Nowadays, an opposite decision framework emerged: within a certain limit, the same product can be made by different production processes. The following figure shows how the industries use the available technologies in a different way.

Summarizing, the extreme dispersion on the adopted technologies, highlights that it does not exists an absolutely best technology because the processes are, under certain circumstances, equivalent. This means that an excellent organization and control of all production phases can make the best use of different technologies and materials: the manufacturers must only focus on the target product quality, taking into consideration
the constraints concerning the availability of local resources and energy, the level of human resources and the financing possibilities.

Figure 3.5: Products and raw materials (years 2003, 2004)

![Bar Charts](image)

Source: Authors' elaboration on data from Vilmy Montanari Publisher

**Product destination**

At worldwide level, the wall products account for 60% of consumption, whereas the rest is for floor destination. This distribution depends on both esthetic factors and functional needs: a specific product such as gres porcellanato, traditionally used for flooring, can be used for walls and the opposite can be true for other typologies.
Most of the benchmarked countries follow the global market trends, with local productions clearly driven by the export demand, whereas Brazil and Egypt behave differently. If the former presents higher shares in floor tiles according to North American consumers’ preferences (USA is the main export destination for Brazil), the Egyptian preference for flooring is completely due to the local demand.

**Figure 3.6: Floor and wall tiles (years 2003, 2004)**

![Floor and wall tiles chart](image)

Source: Authors’ elaboration on data from Vilmy Montanari Publisher

### 3.4. Access to foreign markets

Brazil, Turkey and UAE are, with no doubts, cases of success in exporting ceramic tiles and sanitary ware both in neighboring and distant countries. During their process of internationalization, each of them adopted different and sometimes alternative approaches, starting from a different endowment of local raw materials, industrial organization, cost structure, attitude to interact with foreign markets, cultural and social connections with specific destination countries. Therefore, analyzing these approaches
can help to identify the possible alternatives a national ceramic sector may implement to successfully take and maintain export market shares.

Table 3.2: Top exporting countries in ceramic tiles

<table>
<thead>
<tr>
<th>RANK</th>
<th>COUNTRY</th>
<th>Export (million sq. m.)</th>
<th>% of world export 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1999</td>
<td>2000</td>
</tr>
<tr>
<td>1</td>
<td>ITALY</td>
<td>417</td>
<td>436</td>
</tr>
<tr>
<td>2</td>
<td>SPAIN</td>
<td>270</td>
<td>312</td>
</tr>
<tr>
<td>3</td>
<td>CHINA</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>BRAZIL</td>
<td>43</td>
<td>48</td>
</tr>
<tr>
<td>5</td>
<td>TURKEY</td>
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</tr>
<tr>
<td>6</td>
<td>INDONESIA</td>
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</tr>
<tr>
<td>7</td>
<td>UAE</td>
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</tr>
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<td>8</td>
<td>MEXICO</td>
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<td>9</td>
<td>MALAYSIA</td>
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<td>15</td>
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<td>10</td>
<td>PORTUGAL</td>
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<tr>
<td>11</td>
<td>GERMANY</td>
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</tr>
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<td>12</td>
<td>FRANCE</td>
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<td>13</td>
<td>CZECH REP.</td>
<td>14</td>
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<tr>
<td>14</td>
<td>INDIA</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>THAILAND</td>
<td>11</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: ACIMAC
Brazil: a long period self-making growth

The Brazilian ceramic tiles export performances in the 1999-2003 period look very impressive: + 239%, reaching 1.8% of world total export (among the top exporters, only China did better in the same period).

The main destination country is USA, where Brazil is strongly expanding its market share. UK, South Africa and Australia are other distant destinations that the Brazilian manufacturers successfully entered.

The rest of the export satisfies the Central and South American market. Therefore, the Brazilian manufacturers succeeded in approaching very distant market with regard to geographical location as well as socio-cultural characteristics.

Table 3.3: Top export markets for Brazil

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Destination country</th>
<th>2002 million sq. m.</th>
<th>2003 million sq. m.</th>
<th>% of total import in the country (2003)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>USA</td>
<td>25,7</td>
<td>36,7</td>
<td>17,7%</td>
</tr>
<tr>
<td>2</td>
<td>UK</td>
<td>1,6</td>
<td>7,1</td>
<td>13,7%</td>
</tr>
<tr>
<td>3</td>
<td>South Africa</td>
<td>7,7</td>
<td>6,5</td>
<td>54,2%</td>
</tr>
<tr>
<td>4</td>
<td>Canada</td>
<td>4,8</td>
<td>5,4</td>
<td>21,6%</td>
</tr>
<tr>
<td>5</td>
<td>Chile</td>
<td>3,9</td>
<td>5,1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Paraguay</td>
<td>3,9</td>
<td>4,3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Puerto Rico</td>
<td>3,1</td>
<td>3,4</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Costa Rica</td>
<td>2</td>
<td>3,2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Jamaica</td>
<td>1,9</td>
<td>2,3</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Australia</td>
<td>1,7</td>
<td></td>
<td>6,8%</td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration on ACIMAC data

Focusing on the US market, the richest importer in the world, the Brazilian approach to get and maintain a market share has been based on the following elements:
Long term objectives;
Investments in technological evolution and quality improvement;
Traditional marketing channels;
Development of an own export sales organization.

In other words, the Brazilian companies which targeted USA spent many years to understand the consumption patterns (bearing the cost of being refused), developed an “export quality” production compliant with the demand and built a solid system of direct business relationships using an internal sales force and focusing on the retail market. This resulted in an expensive long term expansion which is now producing a good control over foreign operations and a lasting profitability.

Like in many other industrial sectors, the growth was also favored by the cultural diversity and vitality of the Brazilian socio-economic context: many manufacturers have Italian or German origins and an open approach to western markets encouraged the trend for the technology evolution and the product innovation.

**Turkey: fast growing through low cost sales organization**

Compared to the Brazilian approach, Turkey adopted an opposite export strategy based on:

- DIY channel;
- Big volumes and very good quality;
- Direct sales organization.
This approach clearly aimed at getting results in terms of market shares in a short time and minimizing costs. A huge installed productive capacity and the consequent need to maintain high levels of utilization and minimize idle capacity (at the moment around 30%, on average), is the basis for the Turkish focus on expanding foreign sales.

Table 3.4: Top export markets for Turkey

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Destination country</th>
<th>2002 million sq. m.</th>
<th>2003 million sq. m.</th>
<th>% of total import in the country (2003)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>USA</td>
<td>9,1</td>
<td>10,2</td>
<td>4,9%</td>
</tr>
<tr>
<td>2</td>
<td>UK</td>
<td>6,6</td>
<td>9,9</td>
<td>19,0%</td>
</tr>
<tr>
<td>3</td>
<td>Israel</td>
<td>7,9</td>
<td>9,7</td>
<td>38,8%</td>
</tr>
<tr>
<td>4</td>
<td>Germany</td>
<td>8,7</td>
<td>9,3</td>
<td>8,4%</td>
</tr>
<tr>
<td>5</td>
<td>Canada</td>
<td>7</td>
<td>6,4</td>
<td>25,6%</td>
</tr>
<tr>
<td>6</td>
<td>France</td>
<td>4,9</td>
<td>5,2</td>
<td>5,0%</td>
</tr>
<tr>
<td>7</td>
<td>Saudi Arabia</td>
<td>6,1</td>
<td>5,2</td>
<td>9,5%</td>
</tr>
<tr>
<td>8</td>
<td>Greece</td>
<td>3,9</td>
<td>4,4</td>
<td>13,3%</td>
</tr>
<tr>
<td>9</td>
<td>Netherlands</td>
<td>1,5</td>
<td>1,7</td>
<td>9,4%</td>
</tr>
<tr>
<td>10</td>
<td>Russia</td>
<td>1,1</td>
<td>1,6</td>
<td>11,4%</td>
</tr>
</tbody>
</table>

Source: Authors' elaboration on ACIMAC data

Also for Turkey, the main export country is USA. Together with the traditional Western European importers other regions are primary destinations: East Europe, where the Turkish manufacturers are building an own production capacity, and the Mediterranean and Middle East (Israel and Saudi Arabia).

At a production level, Turkey can rely on strong competitive advantages: local fine raw materials (Turkey is the biggest supplier of feldspar via shipping) and low labor costs. Moreover, exporting final product is naturally encouraged by non – technological conditions:
A strategic location in the Eastern Mediterranean makes Turkey a key link among Central Asia/Middle East/Africa and the European continent, with a powerful shipping system;

- A strong business relationship with the German market, the second biggest world importer.

The strong export vocation in the ceramic Turkish sector derives, in addition to an optimal geographic position in terms of raw materials and transport, mostly from the ethnic and cultural link with Germany (the Turkish community in Germany accounts for more than 2,000,000 people). Turkey produced at first sanitary ware industry for Germany, later on its production has been addressed also to the floor tiles. Currently more than 80% of industries produce both sanitary ware and floor tiles in ceramics and many of them are oriented towards the creation of joint-ventures with foreign enterprises, with which they have signed important supply contracts (each contract generally exceeds 1,5 million square meters).

The Turkish manufacturers focused on two main marketing channels: the DIY, which absorbs around 80% of the export, and the “private label” selling.

Accounting for half the market in Germany and France, the DIY channel mainly demands big volumes, with a high level of constancy and respect of delivery times. This means that failures in satisfying a very low tolerance for late and dishomogeneous deliveries can easily cause important losses in sales and damage the customer portfolio. Therefore, the effective integration of the supply chain is a matter of importance for any manufacturer dealing with DIY players.

On the other hand, approaching few large distribution chains minimize the costs to manage complex activities which require skilled people, such as contacting the
customers, pre-sales and post-sales services (about the DIY channel, see also above, chapter 1, “Market evolution and access to market”).

**UAE: investing in brand and technologies**
Concerning foreign trade in ceramics, the UAE peculiarity is that the Arab country is both a top exporter, with 35 million sq. m. in 2003, and an interesting market which imported 12 million sq. m. in the same period. This makes UAE the 7th exporting country and the 21st importer in the world, highlighting the vitality of the ceramic sector compared to the national population and extension.

Nowadays RAK CERAMICS, the main UAE company, declares to export to more than 135 countries, although the overall industrial history of the country is very recent (RAK itself was created in 1988). This remarkable position in the global market is the result of an intensive development strategy based on:

- A state-of-the-art technological endowment;
- A strong brand development;
- Local sales organizations in the export markets.

The investment flow in upgrading the production facilities is continuous and, sometimes, RAK adopted the latest innovations even before the Italian world leaders, strongly investing in automated systems and robot machines both in all the operations.

But every investment remains a cost if no sales policy gets to valorize the final output and obtain profitable margins. RAK adopted a long term penetration strategy and chose to develop and impose a new brand instead of selling its own production through foreign producers or distributors (like Turkey preferred). Moreover, most sales activities in the foreign markets have been assigned to local sales network (sales representatives),
instead of sending own staff abroad, thus minimizing the penetration time. The logistic management keeps on playing a big role in RAK’s success: approaching the most developed markets has required local warehouses to better guarantee **delivery times** and **post sales services** (i.e. in Europe RAK has a logistic headquarter in Belgium with branches in Italy, France, Germany, UK). Sometimes, local sales organizations have been first participated, then completely bought in order to take an actual control of the access to market. The retail distribution channel has been considered as the natural way to allocate a high quality product with a distinctive brand.

The following figure shows the different strategic approaches in terms of direct use of own sales organization and target marketing channels.

**Figure 3.7: Access to foreign markets strategies**

<table>
<thead>
<tr>
<th>RETAIL</th>
<th>DIY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct approach</td>
<td>Indirect approach</td>
</tr>
<tr>
<td>Brazil</td>
<td>Turkey</td>
</tr>
<tr>
<td>UAE</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Authors’ elaboration*
Iran: becoming the fifth manufacturing and exporting country in the world
The official data do not yet show Iran as a global player, even though the new investments are with no doubts building the potential to become one of the largest world producers and exporters: between 1999 and 2003 the production doubled from 60 million sq. m. to 120, whereas the internal consumption increased by 60% reaching 87 million sq. m. When focusing over the past two years, the sector is literally booming and for the technology suppliers Iran has been a gold mine with, of course, the Italian world leaders playing the most important role in supplying new plants. The sector modernization included a strong increase in production capacity as well as a consistent quality improvement, affecting every industrial cluster in the country.

This dramatic growth is mainly caused by the excellent profitability of the ceramic business which forced the manufacturers to increase and upgrade production and attracted many new entrepreneurs from other sectors (sometimes by acquiring shareholdings in new start-ups). Who recently entered the ceramic industry often underestimated the overall supply chain complexity. Since also a number of former tiles retailers started their own production, the risk of overproduction and idle capacity is a matter of importance.

The first player which organized the production on an industrial basis was IRANA TILES (1960), followed by SAADI and HAFEZ TILES. During the seventies, private manufacturers begun cooperating with foreign partners in the white body double fired production and after the Revolution (1979) a certain number of state owned companies entered the market. A growing interest for the sector dates from 1986 and after the war with Iraq both the growing population and the expansion of the building activities fuelled the production increase.

The basis for the Iranian competitive advantage rely on:
Low labor costs (monthly salary is around $100-110 for unskilled labor force);
Low cost and availability of energy (natural gas and LPG which are needed in modern productions);
Availability of good quality raw materials;
Strong entrepreneurship and traditional experience in manufacturing ceramics;
Availability of funds for investments in public infrastructures and development policies, mainly coming from the oil sector revenues;

Concerning the local distribution of the industrial activities, the main areas are as follows:

- Yazd, 600 km south-east of Teheran;
- Teheran;
- Ishafan, the second largest city in Iran, 414 south of Teheran;
- Gazvin, around 120 km. north of Teheran;
- Semnan, 175 km. west of Teheran.

Yazd province currently accounts for the 30% of the overall sector with 59 million sq. m. of installed capacity and around 5.500 employees (year 2000)\(^\text{27}\). More recent figures include no less than 30 companies in the district and 15 of them started production during the last year and a half. Therefore, Yazd is one of the most growing ceramic industrial areas in the world and is rapidly taking the shape of a cluster (the rest of the country accounts for no more than ten ceramic companies).

\(^{27}\) Data kindly provided by ISIPO (Iran Small Industries & Industrial Parks Organization).
The Iranian ceramic tiles output between 2003 and 2004 reached 120 million sq. m. but forecast for the next years show a dramatic increase.

By 2007 the production will triple the internal consumption, requiring a strong export performance to guarantee adequate plants utilization rates. Other estimations by free consultants interviewed during this study even forecast the 300 million level to be reached by the end of 2005.

Concerning the product types, the range looks quite differentiated, with a prevalent production of double firing among wall tiles and single firing for floor tiles. Porcelain tiles

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28 March 20th is the end of Iranian year.
are becoming more common, mainly focused on polished products, as common in the early stages of porcelain production. Glazed porcelain is expected to fast grow, whereas the religious buildings require a significant mosaic production.

Per capita domestic consumption reached 1,3 sq. m./year and 1,5 seems to be a possible future level. With a population of 70 million people, a total consumption of 100 million sq. m. looks like a reasonable level but very far from absorbing the huge foreseen capacity.

Morocco: the ceramic sector at a crossroad
Morocco has a long tradition in ceramics, with some distinctive productions with regard to the handicraft techniques and motifs. Nowadays, the sector developed in an industrial structure which so far successfully satisfied the domestic market.

According to the ACIMAC data (see chapter one), Morocco reached 40 million sq. m. in 2003 and the ceramic tile production in 2005 should be around 48 million. The Moroccan output is mainly a red body made from local raw materials.

The production is split in two different typologies: 60% of wall tiles (fast double-fired) and 40% of floor tiles (single-fired), whereas new investments are expected to start the monoporosa production. The floor tiles usually imitate screen-printed marble but some more dynamic companies introduced country-style (rustic) tiles. On the other hand, the traditional Arab motifs dominate the wall tiles segment.

The development of the Moroccan sector can rely on some factors of strength:

- Good profitability of the ceramic business compared to other local industrial sectors;
- Growing domestic market;
- Low labor cost
- Good level of companies operations.

According to a recent sectoral study, the State settled a 200,000 apartments program with incentives for buying, which makes the domestic market able to easily absorb the sector output and maintain low levels of warehouse.

Many companies directly control the sales activities, payments times are good and the profit margins are very interesting.

The main concerns for the future come from the international competition, due to the progressive reduction of custom duties with UE. Until the beginning of years 2000, the national market was protected by 50% duties but the agreements for the Euro-Mediterranean Free Trade Area are rapidly dismantling tariffs at 10% rate per year. The reductions in 2003 and 2004 resulted in a strong import increase. Spanish manufacturers are in the best position to expand their shares in the Moroccan market, selling at competitive prices and introducing new product ranges: larger formats, aesthetic variations, porcelain tiles.

On the other hand, the cost of thermal energy is one of the main problems concerning the new products development. Since the natural gas is not available, imports of liquid gas causes strongly affect the industrial costs structure: the thermal energy is four times more expensive than in Italy and 40 times more expensive than in Egypt.

The sanitary ware sector started on an industrial basis in the second half of the seventies and is now strongly export oriented, with large international groups which control three of the four Moroccan companies. This results in 44% of export compared to the total output. The high labor intensive level of Moroccan sanitary ware plants makes

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29 Quoted in Ceramic World Review, n.58/2004
30 Ibidem.
particularly profitable for multinational companies to relocate production in the country, realizing a product range on international standards. The main export destinations are Europe, USA and North Africa.

3.5. Comparison on productivity and profitability factors

Ceramic tiles

Automation plays a big role in supporting the levels of industrial productivity in Spain, Italy, Brazil and UAE. In Brazil, a consistent part of the manufacturers aims at satisfying an internal market of low-medium quality by using labor saving dry processes and realizing important economies of scale. For Italy and Spain the productivity is strongly favored by the transactions performed within an integrated ceramic supply chain: in the Italian and Spanish clusters companies usually outsource a number of activities keeping the focus on the final production and the control of sales and marketing variables (i.e. the distribution network management). This means that many operations are performed outside the company plants by specialized suppliers, so the productivity of the “pure” manufacturing process within the final producer is higher. Such a kind of “labor division” inside the cluster affects different production phases: in Spain some suppliers deliver the glazes “ready to use” (already grinded and sieved), while the mould die changing is performed by the mould producer himself, delivering a specialized service which allows the final producer to dedicate the internal labor force to the company core production phases.

Another driver of productivity is the level of flexibility: the less flexible is the plant (like in Spain, the best performer in labor productivity), the more efficient is the production in terms of physical output per worker. The total per-capita productivity, which includes the efficiency of non industrial operations, does not change the placing: Turkey, Egypt, Iran and Morocco are characterized by the lowest levels of productivity and leverage on clear labor costs advantages.
The similarity between industrial costs and prices has to be noticed as a result of a common level of mark-up\(^{31}\) in the world industry. From the opposite point of view, it is clear that the market recognizes a “premium price” to producers who guarantee a superior level of service in terms of capability to deliver small quantities in a very short time (less than one week) and provide pre and post-sales assistance through expensive inventory stocks and distribution networks. This kind of strategic positioning (“high quality – high service – high price”) was successfully achieved by Italian producers and it is far from being realized by other competitors, even though a general trend towards an increasing quality is common among many emerging world exporters. Concerning the Egyptian industry, graphs on prices and costs confirm the conclusions highlighted in the previous chapter: a model of low cost and low price (the Egyptian value is the lowest) is an advantage as well as a “cage” difficult to escape. If Egypt has undeniable cost advantages, more efforts are required into the field of improving quality and marketing the final product.

**Industrial profitability** (EBITDA) is polarized into two main groups with Iran, Brazil and UAE showing the highest levels. Egypt maintains a “good shape” with an average 20%. If the levels of the Italian and Spanish profitability seem to be lower in percentage on sales, it should be considered that they are extremely higher in value, due to extremely high sales in value: in other words, in order to make profit, it is easier and safer starting from 16% of 9 euro final price (Italy) than starting from 31% of 3.5 (Iran).

\(^{31}\) As a percentage of surcharge on the production costs to define the price.
Table 3.6: Productivity/profitability factors in ceramic tiles (2004)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Italy</th>
<th>Spain</th>
<th>Turkey</th>
<th>Egypt</th>
<th>Iran</th>
<th>Brazil</th>
<th>UAE</th>
<th>Morocco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company type</td>
<td>(Medium enterprises)</td>
<td>(Sector)</td>
<td>(Medium enterprises)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production (‘000 sq. m. per year)</td>
<td>4,500</td>
<td>4,500</td>
<td>15,000</td>
<td>100,000</td>
<td>13,475</td>
<td>12,250</td>
<td>59,000</td>
<td>8,400</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>150</td>
<td>100</td>
<td>1,000</td>
<td>13,000</td>
<td>1,683</td>
<td>470</td>
<td>3,000</td>
<td>660</td>
</tr>
<tr>
<td>Per-capita industrial productivity (sq. m. year per worker)</td>
<td>30,000</td>
<td>45,000</td>
<td>15,000</td>
<td>8,000</td>
<td>8,000</td>
<td>26,000</td>
<td>20,000</td>
<td>13,000</td>
</tr>
<tr>
<td>Non industrial employees</td>
<td>75</td>
<td>50</td>
<td>500</td>
<td>3,000</td>
<td>125</td>
<td>100</td>
<td>300</td>
<td>60</td>
</tr>
<tr>
<td>Total employees</td>
<td>225</td>
<td>150</td>
<td>1,500</td>
<td>16,000</td>
<td>1,808</td>
<td>570</td>
<td>3,300</td>
<td>720</td>
</tr>
<tr>
<td>Total per-capita productivity (sq. m. per year)</td>
<td>20,000</td>
<td>30,000</td>
<td>10,000</td>
<td>6,500</td>
<td>7,500</td>
<td>21,500</td>
<td>18,000</td>
<td>12,000</td>
</tr>
<tr>
<td>Average price (euro per sq. m.)</td>
<td>9</td>
<td>6</td>
<td>4,5</td>
<td>2,5</td>
<td>3,5</td>
<td>4</td>
<td>4,5</td>
<td>2,75</td>
</tr>
<tr>
<td>Per-capita turnover (euro year per worker)</td>
<td>180,000</td>
<td>180,000</td>
<td>45,000</td>
<td>16,300</td>
<td>26,250</td>
<td>86,000</td>
<td>81,000</td>
<td>33,000</td>
</tr>
<tr>
<td>Per-capita labor cost (euro year per worker)</td>
<td>40,000</td>
<td>27,000</td>
<td>6,000</td>
<td>2,600</td>
<td>1,850</td>
<td>5,800</td>
<td>6,000</td>
<td>2,600</td>
</tr>
<tr>
<td>Average industrial cost (euro per sq. m.)</td>
<td>5.5</td>
<td>3-3.5</td>
<td>2-2.5</td>
<td>1.6</td>
<td>1.8</td>
<td>2.2</td>
<td>2.5</td>
<td>2</td>
</tr>
<tr>
<td>Full cost (euro per sq. m.)</td>
<td>7-7.5</td>
<td>4.5-5</td>
<td>3.3-3.7</td>
<td>2</td>
<td>2.4</td>
<td>2.8</td>
<td>3.1</td>
<td>2.4</td>
</tr>
<tr>
<td>EBITDA (euro per sq. m.)</td>
<td>1.5-2</td>
<td>1-1.5</td>
<td>0.8-1.2</td>
<td>0.5</td>
<td>1.1</td>
<td>1.2</td>
<td>1.4</td>
<td>0.35</td>
</tr>
<tr>
<td>EBITDA (% on production value)</td>
<td>&gt;16%</td>
<td>&gt;16%</td>
<td>&gt;17%</td>
<td>&gt;20%</td>
<td>31%</td>
<td>30%</td>
<td>31%</td>
<td>13%</td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration
Figure 3.9: Productivity/profitability factors in ceramic tiles (2004)

Per-capita industrial productivity (sq. m. year per worker) vs Total per-capita productivity (sq. m. year per worker)

Average industrial cost (euro per sq. m.) vs Average price (euro per sq. m.)

Per-capita labor cost (euro year per worker) vs % EBITDA on production value

Source: Authors’ elaboration
Sanitary ware
When compared to the tiles situation, in sanitary ware the productivity gap between top and low performers tends to narrow, that is fully compliant with the technological contents of the sub-sector. The level of automation in sanitary ware production cannot be pushed over a certain limit, the manufacturing processes must contain a certain number of manual activities and the labor savings achieved by investments in technology are lower than in tiles. The high labor intensity in sanitary ware production explains why the delocalization process consolidated before in this sector than in tiles industry. Moreover, unlike in tiles, the sanitary ware segment development was very soon driven by western big companies which were able to re-locate plants in emerging countries to achieve consistent savings.

Despite a shorten distance among the competitors, Egypt is again the weakest in the productivity indicators. And again, the Egyptian industry finds an advantage both in labor costs and overall industrial costs. Like in tiles, prices and costs are positively correlated and, more interesting, the differences among the competitors are often similar (Italian prices are again 50-60% higher than Spanish prices, while Turkey and UAE sell at the same price in both sub-sectors) or even widened. The latter is the case of Egypt which shows again the lowest price, even more distant from all the other players.

On the other hand, profitability is generally higher in the sanitary ware sector than in tiles, due to different reasons. As highlighted in the global assessment, there is a different market structure with few big players controlling the sanitary ware market: the barriers to entry are higher because of the branding importance and this means an overall lower level of competition. Consumption patterns play also a role: final customers are often less sensitive to price when buying sanitary ware than tiles because of the lower absolute amount of money to spend and the more reasonable expenses to install sanitary pieces. With a 20% of EBITDA, the Egyptian industry is aligned with the competitors.
### Table 3.7: Productivity and profitability factors in sanitary ware (2004)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Italy</th>
<th>Spain</th>
<th>Turkey</th>
<th>Egypt</th>
<th>Iran</th>
<th>Brazil</th>
<th>UAE</th>
<th>Morocco</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Company type</strong></td>
<td></td>
<td>(Medium enterprises)</td>
<td>(Sector)</td>
<td>(Medium enterprises)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production (‘000 pieces per year)</td>
<td>1,000</td>
<td>8,000</td>
<td>3,400</td>
<td>3,100</td>
<td>1,400</td>
<td>450</td>
<td>2,450</td>
<td>1,050</td>
</tr>
<tr>
<td>Industrial employees</td>
<td>300</td>
<td>2,000</td>
<td>1,400</td>
<td>2050</td>
<td>530</td>
<td>190</td>
<td>1,200</td>
<td>400</td>
</tr>
<tr>
<td>Per-capita industrial productivity (pieces year per worker)</td>
<td>3,200</td>
<td>4,000</td>
<td>2,500</td>
<td>1,500</td>
<td>2,600</td>
<td>2,450</td>
<td>0,050</td>
<td>2,600</td>
</tr>
<tr>
<td>Non industrial employees</td>
<td>100</td>
<td>1,000</td>
<td>500</td>
<td>400</td>
<td>60</td>
<td>10</td>
<td>200</td>
<td>50</td>
</tr>
<tr>
<td>Total employees</td>
<td>400</td>
<td>3,000</td>
<td>1,900</td>
<td>2,450</td>
<td>590</td>
<td>200</td>
<td>1,400</td>
<td>450</td>
</tr>
<tr>
<td>Total per-capita productivity (pieces year per worker)</td>
<td>2,500</td>
<td>2,700</td>
<td>1,800</td>
<td>1,260</td>
<td>2,400</td>
<td>2,250</td>
<td>1,750</td>
<td>2,350</td>
</tr>
<tr>
<td>Average price (euro per piece)</td>
<td>40-50</td>
<td>25-30</td>
<td>15</td>
<td>4,5</td>
<td>8</td>
<td>10</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>Per-capita turnover (euro year per worker)</td>
<td>120,000</td>
<td>75,000</td>
<td>27,000</td>
<td>5,700</td>
<td>19,200</td>
<td>22,500</td>
<td>28,000</td>
<td>14,100</td>
</tr>
<tr>
<td>Per-capita labor cost (euro year per worker)</td>
<td>33,000</td>
<td>24,000</td>
<td>6,000</td>
<td>1,200</td>
<td>1,850</td>
<td>2,720</td>
<td>6,000</td>
<td>1,500</td>
</tr>
<tr>
<td>Average industrial cost (euro per piece)</td>
<td>20</td>
<td>15</td>
<td>8,5</td>
<td>3,5</td>
<td>5</td>
<td>6</td>
<td>9,5</td>
<td>4,2</td>
</tr>
<tr>
<td>Full cost (euro per piece)</td>
<td>35</td>
<td>20-23</td>
<td>11-12</td>
<td>4</td>
<td>6</td>
<td>7,5</td>
<td>12,5</td>
<td>5,2</td>
</tr>
<tr>
<td>EBITDA (euro per piece)</td>
<td>5-15</td>
<td>5-7</td>
<td>4-5</td>
<td>0,5</td>
<td>2</td>
<td>2,5</td>
<td>3,5</td>
<td>0,8</td>
</tr>
<tr>
<td>EBITDA (% on production value)</td>
<td>22%</td>
<td>20%</td>
<td>30%</td>
<td>20%</td>
<td>25%</td>
<td>25%</td>
<td>21%</td>
<td>13%</td>
</tr>
</tbody>
</table>

*Source: Authors’ elaboration*
Figure 3.10: Productivity and profitability factors in sanitary ware (2004)

Per-capita industrial productivity (pieces year per worker)  Total per-capita productivity (pieces year per worker)

Average industrial cost (euro per piece)  Average price (euro per piece)

Per-capita labor cost (euro year per worker)  % EBITDA on production value

Source: Authors’ elaboration
The following table summarizes the main performance indicators and competitiveness factors analyzed through the chapter.

**Table 3.8: Egyptian performances in production and marketing/trading**

<table>
<thead>
<tr>
<th>Production areas</th>
<th>Egyptian performance</th>
<th>Position in the region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production capacity</strong></td>
<td>Tiles: around 140-160 million sq. m</td>
<td>High performer</td>
</tr>
<tr>
<td></td>
<td>Sanitary ware: around 9 million pcs</td>
<td></td>
</tr>
<tr>
<td>Production utilization</td>
<td>Around 70%</td>
<td>Similar to competitors</td>
</tr>
<tr>
<td>Productivity</td>
<td>Tiles: 6,500 sq. m./year/worker</td>
<td>Low performer</td>
</tr>
<tr>
<td></td>
<td>Sanitary: 1,260 pieces/year/worker</td>
<td></td>
</tr>
<tr>
<td>Technology used</td>
<td>Tiles: Red body/wet process</td>
<td>Low performer</td>
</tr>
<tr>
<td></td>
<td>Sanitary: Manual intensive</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>Low-medium, no specific &quot;export quality&quot;</td>
<td>Low performer</td>
</tr>
<tr>
<td></td>
<td>Low perceived value</td>
<td></td>
</tr>
<tr>
<td>Costs</td>
<td>Tiles: 1.6 euro/sq. m.</td>
<td>Best performer</td>
</tr>
<tr>
<td></td>
<td>Sanitary: 3.5 euro per piece</td>
<td></td>
</tr>
<tr>
<td>Raw materials</td>
<td>Availability of local raw materials for tiles (focus on red body) Poor quality management</td>
<td>Low performer</td>
</tr>
<tr>
<td>Marketing/trading areas</td>
<td>Egyptian performance</td>
<td>Position in the region</td>
</tr>
<tr>
<td>Exports</td>
<td>Around 20% of total output</td>
<td>Low performer</td>
</tr>
<tr>
<td>Access to foreign markets</td>
<td>Low integration in the global market</td>
<td>Low performer</td>
</tr>
<tr>
<td>Prices</td>
<td>Tiles: 2.5 euro/sq. m.</td>
<td>The lowest prices in the region</td>
</tr>
<tr>
<td></td>
<td>Sanitary: around 5 euro per piece</td>
<td></td>
</tr>
</tbody>
</table>
## Branding

<table>
<thead>
<tr>
<th></th>
<th>Tiles: few internationally known brands</th>
<th>Sanitary: some international groups</th>
<th>Low performer</th>
</tr>
</thead>
</table>

## Profitability

|                        | Tiles: > 20%                            | Sanitary: > 20%                     | Similar to competitors |

*Source: Authors' elaboration*
4. SWOT ANALYSIS

This chapter deal with strengths, weaknesses, opportunities and threats which define the competitive framework Egypt is facing at the moment. Before the part dedicated to the development strategy and action plan definition, the SWOT analysis wants to be a summary of the main elements highlighted along the global and local assessment and during the benchmarking exercise.

4.1. Strengths

- The sector shows the lowest labor costs, compared to regional and developed countries. This could both favor a penetration of interesting foreign markets and the attraction of foreign direct investments.

- The other production costs are generally lower than in regional competitors.

- The Egyptian ceramic sector adopts modern technologies and the technological endowment is aligned with the main competitors.

- Availability of local raw materials of low-medium quality at reasonable prices.

- Important installed capacity, as a result of continuous private investments in the sector, also by new entrepreneurs operating in the distribution channels. It is a basis to diversify production and sustain development.

- The overall satisfaction of a growing domestic market is guaranteed by the local manufacturers, with small imported quantities (especially in the top price segments) for tiles, whereas the foreign competitors are not relevant in the internal sanitary market.
4.2. Weaknesses

- Low productivity, as a result of a poor raw materials quality and low automation in some production phases (especially in sanitary ware). This affects the final product quality and the capability to manufacture an “export quality” suitable to enter the richest markets.

- The internal raw materials supply suffers from inconsistency and, in general, the raw materials management needs consistent improvement in quality. Egypt has not developed a high quality raw materials sector and importing materials (or refining abroad the local supply) increases the costs of production.

- Low supply chain integration, with a lack of an effective internal sub-sector providing glazes to the tiles industry and other non natural materials to the sanitary ware sector.

- Low overall quality of final products and limited level of customer relationship (constancy, packaging, respect of international quality targets, lack of “culture” for services, etc.).

- The perceived value of Egyptian products is low and, consequently, the price that the global market is willing to pay for the Egyptian production is the lowest one, compared to competitors. Correspondence between product range and international market trends is weak. These are results of the low product quality but the inconsistency of international marketing actions even worsens the perception among the global dealers. Only few companies have developed a quality suitable to be marketed into the most competitive markets.

- Shortage in some categories of skilled people. The companies need a middle management (also suitable to internationally operate) and expert technicians in order to sustain the quantitative and qualitative production development and implement strategies of global marketing.
Deep dependency on the local and neighboring markets. A direct consequence is a little international experience, mainly caused by decades of protected internal market. Egyptian manufacturers did not develop a clear and coherent strategy to export: low quality sales to neighboring countries are common, no strong links with international dealers and operators exist, no clear orientation towards the retail market or other channels. The world sector experience is rich in stories of success about an export-oriented growth.

Low diffusion of information about the sector. This affects the consciousness of the actual sector situation among the public institutions (policy makers) as well as among the manufacturers themselves.

4.3. Opportunities

- Delocalization of global production (many developing countries succeeded in attracting industrial investments from the international players).
- Closeness to European markets, the richest market in the world and an area of economic integration for Mediterranean Countries.
- Sourcing globalization (i.e. the DIY organizations are more and more competing on cost bases and their procurement departments are continuously looking for reliable foreign vendors);
- Adoption of low cost production processes. The adopted technologies seem not always to be the best choice if compared to the final target quality (lower cost processes exist).

4.4. Threats

- Reducing barriers to entry the local market. Regional trade agreements and the relevant associated phasing-out tariff and non-tariff barriers are often an actual
threat, rather than an opportunity, because of the fast growing exposition to competitors and the weakness of the Egyptian competitiveness.

- Aggressive new competitors, with a strong increase of the regional installed capacity. Threats are not coming from traditional global industries such as Italy or Spain, which can compete only in the medium – high price segments, but from consolidated top exporters (Turkey), growing global operators (UAE) and emerging industries (especially Iran, but also a small country like Morocco can become a dangerous competitor).

- Global trend towards improvement of the overall products quality. Most competitors seem to be more ready than Egypt to follow the latest trends in functional, technical and esthetic requirements of the most developed markets.
5. STRATEGIES AND ACTION PLAN FOR THE EGYPTIAN SECTOR

5.1. Objectives and methodology

The final output of the study is to identify a strategy and action plan to improve the positioning of the Egyptian ceramic tiles and sanitary ware industry. In particular, three main objectives were highlighted by IMC when outlining the purposes of the strategic exercise:

- **Upgrade the industry**, making it able to face the challenges of the global market evolution and to take advantage of the potential the sector can express;
- **Increase exports**;
- **Attract foreign direct investment (FDI)**.

These objectives are addressed by a vision which summarizes the main elements of the strategy and directly results from the analysis provided by the previous parts of the study, where the challenges and the potential were identified as regards the world sector and competitive framework evolution.

5.1.1. Vision and strategy definition

The development of a local ceramic tiles and sanitary ware industry is a case of success in the Egyptian industrial growth. Over the last two decades the national production achieved the important goal of making the country to switch from a net importer condition to an overall satisfaction of the internal demand, substituting imports with a product that generally fit the local expectations. Moreover, a certain international
presence has been built, even though Egypt seems to be far from playing an active role in the global market and cannot be considered a “true exporter” compared to other regional competitors.

On the whole, these achievements have been compliant with the general trend of the Egyptian economic development towards the private sector growth and the industrial modernization and the sector can rely on a promising production capacity, a good technological endowment and diffused technical skills. Less important results have been achieved in the field of export and exposition to international competition, where the local output cannot boast a strong international reputation and an appreciated value in the most developed markets. As a matter of fact, a long period of protection consolidated the internal market and offer, taking away the international competition and favoring a general bias of the Egyptian manufacturers for the domestic demand. The result has been a “consumption driven” production capacity, with new investments and growth strategies mainly focused on the (captive) local market development to seize economies of scale.

With the continuous progression of trade liberalization, regional integration and tariff and non-tariff barriers cutting, the inputs which favored the sector growth are now becoming elements of threat. The ceramic industry is very crowded of developed and emerging competitors aiming at expanding their international presence and taking advantages of the global market. According to the Association Agreement with the EU (ratified by the Egyptian Parliament in April 2003), Egypt will have to gradually phase out all tariff and non-tariff barriers against manufactured imports from the EU within a transitional period which will end on 2015 but many sectors will start feeling the effects of liberalization before. The beginning of next decade appears an appropriate deadline to make the ceramic tiles and sanitary ware industry ready to fully compete in the new integrated context.
The vision of the Egyptian sector should consider the following few objectives to achieve and maintain a global competitiveness positioning by 2010 in the absence of protection levels:

- **Improve the competitiveness of the individual companies** by making the best of the technologies available on the market, strengthening the undeniable competitive advantages based on the labor cost. It means that each investment decision in new equipments should be taken considering the quality target segment to reach by the final product. The local market could be served with lower costs, strengthening the competitiveness of the Egyptian companies against low cost foreign producers. The world industry is rich in examples of further reduction in the overall production costs by adopting different technologies for different levels of final quality.

- **Consider external markets as a resource** and not only as an outlet market for residual production or a source for foreign currency to feed the raw materials procurement. At least for the most dynamic Egyptian players, reducing the dependency from the local market is an option for diversifying risks and increase profits.

- **Re-orientate the export** from the neighboring countries to the European market implementing integrated actions in the production field as well as in the marketing and sales approach. In fact, the Egyptian manufacturers have the potential to better perform in both areas: on the whole, the technological endowment allow to develop new and more profitable products, while accessing the richest markets is mainly a problem of organization, commitment and investment in human resources. Approaching innovative marketing channels such as the “Do It Yourself” sales organizations, more willing to source from new emerging actors, requires actions also on all production phases, with special attention to packaging, transports, delivery times.
- **Improve and modernize the Egyptian sector**, by a set of actions aimed at reducing the cost of factors, providing better inputs for the industry and developing complementary segments along the supply chain. This part of the vision requires a strong commitment by the public authorities as well as by private actors and it could be the most difficult to achieve. On the other hand, it is likely to produce the most important effect with regard to FDI attractiveness and promises important outcomes for the Egyptian economy, including an increased and more qualified employment and a more diversified production.

### 5.1.2. Strategic areas and integrated approach

All proposed specific actions are organized within three main strategic areas focusing on the objectives as mentioned above but the overall plan must be considered as an integrated effort where the different sets of actions are mutually reinforcing. For example, the actions aimed at improving the export performance are expected to have a direct impact on Egyptian sales and access to foreign markets while the same actions are likely to produce positive effects on the attractiveness for FDI: foreign companies, when evaluating alternative investment decisions in countries with competitive advantages, can take into consideration the possibility to use the country as a platform to re-export part of the production. The opposite is also true: consistent and appropriate FDI would strengthen the ability of the Egyptian industry to access markets abroad as far as the local industry is introduced to powerful and structured global supply chains.

The following figure better clarifies that all the strategic areas contribute, although in a different manner, to the achievements of the main objectives and that the final impact will be determined by integrating concrete actions.
For each area, a strategic context introduces the main competitive forces working in the sector, both locally and globally. Although the focus remains on the specific industry, a **strategic context** for each area can include issues concerning also the overall Egyptian macroeconomic situation, highlighting how the achievement of sector objectives will result in addressing more general and comprehensive economic challenges. Then, the **specific actions** are discussed in details, whereas the action plan section focuses on the needed resources and specific actors involved. A number of **examples from best practices** adopted by the world industry are provided in order to suggest possible implementation of the specific actions.
5.1.3. Actions for companies and overall sector improvement

The present and future manufacturers will be the actual engines and main channels to implement the strategy and their role is always irreplaceable. Of course, a role for public institutions is often desirable and, sometimes, necessary. In fact, the strategic area concerning improvements on the sector environment suggests a set of actions of which the successful implementation is likely to require a sort of public coordination, at least in the phases of needs assessment, programming and monitoring. In some cases, when the strategy involves and benefits the sector on the whole, a more pro-active role by the institutions is expected to increase the level of awareness and commitment or to start actions by an external input. This will contribute to overcome the natural competition originated by the high concentration level of the sector.

5.1.4. Achievable results

At the end of the period 2005-2010, the proposed strategic approach could draw the following scenario for the ceramic tiles and sanitary ware industry:

- **Total output**: + 50% (from around 300 to around 450 million $)
- **Export**: + 100%
- **% of export on total output**: 25% (the current percentage is around 20% whereas the corresponding share for Turkey is around 40%)
- **Employment in the sector**: + 50%
- **Employment along the supply chain (intra-industry sectors concerning raw materials, glazes and other materials, transports, packaging, trade etc)**: + 50%

Among the other cautious assumptions that feed the above forecasts, the following should be highlighted: the internal sales grow at 7% rate per year (compliant with past
growth in Egypt and forecasts for the world sector) but the export progressively performs better; the export price will not increase in the period because in the near future the most developed markets will not perceive the increased value of the Egyptian production (afterwards, the industry will start moving along a durable path of “more value – higher price” like other countries already did during the last decade, i.e. Turkey or Brazil); direct employment and intra-industry employment will grow to sustain the increased output but less than proportionally, considering improvements in productivity.

5.2. Strategic area: upgrade production

5.2.1. Strategic context

Concerning the issues more related to physical production, the previous chapters of the study showed that two main trends are shaping the new world competitive framework:

- A consolidated production capacity **reallocation** from the most developed countries to the emerging economies;
- A strong development of emerging countries in terms of production assets, diffusion of skills to manage and take advantage of the latest technologies and a general trend towards the improvement of the final products quality.

Many developing countries completed the phase of acquiring the “state of the art” technologies (the technology for producing tiles and sanitary ware can be considered mature and available on the market), built a surplus of production capacity as regards the domestic demand and are now to start exporting towards neighboring markets, sometimes through the network of large companies. The **competitive advantages** are no more only based on labor costs differences but rely also on the ability to effectively combine the production processes with a desired and marketable quality. The
importance of issues concerning the respect of standards and delivery times, as well as quality homogeneity in supplying, is increasing and many developing countries are investing in both machineries and organizational assets to address these issues.

In such a framework, the Egyptian manufacturers have the opportunity to increase their production performances in many areas: adoption of more economic processes, standardization, control of all the production phases.

### 5.2.2. Low cost cycles

The main competitive advantage for the Egyptian industry compared to developed countries is the labor cost and, more important, a large and not expensive workforce maintains its advantageous basis even if compared to other regional competitors.

According to a consolidated “product approach” which above all leverages on economies of scale and cost control by using the less expensive factors, Egyptian manufacturers adopt labor intensive processes and reduce technological procurement. This is especially true in the sanitary ware production, traditionally requiring more manual activities than tiles production.

Interestingly, the dominant technology in the Egyptian factories seems not to be fully focused on cost reductions. The problem deals with “which technology” has been chosen to build the production lines, rather than “how much technology” a factory contains (and the balance sheet must consider). In other words, even if many activities are still manually executed, the technology the companies bought is not the most compliant with the overall approach to cost reduction, because the production processes can affect other costs than labor: electricity, thermal energy etc.

Experiences from other countries clearly show that the latest technology may not be the most effective one, when the global cost structure is considered. Egyptian manufacturers could further reduce their costs through a combination of latest and “old” technologies. In such a framework, the dry cycle in manufacturing tiles represents a
valid choice to contain the energy costs, following the example of Brazilian manufacturers which maintain a consistent production capacity base on this kind of process (see above the benchmarking chapter).

Dry grinding is still common in many countries as a way to overcome structural financial constraints or limitation in natural resources. Benefits from the latest application of this process may include:

- minimizing fuel consumption, due to the lack of spray-dryer in dry processing;
- up to 2/3 saving in cost of capital;
- consistent decrease in raw materials costs (no deflocculants are used);
- almost no water consumption and exhaust fumes in the atmosphere.

**RAK uses dry cycles in a new plant based in UAE**

Dry grinding is common both in developing countries (i.e. in India) and among developed industries. In September 2002 RAK Ceramics started a new factory in UAE. The plant was equipped with an Italian manufactured raw material dry preparation line for the production of 24,000 sq. m./day of monoporosa and fast single firing.

The following is a practical example of savings that can be achieved by a typical company that produces 10 million sq. m.:  

| Total ceramic tile production per year | 10,000,000 sq. m. |  |
| Weight per sq. m. | 16 kg. |  |
| Final weight of production | 160,000 tons |  |
| Grinding water used in wet processes | 56,000 tons (35% of the final weight) | The dry process saves up to 56,000 tons of water per year |
Energy used to dry the grinding water | 5,600,000 cubic meters of natural gas (1 cubic meter is usually enough for about 10 kg of grinding water) | The dry process saves up to 5,600,000 cubic meters of natural gas

Workers needed in the body preparation with wet cycles | about 20% of the industrial workers |  

Workers needed in the body preparation with dry cycles | about 10% of the industrial workers | The dry process saves up to 10% of the industrial workers

In the whole, the dry cycle minimizes depreciation and average costs and it is the best solution for manufacturers exclusively focused on red body production. Brazil, Argentina and even the top quality producer Italy keep on using dry grinding for low priced small formats. These are examples of ceramic sectors that combine both technologies with the aim to reach the most competitive production model for each final price segment.

Therefore, the adoption of dry grinding for new investments in production capacity is perfectly compliant with the present positioning of the Egyptian sector and could result in further cost based advantages.

The dry cycle can be used in two different steps inside the production flow:

- As a pre-grinding procedure, in order to purify and stabilize the incoming raw materials supplies which are inputs for the atomization;
- As a post-grinding phase, replacing the atomization step.

Particularly interesting for the Egyptian applications, is the use of dry grinding to minimize the poor quality (in terms of constancy) of the raw materials: it could be a contribution to overcome one of the main concerns the local manufacturers complained
about during the company survey (see above chapter one, “Raw materials as a strategic factor”).

The adoption of wet cycles in Egypt (instead of dry cycles) may be the result of imitation process among the manufacturers or, most probably, be determined by the excessive market power of the technology suppliers.

Therefore, the dry grinding:

- It can be integrally chosen by those manufacturers exclusively focused on the internal demand and neighboring markets, saving at least 10% of costs;
- It can be serially combined with the wet technology to improve the raw materials quality before the manufacturing process, providing a pre-treatment to reduce the inconstancy originated in the local quarries.
5.2.3. Automation, standards and quality improvements

The final phases of the production flow clearly include a trade-off between automation and manual operations but, even in the less automated systems, a minimal standard should be guaranteed. According to the feedback from the company survey, it seems that more attention should be paid to these issues, especially by those companies which aim at competing in the developed markets.
Some Egyptian manufacturers cannot increase the automation level because of:

- Depreciation costs of new machines;
- Additional costs for maintenance and spare parts management;
- Loss of control on the production flow in case of breakage.

For these manufacturers a possible increase in the process quality can however rely on deeper and more diffused skills among the labor force and the training actions suggested to improve the sector environment can play a role.

But when the companies are in the financial position to increase fixed assets, they should focus on increasing the level of automation. The sanitary ware production could much benefit from less labor intensive operations.

Current standards among Egyptian companies vary significantly but it is a matter of fact that complying with the international quality standards (first of all ISO standards) is an essential condition for each manufacturer. The importance of a rapid diffusion in certification is perceived when the value proposition of most exporters to the global market, also from emerging industries, is based on respect of international standards.

But standards are important also for those manufacturers not focusing on export because better qualified production from abroad could substitute the local production especially in the professional markets more sensible to quality issues (i.e. contractors). It is worth referring to the main constraints affecting the customer satisfaction on domestic market, as highlighted in the local assessment as regards the supplies to contractors:

- No regular stock for some product typologies;
• An excessive interval time between the order and the delivery;
• Production problems cause sometimes delays in the delivery schedule;
• Lack of conformity for the same product type (inconstancy of the final product, mainly concerning dimensions and colors); this problem is particularly frequent in case of tiles supplied in different deliveries, i.e. at end of a project;
• Gap between designs of imported and Egyptian tiles;
• Differences between the catalogue and the actual repertoire and between approved samples and tiles delivered.

The Egyptian production seems not to have developed the strong culture for services and total quality which at the moment dominate the global market.

5.3. Strategic area: access European markets

5.3.1. Strategic context

Egyptian foreign trade: expanding exports as an overall economic objective
Over the last two decades Egypt experienced an increase in the trade deficit. The negative trade balance performances in merchandise exports have been partially compensated by tourism, Suez Canal service revenues and labor remittances.

The strong devaluation of the Egyptian against the US dollar cannot fully support the industrial competitiveness, since the Egyptian industry suffers from constraints other than the price conditions. The competitive advantages in many industries are no longer price-related only: in many markets, also for ceramic tiles and sanitary ware, the consumers’ perceptions, the changing fashion, the quality issues and the reliability of suppliers are matters of importance. Moreover, the devaluation can negative influence
the industrial sectors by increasing the cost of imported supplies, such as raw materials and technology.

The Egyptian manufacturing sectors have been traditionally protected from international competition and, with an increasing domestic market, the import substituting industries have been favored over the export oriented sectors. Ceramic sector is no exception and the local industry is not ready to successfully compete in the global market.

Over the '90s Egypt signed several regional trade agreements, while other agreements are under discussion. Ratified by the Egyptian Parliament in April 2003, the Association Agreement with the EU represents the most important agreement that Egypt has joined recently. In the framework of establishing a free trade area, Egypt is going to gradually eliminate all tariff and non-tariff barriers against manufactured imports from the EU within a transitional period of 12 years. The phase-out from trade barriers is also the bulk of other agreements: GAFTA, COMESA, EFTA, etc. Since for many Egyptian industries the export constraints do not only concern barriers to trade but rather result from a weak export orientation (due to a long tradition of internal market satisfaction, low productivity, low FDI), increasing the Egyptian exposition to the global market before strengthening the local competitiveness risks to further increase the trade deficit\(^{32}\). The ceramic sector is no exception.

**Box 5: Egypt and the regional trade agreements**

One of the main objectives of the EU-Egypt Association Agreement is phasing out tariff and non-tariff barriers within a period of 12 years (only the automobile sector will be liberalized within 16 years). The agri-business and services sector are only partially affected by this liberalization framework. The Greater Arab Free Trade Area (GAFTA), starting from 1998, aims at eliminating the barriers with the Arab League countries within 10 years at 10%/year rate, but the end of the transitional period has been recently anticipated to 2005. Other preferential bilateral trade relationships include agreements with Lebanon, Syria, Morocco, Tunisia, Libya, Jordan, and Iraq. The Common Market for East and South Africa (COMESA) started in 2001 aiming at further integrating 22 African countries. The Agadir Declaration

\(^{32}\) Economic Research Forum for Arab Countries, Iran and Turkey – *Egypt Country Profile*, 2004
creates a free trade area among Morocco, Tunisia, Egypt and Jordan. A free trade area with the USA is under negotiation and in 1999 the Trade and Investment Framework Agreement (TIFA) was signed. Moreover, on December 2004, the Bush Administration announced the formation of Qualified Industrial Zones (QIZs) in Egypt, concerning a partnership between Egypt and Israel in order to strengthen economic cooperation between the two countries providing also opportunities for US companies to import products from Egypt duty-free.

For most sectors, the benefits of such an integration strategy for Egypt are not clear, because of the fast growing exposition to competitors and the weakness of the Egyptian competitiveness. For example, after joining COMESA, the Egyptian trade balance experienced an increasing deficit against the members (from 102 million dollars in 1997 to 155 million in 2000). The global competition strongly demands the Egyptian industry upgrade in order not to exclusively result in more imports and loss of the domestic market share.

Table 5.3: Egyptian trade agreements

<table>
<thead>
<tr>
<th>Agreement</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAFTA (free trade area to be reached by 2007)</td>
<td>1998</td>
</tr>
<tr>
<td>COMESA (free trade area already taking place, aimed at reaching a customs union by 2004)</td>
<td>1998</td>
</tr>
<tr>
<td>TIFA (agreement to enhance trade and investment)</td>
<td>1999</td>
</tr>
<tr>
<td>A number of bilateral preferential trade agreements with Arab countries including Lebanon, Syria, Morocco, Tunisia, Libya, Jordan</td>
<td>In the 1990s</td>
</tr>
<tr>
<td>Aghadir Declaration (free trade area with similar rules of origin to be reached soon)</td>
<td>2001 (signed in 2004)</td>
</tr>
<tr>
<td>EU-Med Partnership Agreement (free trade area to be reached after 12 years from entry into force of the agreement, with the Automobile sector exception)</td>
<td>2002</td>
</tr>
<tr>
<td>QIZ (Qualified Industrial Zones)</td>
<td>2004</td>
</tr>
<tr>
<td>Free trade area with EFTA, Turkey, South Africa, Nigeria, Australia, India, Tanzania, Sri Lanka, and EMUWA, Japan</td>
<td>On progress</td>
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Source: Economic Research Forum for Arab Countries, Iran and Turkey, 2004

Egyptian exports in ceramic tiles and sanitary ware: need for approaching European markets

Like many other manufacturing industries, over the last years the ceramic sector is experiencing a general production capacity reallocation from the most developed countries to the emerging economies. A challenging condition for the production surviving in Europe and USA is the success in compensating higher production costs with higher selling prices for the top quality market segments. On the other hand, the
The ceramic sector is still behind many other industries when comparing the export share on the total world output (around 25%, and most export is concentrated in few countries) because of many structural issues:

- The nature of the physical output (heavy and bulky and generating high transportation and storage costs);
- The importance of traditional cultural trends and new fashions in both developed and developing markets which force the exporters to strongly invest in market research and imitation to develop appealing products and get a profitable and sustainable positioning in the market.
- The importance of sales networks which can represent barriers to enter for the foreign producers, requiring investments in relationship management and trust building.

Many developing countries installed the latest technologies and are now to sell abroad important surplus, starting from the neighboring markets. In the global export game, the stories of success come from countries which focused on specific markets and segments, often splitting the output in two completely different lines: one for export, the other one for the domestic market.

As highlighted in the previous chapters (see the global assessment) the most developed markets more and more demand white body products with high technical performances and an increasing esthetic content. Approaching these markets require developing a specific production by investing in the raw materials selection, technology equipments and design.
Focusing on the Egyptian performances, the local manufacturers exclusively paid attention to the neighboring markets, showing a little interest for Europe and USA\textsuperscript{33}. They did not build effective marketing channels with the richest markets and the perceived value of the Egyptian product is very low among the world trader and manufacturers. Egypt cannot be considered a global player in the ceramic market.

The important growth the Egyptian industry performed over the last two decades is almost \textbf{entirely due to the increasing domestic demand} which was successfully satisfied by a local production of low-medium quality, with a corresponding growth of the installed capacity. This means that a future reduction of the local market would expose the Egyptian manufacturers to increasing level of idle production capacity with negative effects on productivity and profitability.

Moreover, as the benchmarking exercise highlighted, the local industry could also face an increasing competition from regional players which could be interested in expanding their presence in a large market such as Egypt. The local entrepreneurs should take into consideration the risk of losing internal market shares in the near future.

On the other hand, focusing only on neighboring countries is likely to expose the industry to the growing competition from incoming players such as North African countries or Iran relegating Egypt to a low profile role. As the assessment of the Egyptian industry highlighted (see above, chapter two), the Arabic region already represents an outlet market for the local production, thanks to the geographical proximity and the cultural homogeneity. An export strategy suggesting any further effort to expand exports to the neighboring countries, although profitable within the short term, could result in some \textbf{negative effects through the medium-long period}:

\textsuperscript{33} Concerning the main trade partners for the overall economy, around 30\% of Egypt’s foreign trade (import and export) depends on EU market, whereas the USA absorbs 10\% of Egypt’s imports and represents 15\% of its imports. Arab countries account for around 9\% of Egyptian foreign trade.
• It would distract vital financial and human resources from more remunerative marketing actions;
• It would postpone the necessary actions to put the industry on a path of growth towards “higher quality – higher perceived value – higher selling prices” in order to follow the footsteps of countries that successfully escaped from the schema “bad image – bad prices” (see above the positioning maps at the end of chapter two, “General positioning of Egyptian industry”).

In such a framework, developing a consistent export production for the richest markets is a necessary prerequisite to reduce the Egyptian dependency on the local demand and is a way to expand production. Among the possible most developed markets, the European context is the easiest to approach, considering the strong links Egypt is establishing with EU and the relationships the sector has build with the European suppliers.

Besides the above benefits, increasing exports will indirectly affect the Egyptian attractiveness for FDI. Most international groups use to select a country as a kind of platform to export in the neighboring region and to re-export to the richest markets, working on the local competitive advantages. Therefore, the larger sales generated by exports could justify the foreign involvement in the Egyptian production by reducing the risk of idle capacity and providing logistic advantages. The following example concerns the cement sector and shows a recent FDI operation by a large multinational company which aims at feeding the local market as well as exporting in the Mediterranean area.
Box 6: ITALCEMENTI expands in Egypt

ITALCEMENTI Group, through its international sub-holding CIMENTS FRANÇAIS, has taken the control of the Egyptian Suez Cement, the main local producer which accounts for 22% of the market with global sales for 186 million US dollar, while Egypt is one of the main cement exporters in the world. The majority share has been bought from the Egyptian Government within a privatization program started in 2001. ITALCEMENTI becomes the main operator in Egypt and strengthen its involvement in emerging countries which now account for half the total group production. ITALCEMENTI is the largest operator in Italy and ranks fifth in the world. It is already active in Morocco and Turkey and the latest operation will guarantee new production outlets in the Mediterranean area.

(from the “Corriere della Sera”, 4th March 2005)

The starting point

With no doubt, the future actions on the export side are the most challenging issues for the Egyptian companies. For the present conditions of the local industry, the objective of “increasing export” contains at least four levels of complexity and addresses a number of issues concerning the ceramic industry performances as well as general objectives of economic growth in Egypt:

- Increase the total amount of export in quantity (to reduce the risk of idle production capacity);
- Increase the total amount of export in value (providing foreign currency and improving the trade balance);
- Change the export destination, totally or partially moving the export flows from the present countries to other countries;
- Modify the export composition, focusing on different products.

The four levels are clearly strictly connected and the overall objective can take the shape of “changing the export mix”, with the objective to provide a significant contribution to the sector trade balance.
At the moment, 80% of the Egyptian production is absorbed by the domestic market and the rest is exported to neighboring countries. On the whole, the exported products and the internally sold output do not much differ in quality, and for some producers the foreign markets represent an optional channel to allocate a low quality output. In other words, the Egyptian sector did not develop an “export” production, in terms of functional performances as well as pre-sales and post-sales services, unlike other successful exporting countries did. The benchmarking focused on the Brazil and Turkish cases as example of success.

The high level of protection negatively affected also the ceramic industry and did not gave the right market signals to develop a competitive export presence. Few companies tried to leverage also on “intangible” assets, such as the corporate image or the product design, strongly investing in advertising, sales organization, product development. Most of the manufacturers do not seem to be ready to approach the international markets with the required typology (tiles that imitate natural stones, for example), product quality level (use of white body) and attention to other components of the supply chain (such as packaging).

However, Egyptian production is not lacking in examples of export oriented product ranges, realizing “total concept” collection with a good level of quality. This stands for a capability of the local industry to formulate a quality proposition to the most developed markets.

In order to define a possible strategic approach to the richest markets, first of all European markets, it is necessary to understand the demand segmentation and identify possible consumer target, taking into consideration:

- The present level of the Egyptian products perceived value which determines the possible selling price target in the foreign market;
- The competition from present and potential sellers;
The accesses to market which allow getting sales targets within a considered timeframe and assuring sustainable profitability levels.

Concerning the first two elements, figure 5.3 shows the main price segments for the European tiles market with the corresponding market shares. The most important segment includes products with prices between 5 and 10 dollar and accounts for half the whole market. The rest of the demand is represented by a low price production, mainly imported from non European countries, and a high price segment where the Italian offer dominates the competition. Of course, the chart wants to suggest the main differences among a limited set of countries showing the main suppliers for each segment (there are also Italian manufacturers who produce in the medium segment but the Italian production mainly focuses on the higher priced products).

On the other hand, the access to market models identified in the benchmarking exercise provide a framework to suggest an approach to allow Egypt entering the developed markets.

Combining the above considerations about the present Egyptian sector potential with the external opportunities, the most suitable strategy to increase the exports includes **two different integrated actions**:

1. Develop an export production with higher added value content focusing the European markets;
2. Approach the DIY market starting from the 2.5-5 dollar segment, by using a direct interaction with a limited number of buyers.

The following pages deal with these actions.
5.3.2. Export production development

An export production targeting the richest markets will take advantages of a higher attention to all the quality issues which affect the whole supply chain. Some of these issues have been identified when considering the first strategic area “upgrade production”. Improvement in the sorting and packaging activities, as well a stronger commitment to international quality standards, are prerequisites to be considered as potential supplier in the global market. But the successful entry to the European markets requires also other actions which often must integrate the efforts of more producers, sometimes with the support of public coordinating bodies, in a vision of growing together to win abroad.
A “market oriented” instead of a “product oriented” offer
If each company must develop a collection focusing the foreign consumer requirements, its collections must be expanded and diversified. The dealers demand “environments” and not only single products. In the classical spaces dominated by the ceramic tiles, bathroom and kitchen, there is now a total integration with other ceramic and not ceramic components within a framework of “total concept” combination. Of course, a strong collaboration with the raw materials and technological suppliers (especially glazes suppliers) is essential. As highlighted before, the Egyptian sector has already demonstrated its ability to propose “total concept” collection.

Inter-company collaboration
This will require an increasing collaboration among companies producing near products such as sanitary ware, tiles, household goods etc. Therefore, signing agreements among manufacturers with complementary products should be considered a profitable option to approach the European manufacturers and increase the perceived value of the Egyptian sector on the whole.

The promotion of such inter-companies agreements aiming at offering “export collections” should be favored by the public institutions by:

- Providing economic incentives for marketing research on foreign markets including more producers;
- Funding the companies which decide to develop joint collections;
- Reducing taxes for inter-companies procurement, when the procurement aims at offering joint collections.
- Supporting the costs to propose the joint collections directly to buyers or during fairs and exhibitions.
The nature of these and other public actions will be further considered in the next strategic proposals.

**5.3.3. Export marketing and sales**

The benchmarking chapter identified different ways to access foreign markets. For the present condition of the Egyptian industry, the most appropriated approach is summarized by the following chart:

**Figure 5.4: Inputs and outputs of a strategic approach to foreign markets**

- Direct contact with European DIY channel
- French, German and British markets
- Big volumes selling
- Minimize cost of entry
- Reduce idle capacity
- Leverage on economies of scale reducing production costs
- Minimize payback time

The strategy focuses on few integrated elements which leverage on the present strengths of the Egyptian industry (a consistent installed capacity and low production costs) and takes into consideration the limited international experience of the Egyptian manufacturers. On the other hand, the marketing mix aims at getting practical outputs within a reasonable short timeframe, since the main objectives are:
achieving a **consistent presence** in specific foreign markets in order to take advantage of every opportunity will be provided by the establishment of the most important regional integrated area Egypt is going to join, the Euromediterranean Free Trade Area, which will become real in the near future;

- providing outlet markets for the **top quality Egyptian products** supporting the process of quality improvement in the sector, as defined by the overall development strategy;

- Making the Egyptian products **more familiar** to the European consumers, laying the basis for improving the perceived value of the Egyptian production.

Concerning the specific actions to enter the European market, the **DIY channels** should be preferred, at least in the near future, since the large distribution chains allow to allocate consistent volumes by approaching a limited number of dealers. This would facilitate the relationship management with foreign sales organizations, preventing the manufacturers from strongly investing in contacts with the modern retail organizations. These are complex systems made by a large number of actors with diversified strategies and high barriers to entry, making the retail channel suitable only to manufacturers with a large and expensive own sales organization. The alternative approach, using independent sales networks, would be very expensive and increase the risks. Moreover, the level of complementary services required in this channel is lower compared to the assistance generally provided in retail.

The DIY channel accounts for half the market in Germany and France, therefore these are the markets the Egyptian manufacturers should approach first of all. Another interesting market, with similar characteristics, is UK. Although Italy and Spain are top consumers in Europe, they are more difficult to approach because their markets are very
focused on the traditional retail system and, especially in Italy, the consumers demand a high level of pre and post sales services.

Since the DIY channel requires bigger supplies than the retail channel, providing consistent economies of scales to manufacturers with a corresponding production capacity, the risk of unsuccessful sales are higher: if the manufacturer cannot satisfy a very low tolerance for late and dishomogeneous deliveries, the losses in sales will be important with **dangerous effects on the image**. Therefore, a set of complementary actions should be implemented along the entire supply chain in order to minimize the risk of failure in the single big deliveries. Many of these improvements focus on the upgrade of the Egyptian sector and are highlighted on other section of the development strategy, including the support of public institutions:

- Increase reliability on the raw material management, in terms of delivery times and product quality;
- Improve the sorting and packaging phases, in order to minimize the costs of dishomogeneous delivery;
- Speed the customs procedures, because the time factor is so relevant in deliveries for the DIY channel.

The following figure shows a possible evolution to approach foreign markets, first focusing on the DIY channel to be directly (using own employees) approached within a limited number of European dealers. The DIY organizations are more and more competing on cost bases as well as on warehouse efficiency, product assortment and space management at the points of sales. In such a framework, their procurement departments are continuously looking for reliable foreign vendors which are often required to dedicate full production lines to the distributors’ orders. The direct
relationship with these procurement organizations is the best way to be considered as potential vendors.

Further actions should consider the opportunity to supply the foreign retail systems, once the Egyptian production starts becoming more accepted and considered reliable by the markets. This may need to buy services from independent sales organizations based in the target countries, in order not to build expensive own sales structures which require time to become effective (the benchmarking exercise highlighted the UAE experience as an example of using external organizations). The following list includes examples of simple and more complex services that a local sales organization could provide:

- Marketing researches and selection of retailers
  - Analysis of the geographical distribution of the retail system
  - Consumption patterns of final customers
  - Sales profitability
- Relationship with retailers
  - Local contact
  - Contract management
  - Preparation of materials for the product presentation at the point of sales (catalogues, samples etc.)
- Warehouses
  - Selection of the best localization to serve the local market
  - Contract management
  - Warehouse management
- Foreign sales management
Like for the product development issues, there is a need of public actions to support the local manufacturers to approach the international marketing channels. In particular, Egyptian institutions should implement a set of activities to minimize the transaction costs during the initial phases. Relevant actions are described in the section dedicated
to a Ceramic Industry Development Center (mission and role of such institution is outlined in the strategic area).

5.4. Strategic area: improve the sector environment

5.4.1. Strategic context

Supply chain integration
With regard to the downstream segments which build the supply chain, the Egyptian ceramic sector shows a modest level of integration. The local assessment highlighted the importance of imports in both raw material and other non-natural materials (glazes, dies etc.), even though the local supplies are generally less expensive than the corresponding imported products. The main issue to be addressed is the quality of supplies.

On the other hand, the world best practices identify the integration of the industrial system as a key factor for the success of the ceramic sector, where the most innovative countries are those that have a production chain that embraces tile and sanitary ware producers and suppliers of technologies, glazes and other materials. Countries with a system capable of producing all or part of the necessary expertise are capable of independently generating product and process innovation and have the potential to become product leaders and therefore market leaders.

Of course, the Italian and Spanish cluster experiences cannot be easily imitated but however show that all actors in the supply chain can benefit from fostering each segment in the chain, with undeniable returns in the medium-long period.

If the Egyptian productions cannot substitute all foreign inputs (i.e. in sanitary ware industry), a strong quality improvement of the local feeding industry in specific supplies could originate great results for the sector in terms of:
The first industries to be strengthened should be the raw material sector and the production of glazes, dies, punches etc. ("non natural materials")

Labor market
Employment is one of the most important issues Egyptian economic development has to face. Both the demand and the supply side of the labor market are affected by structural transformations and any potential of reducing unemployment and improving the human resource allocation in every sector has to be taken into consideration. In such a framework, the private manufacturing industry can play an important role only if the market labor can provide effective signals to improve matchmaking between demand and supply. A role exists for the public institutions in order to allocate education investments on the profiles for which the scarcity is more important.

Due to its strong development, Egyptian industry seems to experience a certain pressure on some specific categories of labor force. Some manufacturers interviewed during the local sector assessment, complained a shortage on specific typologies of skilled workers. Particularly in the industrial cities (i.e. 10th of Ramadan) companies strongly compete for hiring educated and experienced profiles such as:

- Skilled technicians with 3 to 5 years of experience (that are the middle management);
Young technicians with some months of practical experience in factory.

The scarcity seems to concern the young workers that come from the secondary school (a specialized secondary school in industrial ceramics does not exist in Egypt) rather than engineers with a long university curriculum. Losing such a kind of workers, for the company which sustained the costs of training them, means to lose important investments in human resources and a delay in building an important layer of middle level technicians.

Suggesting policies to improve the efficiency of the Egyptian market labor is outside this project scope. Nevertheless, actions can be addressed on the supply side to focus specific educational programs on the ceramic sector requirements and favor the companies to find the most appropriate human resources for their development needs.

**Investment climate and attractiveness for FDI**

Egypt implemented open-market and export oriented policies before many other countries in the Mediterranean area but there are still a number of fields where the efforts should be increased or rationalized in order to make the country one of the most attractive markets for foreign direct investment (FDI) in the region. Most of the actions aimed at the sector efficiency and export potential will directly increase the interest of foreign operators to invest into the Egyptian production.

Concerning the ceramic sector, FDI are so far **limited to the sanitary ware segment**, with joint ventures and industrial involvements by three multinational groups (American Standard, Duravit and Sanitec) which allocate different shares of their global production to their Egyptian partners. The main benefits for the local producers is clear and tangible, a better access to foreign markets through organized and powerful sales networks, but also improvements in quality and technologies can arise, because the manufacturers operate nearer to the global market, have the opportunity to cooperate
with global players and the process to comply with international standards is favored. With regard to the effects of FDI about the export, joint ventures with the biggest groups generally produce a smaller export orientation. The giant networks with productions in dozens and dozens of countries, will limit the use of inter-company exports and the manufacturers will mainly sell locally. The smaller networks and mainly based in the developed markets will make the most use of exporting from developing countries and selling in the richest ones, in order to make profit by lower production costs (first of all, labour costs). The Egyptian sanitary ware industry confirms this framework: the company which belongs to the biggest world multinational group exports only 20% of its production, while companies belonging to smaller networks (mainly concentrated in Europe) export up to 60%.

A strategy aimed at increasing FDI, especially in the ceramic tiles market, has to take into consideration:

- **The size of the local market.** The demand is approaching 100 million sq. m., but the local production is ready to satisfy the current and more important levels. Moreover, the limited share of higher price segments may not justify investments by multinational groups focused on the local sales. Finally, the decreasing protection context with declining tariff and non-tariff barriers will make more and more convenient for foreign companies to serve the Egyptian market by exporting from other countries.

- The poor exporting performances of the Egyptian industry. Since the Egyptian production has a **little international appeal**, it is difficult to use the country has a platform to re-export to Europe or other richest markets.

Therefore, any kind of action aimed to make the internal market more attractive in terms of required quality and to expand the export should be considered.
5.4.2. Raw materials management

One of the main issues among the manufacturers interviewed during the local company survey concerns the raw materials quality. As highlighted in the previous chapters, the raw materials feeding the production cycle represent a strategic factor for the ceramic industry worldwide and can strongly affect the return on investments for technology and product development. Moreover, this issue is strictly connected to other important elements:

- How the cost of managing the raw materials are shifted across the global supply chain. The final objectives, constancy and quality of the input, can be in charge of the raw materials supplier (at the quarry) as well as of the final product manufacturer.

- How the raw materials get to the final producer. In the ceramic industry, the transport system has a great effect on the raw materials cost. The transport system must integrate as much as possible the different carriers, routes and ways in order to minimize the final cost: public and private companies providing intermediate storage locations, transports via truck, shipping and railways. Also export oriented countries with a favorable cost base and advantages in terms of geographical location (i.e. Turkey) did not build such an integrated system, whereas countries with a developed transport network and a diffused industrial localization often focused on a short term vision favoring one main transport way (above all the trucks, i.e. in Italy) and affecting both industrial and social costs. Good examples of such effects are the environmental damages caused by the truck transport.

On the other hand, also the raw material manufacturers face a growing international competition by strong producers which can easily access the Eastern Mediterranean destinations (first of all, Turkey and Ukraine). Within an ongoing process of tariff
protection removal, the risk of substituting the local raw materials with imported ones is real. Therefore, a more effective raw material production could both benefit the mining sector and result in an advantage for the final product manufacturers.

The following examples are about raw materials management and transport and show that these issues often require answers including many actors in the value chain.

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**Box 7: Best practices from clay production**

Top quality in raw material production depends on the quality of each step in a complex supply, including mining operations, tests in laboratories, long distances transports, huge volumes infrastructures.

**Before extraction: prepare the mine**

A geological survey is the first phase of the process, in order to find the most suitable zones for quarrying. Modern excavators execute a complete stripping of the layer earth over the mine.

**Extract and handle the clay**

After the mine cleaning, clay can be collected by hydraulic and rotary excavators. Then, the clay is loaded by special lorries transporting the clay outside the mine.

**Mix and prepare the batch**

The lorries transport the clay to deposit areas where the lump-breakers reduces the clay lumps: the material can be stored. When the clay is flowing on the belts of the automatic stackers, samples are sent to laboratories for other quality checks and tests.

**Storing the raw material**

The cement flooring of the deposits prevent from contamination of the clay by foreign materials. The deposit dimension is clearly a competitive driver in raw material production (the capacities are measured in hundreds of thousands of tons). Normally, rail freight wagons transport the materials to the port. Before being loaded, the wagons are severely washed to prevent any risk of contamination.

**Transport by shipping**

At the departure port, the wagons are loaded into cargo ships to be delivered to the ceramic manufacturing areas. After reaching the docking ports, clay is unloaded from the ships. Modern cranes can take few days to disembark holds containing over 20,000 tons of clay.

**At the destination deposits**

From the docks, a stream of trucks transports the clay to the deposits. Further treatments to remove iron and break lumps are executed by plants dedicated to the different types of material. The clay is constantly moved to complete drying and increase homogeneity. The Ravenna dock which serves the ceramic cluster in Sassuolo (Italy), for example, can rely on very large deposits, with a capacity of 250,000 tons, ready for delivery. The final transport to the factory usually involves trucks and railways, sometimes in an integrated delivery system.
Box 8: The “Clays’ railways” serving the Sassuolo ceramic cluster

The project started in Spring 2003 thanks to a great effort by the Emilia-Romagna region (North Italy) aiming at the development and sustainability of the regional industry, especially concerning the ceramic sector. The objective was to strengthen the railway transport, valorizing the Ravenna maritime port and creating economies for the ceramic district. The line Reggio Emilia-Sassuolo was strengthened too, to favor a railway station near the district. At the moment the traffic volume reached 100,000 tones of clays per year, 4,100 containers of ceramics, transported by four light trains (10 carriages each) and one large train (30 carriages). By this way, the share of goods transported by truck has been strongly reduced with a consistent lightening of the TIRs traffic through many medium sized industrial cities in the region. The same quantity of clay would be yearly carried by 11,000 trucks, let alone the truck that would be needed to transport the final product (tiles and sanitary ware) to the Ravenna port. The project required the collaboration among a number of companies, both public and private, and the local administrations. The entire system can be considered an example of excellence in Italy, where more than 80% of goods is transported by truck with dramatic consequences for the environment and the cost of energy and infrastructures. Concerning the cluster development, the manufacturers can leverage on the economies generated by the transport integration.

Therefore there is a space for an institutional support in order to transform the local raw material feeding from a further cost for the industry to a competitive asset. Some specific actions can be highlighted.

- Define a raw material quality level that the local suppliers should guarantee in terms of homogeneity and delivery times in order to get cost reductions among the manufacturers. A joint panel of experts, suppliers and producers could get to specific technical measures.

- Favor investments in extraction, processing and quality control among the raw materials suppliers.

- Identify the main issues in order to improve the raw materials transport system. This action should include the Egyptian relevant authorities with the objective of defining a public plan for investments in the transport system, storage facilities, raw materials management plants. Some of these facilities and plants could benefit many manufacturers and be shared among a number of companies.
5.4.3. Local production of glazes and other inputs for the industry

It is worth considering the supply of glazes and other non natural materials as industrial segments to valorize within the whole supply chain.

Besides the raw materials offer, one producer of glazes and one manufacturer operating in the maintenance, adaptation and production of punches, liners, bodies and dies are the main Egyptian feeding companies for the sector. The competitive framework where the suppliers operate has been highlighted in the local assessment chapter:

- The selling prices are average 60% lower than the imported materials;
- The product quality is compliant with the local needs and cannot compete with similar imported goods;
- The suppliers only serve the local market (no export);
- A lack of collaboration between the suppliers and the ceramic manufacturers can be considered a serious obstacle to the development of a reliable and effective feeding industry.

As a matter of fact, there are a number of issues to be addressed when considering the procurement needs of the companies and the potentialities for a local production development in glazes and other inputs.

On the demand side, the manufacturers of finished products can buy both raw materials and other input on the international markets and they adopt procurement strategies taking into consideration the price, the quality, the availability of complementary services (i.e. design and product development activities) the supplier can sell apart from
materials. Of course, the overall service that Spanish or Italian suppliers can offer is dramatically better than any service the local suppliers can guarantee at the moment. On the other hand, the Egyptian market is quite near to the main exporting countries and this favors the external sourcing. Finally, in a context of tariffs reductions, the entry of imported materials will be easier and easier.

Concerning the supply side of the market, the market signals for an improvement of the local production are, at the moment, inconsistent. A stronger collaboration among upstream (the supplier of glazes) and downstream sectors (the manufacturers of ceramic products) would improve the sector by settling long period procurement plans and sharing quality requirements, replicating a “cluster” approach where the innovation quickly spread among manufacturers and technology and materials suppliers and distributors. If such a mechanism has been the basis for the successful growth of the worldwide renowned Italian and Spanish districts, there is a little hope in Egypt to get the benefits of modern supply chains integration without external incentives to a stronger collaboration.

In such a framework, the Egyptian manufacturers will keep on relying on imported inputs and the sector will lose the opportunity to increase the overall added value and substitute imports.

The policy actions that a public institution could implement to strengthen a local feeding industry are mainly linked to:

- Increase the attractiveness of the Egyptian market for foreign suppliers in order to increase the FDI in this segment. The same policies to attract FDI in the downstream segment could be extended to the feeding sector;

- Incentive long term agreements between local suppliers and local manufacturers of final products. The parts could receive a favored taxation treatment when the
agreement includes deliveries over a minimum period of years and with a certain commitment to improve quality of materials.

5.4.4. Labor force

In order to reduce the pressure on the labor market for the most required profiles, the public institutions could settle a training plan focused on the sector requirements. Public investments in education programs for the ceramic industry would directly result in:

- higher availability of skilled people and lower labor costs for specific profiles;
- higher productivity of human resources and better commitment of workers to quality control;
- more flexibility for companies to follow changes in technology and adopt new organizational procedures.

A dedicated institutional body, independent from the companies but maintaining strong relationship with them, should define and manage the training investments. The programs should comply with some important guidelines which the experiences in both developed and developing countries have identified as best practices:

- Before organizing any action, a deep company survey should be carried on among all main producers, including every actor of the supply chain in order to have a complete picture of the most needed skills, the relevant priorities, the geographical locations where the skilled people are needed, the present requirements for each specific profile and forecast for the future. Opinions and
suggestions should be collected among manufacturers of finished products, suppliers of raw materials and other non natural materials (i.e. glazes), traders, logistic operators, academic personalities and international experts. Strengthening the cooperation between technical education institutions and the private sector is worldwide considered a best practice and is one of the key success factors to develop effective and sustainable cluster experiences;

- The training courses should be attended by a specific number of people, corresponding to the actual and future needs of the sector. Otherwise, the training programs risk to originate other “skilled” unemployment;

- The training should take place as near as possible to the industrial sites, in order to expose the trainees to the productive system from the very beginning of their technical classes and guarantee a continuous link with local needs. This could also require a decentralization of the decision making process for the educational programs;

- The schools should be equipped with the technologies more common in the outside industrial plants but the programs should also consider the “state of the art” technological developments;

- **Practical experiences** inside the companies should be included in the programs;

- Public/private funded rewards for the students should be considered, in order to make the technical training more attractive, especially when the coursers are provided in non residential zones;

- Public/private rewards for the students should be considered in case of practical work experiences inside the companies (if fully provided by the public authorities, the rewards would contribute to reduce the labor costs of youngest workers).
- The technical schools should be accredited by a public quality assurance body for vocational training.

Some opportunities exist for supporting such a kind of programs. First of all, the international donors use to fund technical training within their programs of human development or assistance to industrial development. Moreover, industrial associations and public institutions from different countries use to co-finance training program to promote their export productions. The following is a relevant example.

**Box 9: Italy promotes training courses for ceramic industry technicians**

At the beginning of the years 2000s, Russia and Iran are among the most interesting markets for the Italian suppliers of technology in ceramic production. This is the reason why ACIMAC (Italian Ceramic Plant & Machinery Manufacturers' Association) in cooperation with ICE (the Italian Trade Commission) organized in 2004 in Moscow and Tehran intensive training courses about the production processes, as a way to promote the latest Italian technological offer.

The training course in Moscow was entitled ‘The ceramic tile production process: applied technologies and innovative developments’ and was attended by more than 60 technicians from important Russian operators. The course included lessons on all stages of the production process, from raw materials preparation to packaging of the finished tiles. During the final workshop nine Italian suppliers could present their latest technological innovations to the Russian technicians.

The Iranian course focused on ‘New technological developments in the grinding, pressing and tile firing processes’.

### 5.4.5. Investment attraction programme

An important contribution to achieve the objectives of the export development and a better positioning of the ceramic industry could be represented by investments of foreign companies in Egypt. FDI are an essential way of international growth especially in the **sanitary ware sub-sector**, where the global market is dominated by a small number of big players which build (or “buy”) production capacities all over the world in order to get market shares in growing markets as well as to re-export outputs leveraging on the cost
advantages that many developing countries can offer. If the tiles producers have the potential to find their own way to the richest foreign markets by increasing the quality and implementing effective export strategies, the sanitary ware manufacturers are prevented to enter the developed markets by the absolute market power of the giant corporations (the main international groups in the sub-sector are analyzed above, in chapter one). These companies have a deep link with national sales organizations (retailers and large distributors) and their brands often represent an insurmountable barrier for standing alone foreign producers to entry local markets. Therefore, establishing a durable relationship with the big players is the main way to enter the sanitary ware global market.

In fact, experiences of FDI within the Egyptian ceramic industry are limited to the sanitary ware sector and they were born in the last decades mainly to take advantage of a growing Egyptian market, rather than to use the local industry as a base to re-export production to the richest markets under a well known international brand. However, these experiences show the Egyptian potential in attracting foreign investments in the sector and the policy makers should take into consideration a specific programme to extend the amount and the outcomes of FDI. Such a kind of action could use the resources and experiences of General Authority for Investment (GAFI) in collaboration with a sectoral institution (i.e. the Ceramic Industry Development Center, below described).

Many countries that succeeded in attracting FDI implemented a proactive program, directly promoting their industrial system abroad, approaching potential investors around the world through a persuasive and targeted action. Such kind of strategy is even more important for Egypt that cannot boast at the moment a fast growing internal market as other countries can do.

The sanitary ware FDI strategy should rely on a specific sub-programme that can be outlined as follows:
1) Understand the FDI mechanisms already active in the Egyptian ceramic market

- Analyze the needs of the local manufacturers to select the companies ready to start an international collaboration which would fit their development strategy;
- Some international sanitary ware producers have already established collaboration less or more intensive with local manufacturers. On the one hand, these global players are aware about the benefits Egypt can offer and are the better source of information to deeply analyze needs, motivations and perspectives of foreign investors. On the other hand, these successful relationships can help GAFI and the other policy makers to identify a general mechanism to start and develop FDI projects, focusing on the actors to involve, the needed timeframe, the public and private resources to provide for a successful collaboration.

2) Create a value proposition within an FDI attraction schema for the sector considering:

- The requirements of local and foreign companies and the competitive advantages of the industry;
- Benefits of the Egyptian industrial system specific for the ceramic sector; besides the existing general policy instruments for FDI, other policy measures should be specifically designed for the sector;
- Overall advantages that Egypt offers as a location for foreign investments, including the present FDI attraction laws and other instruments (i.e. the industrial zones regulatory system);
- The successful mechanism of implementation;
3) Direct contact with a set of international companies

- Among all the global group, a specific set of companies with the higher potential for FDI in Egypt should be selected, according to their procurement strategies, their past experiences of foreign investments around the world and in the region, their range of products;

- The attraction schema should be directly proposed to the companies, approaching the corporate level; the number of big players in the sanitary ware market is quite restricted, therefore there the opportunity to define tailored propositions for each of the selected companies; this task, preliminary to further private negotiations between the international company and the local manufacturer, should be better implemented by an Egyptian public authority (i.e. GAFI)

5.4.6. Ceramic Industry Development Center

Many of the above suggested strategies need a public involvement during the phases of:

- Needs assessment, consensus creation, definition of programs and detailed plans of action;

- Program management and upgrading according to the changing local and international context.

The Egyptian industry seems to be lacking in a public institution specifically focused on the development needs of the sector and the centralization of public activities related to the sector promotion would create a key reference actor with an overall vision able to guarantee the commitment to a global strategy. There are a number of activities that a
ceramic industry development center (the “Center”) could perform in the best effective way, following the example of similar structures in other countries (mainly associations of manufacturers):

- **Improve the knowledge** of both local and international market, providing statistics, prospects and specific studies. One of the main difficulties the Team has faced during the study concern data collection on the Egyptian sector. The official statistical sources cannot considered reliable (when existing) and the interviews with the companies highlighted deep inconsistencies between the market operators’ experience and the available statistics with the main differences concerning export and import flows. In many cases, even basic information such as market shares is only known in the most approximate manner. Although these limitations affect the sector’s knowledge worldwide, the Egyptian industry is lacking in a key reference institution which researchers and company can ask for reliable data and prospects. In the most organized markets, such a kind of institution is usually represented by an association of manufacturers, with a structure devoted to data collection and studies about the relevant domestic market. The industrial associations operating in the most important markets (i.e. Italy or Spain, but also Brazil and other top exporters), generally show a good control of their domestic industries and maintain a good knowledge of the main world trends. They periodically inform the associated manufacturers and the public interested community in general, about emerging competitors, new outlet markets, events and so on. The services of the Center should be addressed both to the industrial community, to provide elements of a company strategy, and to the public policy makers, as decisional support in developing strategies for the sector. For example, concerning the imported production, in a global context of dismantling tariffs and growing competition a
clear and up-to-date knowledge about the import situation and forecast should be a prerequisite for each manufacturer willing to stay in tune with the market. The same knowledge could also be useful to undertake practical actions to support the sector.

- All actions concerning the **vocational training** for the ceramic industry should be managed by a dedicated body and the Center could take in charge to assess the manufacturers' needs, formulate a plan and manage the programs.

- Most countries focusing on export driven sectors created specialized agencies to **promote the domestic industries abroad**. Considering the low exposure of Egyptian manufacturers to the global markets and the low perceived value of the Egyptian ceramic production, the Center could help the overall sector to access foreign markets by organizing international events, presenting Egypt as an interesting market for FDI, improving the international image of the Egyptian industry. These marketing actions should try to introduce the sector under a common “flag”, with a joint participation of the companies, in order to present the differences about the Egyptian manufacturers as a value (next example is about such marketing actions a country can implement).

- Increasing the knowledge of the European markets among the local sector is another desirable action. Market researches could be carried on to identify the most suitable dealers and chain to contact, highlighting their procurement strategies, their attitude to buy from Mediterranean manufacturers, the competitors already in their vendor lists, the average amount of the orders.

**Box 10: “Made in Turkey” exhibition in UAE**

According to recent declarations from Turkish Authorities, Turkey plans to increase trade volumes with the Gulf region to equal 30% of its total foreign trade. The Turkish Government is pursuing a free trade agreement with the GCC countries, in particular the UAE which provides a gateway to the rest of the Gulf region, the Indian sub-continent and the East African markets. Within these strategic framework, the first
official Turkish trade exhibition in the Emirates is going to take place at Dubai’s World Trade Center at the beginning of June 2005. The “Made in Turkey” trade fair has been organized by Expotim International Fair Organizations Inc., a Turkish events management company, and aims at providing the opportunity for Turkish companies to present their high quality, reasonably priced products to customers in the GCC region. With exhibitors from the machinery, construction, fashion, decoration and furniture industries taking part, ‘Made in Turkey’ highlights the country’s efforts to increase the diversification of the goods it exports, and all participating sectors have contributed to a significant rise in trade volumes to and from the Middle East.

Even though the mission and scope of the Center, as well as the services to supply through such a structure, can only be identified in detail by a dedicated feasibility study, the following pages give an overall picture of the institutional building framework, anticipating a possible structure of the Center.

**Actors involved in the Center**

The establishment of the Center should take place with the participation of both the public and private sector to the Center’s capital and Board of Administration.

**Public participation** to the Center is fundamental in order to guarantee financial sustainability, especially during the start-up phases, and activities’ coherence with the Egyptian general policy objectives.

**Private sector participation** is just as important since it guarantees that activities delivered meet real needs of enterprises and are really useful for Egyptian companies. The private contribution to the Center development and management could take the form of a fee to be paid by the local manufacturers.

Important will be also the industrial and sector-oriented associations’ participation in the Center because it will guarantee proper links with final clients, preventing from the creation of an instrument detached from industrial reality.

A mixed structure such as this one could promote a stable dialogue between private and public counterparts of the local system, laying the bases for further development in other areas of industrial policy.
The Center could be structured as a no-profit limited company or a consortium and will be subject to all relevant laws according to local legislation.

**Structure of the Center**

Several models of intermediaries for innovation and technology transfer, export promotion and local industrial development could be considered and the actual establishment will necessarily follow intermediate phases of implementation. The following figure shows a possible final configuration.
The structure should be organized in a **modular way**, to foster the flexibility of the Center start-up and growth in a changing world. The following six operative units may support the entire activity range of the Center:
**Information & Studies**

This unit is conceived to collect, elaborate and provide relevant information related to the ceramic tiles and sanitary ware sector to entrepreneurs and other interested stakeholders in the sector. This service could be provided through a regular bulletin, web portal, workshops and conference.

**Training**

This unit will supply to entrepreneurs, managers, young engineers and other ceramic tiles and sanitary ware personnel a professional and updated education service on technologies, management, marketing & fashion design, quality certification, etc. This is going to be provided through the establishment of long courses (i.e. Masters Degree) and short class courses, as well as training on the job and visits.

**Laboratories & Technical Assistance**

This unit will provide to companies analytical services, applied research facilities (also in collaboration with local Universities) as well as expert personnel that could provide technical assistance directly at the enterprise site.

**Fashion and Design Services**

This unit will provide services focused on designing, marketing and trends in order to make enterprises more informed about international markets, as well as develop stronger creative skills.

**Management Consulting to Enterprises & Internationalization**

This unit provides the most customized and tailored service to enterprise, supporting them in their innovation strategies development (new product development, new marketing strategies, specific support on reaching new customers, etc.)

**Quality and Environmental Services**

This unit will work closely with the training, laboratory and the consulting unit in order to provide services related to quality (including environmental control), support in Enterprise Certification, and granting Product Certification Labels.

In addition, to coordinate and to lead the organization a Director General Unit has to be established, with the support of a secretariat and an administrative unit (if not outsourced).
A public relation unit would be necessary to foster the marketing area, the promotion of the Center and networking at local, national and international level.

As told before, this is a fully developed Center structure that will be achieved through a step approach evolution, in order to consolidate step by step the professional growth of management and technical personnel and the realization of the infrastructures.

5.5. Action plan

The action plan to progressively implement the strategy considers the relevant stakeholders, the key success factors, the period when each action will give the first effective results (short/long term and priorities) and how to protect the internal market in the next few years, waiting for the positive effects of the overall integrated strategy.

5.5.1. Phasing

The implementation of the action plan should be performed through two main phases.

First phase: short-term (1-2 years)

- Adopt low cost cycles (defensive action);
- Improve the quality and adopt international standards (defensive action);
- Start proactive export marketing;
- Develop specific products for the export.

The above actions are mainly in charge of the individual manufacturers, affecting their internal operations and investments decisions. Moreover, the defensive actions are likely to produce effective results in terms of better positioning the local industry against potential competitors from abroad and, therefore, these actions should be implemented as soon as possible in order to prevent the local manufacturers from losing shares within
the internal market. On the other hand, starting activities to increase the export both in marketing and in production fields is a necessary step to achieve better export performances in the second phase.

**Second phase: long-term (3 years and after)**

- Create a Center for the ceramic industry development and deliver institutional support to local manufacturers;
- Direct contact with international groups for foreign investments attraction;
- Improve the local raw materials production;
- Build an effective local sector for glazes and other material feeding the industry;
- Improve the availability of skilled people.

Although the long-term actions should be planned in the first phase of the strategy, their complete implementation will take more time than the short-term activities and the practical outcomes will be appreciated in the second phase.
5.5.2. Framework

The following table outlines the proposed action plan linking the sets of actions to objectives, relevant stakeholders, assumptions and pre-conditions that will affect the successful implementation within an estimated duration. Of course, some action can be repeated, as long as the advantages for the individual manufacturers and the overall sector persist (i.e. for what concerns the upgrade of production). When possible, the required financial resources have been estimated. Once established, a dedicated center for the development of the ceramic industry (the “Center”) will be the focal point for any action promoted or supported by public institutions.

<table>
<thead>
<tr>
<th>Strategic area</th>
<th>Upgrade production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>Adopt low cost cycles</td>
</tr>
<tr>
<td>Impact on sub-sectors</td>
<td>The action concerns the ceramic tiles sector</td>
</tr>
<tr>
<td>Relevant objectives and interactions</td>
<td>Improve the competitiveness by focusing on cost advantages</td>
</tr>
<tr>
<td>Key assumptions</td>
<td>New investments in production capacities should consider the lowest cost process compared to the final quality target</td>
</tr>
<tr>
<td></td>
<td>Reductions in production costs should result in lower final prices or in investments in other production phases (i.e. packaging) or in better quality for other products</td>
</tr>
<tr>
<td>Main actors</td>
<td>Manufacturers</td>
</tr>
<tr>
<td>Specific plans</td>
<td>Manufacturers include new investments in low cost processes into their development strategies</td>
</tr>
<tr>
<td>Financial investments</td>
<td>Costs for dry process lines (upgrading of an existing line):</td>
</tr>
<tr>
<td></td>
<td>- Pre-pressing installation: around 650.00 $</td>
</tr>
<tr>
<td></td>
<td>- Post-pressing installation: around 650.00 $</td>
</tr>
<tr>
<td>Financial sources</td>
<td>Manufacturers’ funds (expected savings in production costs can partially fund new investments)</td>
</tr>
<tr>
<td>Start</td>
<td>As soon as new production lines or upgrades of the existing ones are required</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Estimated duration</td>
<td>Within one year for each upgrade or new line. Manufacturers implement the action as long as the cost advantages persist</td>
</tr>
<tr>
<td>Indicators</td>
<td>Industrial cost in existing and new production lines</td>
</tr>
<tr>
<td>Action</td>
<td>Increase automation and improve quality</td>
</tr>
<tr>
<td>Impact on sub-sectors</td>
<td>The action concerns both sectors</td>
</tr>
<tr>
<td></td>
<td>Insufficient automation is mainly a problem for sanitary ware factories, whereas tiles production need to better respect total quality concepts (quality along all the production cycle, including packaging and post-sales services)</td>
</tr>
<tr>
<td>Relevant objectives and interactions</td>
<td>Improve the competitiveness and the perceived by focusing on quality in all production phases</td>
</tr>
<tr>
<td>Key assumptions</td>
<td>Manufacturers must care of all production phases and be aware of the effects resulting from improvements in sorting and packaging</td>
</tr>
<tr>
<td>Main actors</td>
<td>Manufacturers</td>
</tr>
<tr>
<td>Specific plans</td>
<td>Manufacturers include new investments in all the phases of production into their development strategies</td>
</tr>
<tr>
<td></td>
<td>The Center promotes training for middle management about quality requirements and manual operations</td>
</tr>
<tr>
<td>Financial investments</td>
<td>To be assessed by dedicated programs at both company and institutional level</td>
</tr>
<tr>
<td></td>
<td>The costs for manufacturers depend on the present companies’ organization and equipments</td>
</tr>
<tr>
<td>Financial sources</td>
<td>Manufacturers’ funds</td>
</tr>
<tr>
<td></td>
<td>Public/private funds to finance the training at the Center</td>
</tr>
<tr>
<td>Start</td>
<td>As soon as possible</td>
</tr>
<tr>
<td>Estimated duration</td>
<td>Within two years</td>
</tr>
<tr>
<td>Indicators</td>
<td>Percentage of loss in deliveries for local and foreign markets</td>
</tr>
<tr>
<td></td>
<td>Customer satisfaction among dealers, importers and final customers.</td>
</tr>
<tr>
<td>Action</td>
<td>Adopt international standards</td>
</tr>
<tr>
<td>Impact on sub-sectors</td>
<td>The action concerns both sectors</td>
</tr>
<tr>
<td>Relevant objectives and interactions</td>
<td>Improve the competitiveness and the perceived value by focusing on quality</td>
</tr>
<tr>
<td>Key assumptions</td>
<td>Manufacturers must be aware of the effects resulting from no adopting international standards. They should be committed in completing certification processes and invest in certification procedures</td>
</tr>
</tbody>
</table>
| Main actors          | Manufacturers  
The Center |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific plans</td>
<td>The Center provides guidelines from a specific study to investigate the current level of certification. The Center assesses the customer satisfaction by periodic market researches and, in collaboration with Egyptian Institutions for Standardization and Certification, monitor the progress of accreditation procedures among the companies monitor the progress.</td>
</tr>
<tr>
<td>Financial investments</td>
<td>To be assessed by dedicated programs at both company and institutional level The costs for manufacturers depend on the present companies’ adoption of standards</td>
</tr>
<tr>
<td>Financial sources</td>
<td>Manufacturers’ funds Public/private funds to provide guidelines and monitor the progress through the Center</td>
</tr>
<tr>
<td>Start</td>
<td>As soon as possible</td>
</tr>
<tr>
<td>Estimated duration</td>
<td>Within two years</td>
</tr>
<tr>
<td>Indicators</td>
<td>Percentage of companies complying with the international standards</td>
</tr>
<tr>
<td>Strategic area</td>
<td>Access European markets</td>
</tr>
<tr>
<td>Action</td>
<td>Product development</td>
</tr>
</tbody>
</table>
| Impact on sub-sectors | The action concern both sectors  
DIY channel is an opportunity for the tiles companies  
The sanitary ware producers must focus on partnership with global corporations |
| Relevant objectives and interactions | Increase the export to Europe, by improving the attractiveness of Egyptian production with better quality and compliance with the latest trends in the most developed markets |
| Key assumptions     | Manufacturers should always be aware of the most required product typologies in the European market  
Manufacturers should be committed in developing productions suitable to the richest markets  
Reductions in production costs should be invested in product developments  
Collaboration among more manufacturers reduces the risk of new products developments and takes advantage of complementary productions |
| Main actors         | Manufacturers  
The Center |
### Specific plans
- Manufacturers modernize their product range, focus on “total concept” and “export collections”, and integrate products from different producers.
- The Center supports collaborations among companies by funding joint collections and favoring inter-company procurement.

### Financial investments
- Costs for new product development (according to the international experience):
  - Glazed products: around 40,000 $ per collection
  - Unglazed products: around 350,000 $ per collection

### Financial sources
- Manufacturers’ funds
- Public/private funds to support joint collections and favoring inter-company procurement

### Start
- After the consolidation of the product quality and possible cost reductions

### Estimated duration
- Within one year

### Indicators
- Sales in the European markets
- Customer satisfaction among dealers, importers and final customers in foreign markets

### Action
- Improve international marketing and sales

### Impact on sub-sectors
- The action concerns the ceramic tiles sector
- For sanitary ware manufacturers, the main way to access the richest markets is by international partnerships

### Relevant objectives and interactions
- Improve the access to foreign markets by developing contacts with international operators

### Key assumptions
- Manufacturers should be committed in directly approaching international buyers and dealers
- Manufacturers should dedicate own human resources to international marketing
- Local producers should be helped by the Government to invest in operations aimed to foreign marketing

### Main actors
- Manufacturers
- The Center

### Specific plans
- Manufacturers allocate people and funds to internal marketing and sales departments
- The Center promotes a market research to identify potential buyers and DIY organization
- The Center promotes training courses to develop human resources in export issues and international marketing
## Financial investments
To be assessed by dedicated programs at both company and institutional level
The costs for manufacturers depend on the present companies’ internal organization (i.e. availability of departments dedicated to international activities with skilled and motivated human resources)

## Financial sources
- Manufacturers’ funds
- Public/private funds to provide market researches and training through the Center

## Start
After the consolidation of the product quality and possible cost reductions

## Estimated duration
Depending on the present organization and know how of each company

## Indicators
- Available information about potential channels for export
- Number of employees specifically working on export promotion inside the companies
- Presence of Egyptian products in DIY and retail point of sales abroad
- Number of companies supplying the European market

## Strategic area
Improve the sector environment

## Action
Create a center for the ceramic industry development (the “Center”)

## Impact on sub-sectors
The action concerns both sectors

## Relevant objectives and interactions
Improve the competitiveness of the entire sector by providing services for development

## Key assumptions
The Government creates consensus about the creation of a focal point to provide guidelines, address public funds, evaluate sub-projects, deliver services such as training, information, consulting, support for international marketing (i.e. participation to fairs)

## Main actors
Government

## Specific plans
The Center should be planned and implemented with the help of international consultants in marketing, training and production, possibly in collaboration with corresponding European structures

## Financial investments
Start-up costs for a Center delivering Training, Information services, National and International Promotion and Laboratory tests: around 2,500,000 $ The above estimation is based on a feasibility study for the establishment of a “Service and Technology Specialized Center in the Egyptian Stone Sector” (IPI proposal to the Egyptian Ministry for Industry and Technology, March 2001)

## Financial sources
Public funds

## Start
Within two years

## Estimated duration
Around two years
## IPI – Italian Institute for Industrial Promotion

### A Strategic Study on the Egyptian Ceramic Tiles and Sanitary Ware Industry

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Customer satisfaction among the companies using the services provided by the Center</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action</strong></td>
<td>Attract foreign investments</td>
</tr>
<tr>
<td><strong>Impact on sub-sectors</strong></td>
<td>The action mainly concerns the sanitary ware sector</td>
</tr>
<tr>
<td><strong>Relevant objectives and interactions</strong></td>
<td>Improve the companies competitiveness by making them establish collaboration with international groups</td>
</tr>
<tr>
<td><strong>Key assumptions</strong></td>
<td>The Government (GAFI) creates consensus at an institutional level about the formulation of a FDI strategy specific for the sector</td>
</tr>
<tr>
<td><strong>Main actors</strong></td>
<td>Government (GAFI)</td>
</tr>
<tr>
<td></td>
<td>The Center provides consulting and technical support</td>
</tr>
<tr>
<td><strong>Specific plans</strong></td>
<td>GAFI define an FDI attraction schema for the sector, select the potential international group and contact them</td>
</tr>
<tr>
<td><strong>Financial investments</strong></td>
<td>To be assessed through a specific sub-program</td>
</tr>
<tr>
<td><strong>Financial sources</strong></td>
<td>Public funds</td>
</tr>
<tr>
<td><strong>Start</strong></td>
<td>Within two years</td>
</tr>
<tr>
<td><strong>Estimated duration</strong></td>
<td>Around two years</td>
</tr>
<tr>
<td><strong>Indicators</strong></td>
<td>Number and quality of contacted companies, number of FDI projects in the sector, amount of FDI in the sector</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Raw materials management</td>
</tr>
<tr>
<td><strong>Impact on sub-sectors</strong></td>
<td>The action concern the ceramic tiles sector that can make better use of local raw materials</td>
</tr>
<tr>
<td><strong>Relevant objectives and interactions</strong></td>
<td>Improve competitiveness by reducing production costs and enhancing the quality of local raw materials</td>
</tr>
<tr>
<td><strong>Key assumptions</strong></td>
<td>A consensus should be created about the need for joint actions among the manufacturers and the other actors in the supply chain and the involvement of Authorities for transportation, ports, railway system should be guaranteed</td>
</tr>
<tr>
<td><strong>Main actors</strong></td>
<td>Manufacturers</td>
</tr>
<tr>
<td></td>
<td>The Center</td>
</tr>
<tr>
<td><strong>Specific plans</strong></td>
<td>The Center promotes a panel of experts, manufacturers and suppliers to:</td>
</tr>
<tr>
<td></td>
<td>• Define a raw material quality level that the local suppliers should guarantee</td>
</tr>
<tr>
<td></td>
<td>• Identify the main issues in order to improve the raw materials transport system, in collaboration with relevant Authorities</td>
</tr>
<tr>
<td></td>
<td>• A detailed development plan is designed in order to favor investments in the extraction, processing and quality control among the raw materials suppliers</td>
</tr>
<tr>
<td><strong>Financial investments</strong></td>
<td>To be assessed by a specific sub-program</td>
</tr>
</tbody>
</table>
### Financial sources
Government

### Start
Within two years

### Estimated duration
Two years or more to improve the raw materials quality along the procurement chain

### Indicators
- Raw material quality
- Price of local raw materials compared to similar imported inputs
- Customer satisfaction among the manufacturers as regards raw material supplies

### Action
Local production of glazes and other inputs

### Impact on sub-sectors
The action concerns both sectors

### Relevant objectives and interactions
Improve competitiveness by reducing production costs and enhancing the quality of local non natural materials, including complementary services such as assistance to final product manufacturers for the product development

### Key assumptions
- Local supplier of non natural inputs must be aware of the overall quality provided by international producers
- Local suppliers must be helped in enhancing the quality, especially concerning the complementary services

### Main actors
Local suppliers of non natural inputs
The Center

### Specific plans
- A detailed needs assessment is promoted by CIDA in order to define the gap between local and imported production in terms of quality and complementary services
- Fiscal incentives are provided to both manufacturers and suppliers when long term procurement from local suppliers include a quality enhancement

### Financial investments
To be assessed by a specific sub-program

### Financial sources
- Suppliers’ and manufacturers’ funds
- Public funds

### Start
Within two years

### Estimated duration
Two years or more to start-up new companies or foster the existing suppliers

### Indicators
- Local non natural materials quality
- Price of local non natural materials raw materials compared to similar imported inputs
- Customer satisfaction among the manufacturers as regards non natural materials supplies, including complementary services
### IPI – Italian Institute for Industrial Promotion

#### A Strategic Study on the Egyptian Ceramic Tiles and Sanitary Ware Industry

<table>
<thead>
<tr>
<th><strong>Action</strong></th>
<th><strong>Labor force development</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact on sub-sectors</strong></td>
<td>The action concerns both sectors</td>
</tr>
<tr>
<td><strong>Relevant objectives and interactions</strong></td>
<td>Improve the competitiveness by increasing the human resources quality</td>
</tr>
<tr>
<td><strong>Key assumptions</strong></td>
<td>The sector must exactly know the human resources needs in terms of number of people, types of skills, experience</td>
</tr>
<tr>
<td></td>
<td>Vocational training programs in ceramics should be attracting for the students</td>
</tr>
<tr>
<td></td>
<td>Training should be organized near the productive site and maintain strong links with companies</td>
</tr>
<tr>
<td><strong>Main actors</strong></td>
<td>The Center</td>
</tr>
<tr>
<td><strong>Specific plans</strong></td>
<td>The Center carries on periodical company surveys among stakeholders to assess:</td>
</tr>
<tr>
<td></td>
<td>▪ Most required skills;</td>
</tr>
<tr>
<td></td>
<td>▪ Number of people to be trained yearly and forecast for future considering the industrial locations to feed with trained people</td>
</tr>
<tr>
<td><strong>Financial investments</strong></td>
<td>To be assessed by a specific sub-program</td>
</tr>
<tr>
<td><strong>Financial sources</strong></td>
<td>Public funds</td>
</tr>
<tr>
<td><strong>Start</strong></td>
<td>Within two years</td>
</tr>
<tr>
<td><strong>Estimated duration</strong></td>
<td>Two years or more to start-up technical schools</td>
</tr>
<tr>
<td><strong>Indicators</strong></td>
<td>Number of trained people</td>
</tr>
<tr>
<td></td>
<td>Cost of labor for specific technical skills</td>
</tr>
</tbody>
</table>
6. COMMENTS FROM STAKEHOLDERS ABOUT THE STUDY

This report includes all the comments made during the meetings with the Project Steering Committee for the presentation of intermediate results. The main findings of the study were presented during a seminar at IMC at the end of June 2005. The participants to the seminar generally appreciated the study and their main feedbacks can be summarized as follows:

- The main problem the manufacturers are facing at the moment concerns human resources. The lack of an institution in charge of vocational training for the ceramic tiles and sanitary ware sector seriously affects the perspectives for a future development and risks to compromise the effort made by the manufacturers to upgrade the industry in terms of production capacity and quality improvement. The available schools for ceramics only focus on the artistic dimension of the industry, do not have contacts with the industrial production and are not ready to satisfy the needs of operating companies. On the other hand, establishing public schools to deliver technical training may not be the most effective way to solve the problem: public institutions risk to replicate the inadequacy of the present structures and a solution could rather be found by the manufacturers themselves, by creating their own schools and directly managing training programs and facilities. In such a way, young people could receive training suitable to allow them to be easily employed by the local companies.

- Manufacturers are aware about the productivity issue concerning the industry but, when comparing different national sectors, it should be taken into account that the Egyptian industry is lacking in an effective cluster organization and the manufacturers cannot take advantages of the efficiency that an industrial district
can usually guarantee, by providing a framework of specialized services and competencies.

- In order to access the most developed market, the manufacturers should be better assisted by the Authorities, because the global completion is strong and other countries are implementing effective policies to support their exports and promote the national production.
ANNEX I

The Team
IPI has managed the overall study according to an assignment commissioned by the IMC.

The Team which collaborated into the study preparation is briefly introduced below. Besides the experts who worked in Italy as well in Egypt to carry out the company survey and present intermediate and final results to the IMC and stakeholders (profiles 1 to 6), other IPI resources gave a precious support to the project management and activities.

1) Mr. Alberto Bonilauri

Team Leader, International Expert

His career started in the marketing area at Marazzi group, during the 1980s, first working on the North Italian region and then planning the marketing corporate strategy. At the beginning of the 1990s, he is responsible for the marketing and the network selling management at Gruppo ceramiche Cisa-Cerdisa. For Riwal group he works in Italy, France (France Alfa Cerabati, Gres d’Artois), Nederland (Mosa) and USA (Imac), then he is at the commercial direction of Floor Gres, while the direction of Eiffelgres is his last position before starting an independent top consulting activity, based in Sassuolo, the worldwide famous cluster of the Italian ceramics. Mr. Bonilauri has a strong educational background in Marketing and Strategic Management and an extensive international experience in market analysis, performance evaluation and business strategic positioning.
2) Mr. Cristiano Canotti

*International Expert*

He started his international career in the ceramics sector working in Sacmi, world leading company for machinery and plants supply in ceramic field. He has been involved in different technical and market divisions, mainly operating with the most important customers as Key Account Manager in top countries such as Italy, Spain, Portugal, Germany, France, Turkey, Lebanon, UAE, United States, South America, Eastern Europe and former Soviet Union. Other companies charged him with managing investments in controlled companies in Italy and in other countries. Projects of industrial development and cooperation in the sector have been carried out by Mr. Canotti in Spain, Germany, Brazil and Poland. He has been working together with Mr. Bonilauri in the same consulting firm focused on ceramics sector and based in Sassuolo. Because of his customer relationships with producers of tiles, especially porcelain tiles, plants and machinery producers, raw materials, glazes and frits producers, glass, marble and granite, Mr. Canotti is constantly in contact with enterprises located in Europe, North and South America, Italy, Mediterranean and Middle East region.

3) Mr. Marco Iezzi

*International Expert*

He is a senior economist expert in competitiveness issues, industrial development and international economy. As Head of Department of Industrial Competitiveness at IPI, Dr. Iezzi is working on national programs for the Italian Ministry of Industry as well as for international projects of technical assistance aimed at developing cluster structures and policies in less developed countries (Iran, Syria). Ph.D. in Business Management, he is Professor of International Economics at University of Malta.
4) Mr. Wael Galal Eldin  

Local Senior Expert  

He is currently Project Sales Department Manager at Gemma (Ezz Industries), with responsibility for increasing the company profit margin and market share, determining the sales plans, collaborating in the yearly models repertoire preparation, developing the company image in media. As Technical Senior Sales Engineer he worked in Saudi Arabia, managing market surveys required to forecast demand, forward targets, and setting appropriate pricing policies.

5) Mr. Youssef Assad  

Local Junior Expert  

After an experience in Sales and Marketing at Procter & Gamble Egypt, he joined the ceramics sector at Gemma where he is Demand/Product Manager with responsibilities over markets and trends analysis, forecasting, supply chain management, inventory management. He has been involved in pilot projects of electronic order management and other experiences of Business Intelligence in different functional areas.

6) Mr. Paolo Pispola  

Project Manager  

He has been working in IPI since 2004 as project manager in the “Department for Centers and Networks in Partner Countries” (direction for “Transfer of Knowledge and Innovation”). He is qualified in full-cycle management for organizational change and process re-engineering within ICT, automotive and oil industries (upstream and downstream sectors), small and medium enterprises policies to foster international competitiveness by institution building, know-how transfer, network development (supply
chain integration and optimization). Previously, he had been working as Project Manager at Accenture (formerly known as Andersen Consulting) in several projects of change management, ERP implementation and integration of different business computers applications in international teams operating in Europe and in Middle East.

7) Dr. Silvia Grandi

**IPI Project Coordinator**

Senior expert in innovation and economic development, she studied at the University of Bologna (Italy), University of Newcastle (UK), SPRU (UK) and VUB (Brussels), and her PhD was focused on innovation policy instruments.

Currently she is head of department in the Direction for Transfer of Knowledge and Innovation, at IPI. She manages international projects and initiatives promoting development, technology and innovation within SMEs.

Previously, she worked as manager at Procter & Gamble in Brussels, and as innovation and technology manager a Science and Technology Park in Italy. She has a background in Engineering, Management and Economics.

7) Mr. Armando Anastasio

**IPI Project Officer**

After a master in International and Local Development, he joined IPI in 2001, as a junior economist expert in industrial development and sectoral analysis (Department of Industrial Competitiveness). He is mainly involved in projects concerning technical assistance and economic evaluation in the field of industrial clusters, particularly for the textile and ceramic sectors, both in Italy and other countries.
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