



USAID
FROM THE AMERICAN PEOPLE

USAID FIRMS PROJECT

Pre-feasibility Study Report

Marble/Granite Quarrying/Processing Plant

October 2014

This publication was produced for review by the USAID. It was prepared by KPMG Taseer Hadi & Co. under an assignment commissioned by Chemonics International under the USAID Firms Project.



USAID
FROM THE AMERICAN PEOPLE

USAID FIRMS PROJECT
Pre-feasibility Study Report
Animal Fattening Project

DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development, the United States Government or Chemonics International Inc

Data Page

Contract Number:	GBTI II Task Order No. EEM-4-07-07-00008-00
Contractor Name:	Chemonics International, Inc.
Name of the Component:	<Business Enabling Environment (BEE) or Value Chain Development (VCD)>
USAID Technical Office:	Office of the Economic Growth and Agriculture; USAID Pakistan
Date of Report:	October, 2014
Document Title:	Pre-feasibility report on Marble Quarrying and Processing Facility DRAFT
Author's Name:	KPMG Taseer Hadi & Co. Chartered Accountants
Study Design and Methodology:	KPMG Taseer Hadi & Co. Chartered Accountants
Photo Credits:	N/A
Editing:	N/A
SOW Title and Work Plan & Action ID:	USAID Pakistan FIRMS Project Technical support to conduct pre feasibility studies of various projects that fall under high economic growth sectors, Value Chain Development Component Work Plan Level: 22190, Action ID number: 7351, SOW no. 2305
Project Area:	Khyber Pakhtunkhwa, Pakistan
Key Words:	Pre-feasibility report, financial pre-feasibility, marble, granite, quarrying, processing

Abstract:

The USAID Pakistan Firms project aims to assist the Khyber Pakhtunkhwa Board of Investment and Trade (KPBOIT) in promoting investment and trade in the province. In an effort to achieve this aim preliminary feasibility studies have been conducted in order to highlight the investment opportunities available for international and domestic investors. The focus of these preliminary feasibility studies has been kept on the high economic growth sectors in KPK.

This report is a part of series of pre-feasibility studies conducted for identified projects. The information used for the preparation of this report has been gathered from various reliable sources including economic and statistical surveys carried out by the government of Pakistan. Competitor's data and industry averages have been used as a basis for the preparation of preliminary financial projections.

This report provides a financial and economic analysis of the opportunities available in the sector and identifies the potential technical strengths and constraints that may be encountered by the investor(s) in undertaking the identified project. It aims to help the reader develop an understanding of the operational aspects of the sector and its growth potential in the country particularly in the Khyber Pakhtunkhwa province. An outline for a business plan has been prepared for the identified project which identifies the operational requirements (equipment, human resource, infrastructure etc.). The analysis is supported by preliminary financial projections for the first ten years of the business.

Acronyms

GDP	Gross Domestic Product
HR	Human Resource
IT	Information Technology
IRR	Internal Rate of return
KIBOR	Karachi Inter Bank Offer Rate
KPK	Khyber Pakhtunkhwa
KPBOIT	Khyber Pakhtunkhwa Board of Investment and Trade
NGO	Non-Governmental Organization
NPV	Net present Value
PKR	Pakistani Rupee
ROI	Return on Investment
US or USA	United States of America
USAID	United States Agency for International Development
USD	United States Dollar

Contents

EXECUTIVE SUMMARY	1
RESULTS OF FINANCIAL PRE-FEASIBILITY	1
1 PROJECT BACKGROUND AND RATIONALE	3
1.1 INTRODUCTION	3
1.2 INTRODUCTION TO KPBOIT.....	3
1.3 OVERVIEW OF MINING AND QUARRYING SECTOR IN PAKISTAN	4
1.3.1 <i>Historical Overview</i>	4
1.3.2 <i>Marble and granite resources in KPK</i>	7
1.3.3 <i>Opportunity Rationale</i>	9
1.3.4 <i>Marble Production process</i>	10
1.3.5 <i>Granite Production process</i>	13
1.4 MARKET ANALYSIS.....	14
1.5 KPBOIT ASSISTANCE	15
2 FINANCIAL PRE-FEASIBILITY.....	16
2.1 PROJECT DESIGN ASSUMPTIONS	16
2.2 FINANCIAL PRE-FEASIBILITY OF QUARRYING PLANT.....	18
2.2.1 <i>Project Set-up Costs</i>	18
2.2.2 <i>Operating revenues</i>	19
2.2.3 <i>Operating costs</i>	20
2.2.4 <i>Project returns</i>	21
2.3 FINANCIAL PRE-FEASIBILITY OF PROCESSING PLANT	22
2.3.1 <i>Project Set-up Costs</i>	22
2.3.2 <i>Operating revenues</i>	22
2.3.3 <i>Operating costs</i>	23
2.3.4 <i>Project returns</i>	24
2.4 FINANCIAL PRE-FEASIBILITY OF COMBINED PROCESSING AND QUARRYING FACILITY ..	25
2.4.1 <i>Project Set-up Costs</i>	25
2.4.2 <i>Operating revenues</i>	26
2.4.3 <i>Operating costs</i>	27
2.4.4 <i>Project returns</i>	28
APPENDICES.....	30
BALANCE SHEET QUARRYING PROJECT	31
INCOME STATEMENT QUARRYING PROJECT.....	32
CASH FLOW STATEMENT QUARRYING PROJECT	33
BALANCE SHEET PROCESSING UNIT	34
INCOME STATEMENT PROCESSING FACILITY	35
CASH FLOW STATEMENT PROCESSING FACILITY	36
BALANCE SHEET COMBINED PROJECT	37
INCOME STATEMENT COMBINED FACILITY	38
CASH FLOW STATEMENT COMBINED FACILITY.....	40

Executive summary

Chemonics International is implementing the USAID Pakistan Firms Project that works to develop a dynamic internationally competitive business sector to accelerate sales, increase exports, investment, job growth and produce higher value added products and services. Within the business enabling component, the project has initiated an assistance program for the Khyber Pakhtunkhwa Board of Investment and Trade (KPBOIT) to help it meet its mandate promoting investment and trade in the province. The KPBOIT was created with a mandate to advocate specific investment friendly reforms and advise the KP government regarding the provision of adequate infrastructure facilities for making the KP Province business environment more conducive to international investment.

The Khyber Pakhtunkhwa Board of Investment and Trade (KPBOIT) is considering development of a marble, granite Quarrying and Processing Plant in KP, based on the deposits in Malakand, Chitral, Dir and Mansehra.

The project will be offered to the investor(s) selected through competitive bidding process. Identification of land and obtaining requisite approvals from the provincial government for construction of the proposed facility in the area of Malakand, Chitral, Dir, and Mansehra will be the responsibility of KPBOIT. The investors will be provided land on lease basis, whereas, construction and operations of the Plant will be managed by the investors. The construction of Plant would be subject to pre-conditions with respect to design approval, minimum standards to be followed etc which will be detailed in the project RFPs to be launched at a later stage.

This pre-feasibility has been based on a series of assumptions with respect to design, size, costs, revenues, returns etc. However, these are indicative only and the investors might require to carry out their own feasibility studies.

Results of financial pre-feasibility

The results of this financial pre-feasibility indicate that development of a Marble Quarrying and Processing unit based on reserves in Malakand, Dir and Chitral regions of KP will be a profitable investment.

The feasibility involves three different scenarios i.e. quarrying plant, processing plant and combined plant with quarrying and processing facilities.

The results of this financial pre-feasibility indicate that the project is capable of generating following results:

Quarrying Plant

- **Equity IRR of 20.9%**

Processing Plant

- **Equity IRR 23.7%**

Quarrying and Processing (Combined)

- **Equity IRR 27.4%**

Following are the key assumptions/considerations for the investors which were used in this pre-feasibility and which form basis of projected returns from the project:

- **Total project outlay, for combined plant having quarrying and processing facility, is estimated at PKR 302.5 million.** The project will be financed through equity and debt contributions in the ratio of 40% and 60% respectively. **Total equity contribution is estimated at around PKR 121 million.**
- The cost of equity has been assumed at 15%,
- Based on current economic conditions and future outlook, annual selling price and costs escalations have been estimated as 5% and 10% respectively.
- Capacity utilization has been assumed at 50% for the 1st year, 60% for the 2nd and 100% from year 3 and onwards.
- Cost estimates are based on cost structures in comparable quarrying and processing units in the country.

1 Project background and rationale

1.1 Introduction

Marble and Granite is an emerging and promising sector of Pakistan which has huge potential of investment, export and livelihood. However it needs to transform into dimension stone industry through adopting mechanized quarrying techniques and values. Pakistan is home to some of the finest and purest grades of marble, granite and slate found in the world. Much of the grade A Marble that is exported to European countries have their origins in Pakistan. The Government has taken steps to invest in this crucial sector with the recent establishment of a Marble City in Baluchistan. Khyber Pakhtunkhwa Province accounts for at least 78% of the marble production in Pakistan. The marble and granite sector has considerable potential for growth as huge reserves of highly valued white marble in Ziarat, Mohmand Agency, Gray in Bajaur and other attractive colors in Mohmand, Khyber, Bajaur, Orakzai, Kurrum and Waziristan have been identified. In FATA, the marble quarrying/mining industry has provided jobs to an estimated 2000 persons.

The Khyber Pakhtunkhwa Board of Investment and Trade (KPBOIT) has conceived the idea to develop marble/granite Processing plant in KPK. Land for the project is being identified and will be offered for investment to facilitate investors willing to avail this opportunity.

This study has been prepared to determine the financial feasibility of building and operating a plant comprising of multiple facilities.

1.2 Introduction to KPBOIT

Khyber Pakhtunkhwa Board of Investment and Trade (KPBOIT) is established for the promotion of trade and investment activities in Khyber Pakhtunkhwa (KPK). Government of Khyber Pakhtunkhwa is committed to bring economic prosperity in the Province through industrial and trade development and delegated this role to KP-BOIT.

KP-BOIT has accepted this challenging task towards achievement of its mission under the leadership of a dynamic Board Members comprising of eminent people of public and private sectors.

High motivation and commitment is there to achieve the vision to flourish the investment and trade in Khyber Pakhtunkhwa making it most favorite investment destination for investors.

Our land is blessed with abundance of natural resources of Oil & Gas, Hydel Power Generation, Tourist Destinations, Mines and Minerals along with Agriculture. The Province is located at an outstanding geographical location.

KPBOIT is striving for exploiting the tremendous potential of the Province into reality and is focused on meeting its important objective of facilitating local and foreign investors desirous of benefiting from this huge potential of the KPK. Our aim is creating an attractive business environment through proactive policy advocacy both at the Provincial and Federal level. Another important role of awareness among investors is to the tremendous opportunities available for investment in KPK and therefore facilitating them for undertaking such investment as a joint venture partners.

We also act as a focal point of contact for both foreign and domestic investors providing information and assistance in coordination with other Government Departments and Agencies.

KPBOIT's objectives are:

- To flourish and revive the investment climate of Khyber Pakhtunkhwa and to make it a lucrative investment friendly destination.
- To provide one window operation facility to investors by proactively engaging with all stakeholders to ensure successful investments.
- To act as a bridge between investors and all related government and semi Government Departments/Organizations.
- Advise the Provincial Government to create environment for investment through advocacy of specific investment friendly and comprehensive Public Private Partnership policies.

1.3 Overview of Mining and Quarrying sector in Pakistan

1.3.1 Historical Overview

Pakistan, the sixth, largest country in the world in terms of the resident population and a land of rich natural resources, is a growing country showing great potential and promise in its dimension stone sector, especially in marble, granite and onyx.

Pakistan is well known for its finest and purest grades of marble, granite and slate found in the world. Pakistan has superiority over its neighbors India and China. The global trade in marble and granite is estimated at \$45 billion a year. Standard wastage in the world is 45 percent for the marble sector. Pakistan has a 1 percent share in the world market. According to TDAP, Pakistan had a 0.01% share in total world exports of marble and granite in 2009-10.

Pakistan substantially exports marble slabs and tiles to Saudi Arabia. Semi-finished marble and onyx products find their direction to Russia, the Middle East, the United States and Malaysia.

China is the largest importer of Pakistani marble and granite in raw form. The blocks of marbles imported by China are processed, value-added and exported to different countries in the world at higher prices. Due to very scarce facility for value addition in the country, Pakistan is losing substantial foreign exchange through raw marble.

Pakistani marble exporters reduced their exports to the US and Europe by almost 60 percent after the financial crisis hit the two markets in 2008. Investors from Italy and European countries as well as the United Kingdom, Saudi Arabia, Korea and China have shown enthusiastic interest in local marble and in establishing joint ventures with Pakistani marble exporters but have been demoralized by rising terrorism and deteriorating law and order situation..

In Pakistan, blasting destroys 85 percent marble in mining. However, in 2006 the Pakistan Stone Development Company was set up which imported state-of-the-art machinery for the extraction of square blocks of stones to reduce the losses to 45 per cent from the colossal 85 percent.

Pakistan has major deposits of high quality marble and granite in a wide range of colors, shades and patterns. Marble is used for both construction purposes and Handicrafts manufacturing.

Pakistan has 64 types of marbles, which is more than its competitors India and China. Around 80 types of marble are available in Baluchistan. The stones being produced in India. Baluchistan are of fine quality and comparable to the standard of stones found in Italy. Sindh also has good colors of granite widely spread in the area of Tharparkar. Sindh granite can compete in the international markets with India, as the colors found in Sindh are better than

Availability of high quality Marble reserves in Pakistan in great quantities and the demand of its products in the export markets i.e. European Union countries, Central Asian countries etc. make this sector highly attractive. Foreign tourists are the main customers of the products made of marble and onyx.

Mining and quarrying subsector contributes 14.45% share of the industrial sector and 3.0 percent to the GDP of the country. As per the data published by Pakistan Bureau of statistics 2013-2014, the Mining and quarrying sector is estimated to grow at 4.4 percent in 2013-14 against the 3.8 percent growth achieved last year.

The global trade in marble and granite was estimated at \$45 billion a year. But marble exports from Pakistan are hovering around average \$33 million in recent years. According to the industry

experts, export potential in this sector is up to \$300 million and even more if sustained efforts are made in future.

The following tables depict the import and export statistics for marble.

World Major Importers of Marble					
Importers	Imported value in 2009	Imported value in 2010	Imported value in 2011	Imported value in 2012	Imported value in 2013
	US Dollar				
World	1,697,275	2,402,180	2,547,179	2,595,581	2,944,871
China	860,620	1,488,425	1,632,277	1,659,821	1,846,606
India	104,402	147,438	144,975	204,568	225,836
Taipei, Chinese	55,861	86,450	100,095	106,863	113,965
Italy	101,339	113,459	103,254	103,595	112,330
Saudi Arabia	-	1,911	8,970	8,116	70,439

World Major Exporters of Marble					
Importers	Exported value in 2009	Exported value in 2010	Exported value in 2011	Exported value in 2012	Exported value in 2013
	US Dollar				
World	1,913,353	2,154,064	2,342,254	2,502,913	2,899,967
Turkey	471,158	726,516	770,259	928,250	1,120,685
Italy	287,094	342,845	401,921	395,852	440,123
Spain	224,806	267,858	311,948	312,360	333,967
Greece	51,907	85,408	129,264	142,459	163,342
Egypt	433,635	174,340	152,442	153,380	157,501
Iran	-	147,371	111,496	131,389	122,120
Portugal	61,130	81,240	89,215	89,059	87,411
Pakistan	16,479	26,419	40,328	45,019	63,112

Importing Markets of Marble exported by Pakistan					
Importers	Exported value in 2009	Exported value in 2010	Exported value in 2011	Exported value in 2012	Exported value in 2013
	US Dollar				
World	16,479	26,419	40,328	45,019	63,112
China	10,299	20,151	34,198	39,755	58,432
Saudi Arabia	697	726	896	1,023	909
Italy	436	625	699	326	828
Lebanon	147	148	77	245	444
Vietnam	86	210	243	293	322

1.3.2 Marble and granite resources in KPK

Almost 70% of Khyber Pakhtunkhwa and FATA's area of about 74,521 km², is occupied by mountainous terrains. The northern part of the province has potential for marble/granite, nepheline, syenite, phosphates, and gemstones. Metallic minerals including gold and base metals and variety of other industrial minerals are also found in the province.

Currently, marble industry in the province has been facing multiple challenges. The security situation around marble and granite mines in Khyber Pakhtunkhwa and FATA region is the most crucial issue. Deteriorating law and order situation not only deters the investment in this sector but also halts supply of raw marble and granite from mines to processing units. Most of the marble and granite resources are located in FATA and Swat region where access to marble mines, in addition to old styled mining operations and practices are the challenges impeding development of this sector in the province.

There are around 1700 marble factories in Khyber Pakhtunkhwa and FATA as compared to six marble factories in 1990. These marble and granite units provide 0.1 million direct and another 0.6 million indirect jobs to people. The sector generates an estimated millions of revenue annually for the government.

Since, 2000 domestic demand of marble has increased by many folds. Furthermore, post 2001 situation and development programs in Afghanistan have resulted in enormous demand pressure on the industry. Around 30 – 40 percent of the marble produced is exported to Afghanistan while the rest is consumed domestically. Around 30 kinds of marble and granite has been found in the province and the adjoining tribal belt. The most famous of these are Ziarat marble, super-white, off-white, Badal, Zebra, pink, Nowshera, Jet-black, Bampokha and golden marble.

Government of KP, in collaboration with Pakistan Stone Development Company (PASDEC), is taking steps for the development of Marble Cities in the FATA (Mohamand agency) and Chitral. PASDEC in this regard initiated these projects. Land for Marble City in FATA has been acquired and significant development has been made on the projects.

Hike in demand both in the local as well as foreign markets has created a need for fully-equipped Marble Processing Plants in the Province.

Estimated resource of marble in the province is about 3.0 billion tonne. Major occurrences identified in the in the province are:

Type	Amount (Million Tons)
Chitral Marble	1,000
Shangla Par (Sw at) marble	200
Buner Marble	1,400
Sw abi Marble block	200
Malakand Marble	200
Now shera Pink Marble	100

Further Kohistan, Hazara, Nowshera and Kohat divisions are high potential areas for quality marble in the province. Mohmand, Khyber, Bajaur, Orakzai and Kurram Agencies in Federally Administered Tribal Areas (FATA) have huge marble reservoirs. The need is to develop these natural endowments through private investment and generate economic activity.

The Province also has vast potential of a variety of granite resources of different shades and texture. These include:

Dark colored granites, mostly with green shades, having potential of more than 1000 million tonne.

Light colored granites in the northern part of KPK having significant outcrops along the major roads of for exploration and development of quarries .The estimated resources are to the tune of 100 million tonnes.

Granite varies from black, pink, grey, green, gold, yellow and red colour in, Gilgit, Dir Chital, Swabi, Kohistan, Nagarparker, Chagai, Mansehra, Malakand & Swat.

Nagarparkar (Sindh) and Mansehra (KhyberPukhtoonkhwa) are only known sources of workable Granite in the country. Geology evidence shows Gilgit Region holds great promise of the superior quality deposits.

Lack of quality production and the primitive mining techniques existing in Pakistan obstruct the extraction of standard blocks of marble. The extraction in Pakistan mainly comprise boring of holes in the bedrock, filled with explosives to blast the block, resulting in high wastage substantially reducing the price. Standard wastage in the world is taken at 50% of the gross produce; however, in Pakistan this reaches upto 73%. There are thus bright prospects of setting up joint ventures in the Marble Sector of Pakistan.

1.3.3 Opportunity Rationale

The Province of Khyber Pakhtunkhwa is blessed with lot of natural resources including precious metals, Gemstones, Iron, Ore etc. The Minerals Development Department Khyber Pakhtunkhwa is a major stakeholder of development of mineral resources in the province. According to Pakistan Economic Survey 2013-2014, the major achievements of minerals development department during year 2013-14 were:

- The Geo-chemical exploration survey/study completed in Peshawar, Nowshera, Mardan & Hangu Districts for exploring deposits of precious metals whereas geo-chemical survey/study in Dera Ismail Khan is under process.
- Construction of three (3) regional offices of Directorate General Mines & Minerals one each in Abbottabad, Mingora and Karak as part of strengthening of field formations.
- Construction of 30 km road in mineral bearing areas of Kohistan, Shangla and Abbottabad to facilitate mining operations.
- R&D studies for up-gradation/processing of metallic minerals including low grade iron ore.
- Working group established for reform initiatives in mineral sector of Khyber Pakhtunkhwa. The group has started the work and preliminary framework has been prepared for next four (4) years.
- Work on delineation of exploration blocks for metallic minerals including gold and gemstones has also been initiated to grant the same as exploration licenses through process of competitive bidding to sound parties (local /foreign investors) as part of facilitating large scale investment in mineral sector of Khyber Pakhtunkhwa.
- Revenue generated through collection of royalty on minerals Rs. 600 millions up to April 2014.
- Receipt amounting Rs. 52.034 millions during first three quarters of this fiscal year collected through imposition excise duty on 61 specified minerals by federal government, moreover Finance Department Khyber Pakhtunkhwa has set a target of Rs 80 millions.

- Grant in aid amounting to Rs. 59.2 millions for providing transport facility as well as ambulances for mine labours.

Marble is included in the list of largest minerals extracted among chromite, coal, rock salt, lime stone, china clay, dolomite, fire clay, gypsum, silica sand etc. Since 1990 mining & quarrying has consistently contributed 0.5 percent to the Gross Domestic Product.

Creation of Mineral investment facilitation authority (MIFA) under the Chairmanship of Chief minister/Governor of Khyber Pakhtunkhwa with members from the public as well as private sector.

There is a consistent domestic and foreign demand for the product. Industry and mines location at cross roads of central Asia and Europe. More than 1500 prospecting licenses and mining leases have been granted by the KPK government. Availability of hard working & low-cost granite processing labor.

1.3.4 Marble Production process

Introduction

A metamorphic rock with outstanding beauty and variety, marble has been an important building material for several millennia. Thanks to the precision of modern technology, marble has become increasingly accessible and affordable for consumers. Improvements in marble manufacturing (marble "fabrication") include explosives, composite-tipped drills, diamond-studded wire saws, super-fast saws, epoxy sealing and computer-controlled polishing.

Extraction

During the extraction process, massive cube-like pieces of marble are cut out of the ground and transported from the quarry. To minimize the risk of cracks, fissures and other aesthetic damage to the stone, fabricators use a process known as "wire sawing" to gently separate the marble. Two 3-inch wide holes are drilled perpendicularly to each other. Once the holes connect, a heavy-duty wire embedded with artificial diamonds is fed through and secured to a flywheel, forming a loop. A powerful engine applies massive torque to the flywheel, which circulates the diamond-embedded wire at a very fast rate. Since diamond is much harder than the marble, the friction quickly wears it away, leaving a smooth cut plane.

After wearing all the way through, another perpendicular hole is drilled and the process is repeated, cutting away the other vertical plane. For the horizontal plane, the wire saw cuts about 80 percent of the marble away, leaving a circle in the center remaining. At this point, the wire is removed and a hydraulic excavator machine forces a wedge into the horizontally-cut

planes to break the vertical plane free. Finally, a crane loads the piece onto a truck or rail car for a transport to the fabrication shop.

In the fabrication shop, the piece is loaded onto a platform with hydraulic lifts underneath. Above this platform is the "gang saw," a row of dozens of 10 to 15 feet long steel saw blades connected to a crankshaft via pistons.

A giant engine turns the flywheel, which turns the crankshaft and moves the saw blade back and forth horizontally at an incredibly high rate.

Each saw blade is spaced according to the desired thickness of the resulting slabs, usually 3 cm (although 2 cm is fairly common as well). As the blades saw back and forth, the hydraulic lifts push the block up into them, cutting the slabs. Once complete, two workers will gently tilt out each slab, attach a special clamp to it and use a ceiling-mounted winch to lift it into the finishing area.

Polishing and Sealing

The slab is laid face down and a machine with a finely-graded, diamond-encrusted abrasive pad grinds down the surface of the slab until it is smooth and vaguely reflective. A worker (or machine, depending on the shop) then sprays on a uniform coat of epoxy sealer onto the surface and leaves it to dry for 48 hours. Heat lamps can expedite this process. Once dry, the slab is flipped over and the process repeated for the opposite side. Polished and sealed, the finished slabs then ship out to retailers and distributors.

Water jet Cutting and wet sawing

At the retailer's show room, slabs are displayed in giant, iron oxide-coated easels for customers to view. After choosing a slab(s), the customer gives the dimensions of his project (kitchen counters, ballroom floor or bathroom) to the retailer, who maps the shapes onto the slab itself.

To cut these pieces out, fabricators traditionally used a process called "wet sawing" where circular saws coated with tungsten carbide cut through the slab while continuous streams of water spray on the blades to keep them from overheating.

Today, most fabricators use a technology called "waterjet cutting" to cut pieces, make holes for appliances and create beveled edges. In waterjet cutting, water is pressurized to 60,000 psi and allowed to shoot out in a concentrated stream. Traveling at 2.5 times the speed of sound, the stream mixes mid-air with a powdered abrasive (e.g. aluminum oxide or garnet) before striking the marble. The result is a precise hyper-erosion that can be used for two-dimensional and three-dimensional applications alike. Due to this degree of precision (in the micrometer range), a computer controls the entire cutting process.

1.3.5 Granite Production process

Introduction

Granite is formed underground by the cooling of magma. Deep within the earth, beyond the mantle layer, lies a deep layer of molten rock. As the rock gets closer to the surface, it also cools, creating internal igneous rocks. One of these such rocks is granite. Granite can be a mixture of mainly quartz and feldspar but also may contain mica.

Extraction

There are three main ways to extract the stone:

- The most common method is the production by the blast. A deep hole is bored by drilling method in a rock, where the charge is laid with following blasting. Among the breakaway pieces of rock the largest boulders are selected, which are then sawn into slabs.
- The second method of granite extraction is the method of breaking off with the air bag. It is similar to the first method so that the rock is also drilled with insertion of reservoir being inflated with air under high pressure
- Third, the most expensive method of granite extraction – is the method of stone-cutters - now the most popular in the West. Quarrying by this method provides the possibility to completely avoid micro cracks and gives the most rational way to mine the deposit.

Processing

Once blocks of stone reach the processing facility, they are cut down into smaller more manageable pieces. For tile, this means cutting the stone into billets before polishing. For slab materials, gang saw is used for further processing. A gang saw works has many adjustable blades that allow for the thickness of the slabs to be adjusted. The gang saw can cut the entire block of stone into slabs at one time. More delicate materials may require the use of a diamond wire saw to gently cut one slab at a time with less trauma to the stone. The most recent technology involves multi-wire gang saws which have the potential speed production on exotic materials exponentially.

After slabs are cut on the gang saw, they are moved one at a time to the polishing line, where they are laid horizontally on a large conveyer type line called a polishing line. There, they pass under polishing heads which begin with very coarse diamond abrasives, and then move to finer and finer grit abrasives, just like sanding wood. Travertine slabs and some marbles, will receive a cementitious or epoxy compound to fill the natural voids of the stone. Part of the way through this line, slabs of granite, marble, and onyx will receive a coating of a resin treatment which will fill in any pits or micro fissures which are inherent to the stone in order to make the final surface easier to clean.

Most of the excess resin is removed by further polishing, with only 1% remaining on the finished surface. For materials where the final surface is to be honed, the process will stop with a lower grit abrasive than materials with a polished surface.

Slabs are bundled together and braced with a wooden framework, custom built to ensure the slabs stay upright during the shipping process. All materials are loaded into standard 20 foot shipping containers and braced to prevent any shifting or movement which could cause damage to the material. Due to the immense weight of stone, many containers are not fully packed, but are loaded to maximum weight limit of 42,000 pounds, or 20 tons.

1.4 Market Analysis

Marble is included in the list of largest minerals extracted among others. It is used for both construction purposes and Handicrafts manufacturing, whereas, Onyx which is a semi-transparent and generally used by handicrafts manufacturing industry. Major export markets for these handicrafts are Central Asian Republics, United States of America and Australia. The domestic market also carries a great untapped potential for these handicrafts.

Availability of high quality Marble reserves in Pakistan in great quantities and the demand of its products in the export markets i.e. European Union countries, Central Asian countries etc. make this sector highly attractive. Foreign tourists are the main customers of the products made of marble.

Marble and Granite industry in Pakistan has total estimated reserves of around 160.1 million tons located mainly in Balochistan, Khyber Pakhtunkhwa and Sindh.

Around 98 percent of the total reserves are believed to be in KPK but several of the marble sites in the area are facing closure due to law and order situation, load shedding, improper infrastructure and militancy in the area.

Buner-Mardan gray marble, Chitral, Dir, Mansehra black granite and Shangla are high potential sites for investment in marble.

A brief snapshot of other marble factories in Khyber Pakhtunkhwa is provided below:

Sr. No.	Name	Location	Capacity (sq ft/year)	Products/Activities
1	Sw abi Marble Factory	Small Industrial Estate, Mardan	70,000	Marble tiles/ marble slabs
2	Super star Marble	Small Industrial Estate Now shera road, Mardan	22,000	Construction, stone, marble&onyx and relataed products/items
3	Gandaf Marble Slabs and Tiles	Small Industrial Estate, Mardan	1,000,000	Export, Extraction, Slabs, Tiles and Transformation
4	Inam Marble	Small Industrial Estate, Mardan	12,000	Onyx blocks,w hite marbel, black & gold marble , Indus gold,onyx marble funeral Jars
5	Zia marble	Small Industrial Estate, Mardan	750,000	White Grey Marble, Grey Marble, Badel Marble, Red & White Marble, Nephrite Stone
6	United marble Industries	Small Industrial Estate,Now shera Road Mardan	9,000,000	Marble& onyx and related products/items
7	Abdullah Marble Factory	Small Industrial Estate,Now shera Road Mardan	280,000	Marbles Tiles / Slabs / Marble
8	Habib Marble and Granite Peshaw ar	38-D,Industrial Estate,Jamrud Road Peshaw ar	180,000	Construction, building material flooring and granite tiles

1.5 KPBOIT assistance

In accordance with the objectives of the KPBOIT, it will serve as one window facilitation center for the investors with respect to the proposed project. KPBOIT will assist the investors, in relation to the proposed project, through:

- Obtaining requisite approvals from the provincial government for establishing the marble/granite extraction quarry and processing plant;
- Identification of geographic location and land for the project;
- Provision of pre-feasibility study for the project; and
- Assistance in arranging utilities etc.

2 Financial pre-feasibility

2.1 Project design assumptions

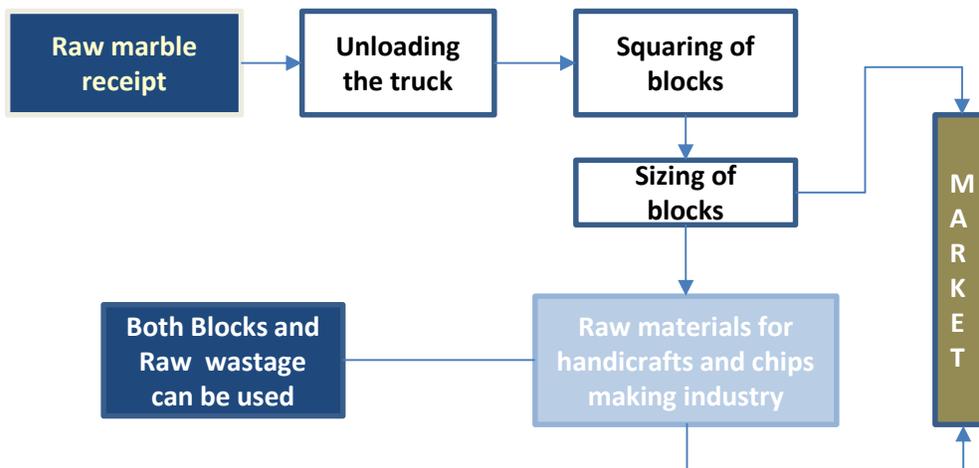
The project aims at the development of a Marble & Granite Processing Factory based on deposits in Malakand, Chitral, Dir and Mansehra.

The plant will be structured to produce the best quality marble products. Special care and quality control will be observed in finishing the marble products, so that the export targets can be achieved. This will maximize the profits. The selection/purchase of raw marble for processing is of immense importance. Expertise will be employed in the purchase of best quality raw marble stone so that there is minimum wastage.

Possible Product categories after Processing:

- **Slabs** are large semi processed sheets of marble stone with varied sizes and thickness of 2 inches. They are further processed in the local industry or exported to the international markets. Slabs are cut on by gang saws from large blocks of marble. This product is used for tabletops, kitchen tops, wall facing, flooring and other allied purposes. Price of slab varies with the quality of material and the size of the sheet.
- **Unpolished tiles:** These are processed and sold by units normally lacking machinery to finish and section the material and are available in different sizes, colors and shades. These tiles are polished normally after application at the desired surface. Main attraction for the consumer for this product is its low price. Unpolished tiles are sold comparatively at low prices than the polished tiles to individuals and other small processing units.
- **Polished Tiles:** These are the fully processed tiles sold in the market at competitively higher prices, which depend on size, color & shades.
- **Decorative items** including, pillars, fire places, railings, sculpture, flower vase, ashtrays, tabletops, office table sets and many other similar items are produced in many countries of the world. In the countries where labor cost is high, carving is done with CNC machines. In Pakistan these items are produced all over the country without the advanced machinery. Major cluster of these items is in Karachi, where more than 400 units are involved in this activity followed by a few units at Lahore and Rawalpindi. Prices of these items vary from product to product, the quality of craftsmanship, and stone used.

- **Marble Chips** are tiny pieces normally of crushed marble used in flooring and facing in the construction industry. These are processed on completely different machinery set up that includes stone crushers of various grades. They vary in size from large grains of 1 inch to 0.5 centimeter, depending on the choice of the consumer.

Process:

The final product will be directly supplied to wholesaler eliminating role of the middleman.

2.2 Financial pre-feasibility of quarrying plant

2.2.1 Project Set-up Costs

The total project outlay has been estimated at PKR 199 million (including PKR 20 million for initial working capital requirements). Please refer table below for detailed breakdown of project set up costs.

Project cost	PKR
Plant, Machinery and Equipment	122,600,000
Mine development expenses	10,000,000
Building and civil works (8,000 SFT)	24,000,000
Furniture and Fixtures	2,500,000
Vehicles	6,000,000
	165,100,000
Initial working capital	20,000,000
	185,100,000
IDC	13,882,500
	198,982,500

For the purpose of this financial pre-feasibility, the debt to equity ratio has been assumed as 60% debt and 40% equity. At these levels, the investor will be required to plough in equity of around PKR 80million. Debt financing of up to PKR 119million will be required during the construction period of one year. Cost of equity has been estimated at 15% and financing cost at KIBOR (currently 10.5%) + 2%.

Following is the break up of machinery requirements for the project:

Plant, Machinery and Equipment	
Chain Saw complete w ith tool kit	15,000,000
Diamond Wire Saw - 50 HP	3,000,000
Diamond Wire Saw - 25 HP	2,000,000
Diamond Wire 28 beads/m	7,200,000
Stitch drills w ith one Jack hammer	4,000,000
Manual Jack Hammers	340,000
Sharpening Grinder pneumatic	400,000
Compressor 650 -750CFM	5,000,000
Hydraulic Jacking Plant	1,500,000
Plugs and Feathers	500,000
Hydro pushing plant	1,000,000
DTH pneumatic	2,000,000
Generator 400 KVA	4,500,000
Excavator 350 HP + Quarry Equip	31,500,000
Wheel Loader 35 tons	30,000,000
Welding plant	3,000,000
Other accessories/ equipment	11,660,000
	122,600,000

2.2.2 Operating revenues

The source of revenue for the plant will be the sale of marble blocks. The plant is expected to have a production capacity of 20,000 tons/annum.

Production capacity	Tons/ Annum
Squared Blocks (Large)	4,000
Squared Blocks (Medium)	8,000
Squared Blocks (Small)	8,000

A capacity utilization rate of 60% has been assumed for the first year of operation keeping in view the duration of establishment of the plant. This rate is expected to increase to 80% in Year 2. A 100% utilization rate is predicted for the continuing years.

Revenues have been estimated on the basis of capacity utilization rates, selling prices, and inflation rates. Selling price estimates have been made with regard to the prevailing market prices for the product.

Selling price	PKR/ Ton
Squared Blocks (Large)	11,200
Squared Blocks (Medium)	9,200
Squared Blocks (Small)	7,200

Annual increase in selling prices has been established at a rate of 5%. Total revenue of PKR 105.6 million is estimated for the first year of operation.

2.2.3 Operating costs

Production Costs

Production costs for the most part have been estimated as a percentage of Plant and Machinery costs:

Other Production Costs	%
Stores and spares (as % of plant and machinery cost)	2%
Carriage outward (per ton of sales)	2,000
Repair and maintenance (as % of plant and machinery costs)	5%
Water charges - per annum	100,000
Insurance (as % of plant and machinery costs)	1%
Royalty and excise duty on mineral extraction - per ton	95
Wastage	60%

Fuel and Lubricants

Estimates for Fuel and Lubricant costs have been made on the basis of prevailing rates

Fuel and lubricants	Ltr	Rate
Diesel (Liters)	200,000	110
Lubricant oil (Liters)	2,400	450
Hydraulic oil (Liters)	2,400	800
Grease (Kgs)	2,400	600

* The above requirements are for 100% capacity utilization

HR Costs

HR costs comprise of Admin/Marketing costs and Production costs.

HR costs - Production	PKR
Quarry master	1,800,000
Mining engineer	1,200,000
Geologist	600,000
Mechanical Engineers (2)	2,400,000
Technicians (equipment operators)	9,600,000
Labour	6,000,000
	21,600,000

HR costs (admin/ marketing)	PKR
Project Manager	2,400,000
Marketing Officers (2)	1,920,000
Accounts/ admin	1,200,000
Drivers/ peons	360,000
Security Guards	960,000
	6,840,000

2.2.4 Project returns

Based on cash flow projections prepared after taking into consideration project set up costs and operating results, the project is expected to generate IRR of 20.9% for the equity investor. Please refer charts below for profitability analysis.

Project Returns

NPV	23,608,206
-----	------------

IRR	18.6%
-----	-------

Equity Returns

NPV	19,930,289
-----	------------

IRR	20.9%
-----	-------

Assumptions

For calculation of IRR and net present value, terminal value in year 10 has been calculated using constant growth model. Perpetual growth rate of 1% has been assumed. Cost of equity has been assumed at 15%.

2.3 Financial pre-feasibility of processing plant

2.3.1 Project Set-up Costs

The total project outlay for the Processing Plant has been estimated at PKR 98.1 million. Please refer table below for detailed breakdown of project set up costs.

Project cost	PKR
Plant, Machinery and Equipment	66,300,000
Building and civil works (6,500 SFT)	19,500,000
Furniture and Fixtures	2,500,000
Vehicles	3,000,000
Capital Cost	91,300,000
IDC	6,847,500
Total Project Cost	98,147,500

For the purpose of this financial pre-feasibility, the project is assumed to be funded by debt and equity in the ratio of 60:40.

Following are the machinery requirements for the project:

Plant, Machinery and Equipment	
Multi Wire Saw (10 wires) - Chinese	20,000,000
Block Cutter (Horizontal and Vertical)	7,500,000
Cross Cutter (Single Blade) x 2	2,000,000
Cross Cutter (Multi Blade) x 1	2,100,000
Splitter(Local)	500,000
Auto Polisher (16 Heads) - Chinese	20,000,000
Champhering Machine	1,000,000
Fork lifts x 1	3,000,000
Gantry Crane (40 Ton) Local	8,000,000
Jib Crane with Scissor Clamps	1,200,000
Other accessories/ equipment	1,000,000
	66,300,000

2.3.2 Operating revenues

The source of revenue for the plant will be the sale of marble tiles/slabs. The plant is expected to have a production capacity of 600,000 Sq.Ft/annum.

A capacity utilization rate of 50% has been assumed for the first year of operation. This rate is expected to increase to 70% in Year 2. A 100% utilization rate is predicted for the continuing years.

Revenues have been estimated on the basis of capacity utilization rates, selling prices, production capacity, production mix percentage and inflation rates. Selling price estimates have been made with regard to the prevailing market prices for the product.

Selling price - Year 1	PKR/ Sq.Ft
Uneven & Unpolished Tiles (Slabs)	300
Even & Unpolished Tiles	415
Resized & Polished Tiles	475

Production Mix	%
Uneven & Unpolished Tiles (Slabs)	40%
Even & Unpolished Tiles	30%
Resized & Polished Tiles	30%

Annual increase in selling prices has been established at a rate of 5%.

2.3.3 Operating costs

Production Costs

Production costs for the most part have been estimated as a percentage of Plant and Machinery costs:

Other Production Costs	%
Stores and spares (as % of plant and machinery cost)	2%
Repair and maintenance (as % of plant and machinery costs)	5%
Water charges - per annum	150,000
Insurance (as % of plant and machinery costs)	1%
Wastage	20%

Fuel and Lubricants

Estimates for Fuel and Lubricant costs have been made on the basis of prevailing rates and extra usage as a result of wastage.

Fuel and lubricants	Ltr	Rate
Diesel (Liters)	180,000	110
Lubricant oil (Liters)	1,750	450
Hydraulic oil (Liters)	1,750	800
Grease (Kgs)	1,750	600

* The above requirements are for 100% capacity utilization

HR Costs

HR costs comprise of Admin/Marketing costs and Production costs.

HR costs (admin/ marketing)	PKR
Project Manager	2,400,000
Marketing Officers (4)	3,840,000
Accounts/ admin (2)	2,400,000
Drivers/ peons	360,000
Security Guards	960,000
	9,960,000

2.3.4 Project returns

Based on cash flow projections prepared after taking into consideration project set up costs and operating results, the project is expected to generate IRR of 23.7% for the equity investor. Please refer charts below for profitability analysis.

Project Returns

NPV	22,679,095
-----	------------

IRR	19.6%
-----	-------

Equity Returns

NPV	26,819,322
-----	------------

IRR	23.69%
-----	--------

Assumptions

For calculation of IRR and net present value, terminal value in year 10 has been calculated using constant growth model. Perpetual growth rate of 1% has been assumed. Cost of equity has been assumed at 15%.

2.4 Financial pre-feasibility of combined processing and quarrying facility

2.4.1 Project Set-up Costs

For the purpose of this pre-feasibility study the term ‘Consolidated’ refers to joint operations of the Quarrying and Processing Plant for investors interested in setting up both the units simultaneously. The total project outlay for consolidated operations has been estimated at PKR 302.5 million (including PKR 25 million for initial working capital requirements).

Please refer table below for detailed breakdown of project set up costs.

Project cost	PKR
Plant, Machinery and Equipment	188,900,000
Mine Development Expenses	10,000,000
Building and civil works (14500 SFT)	43,500,000
Furniture and Fixtures	5,000,000
Vehicles	9,000,000
Capital Cost	256,400,000
Initial working capital	25,000,000
	281,400,000
IDC	21,105,000
Total project costs	302,505,000

Following are the details of machinery requirements for the project:

Plant, Machinery and Equipment	PKR
Processing	
Multi Wire Saw (10 wires) - Chinese	20,000,000
Block Cutter (Horizontal and Vertical)	7,500,000
Cross Cutter (Single Blade) x 2	2,000,000
Cross Cutter (Multi Blade) x 1	2,100,000
Splitter(Local)	500,000
Auto Polisher (16 Heads) - Chinese	20,000,000
Champhering Machine	1,000,000
Fork lifts x 1	3,000,000
Gantry Crane (40 Ton) Local	8,000,000
Jib Crane with Scissor Clamps	1,200,000
Other accessories/ equipment	1,000,000
	66,300,000
Quarrying	
Chain Saw complete with tool kit	15,000,000
Diamond Wire Saw - 50 HP	3,000,000
Diamond Wire Saw - 25 HP	2,000,000
Diamond Wire 28 beads/m	7,200,000
Stitch drills with one Jack hammer	4,000,000
Manual Jack Hammers	340,000
Sharpening Grinder pneumatic	400,000
Compressor 650 -750CFM	5,000,000
Hydraulic Jacking Plant	1,500,000
Plugs and Feathers	500,000
Hydro pushing plant	1,000,000
DTH pneumatic	2,000,000
Generator 400 KVA	4,500,000
Excavator 350 HP + Quarry Equip	31,500,000
Wheel Loader 35 tons	30,000,000
Welding plant	3,000,000
Other accessories/ equipment	11,660,000
	122,600,000
Total Plant and Machinery	188,900,000

2.4.2 Operating revenues

The source of revenue for the consolidated operations will be the sale of marble tiles/slabs and small blocks of output from Quarry after meeting all input demand for the Processing Unit, allocation of which is shown at the end of the page. The processing plant is expected to have a production capacity of 600,000 sq.ft./annum.

A capacity utilization rate of 50% has been assumed for the first year of operation keeping in view the duration of establishment of the plant. This rate is expected to increase to 60% in Year 2. A 100% utilization rate is predicted for the continuing years.

Revenues have been estimated on the basis of capacity utilization rates, selling prices, production capacity, production mix percentage and inflation rates. Selling price estimates have been made with regard to the prevailing market prices for the product.

Selling price (Tiles)	PKR/ Sq.Ft
Uneven & Unpolished Tiles (Slabs)	250
Even & Unpolished Tiles	325
Resized & Polished Tiles	400

Production Mix	
Uneven & Unpolished Tiles (Slabs)	40%
Even & Unpolished Tiles	30%
Resized & Polished Tiles	30%

Annual increase in selling prices has been established at a rate of 5%.

2.4.3 Operating costs

Production Costs

Production costs for the most part have been estimated as a percentage of Plant and Machinery costs:

Other Production Costs	%
Stores and spares (as % of plant and machinery cost)	4%
Carriage outward (per ton of sales)- Quarrying	2,000
Repair and maintenance (as % of plant and machinery costs)	5%
Water charges - per annum	300,000
Insurance (as % of plant and machinery costs)	1%
Royalty and excise duty on mineral extraction - per ton (Quarrying)	95
Wastage-Quarrying	70%
Wastage-Processing	30%

Fuel and Lubricants

Estimates for Fuel and Lubricant costs have been made on the basis of prevailing rates and extra usage as a result of wastage.

Fuel and lubricants	Ltr	Rate
Diesel (Liters)	400,000	110
Lubricant oil (Liters)	4,500	450
Hydraulic oil (Liters)	4,500	800
Grease (Kgs)	4,500	600

** The above requirements are for 100% capacity utilization*

HR Costs

HR costs comprise of Admin/Marketing costs and Production costs.

HR costs - Production	PKR
Quarry master	1,920,000
Mining engineer	1,440,000
Mechanical Engineers (2)	2,880,000
Geologist	600,000
Technicians (equipment operators)	11,520,000
Labour	6,720,000
Skilled Staff (12)-Processing	5,040,000
	30,120,000

HR costs (admin/ marketing)	PKR
Project Manager (2)	5,280,000
Marketing Officers (4)	4,320,000
Accounts/ admin (2)	2,880,000
Drivers/ peons	432,000
Security Guards	864,000
	13,776,000

2.4.4 Project returns

Based on cash flow projections prepared after taking into consideration project set up costs and operating results, the project is expected to generate 27.4% for the equity investor. The consolidated operations is expected to achieve significant cost reduction and synergies as evident from the project's overall profitability.

Project Returns

NPV	78,369,641
------------	-------------------

IRR	22.6%
------------	--------------

Equity Returns

NPV	69,391,296
------------	-------------------

IRR	27.37%
------------	---------------

Assumptions

For calculation of IRR and net present value, terminal value in year 10 has been calculated using constant growth model. Perpetual growth rate of 1% has been assumed. Cost of equity has been assumed at 15%.

Appendices

Balance sheet quarrying project

Marble. Granite Quarrying Financial Projections

Statement of Financial Position

Amounts in PKR											
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
NON CURRENT ASSETS											
Property, Plant and Equipment		153,378,375	137,774,250	122,170,125	106,566,000	90,961,875	81,357,750	65,753,625	50,149,500	34,545,375	18,941,250
Capital work in progress	178,982,500										
Mines and Reserves		9,000,000	8,000,000	7,000,000	6,000,000	5,000,000	4,000,000	3,000,000	2,000,000	1,000,000	-
CURRENT ASSETS											
Stores and Spares		3,678,000	3,678,000	3,678,000	3,678,000	3,678,000	3,678,000	3,678,000	3,678,000	3,678,000	3,678,000
Trade receivables		10,560,000	14,784,000	19,404,000	20,374,200	21,392,910	22,462,556	23,585,683	24,764,967	26,003,216	27,303,377
Cash and bank balances	20,000,000	15,145,188	28,589,475	53,886,239	76,203,358	94,905,411	103,275,626	112,506,747	115,690,903	136,263,224	148,041,101
	20,000,000	29,383,188	47,051,475	76,968,239	100,255,558	119,976,321	129,416,182	139,770,430	144,133,871	165,944,440	179,022,478
Total Assets	198,982,500	191,761,563	192,825,725	206,138,364	212,821,558	215,938,196	214,773,932	208,524,055	196,283,371	201,489,815	197,963,728
EQUITY AND LIABILITIES											
SHARE CAPITAL AND RESERVES											
Share Capital	79,593,000	79,593,000	79,593,000	79,593,000	79,593,000	79,593,000	79,593,000	79,593,000	79,593,000	79,593,000	79,593,000
Unappropriated Profits	-	(8,249,813)	(687,135)	20,068,334	39,352,012	56,716,958	71,658,445	83,607,761	91,925,403	95,893,599	91,067,351
	79,593,000	71,343,188	78,905,865	99,661,334	118,945,012	136,309,958	151,251,445	163,200,761	171,518,403	175,486,599	170,660,351
Long term debt	119,389,500	109,858,375	99,135,860	87,073,030	73,502,347	58,235,328	41,059,932	21,737,611	-	-	-
Current Liabilities - trade payables		10,560,000	14,784,000	19,404,000	20,374,200	21,392,910	22,462,556	23,585,683	24,764,967	26,003,216	27,303,377
Total Equity and Liabilities	198,982,500	191,761,563	192,825,725	206,138,364	212,821,558	215,938,196	214,773,932	208,524,055	196,283,371	201,489,815	197,963,728

Income statement quarrying project

Marble, Granite Quarrying Financial Projections										
Statement of Comprehensive Income										
Amounts in PKR										
Revenue	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue										
Squared Blocks (Large)	26,880,000	37,632,000	49,392,000	51,861,600	54,454,680	57,177,414	60,036,285	63,038,099	66,190,004	69,499,504
Squared Blocks (Medium)	44,160,000	61,824,000	81,144,000	85,201,200	89,461,260	93,934,323	98,631,039	103,562,591	108,740,721	114,177,757
Squared Blocks (Small)	34,560,000	48,384,000	63,504,000	66,679,200	70,013,160	73,513,818	77,189,509	81,048,984	85,101,434	89,356,505
	105,600,000	147,840,000	194,040,000	203,742,000	213,929,100	224,625,555	235,856,833	247,649,674	260,032,158	273,033,766
Total revenues	105,600,000	147,840,000	194,040,000	203,742,000	213,929,100	224,625,555	235,856,833	247,649,674	260,032,158	273,033,766
Cost of Sales	66,640,000	88,865,800	114,880,360	126,268,396	138,795,236	152,574,759	167,732,235	184,405,459	202,746,004	222,920,605
Gross profit	38,960,000	58,974,200	79,159,640	77,473,604	75,133,864	72,050,796	68,124,598	63,244,216	57,286,154	50,113,161
HR-Admin/Marketing Costs	6,840,000	7,524,000	8,276,400	9,104,040	10,014,444	11,015,888	12,117,477	13,329,225	14,662,147	16,128,362
Depreciation	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125
Stores and Spares	2,452,000	2,697,200	2,966,920	3,263,612	3,589,973	3,948,971	4,343,868	4,778,254	5,256,080	5,781,688
Repairs and Maintenance	6,130,000	6,743,000	7,417,300	8,159,030	8,974,933	9,872,426	10,859,669	11,945,636	13,140,199	14,454,219
Communication	120,000	132,000	145,200	159,720	175,692	193,261	212,587	233,846	257,231	282,954
Printing and Stationary	60,000	66,000	72,600	79,860	87,846	96,631	106,294	116,923	128,615	141,477
Vehicle running/travelling	600,000	660,000	726,000	798,600	878,460	966,306	1,062,937	1,169,230	1,286,153	1,414,769
Legal/Professional	240,000	264,000	290,400	319,440	351,384	386,522	425,175	467,692	514,461	565,907
Financial cost	14,923,688	13,732,297	12,391,982	10,884,129	9,187,793	7,279,416	5,132,491	2,717,201	-	-
Others	240,000	264,000	290,400	319,440	351,384	386,522	425,175	467,692	514,461	565,907
Total Overheads	47,209,813	47,686,622	48,181,327	48,691,996	49,216,035	49,750,069	50,289,797	50,829,825	51,363,474	51,939,408
Net profit - before tax	(8,249,813)	11,287,578	30,978,313	28,781,608	25,917,830	22,300,727	17,834,801	12,414,391	5,922,680	(4,826,247)
Tax	-	3,724,901	10,222,843	9,497,931	8,552,884	7,359,240	5,885,484	4,096,749	1,954,484	-
Profit after tax	(8,249,813)	7,562,677	20,755,469	19,283,678	17,364,946	14,941,487	11,949,316	8,317,642	3,968,196	(4,826,247)
Profit brought forward	-	(8,249,813)	(687,135)	20,068,334	39,352,012	56,716,958	71,658,445	83,607,761	91,925,403	95,893,599
Accumulated profit	(8,249,813)	(687,135)	20,068,334	39,352,012	56,716,958	71,658,445	83,607,761	91,925,403	95,893,599	91,067,351

Cash Flow statement quarrying project

Marble, Granite Quarrying Financial Projections

Statement of Cash Flows

Amounts in PKR

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash flows from operating activities											
Profit before tax	-	(8,249,813)	11,287,578	30,978,313	28,781,608	25,917,830	22,300,727	17,834,801	12,414,391	5,922,680	(4,826,247)
Interest payments	-	14,923,688	13,732,297	12,391,982	10,884,129	9,187,793	7,279,416	5,132,491	2,717,201	-	-
Add: Depreciation	-	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125	15,604,125
Add: Amortisation	-	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
	-	23,278,000	41,624,000	59,974,420	56,269,862	51,709,748	46,184,268	39,571,417	31,735,717	22,526,805	11,777,878
Changes in working capital											
Stores and Spares	-	(3,678,000)	-	-	-	-	-	-	-	-	-
Trade payables	-	10,560,000	4,224,000	4,620,000	970,200	1,018,710	1,069,646	1,123,128	1,179,284	1,238,248	1,300,161
Trade receivables	-	(10,560,000)	(4,224,000)	(4,620,000)	(970,200)	(1,018,710)	(1,069,646)	(1,123,128)	(1,179,284)	(1,238,248)	(1,300,161)
	-	(3,678,000)	-	-	-	-	-	-	-	-	-
Income tax paid	-	-	(3,724,901)	(10,222,843)	(9,497,931)	(8,552,884)	(7,359,240)	(5,885,484)	(4,096,749)	(1,954,484)	-
Net cash generated from operations	-	19,600,000	37,899,099	49,751,577	46,771,931	43,156,864	38,825,028	33,685,933	27,638,968	20,572,321	11,777,878
Cash flows from investing activities											
Fixed capital expenditure	(178,982,500)	-	-	-	-	-	(6,000,000)	-	-	-	-
Net cash used in investing activities	(178,982,500)	-	-	-	-	-	(6,000,000)	-	-	-	-
Cash flow from financing activities											
Proceeds from Share Capital	79,593,000	-	-	-	-	-	-	-	-	-	-
Debt (draw down and repayments)	119,389,500	(9,531,125)	(10,722,515)	(12,062,830)	(13,570,683)	(15,267,019)	(17,175,396)	(19,322,321)	(21,737,611)	-	-
Interest payments	-	(14,923,688)	(13,732,297)	(12,391,982)	(10,884,129)	(9,187,793)	(7,279,416)	(5,132,491)	(2,717,201)	-	-
Net cash flow from financing activities	198,982,500	(24,454,812)	(24,454,812)	(24,454,812)	(24,454,812)	(24,454,812)	(24,454,812)	(24,454,812)	(24,454,812)	-	-
Net increase/(decrease) in cash and cash equivalents	20,000,000	(4,854,812)	13,444,287	25,296,765	22,317,119	18,702,052	8,370,216	9,231,121	3,184,156	20,572,321	11,777,878
Cash and Cash equivalents at the beginning of period	-	20,000,000	15,145,188	28,589,475	53,886,239	76,203,358	94,905,411	103,275,626	112,506,747	115,690,903	136,263,224
Cash and cash equivalents at the end of period	20,000,000	15,145,188	28,589,475	53,886,239	76,203,358	94,905,411	103,275,626	112,506,747	115,690,903	136,263,224	148,041,101

Balance sheet processing unit

Marble Processing Financial Projections

Statement of Financial Position

Amounts in PKR

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Property, Plant and Equipment	-	70,482,750	62,318,000	54,153,250	45,988,500	37,823,750	32,659,000	24,494,250	16,329,500	8,164,750	-
Building and Civil works	-	18,525,000	17,550,000	16,575,000	15,600,000	14,625,000	13,650,000	12,675,000	11,700,000	10,725,000	9,750,000
CWIP	98,147,500	-	-	-	-	-	-	-	-	-	-
CURRENT ASSETS											
Stores and Spares	-	1,989,000	1,989,000	1,989,000	1,989,000	1,989,000	1,989,000	1,989,000	1,989,000	1,989,000	1,989,000
Trade receivables	-	11,610,000	17,391,780	26,584,578	27,913,807	29,309,497	30,774,972	32,313,721	33,929,407	35,625,877	37,407,171
Cash and Bank Balances	-	(11,554,010)	(9,033,745)	7,819,166	23,759,313	38,536,508	48,867,136	60,430,341	69,863,784	88,821,222	105,278,092
Total Assets	98,147,500	91,052,740	90,215,035	107,120,994	115,250,620	122,283,755	127,940,108	131,902,311	133,811,691	145,325,849	154,424,263
EQUITY AND LIABILITIES											
SHARE CAPITAL AND RESERVES											
Share Capital	39,259,000	39,259,000	39,259,000	39,259,000	39,259,000	39,259,000	39,259,000	39,259,000	39,259,000	39,259,000	39,259,000
Unappropriated Profits	-	(14,003,563)	(15,334,200)	(1,671,086)	11,823,009	24,990,863	37,653,453	49,607,582	60,623,284	70,440,972	77,758,092
Long term debt	58,888,500	54,187,302	48,898,455	42,948,502	36,254,804	28,724,395	20,252,684	10,722,009	-	-	-
CURRENT LIABILITIES											
Trade Payables	-	11,610,000	17,391,780	26,584,578	27,913,807	29,309,497	30,774,972	32,313,721	33,929,407	35,625,877	37,407,171
Total Equity and Liabilities	98,147,500	91,052,740	90,215,035	107,120,994	115,250,620	122,283,755	127,940,108	131,902,311	133,811,691	145,325,849	154,424,263

Income statement Processing Facility

Marble Processing Financial Projections

Statement of Comprehensive Income

Amounts in PKR

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Uneven & Unpolished Tiles (Slabs)	36,000,000	53,928,000	82,432,800	86,554,440	90,882,162	95,426,270	100,197,584	105,207,463	110,467,836	115,991,228
Even & Unpolished Tiles	37,350,000	55,950,300	85,524,030	89,800,232	94,290,243	99,004,755	103,954,993	109,152,743	114,610,380	120,340,899
Resized & Polished Tiles	42,750,000	64,039,500	97,888,950	102,783,398	107,922,567	113,318,696	118,984,631	124,933,862	131,180,555	137,739,583
Total Revenues	116,100,000	173,917,800	265,845,780	279,138,069	293,094,972	307,749,721	323,137,207	339,294,067	356,258,771	374,071,709
Cost of Sales	104,991,500	148,948,925	217,862,055	230,002,486	242,920,369	256,671,621	271,316,659	286,920,792	303,554,661	321,294,705
Gross Profit	11,108,500	24,968,875	47,983,725	49,135,584	50,174,603	51,078,100	51,820,549	52,373,275	52,704,110	52,777,005
HR Costs (Admin/Marketing)	9,960,000	10,956,000	12,051,600	13,256,760	14,582,436	16,040,680	17,644,748	19,409,222	21,350,145	23,485,159
Other operating costs	3,150,000	3,465,000	3,811,500	4,192,650	4,611,915	5,073,107	5,580,417	6,138,459	6,752,305	7,427,535
Stores and Spares	1,326,000	1,458,600	1,604,460	1,764,906	1,941,397	2,135,536	2,349,090	2,583,999	2,842,399	3,126,639
Finance costs	7,361,063	6,773,413	6,112,307	5,368,563	4,531,851	3,590,549	2,531,585	1,340,251	-	-
Repairs and Maintenance	3,315,000	3,646,500	4,011,150	4,412,265	4,853,492	5,338,841	5,872,725	6,459,997	7,105,997	7,816,597
Net Profit Before Tax	(14,003,563)	(1,330,638)	20,392,708	20,140,440	19,653,514	18,899,387	17,841,984	16,441,347	14,653,265	10,921,075
Taxation	FALSE	FALSE	6,729,594	6,646,345	6,485,660	6,236,798	5,887,855	5,425,645	4,835,577	3,603,955
Net Profit After Tax	(14,003,563)	(1,330,638)	13,663,114	13,494,095	13,167,854	12,662,589	11,954,129	11,015,703	9,817,688	7,317,120
Profit brought forward	-	(14,003,563)	(15,334,200)	(1,671,086)	11,823,009	24,990,863	37,653,453	49,607,582	60,623,284	70,440,972
Accumulated Profit	(14,003,563)	(15,334,200)	(1,671,086)	11,823,009	24,990,863	37,653,453	49,607,582	60,623,284	70,440,972	77,758,092

Cash flow statement Processing Facility

Marble Processing Financial Projections

Statement of Cash Flows

Amounts in PKR

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash flows from operating activities											
Profit before tax	-	(14,003,563)	(1,330,638)	20,392,708	20,140,440	19,653,514	18,899,387	17,841,984	16,441,347	14,653,265	10,921,075
Add: Finance costs	-	7,361,063	6,773,413	6,112,307	5,368,563	4,531,851	3,590,549	2,531,585	1,340,251	-	-
Add: Depreciation	-	9,139,750	9,139,750	9,139,750	9,139,750	9,139,750	9,139,750	9,139,750	9,139,750	9,139,750	9,139,750
	-	2,497,250	14,582,525	35,644,765	34,648,753	33,325,114	31,629,687	29,513,319	26,921,348	23,793,015	20,060,825
Changes in working capital											
Stores and Spares	-	(1,989,000)	-	-	-	-	-	-	-	-	-
Trade payables	-	11,610,000	5,781,780	9,192,798	1,329,229	1,395,690	1,465,475	1,538,749	1,615,686	1,696,470	1,781,294
Trade receivables	-	(11,610,000)	(5,781,780)	(9,192,798)	(1,329,229)	(1,395,690)	(1,465,475)	(1,538,749)	(1,615,686)	(1,696,470)	(1,781,294)
Income tax paid	-	-	-	(6,729,594)	(6,646,345)	(6,485,660)	(6,236,798)	(5,887,855)	(5,425,645)	(4,835,577)	(3,603,955)
Net cash generated from operations	-	508,250	14,582,525	28,915,171	28,002,407	26,839,455	25,392,889	23,625,465	21,495,704	18,957,438	16,456,870
Cash flows from investing activities											
Fixed Capital Expenditure	(98,147,500)	-	-	-	-	-	(3,000,000)	-	-	-	-
Net cash used in investing activities	(98,147,500)	-	-	-	-	-	(3,000,000)	-	-	-	-
Cash flows from financing activities											
Proceeds from Share Capital	39,259,000	-	-	-	-	-	-	-	-	-	-
Debt (draw down and repayments)	58,888,500	(4,701,198)	(5,288,847)	(5,949,953)	(6,693,697)	(7,530,410)	(8,471,711)	(9,530,675)	(10,722,009)	-	-
Finance costs paid	-	(7,361,063)	(6,773,413)	(6,112,307)	(5,368,563)	(4,531,851)	(3,590,549)	(2,531,585)	(1,340,251)	-	-
Net cash flow from financing activities	98,147,500	(12,062,260)	-	-							
Net increase/(decrease) in cash and cash equivalents	-	(11,554,010)	2,520,265	16,852,911	15,940,147	14,777,195	10,330,629	11,563,204	9,433,444	18,957,438	16,456,870
Cash and cash equivalents at the beginning of the period	-	-	(11,554,010)	(9,033,745)	7,819,166	23,759,313	38,536,508	48,867,136	60,430,341	69,863,784	88,821,222
Cash and cash equivalents at the end of the period	-	(11,554,010)	(9,033,745)	7,819,166	23,759,313	38,536,508	48,867,136	60,430,341	69,863,784	88,821,222	105,278,092

Marble Processing Financial Projections

Statement of Financial Position

Amounts in PKR

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Property, Plant and Equipment		200,704,500	177,404,000	154,103,500	130,803,000	107,502,500	93,202,000	69,901,500	46,601,000	23,300,500	-
Building and Civil works		41,325,000	39,150,000	36,975,000	34,800,000	32,625,000	30,450,000	28,275,000	26,100,000	23,925,000	21,750,000
Mines and Reserves		9,000,000	8,000,000	7,000,000	6,000,000	5,000,000	4,000,000	3,000,000	2,000,000	1,000,000	-
CWIP	277,505,000										
CURRENT ASSETS											
Stores and Spares		7,556,000	7,556,000	7,556,000	7,556,000	7,556,000	7,556,000	7,556,000	7,556,000	7,556,000	7,556,000
Trade receivables		13,335,000	17,122,140	30,534,483	32,061,207	33,664,268	35,347,481	37,114,855	38,970,598	40,919,128	42,965,084
Cash and Bank Balances	25,000,000	11,198,427	22,076,455	86,024,440	146,547,947	202,920,294	245,321,500	290,827,746	329,399,703	397,047,251	456,815,773
Total Assets	302,505,000	283,118,927	271,308,595	322,193,423	357,768,154	389,268,061	415,876,980	436,675,101	450,627,300	493,747,879	529,086,856
EQUITY AND LIABILITIES											
SHARE CAPITAL AND RESERVES											
Share Capital	121,002,000	121,002,000	121,002,000	121,002,000	121,002,000	121,002,000	121,002,000	121,002,000	121,002,000	121,002,000	121,002,000
Unappropriated Profits	-	(18,231,292)	(17,527,760)	38,283,354	92,962,319	146,068,994	197,105,756	245,511,440	290,654,703	331,826,751	365,119,773
Long term debt	181,503,000	167,013,219	150,712,215	132,373,586	111,742,628	88,532,800	62,421,744	33,046,806	-	-	-
CURRENT LIABILITIES											
Trade Payables		13,335,000	17,122,140	30,534,483	32,061,207	33,664,268	35,347,481	37,114,855	38,970,598	40,919,128	42,965,084
Total Equity and Liabilities	302,505,000	283,118,927	271,308,595	322,193,423	357,768,154	389,268,061	415,876,980	436,675,101	450,627,300	493,747,879	529,086,856

Balance sheet Combined Project

Marble Processing Financial Projections

Statement of Comprehensive Income

Amounts in PKR

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Uneven & Unpolished Tiles (Slabs)	30,000,000	38,520,000	68,694,000	72,128,700	75,735,135	79,521,892	83,497,986	87,672,886	92,056,530	96,659,356
Even & Unpolished Tiles	29,250,000	37,557,000	66,976,650	70,325,483	73,841,757	77,533,844	81,410,537	85,481,064	89,755,117	94,242,873
Resized & Polished Tiles	36,000,000	46,224,000	82,432,800	86,554,440	90,882,162	95,426,270	100,197,584	105,207,463	110,467,836	115,991,228
Total Revenue-Processing	95,250,000	122,301,000	218,103,450	229,008,623	240,459,054	252,482,006	265,106,107	278,361,412	292,279,483	306,893,457
Total Revenue-Quarrying	41,112,000	49,334,400	82,224,000							
Total Revenues	136,362,000	171,635,400	300,327,450	311,232,623	322,683,054	334,706,006	347,330,107	360,585,412	374,503,483	389,117,457
Cost of Sales	97,948,417	112,356,000	157,100,283	167,878,762	179,735,088	192,777,047	207,123,201	222,903,971	240,262,819	259,357,550
Gross Profit	38,413,583	59,279,400	143,227,167	143,353,861	142,947,966	141,928,960	140,206,905	137,681,441	134,240,664	129,759,906
HR Costs (Admin/Marketing)	13,776,000	15,153,600	16,668,960	18,335,856	20,169,442	22,186,386	24,405,024	26,845,527	29,530,079	32,483,087
Other operating costs	3,180,000	3,498,000	3,847,800	4,232,580	4,655,838	5,121,422	5,633,564	6,196,920	6,816,612	7,498,274
Stores and Spares	7,556,000	8,311,600	9,142,760	10,057,036	11,062,740	12,169,014	13,385,915	14,724,506	16,196,957	17,816,653
Finance costs	22,687,875	20,876,652	18,839,027	16,546,698	13,967,828	11,066,600	7,802,718	4,130,851	-	-
Repairs and Maintenance	9,445,000	10,389,500	11,428,450	12,571,295	13,828,425	15,211,267	16,732,394	18,405,633	20,246,196	22,270,816
Net Profit Before Tax	(18,231,292)	1,050,048	83,300,170	81,610,396	79,263,694	76,174,272	72,247,291	67,378,003	61,450,819	49,691,077
Taxation	FALSE	346,516	27,489,056	26,931,431	26,157,019	25,137,510	23,841,606	22,234,741	20,278,770	16,398,055
Net Profit After Tax	(18,231,292)	703,532	55,811,114	54,678,965	53,106,675	51,036,762	48,405,685	45,143,262	41,172,049	33,293,021
Profit brought forward	-	(18,231,292)	(17,527,760)	38,283,354	92,962,319	146,068,994	197,105,756	245,511,440	290,654,703	331,826,751
Accumulated Profit	(18,231,292)	(17,527,760)	38,283,354	92,962,319	146,068,994	197,105,756	245,511,440	290,654,703	331,826,751	365,119,773

Income statement Combined Facility

Cash flow statement Combined Facility

Marble Processing Financial Projections

Statement of Cash Flows

Amounts in PKR

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash flows from operating activities											
Profit before tax		(18,231,292)	1,050,048	83,300,170	81,610,396	79,263,694	76,174,272	72,247,291	67,378,003	61,450,819	49,691,077
Add: Depreciation		25,475,500	25,475,500	25,475,500	25,475,500	25,475,500	25,475,500	25,475,500	25,475,500	25,475,500	25,475,500
Add: Finance cost		22,687,875	20,876,652	18,839,027	16,546,698	13,967,828	11,066,600	7,802,718	4,130,851	-	-
Add: Amortisation		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
		30,932,083	48,402,200	128,614,697	124,632,594	119,707,022	113,716,372	106,525,508	97,984,354	87,926,319	76,166,577
Changes in working capital											
Stores and Spares		(7,556,000)	-	-	-	-	-	-	-	-	-
Trade payables		13,335,000	3,787,140	13,412,343	1,526,724	1,603,060	1,683,213	1,767,374	1,855,743	1,948,530	2,045,956
Trade receivables		(13,335,000)	(3,787,140)	(13,412,343)	(1,526,724)	(1,603,060)	(1,683,213)	(1,767,374)	(1,855,743)	(1,948,530)	(2,045,956)
Income tax paid		-	(346,516)	(27,489,056)	(26,931,431)	(26,157,019)	(25,137,510)	(23,841,606)	(22,234,741)	(20,278,770)	(16,398,055)
Net cash generated from operations		23,376,083	48,055,684	101,125,641	97,701,163	93,550,003	88,578,862	82,683,903	75,749,613	67,647,549	59,768,521
Cash flows from investing activities											
Fixed Capital Expenditure	(277,505,000)	-	-	-	-	-	(9,000,000)	-	-	-	-
Net cash used in investing activities	(277,505,000)	-	-	-	-	-	(9,000,000)	-	-	-	-
Cash flows from financing activities											
Proceeds from Share Capital	121,002,000	-	-	-	-	-	-	-	-	-	-
Debt (drawdown and repayment)	181,503,000	(14,489,781)	(16,301,004)	(18,338,629)	(20,630,958)	(23,209,828)	(26,111,056)	(29,374,938)	(33,046,806)	-	-
Finance costs		(22,687,875)	(20,876,652)	(18,839,027)	(16,546,698)	(13,967,828)	(11,066,600)	(7,802,718)	(4,130,851)	-	-
Net cash flow from financing activities	302,505,000	(37,177,656)	-	-							
Net increase/(decrease) in cash and cash equivalents	25,000,000	(13,801,573)	10,878,028	63,947,984	60,523,507	56,372,347	42,401,206	45,506,246	38,571,957	67,647,549	59,768,521
Cash and cash equivalents at the beginning of the period	-	25,000,000	11,198,427	22,076,455	86,024,440	146,547,947	202,920,294	245,321,500	290,827,746	329,399,703	397,047,251
Cash and cash equivalents at the end of the period	25,000,000	11,198,427	22,076,455	86,024,440	146,547,947	202,920,294	245,321,500	290,827,746	329,399,703	397,047,251	456,815,773

USAID Firms Project

info@epfirms.com