Pakistan Initiative for Strategic Development and Competitiveness

Economic Impact Assessment of the Pakistan Initiative for Strategic Development and Competitiveness (PISDAC) and Final Report

Contract No. PCE-I-00-98-00016
Task Order No. 036

May 31st, 2008

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This report is made possible by the support of the American People through the United States Agency for International Development (USAID). It was prepared by Marcos Arocha on behalf of J.E. Austin Associates. The contents of this report are the sole responsibility of J.E. Austin Associates Inc. and do not necessarily reflect the views of USAID or the United States Government The author is indebted to all the PISDAC strategy advisors for sharing the acute insights, information, and knowledge they acquired from the industry sectors they diligently helped to become more competitive.

Acronyms and Abbreviations

ACIAR	Australian Centre for International Agricultural Research
ACIMALL	Italian Furniture Machinery Manufacturers Association
ADB	Asian Development Bank
AEDB	Alternative Energy Development Board
AIGS	Asian Institute of Gemological Sciences
AKRSP	Aga Khan Rural Support Program
APHIS	Animal and Plant Health Inspection Service (USA)
ASF	Agribusiness Support Fund
ATC	Apprenticeship Training Center
BBT	A vocational training Institute in Germany
BNU	Beaconhouse National University
BUITMS	Balochistan University of Information Technology & Management Sciences
CELDAC	Community Empowerment through Livestock Development and Credit Project
CEO	Chief Executive Officer
CFTC	Common Facility Training Center
CFTF	Common Facility Training Farm
CFTMC	Common Facility Training & Manufacturing Center
COP	Chief of Party
CSF	Competitiveness Support Fund
DGMM	Directorate General Mines & Minerals
DIN	Deutsche Industrie Normen (German Industrial Standard)
DOC	Development Outreach Communication
DTDC	Dairy Training and Development Center
DTRI	Dairy Training & Research Institute
EDF	Export Development Fund
EPB	Export Promotion Bureau
FANA	Federally Administered Northern Areas
FATA	Federally Administered Tribal Areas
FDA	FATA Development Authority
FDC	Furniture Development Corporation
FRIM	Forestry Research Institute of Malaysia
G&J	Gems & Jewelry
GDP	Gross Domestic Product
GGIP	Gems & Gemological Institute of Pakistan
GIA	Gemological Institute of America
GIKI	Ghulam Ishaq Khan Institute
GNP	Gross National Product
GSP	Geological Survey of Pakistan
HEC	Higher Education Commission
HR	Human Resource

HS	Harmonized System
IBA	Institute of Business Administration
ICA	International Colored Stone Association (sic)
ILO	International Labor Organization
IPO	Intellectual Property Owners Association
IPR	Intellectual Property Rights
LAO	London Assay Office
LOP	Life of Project
M&E	Monitoring & Evaluation
M&G	Marble & Granite
MIDC	Metal Industry Development Centre
MINFAL	Ministry of Food, Agriculture and Livestock
MOIP&SI	Ministry of Industries, Production & Special Initiatives
MOU	Memorandum of Understanding
MTC	Malaysian Timber Council
MTIB	Malaysia Timber Industry Board
MTL	Mineral Testing Lab
NGO	Non Government Organization
NRSP	National Rural Support Program
NTEVTA	National Technical and Vocational Training Authority
NWFP	North West Frontier Province
PARC	Pakistan Agricultural Research Council
PASDEC	Pakistan Stone Development Company
PCSIR	Pakistan Council for Scientific and Industrial Research
PGJDC	Pakistan Gems & Jewelry Development Company
PHDEB	Pakistan Horticulture Development & Export Board
PIDE	Pakistan Institute of Development Economics
PIDC	Pakistan Industrial Development Corporation
PISDAC	Pakistan Initiative for Strategic Development and Competitiveness
PKR	Pakistan Rupees
PNAC	Pakistan National Accreditation Council
PRSP	Punjab Rural Support Program
PSQCA	Pakistan Standards & Quality Control Authority
PVP	Plant Variety Protection
PVTC	Punjab Vocational Training Council
R&D	Research & Development
RFP	Request for Proposals
RVFC	Remount, Veterinary and Farms Corps
SIMAP	Surgical Instruments Manufacturing Association of Pakistan
SIMDEP	Surgical Instruments and Medical Devices Pakistan
SMEDA	Small and Medium Enterprise Development Authority
STTA	Short Term Technical Assistance
SWOG	Strategy Working Group
TA	Technical Assistance
TBD	To Be Decided
TDAP	Trade Development Authority of Pakistan

TEVTA	Technical and Vocational Training Authority
TOR	Terms of Reference
TUSDEC	Technology Upgradation and Skill Development Company
UAF	University of Agriculture, Faisalabad
UET	University of Engineering & Technology
UHT	Ultra High Temperature
UNDP	United Nations Development Program
UVAS	University of Veterinary and Animal Sciences
VDMA	German Furniture Machinery Manufacturers Association
VMCC	Village Milk Collection Centers
WISDEC	Wood Industry Skills Development Center
WFD	Workforce Development
WGC	World Gold Council

Background

The Task Order for Phase III of "Pakistan Initiative for Strategic Development and Competitiveness (PISDAC)" commenced on February 08, 2006. The objective of the project is to build upon PISDAC II and continue to support self-selected Pakistani industries in developing and implementing strategies to increase competitiveness and to institute a sustainable mechanism for effective public-private sector dialogue. The Task Order (036) calls for the Contractor to a) continue to assist the existing Strategy Working Groups (SWOGs) in designing and implementing their strategic and policy initiatives; b) enable three additional SWOGs to develop strategies and design and implement strategic and policy initiatives; c) facilitate public-private sector dialogue and facilitate policy and institutional reforms; and d) assist the SWOGs in designing and implementing at least 4 Workforce Development initiatives and facilitate introduction of pioneering private-sector led, demand driven training models. The Contractor is working with the Pakistan Small and Medium Enterprise Development Authority (SMEDA), and various other government agencies and ministries, provincial and local government authorities and educational institutes to help these self-selected industries organize, plan, and implement actions to increase their competitiveness.

The Technical Proposal for Phase III outlines the following measurable indicators for the project:

- At least 15 policy reform initiatives successfully implemented
- At least 4 workforce development initiatives successfully launched with evidence that other industries and education/training providers have been influenced by these models
- Minimum of 18 strategic action initiatives being implemented by the SWOGs
- A total of USD 7 million in private investment mobilized as a result of PISDAC strategic initiatives

This report presents an overall assessment of project results under the second phase of the Pakistan Initiative for Strategic Development and Competitiveness Initiative (PISDAC II), a USAID project implemented by J.E. Austin Associates Inc. (JAA) and Nathan Associates Inc.

I. Methodology and Report Organization

A competitiveness program working at the sector level such as PISDAC typically requires between 3-5 years to produce measurable impacts. The overall goal of the program is to achieve increases in productivity and value-addition[1], but other measures closely related to competitiveness may include export revenues, enterprise growth, increased wages, and average profitability of the industry. The effort begins by engaging industry leaders to act in concert (PISDAC did so by forming Strategy Working Groups, SWOGs) to develop sustainable strategies to improve the competitive position of their respective industry. Next, the project assists with strategy implementation. It may take time to prepare detailed action plans, feasibility studies, identify leading implementers, and secure financing. While stakeholder contributions begin early-on in modest amounts (through the contribution of the participating firms' executive time, provision of workshop venues, etc), it then accelerates as the project moves to maturity. Thus, the most significant investments occur at the stage of implementing action initiatives and become significant in years 3 through 5, and with them the ability to estimate their impact more accurately increases.

However, in measuring the resulting impact it must be recognized that many of the SWOG strategic initiatives have only recently been implemented and/or their benefits will outlast the project life. Thus, a full assessment needs to be conducted to consider the current and potential impact of the project, and account for the economic benefits that will materialize in the years to come.

It must also be demonstrated that the project contributed directly (wholly or partially) in delivering these results. Additionally, many results are more qualitative. The emergence of trust and cooperation within an industry sector, business-government and academia collaboration, changes in mindsets, and spread effects can be observed but not easily quantified.

As such, the assessment presented in Section III considers both qualitative impacts as well the current and potential economic impact of the project resulting from the implementation of the SWOG initiatives. For the latter, and building on previous efforts to assess competitiveness programs,[2] the concept of "economic impact" used here is based on the standard methodology for an economic evaluation of development projects. In essence, the economic impact is defined as the *current and expected net present value (NPV) of additional incomes* generated by PISDAC's SWOG initiatives. This type of analysis was only carried out for initiatives that satisfy the following criteria:

[1]In earlier efforts to monitor and evaluate cluster competitiveness initiatives, Andrew Warner suggested measuring cluster competitiveness results in terms of value-added.

[2] The methodology used here follows many criteria and aspects used to assess the impact of the USAID TCI Project in Sri Lanka. For more details see Bolnick, Bruce. "The Economic Impact of TCI Cluster Initiatives in Sri Lanka: Interim Assessment and Recommendations", November 2003.

1) Implemented and/or highly probable. The analysis only covers activities that are at a mature stage of planning, and thus have been already implemented or have a high probability of materializing within the ensuing 18 months of PISDAC's close out. Initiatives are deemed highly probable when they enjoy active support by SWOG members and are being actively pursued by their implementers, feasibility studies have or are being conducted, and financing has been secured or appears to be forthcoming. If the benefits materializing still have some degree of uncertainty, the benefits have been adjusted downward by 25%.

2) Attributable. The analysis covers only initiatives in which PISDAC's SWOG activities played a critical role in either producing or accelerating the realization of economic benefits. In cases where benefits are attributable but PISDAC's role is indirect, the benefits are adjusted downward for up to 50%.

3) Quantifiable. The analysis covers only activities where there is a reasonable basis for calculating the impact, based on information collected by SWOG coordinators and SWOG members, strategy documents, business plans, feasibility studies, and industry studies. Many activities and initiatives are likely to have an economic impact, but they are inherently very difficult to measure or data was not available at the time of the assessment, and thus were excluded from this type of analysis.

The methodology unavoidably involves a mixture of measurement and judgment. As far as possible, the judgments err on the conservative side. Also, the analysis is limited to direct effects for the industry in question; inter-industry linkages and multiplier effects are excluded. In addition, the analysis is static as no attempt is made to estimate dynamic benefits that may arise as investors and producers respond to higher profit margins or new market opportunities. All of these restrictions ensure that the estimates represent a *lower bound* on the net economic impact of SWOG initiatives.

Since many of the SWOG initiatives have already achieved a maturity stage in which benefits started accruing, (particularly those emanating from the work of the SWOGs engaged since PISDAC II), in the final analysis, the NPV of additional incomes is adjusted to reflect current and expected incomes in 2008 dollars, using the same rate employed to discount the future benefits. Additionally, all the benefit streams reflect a time horizon to 2013, and thus provide a measure of current and expected benefits limited to five years after PISDAC III close-out.

The next section assesses the extent to which the deliverables outlined in the task order 036 and its targets were met by the project. Section III introduces briefly the composition of the SWOGs, and proceeds to analyze each SWOG initiative according to the framework outlined in this methodology section. It is followed by Section IV which presents the benefit-cost ratio derived from setting the resulting economic impact estimates against the cost of USAID support. Section V contains estimates of the employment opportunities supported by PISDAC activities. Finally, section VI provides a concise account of the policy reforms enacted on behalf of the SWOGs with PISDAC support.

II. Assessment of Overall Project Results

As discussed in the introductory section of this report, the SOW under task order 036 (PISDAC Phase III) outlined five main deliverables and quantitative targets for the project. What follows is a brief assessment of how well those deliverables were met by PISDAC activities.

1) Continue to assist the existing Strategy Working Groups (SWOGs) in designing and implementing their strategic and policy initiatives;

PISDAC continued to assist the existing SWOGs (Dairy, Gems and Jewelry, and Marble and Granite) as well as the resulting sector management companies, which were in themselves a central strategic initiative for the SWOG. As detailed in Section III of the present report, the Dairy, Gems and Jewelry SWOG were assisted by PISDAC in structuring, designing and implementing at least 20 of their strategic initiatives. Additionally, PISDAC supported the existing SWOG to propose policy reforms to improve their sector competitiveness, resulting in 19 policy reforms enacted by the GoP.

2) Enable three additional SWOGs to develop strategies and design and implement strategic and policy initiatives

The PISDAC project engaged the leadership representing the entire productive value chain[3] of three additional sectors- Horticulture, Furniture, and Surgical Instruments, which agreed to work with PISDAC on a regular and more intensive basis and take part in Strategy Working Groups (SWOGs) to analyze the strengths and weaknesses of their sector by applying benchmarking and other diagnostic tools. The latter allowed the SWOGs to identify opportunities and constraints to make their sector more competitive. PISDAC acted mainly as a facilitator, which ensured stakeholder ownership and acceptance of the resulting strategies and initiatives.

PISDAC assistance enabled the three additional SWOGs to develop and design many strategic initiatives. The implementation of 14 strategic initiatives across the 3 additional SWOGs is being funded with public and private resources and leading entities are actively pursuing them, as detailed in Section III. Likewise, PISDAC assistance resulted in 14 policy reforms enacted to benefit these industry sectors. Further, in all three SWOGs, platforms leading to increased public-private collaboration (sector management companies for Furniture and Surgical Instruments), and private-private collaboration (the Balochistan Horticulture Society) have been facilitated by the project.

3) Facilitate public-private sector dialogue and facilitate policy and institutional reforms (at least 15 successfully implemented).

[3] While consumers are indeed part of the value chain, the competitiveness of an industry frequently requires targeting more sophisticated markets and consumers.

Each of the 6 SWOGs that PISDAC has been working with has served as an effective platform for public-private consultation to take place. Over PISDAC's III life, the SWOGs built working relationships with government counterparts, who have been receptive and supported many initiatives. Such dialogue has lead to the incorporation of 4 sector management companies, managed by professional private sector CEOs with board of directors composed of public-private representatives, leading to increased public-private consultation and coordination. Several strategic initiatives implemented through these companies have been funded by public and private sources, constituting evidence of the increased coordination taking place. Funding has been approved for a fifth one.

The diagnostic and benchmarking tools that were applied to each industry sector lead to the identification of many policies and institutional reforms to support each sector's competitiveness. PISDAC assisted the 6 SWOGs in developing proposals and presenting their cases to the appropriate government agencies. The GoP accepted 33 policy reform proposals as detailed in Annex II, which have lowered the entry barriers to upgrade production and have lowered the costs of operating in the sector, to the benefit of all enterprises. Through the process, the SWOGs have acquired the capacity to identify reforms, the strength of speaking with a unified voice, and how to present their case effectively.

4) Assist the SWOGs in designing and implementing at least 4 Workforce Development initiatives and facilitate introduction of pioneering private-sector led, demand driven training models.

The strategic planning process facilitated by PISDAC made it evident to all the SWOGs that skill shortages in their respective industries were limiting their ability to compete to reposition their sector into higher value-added segments, and to compete successfully in international markets. Specific training needs across all parts of each value chain were identified, and private sector-academia partnerships have emerged to address the skills deficit through new course offerings and curricula enhancement to meet current labor requirements. The SWOGs have used the benchmarking trips to establish linkages with internationally reputed institutions that are helping in addressing the skill shortages, and now have established technical cooperation agreements with local counterparts. Further, the skill shortages are also being addressed through demonstration centers and pilot projects stemming from the SWOG's strategies. Numerous workshops and seminars sponsored by PISDAC have enhanced the capacity of master trainers to develop local capacity to deliver training programs at those centers.

Four distinct private-sector led models, advised and supported by the SWOGs, have been launched. These are the AIGS-GGIP affiliation, Dairy Training and Development Centre at the University of Veterinary and Animal Sciences, the Lahore Center for Excellence for Creativity and Design (Pakistan School for Fashion Design), and the Mosaic Training Centers. These are described in detail throughout the report.

Workforce development is also occurring at the individual firm level. A firm-level survey administered by PISDAC to a sample of 60 firms participating in the SWOGs showed a 20% increase in the number of firms running formal training programs for their employees, from 30% in 2003 to 50% in 2007, attributing it to PISDAC's technical assistance and emphasis on the importance of workforce development.

5) A minimum of 18 strategic initiatives are under implementation, and a total of USD 7 million in private investment mobilized

PISDAC was very effective and successful in assisting the SWOGs in implementing their strategic initiatives. The implementation of most strategic initiatives requires the identification of funding sources, and PISDAC was also very successful on this account. Indeed, the project accomplishments largely exceeded both targets.

Across the six SWOGS, 34 strategic initiatives are being implemented. Public and private sources of funding are financing those initiatives, and either private firms, public-private institutions, government agencies, and education and training centers or other stakeholders are actively pursuing them and leading the implementation, as described in each particular case in Section III.

A total of US$106.8 million was mobilized towards the design and implementation of the SWOG initiatives, with US$67.1 million coming from private sources. They were made directly by the SWOG members as a result of a SWOG initiative, or were otherwise influenced by PISDAC activities. They only reflect the amount that PISDAC staff was able to track through its interactions with the SWOGs and other stakeholders, but the project is likely to have influenced many other investments. The most significant ones are detailed in Section III.

TABLE II.1: INVESTMENTS MOBILIZED BY PISDAC III

US Millions	*Private*	*Public*	**Total**
Dairy	$ 63.4	$ 9.4	$ 72.8
G&J	$ 0.5	$ 2.2	$ 2.7
Furniture	$ 0.3	$ 9.8	$ 10.1
Horticulture	$ 0.4	$ 0.0	$ 0.4
M&G	$ 0.2	$ 16.7	$ 16.9
Surgical Inst.	$ 2.3	$ 11.6	$ 13.9
Total	$ 67.1	$ 49.7	**$ 106 .8***

III. Economic Impact Assessment

A. Dairy

The Dairy SWOG is composed of 16 farmer organizations and 6 rural support programs (representing a total of 710,000 farmers), 15 processors, 6 NGOs working with farmers; 3 feed providers; the four provincial Livestock and Dairy Development Departments (employing over 11,000 breeding and veterinary services providers); 3 industry associations; 4 equipment manufacturers, 7 universities, and 2 business service providers. Additionally, government quality testing and research laboratories (PCSIR, UVAS, UAF & PSQCA), and federal government ministries such as the Ministry of Food, Agriculture & Livestock, Ministry of Industries, Ministry of Science and Technology, Central Board of Revenue and Departments of Sales and Income tax, and the State Bank of Pakistan, Bank of Punjab and Standard Chartered Bank have been supporting the SWOG's work and the initiatives that have emanated.

In early 2006, the SWOG identified and agreed on an initial set of 9 strategic, as well as many policy constraints and workforce development skill gaps that needed to be addressed to raise the productivity and the competitiveness of the sector. Throughout the process, PISDAC has provided international and national specialized technical assistance including business strategists, dairy experts, research specialists, and dairy farming experts to structure action plans and implementing the resulting initiatives.

With PISDAC assistance, the SWOG, as well as the sector management company that resulted from its efforts (Pakistan Dairy Development Company), subsequently refined, improved, created action plans, and found diverse public and private sources of funding as key implementing entities and leading sponsors to advance its vision. At the close out of PISDAC III, 8 strategic initiatives are being implemented as a result of those efforts. They are:

1. Model Commercial Farm Program
2. Farm Cooling Tank Program
3. Creation of Dairy Pakistan (DP) to facilitate its strategy implementation and public-private collaboration
4. Strengthen international linkages to acquire modern technology
5. Develop new supply pockets
6. Organize Farmer Cooperatives
7. Genetic Improvement of Animals
8. Raising the Capacity of training and research institutes

<u>Quantifiable Impacts and Results</u>

MODEL COMMERCIAL FARM

With the objective of increasing the supply and quality of milk, a main strategic initiative identified by the Dairy SWOG was to establish model commercial dairy farms, using advanced techniques that increase productivity per animal. The benchmarking exercises highlighted that Pakistan's animal productivity was well behind other major dairy producers. These farms would have a demonstrative impact, serve to disseminate the superior practice throughout Pakistan, and be used to provide practical training to other farmers.

To advance the initiative, Pakistan Dairy Development Company (PDDC, also known as Dairy Pakistan), the sector management company created by the SWOG efforts to implement the SWOG's strategy, focused on putting together a SWOG inspired program to establish 300 model commercial farms. Interventions in the farms have been carried out under the advice of DP technicians in three phases, during which best practices transferred focus on providing water at the right time, record management, improving the feed and vaccinations, among others. The exact nature of the intervention varies by farm size and the prevailing practices. However, the intervention aims principally in mechanizing the farm to increase productivity per animal, as opposed to providing support for the acquisition of more animals. Farms selected for the program negotiate an interest free loan to invest in the improvement, with the interest covered from PDDC's budget. The design of program has built-in a strong incentive for the farmer to follow the transferred practices and thus fulfill the objectives of the program. In the third year, if the practices have been followed as measured by certain parameters, 50% of the loan would be also covered by PDDC. The program includes in its costs 3 years of advisory services from PDDC's technical staff, which now has 18 technicians dedicated to this initiative.

At the end of 2007, 167 farms were installed, and by project close-out, 250 will be in place. Thus, the original target has been practically met. Nevertheless, the success and need for the initiative, as well as the demand generated for it, has prompted PDDC to increase the target. At the current pace, they estimate they'll have intervened 600 farms by year end, and intervene 600 more every year.

The original model presented in PISDAC's II Close-Out Report was developed before the program rolled out, and it was built using very preliminary estimates on the basis of early testing conducted by PDDC's technical staff and the programs original targets.[4] With the benefit of 250 farm interventions, more accurate estimates have become available to measure the impact of the current and expected economic impact of the initiative, and our original model has been adjusted to reflect them (all the parameters used are presented in Annex III).

The key parameters used to estimate the economic benefits our updated impact model uses are that output per farm increases 50%[5], which is a conservative estimate since

[4] As correctly pointed out by the drafts shared by the MSI Team that is conducting an evaluation of USAID's Economic Growth Programs in Pakistan

[5] According to data collected by PDDC's, a 4-day installation period is required per farm, and results of at least 30% in increased output are achieved within 10 days. In some cases, output has increased as much as

output benefits of proper management are excluded, and average production costs on a per liter basis fall by 35%. Although the costs of most farm intervention have been PKR 184,000 (about US$ 3,000), it has been revised upwards to PKR 200,000 to reflect recent increased costs. The model assumes an initial capital outlay of 10%, and the total investment, including the interest paid by PDDC as well as loan amortizations on the remaining 90% of the loan over five years are subtracted from the benefit stream in equal yearly amounts. Further, yearly production of milk is adjusted to 305 days per animal. For simplification purposes, we adjusted the number of farms installed to 425 initially, which is the mid-point between the 250 that were already installed by May 2008, and the target PDDCs target of 600, and it assumes that PDDC will complete interventions in 525 farms each year (75 farms less than the established target). Extending the benefit horizon to 2013 (five years after PISDAC III closes out in 2008), **the NPV (2007) of additional income as a result of this initiative (returns to capital) is US$96.6 million.**

The initiative is fully attributable to the work of the Dairy SWOG and technical assistance through PISDAC. The SWOG's work highlighted the productivity gaps, established the linkages with appropriate international institutions, triggered the creation of PDDC and secured the funding, facilitated technical assistance to the sector management company to structure the best practices program.

It must be noted that the analysis excludes the additional benefits to come from the demonstration effects and potential spread of the best practices to neighboring farms. Additionally, it is also important to note that, even though PDDC is facilitating the interventions through technical assistance and interest free loans, at least 50% of the investment (excluding interest) is effectively being made by the private sector through the loans negotiated with participating banks. In this respect, the private sector has invested approximately PKR 23,000 million (about US $383,000), and about US $1,500 per each additional farm installed.

FARM COOLING TANKS

Refrigeration and logistics are significant constraints to milk production and distribution in Pakistan. While milking occurs twice per day, in most areas only the morning milk (60% of potential output) gets distributed and sold. The rest is either consumed in farm or wasted. Of the milk farmers do sell, more wastage accumulates en-route-to market due to lack of proper cooling, storage and transportation systems. The result is that demand for milk is growing much faster than supply.

One of the key initiatives identified by the Dairy SWOG was upgrading rural and urban supply chains by facilitating investment in chilling tanks for purchase and collection of milk; which will increase the quality and supply of milk as well as provide farmers with an outlet (in effect, a market) to sell it at. PDDC has advanced this initiative in what is known as the Model Collection Program or Farm Cooling Tank (FCT) scheme.

400% within 3 months, although these are the least of the cases to date. This data was provided by PDDC, through Bill McD Stevenson, General Manager Farm Production, on a personal interview that took place on April 30th, 2008.

The original FCT scheme aimed at facilitating the installation in Pakistan of an additional 2,150 farm cooling tanks, effectively doubling the number of the ones in place in 2006. Under the program, prospective owners/operators are required to make an initial investment of 20 percent of the total costs, and finance the rest through a five-year interest free loan. The interest is to be absorbed by the GoP, though, unlike the model commercial farm program, there is no grant forthcoming and the private sector must amortize the loan fully. PDDC processes the private sector applications for the tanks, and those approved are forwarded to collaborating banks to negotiate the loan. The general criteria in approving applicants are the ability to collect milk to operate the tank at an optimal capacity, and the availability of all required utilities. **To date, PDDC has facilitated the installation of 1,000 farm cooling tanks, providing employment to at least 1,000 tank operators, but most likely 1,500 as many tanks are being operated by 2 persons.**

The original impact model presented in the PISDAC II Close-out report was prepared before a single cooling tank facilitated by PDDC was installed. As such, very preliminary estimates were used. We have updated the original impact model (the full assumptions are detailed in Annex III) to reflect the estimates that are now available. Thus, we lowered the original assumption with respect to the operating capacity of the tanks (from 75% of their capacity to 50% to reflect the experience with the initial 1,000 tanks). We adjusted the investment requirement upwards (steel price increases are creating pressures on the costs of the tanks), and revised the margin per liter downwards to 1 rupee, to account for the increased collection costs stemming from lower capacity utilization). The initial capital outlay is assumed at 20%, and loan amortization payments as well as interest payments[6] are deducted from the benefit stream.

Each tank is employing between 1 and 2 operators, we assumed 1.5 operators per tank at a yearly wage of PKR 54,000, and included this payment to labor in the benefit stream. It is expected that at least a portion of the milk collected in the tanks would have been lost due to the existing constraints in supply. The exact amount of waste reduction is not known, and varies with respect to the exact location of the cooling tank. The previous model assumed a higher level of wastage, but it has been adjusted to a lower 3%. For simplification purposes, the impact model assumes the installation of 500 in 2007, and 500 additional ones each year until it reaches 2,000 in year, and then extending the benefits through 2013 (five years after PISDAC III close-out), although the real numbers up until now have been 133 (early as 2006), 748 (end of 2007), and 1000 (April 2008). Under these assumptions, **the NPV (2006) of additional incomes to the economy (returns to capital and labor) of this initiative is US $32.0 million.**

One qualification is important to note here. The future of the farm cooling tank program is unclear, as Dairy Pakistan is considering that there are enough demonstration projects showing the viability of this operation, and it is likely that other donors, provincial governments, and the private sector itself would follow the example. In this context,

[6] The loans will be interest free, but the GoP will be paying the costs nevertheless, thus, these costs are included in the benefits calculation.

PDDC is considering making use of its resources in other more ambitious programs. Since the final outcome of PDDC's deliberations is yet unknown, we assumed in our model that PDDC will continue to work towards the original installation target, as explained.

Nevertheless, it is useful to note that PDDC is merely facilitating the purchase of the tanks at a reasonable cost and providing limited technical advice, reducing the risk of the investment by absorbing the interest cost, as well as processing applications to ensure the economic viability of the tank and ensure that the demonstration is maximized. The private sector has borne all of the other investment costs (including land and building, which are excluded from the impact model). **At a total cost of PKR 432,000 (about US $7,000) and even if the not a single additional tank is facilitated by PDDC beyond the 1000 installed, the private sector has invested a total of US$7 million in the initiative** (out-sizing largely the public sector investment in the operating costs of the initiative and the interest free loans).

Even further, the analysis up to this point excludes likely productivity increases due to improved market access; and the value added to the extra milk through the rest of the supply chain. While there is no reliable data at this time to measure the first exclusion, some indicative estimates can be made regarding the second one. Indeed, the Farm Cooling Tank must be understood as an "enabling program". By this we mean that it is significantly improving the quantity of quality raw material, it allows processors to generate more value added. With 1000 cooling tanks installed collecting each 500 liters per day (operating at 50% of the capacity), **the supply of chilled milk has effectively been increased by 500,000 liters per day.**

In this context, industry sources indicated that in some cases, a profit of PKR 8 on each liter of chilled milk is possible. While this represents an upper bound estimate, it reasonable to estimate that the bulk of the extra milk is earning processors between PKR 2 and 3 per liter. Using data obtained from a firm-level survey in which 4 processors participated, the net margin as a percentage of sales averaged for these processors 26.8 percent, which will indicate that this net margin supports PKR 7 of sales per liter. Likewise, labor costs averaged 37.0 percent of sales, and the average annual salary for these processors was PKR 111,109 (about US$ 1850). Under these assumptions, **value added (pre-tax profits and payment to labor) at the processing stage due to the increase of half a million liters per day over a five year horizon results in a NPV (2008) of US$68.4 million.** If the resulting yearly payments to labor under these assumptions are divided by the annual average wage results in **4,473 jobs** supported by the initiative.

From the early days of working with the Dairy SWOG, many processors reported to PISDAC staff that the prospects of increases in the supply of chilled milk were triggering sizable investments in processing capacity, which makes the above impacts all the more likely even if the exact amount or returns are impossible to measure with the data available. Given the indirect role of these impacts and that only data from four

processing units was available at this time **we discounted 50% of the impacts at the processing stage resulting in an adjusted NPV (2008) of US$34.2 million.**

In May 2008, Pakistan Dairy Development Company (known as Dairy Pakistan) facilitated the installation of 1,000 farm cooling tanks, mobilizing private sector investment worth US$ 7 million

PAKISTAN DAIRY DEVELOPMENT COMPANY

The SWOG benchmarking and study trips facilitated by PISDAC enabled its members to learn about institutions such as Dairy Insight in New Zealand) and Dairy Australia, making it obvious to them that a body of this type was necessary in Pakistan. This led the SWOG to propose the creation of Pakistan Dairy Development Company to serve as public-private platform to promote the competitiveness of the dairy sector and made it an integral part of its strategy. The various presentations led to an initial commitment of government funds of just under US $8 million over five years for its operation and activities. It is managed by a private sector CEO, under the guidance of a Board of Directors composed on public and private stakeholders (many of them members of the SWOG).

The facilitating role that the SWOG inspired sector management company (PDDC) has been introduced through the explanation in the preceding sections of the two SWOG inspired programs it was originally tasked to implement. Since its creation, Dairy Pakistan improved, administered, implemented, and augmented the SWOGs' original

portfolio of strategic initiatives. It has crafted at least 8 programs that were not originally in the SWOG strategy and moving towards implementation. A case in point is the Biogas plant Program, which make use of cow dung to manufacture natural gas which can be used for cooking, heating and other household usage. So far 47 Biogas Plants have been deployed. Additionally, it has received private funding from processors (the latest figure indicated PKR 107 million, about US$1.7 million) towards completing its mission.

Indeed, PDDC has had an impact beyond the implementation of the SWOG program, and serving as a public-private coordination mechanism for the dairy sector. It has served as a model which has been replicated in structuring sector management companies in four other sectors that PISDAC worked with.

"The potential of the Dairy Sector in Pakistan is being realized, even if it will take time to get close to achieving its potential"- Geoff Walker, CEO, Pakistan Dairy Development Corporation

BALOCHISTAN DAIRY COOPERATIVE

The organization of the Balochistan Dairy Cooperative embodies a pilot implementation of two SWOG initiatives, that of developing new milk supply pockets by surveying areas where there is production and marketing potential, and if viable, organizing them in Dairy Cooperatives. Towards the implementation of this initiative, more than 400 households in the towns of Pishin and Kuchlak (and other surrounding areas) were surveyed by PISDAC consultants to determine daily production capabilities, daily milk consumption, what portion of the total was sold, as well as the prices farmers obtained for the latter. The survey showed that a total they were more than 1000 animals in the areas with a daily milk production of 11,481 liters, of which 7237 was consumed, and 4263

was sold at an average price of PKR 17 per liter. The survey also showed that at a two-hour drive, in the capital city, Quetta, milk sold at retail shops at a significantly higher price of PKR 28 per liter.

These findings demonstrated that it was feasible to obtain 1,700 liters a day, which was enough volume to start a dairy cooperative that would collect milk in Pishin and Kuchlak, and transport it to Quetta where retail shops could be established and owned by the cooperative. PISDAC thus promoted the idea among the potential participants, securing enough support, including NGOs and government agencies, to start operations. It also assisted in preparing the feasibility study, as well as securing the matching grant from the Competitiveness Support Fund.

The assumptions our impact model uses are a gross margin for the cooperative would amount to PKR 8 per liter collected (PKR 27 – PKR 19 paid to the milk suppliers). The expenses per liter of operating the cooperative are estimated at PKR 4.56, leaving an income of PKR 3.44 to be redistributed and/or expand operations. The farmers would receive a premium of PKR 2, encouraging a strong supply response. The activity will create 12 direct jobs (collection and selling staff, project coordinator, other support staff and drivers) that will run the operation. Initially, the cooperative is expected to benefit as many as 300 households, and perhaps 1500 by the third year.

The costs of the machinery, including the 4 cooling tanks needed to transport the milk as well as other start-up expenses are used as the initial capital outlay. The earnings of the cooperative, payments to labor, as well as the PKR 2 per liter premium that the cooperative will pay its suppliers are included in the benefit stream. Under these assumptions, **the NPV of net additional incomes of this activity over a five year horizon amounts to US$0.2 million.**

The Competitiveness Support Fund has approved this project, and will provide a matching grant of around PKR 7.5 million. The first installment was disbursed in April 2008, and the cooperative is expected to start operations very shortly. It is hoped that at later stages, when enough volume is obtained, the Balochistan Dairy Cooperative could engage in processing the milk it collects. So this model is not only highly replicable, but also expandable.

DAIRY TRAINING AND DEVELOPMENT CENTER

Through the strategic planning process undertaken by the SWOG awareness has increased amongst public and private stakeholders about the important gap in skilled manpower across the entire productive value chain, from farms and collection centers to distribution, which needs to be addressed to increase the competitiveness of the sector. The Training Core Group of the Dairy SWOG worked on a sub strategy to address skill gaps in the dairy sector, and worked closely with academia to propose the establishment of a sustainable and demand driven practical training center at University of Veterinary & Animal Sciences, Lahore (UVAS).

The Dairy Training and Development Center (DTDC) is being established at the UVAS Ravi Campus in Patoki, Punjab Province. The foundation stone laying ceremony was held on April 07, 2008 at Patoki, chaired by the interim Minister for Food, Agriculture and Livestock Mr. Mumtaz Manees. The initial staff to run the DTDC has been hired, including the Project Director, four instructors and janitorial staff.

The DTDC initial mandate is to provide training in the form of 1 and 2 year diploma courses, as well as short courses spanning over 6 weeks. The estimated number of professionals to be trained in a year is estimated at 160. The Center will include a modern dairy processing plant for research and training purposes. The center will include a Dairy plant which is equipped with facilities to enable the DTDC to undertake product and process' development on a fee basis. The SWOG, assisted by PISDAC, facilitated the collaboration of the UVAS with PTC+, an international training centre located in Netherlands, which focuses on high quality training in the field of agriculture, dairy technology and dairy production. Private sector representatives (including SWOG members), as well as PDDC, participate in the Advisory Board, which will ensure that the center continues to responds to private sector needs.

B. Gems and Jewelry

The Gems and Jewelry SWOG groups about 80 core members, which are enterprises involved in activities that represent the complete value chain- processors, retailers, manufacturers, artisans, exporters, and equipment manufacturers. Many academia and training institutions, such as Lahore University of Management and Science (LUMS), Pakistan School of Fashion and Design, Beacon House National University, Technical Education & Vocational Training Authority (TEVTA), the Institute of Business Administration, the Punjab Vocational Training Council (PVTC), and the Gems and Gemological Institute of Pakistan have participated in meetings to discuss and assist in the development of many of the resulting initiatives. The SWOG also works closely with Pakistan's Council for Scientific and Industrial Research (PCSIR), Pakistan's National Accreditation Council, and Pakistan's Council for Quality Standards Assurance, as well as with Ministry of Commerce through the Trade Development Authority of Pakistan (TDAP) formerly known as the Export Promotion Board, and the Ministry of Industries through SMEDA.

With PISDAC's assistance, the SWOG arrived at the common, overall strategy of *repositioning the industry from a cost-based sector to a high value-added, competitive brand in the global market*, identifying an initial set of 8 strategic initiatives as well as specific policy constraints and workforce development skill gaps needed to be addressed to advance this vision and build the industry's competitiveness. It was presented to several government agencies, resulting in an initial commitment of about $2.2 million for the creation and expenses of a sector management company proposed by the SWOG.

This lead to the creation of the Pakistan Gems and Jewelry Development Company (PGJDC[7]), led by a Board composed of private and public members, to facilitate the implementation of the SWOG's initiatives. PGJDC has worked with PISDAC's and the SWOG assistance towards structuring, refining and prioritizing its strategic initiatives, as well as allocating funding commitments from the GoP.

At PISDAC III close-out, 6 SWOG strategic initiatives satisfy the criteria set forth for considering an initiative under implementation (or implemented), which are receiving both public and private funding:

9. Country Branding and Marketing Campaign
10. Hallmarking and Assaying (Karachi & Lahore)
11. Sector Management Company
12. CFTMCs (3) (In Karachi, Lahore & Gilgit)
13. Gem Laboratories (3) (In Quetta, Peshawar & Gilgit)
14. Gem Exchange (1) (In Peshawar)

[7] PGJDC has launched a website which can be consulted for up to date information on the status of the G&J SWOG initiatives www.pgjdc.org.

Quantifiable Impacts and Results

A main initiative of the G&J SWOG that has been implemented over the life of the PISDAC program is the establishment of Pakistan as a world-class gold jewelry supplier through a country campaign to position the industry in the international market and establish recognition at trade shows. As reported in PISDAC's II Close-out report, a country campaign to position the industry in the international market and establish recognition at trade shows was launched at the Bangkok Gems and Jewelry Show, in September 2005. Assisted technically and logistically by PISDAC, the SWOG participated for the fist time under a single umbrella and launched the Pakistan Gems and Jewelry Brand. The effort included an elegant constructed pavilion, pre and post exhibition advice by a marketing consultant, organized press coverage, and world-class catalogs and brochures. The exhibition was a complete success, leading to **4 million USD in new export sales of jewelry** (a very significant amount when compared to the US$20 or so million that Pakistan exports in a given year).

The SWOG and the now constituted PGJDC continued the effort of putting Pakistan on the international map in subsequent years. In 2006, an increased number of Pakistani companies participated at the Bangkok Fair, and even though the fair organizers reported a 20 percent drop in visitors over the previous year, after show surveys and interviews with participants captured **sales for about US$10 million. In 2007, a similar amount of sales was reported for participation in the Bangkok Fair as well as an additional $10 million in an exhibition Dubai.**

We have adjusted the model presented in PISDAC's II Close-out Report to reflect the larger amount of sales in 2006 and 2007. Keeping the level of sales reached in 2007 constant over the time horizon to 2013 (five years after PISDAC III close-out, these adjustments result in a **NPV (2005, returns to capital and labor) of the marketing initiative of USD$10.8 million.** At this level of increased sales, the estimate of artisans employed, **either under sub-contract or at the exporters' premises, increases to 480 from the 80 estimated before.**

Visibility and know-how to develop awareness and generate traffic to the exhibitors' stands are crucial to have successful participation in these events. PISDAC and the SWOG collective efforts provided those two crucial elements. However, our adjusted NPV reflects a 50% discount to account for the possibility that the sale success could have happened without the collective marketing effort. With the discount, **our adjusted NPV (2008) of the additional incomes from the initiative's implementation results in US$7.8 million.**

The Country Branding Strategy from the G&J SWOG has continued to generate traffic towards the Pakistani pavilion and to produce large amount sales at international exhibitions

"The Pavilion was unique in that with a unified, striking presentation it provided an education to the international trade in the country's strengths"- Hanif Kapadia, Thailand

Beyond the continued success of the branding campaign, the formation of Pakistan Gems and Jewelry Development Company has created a platform for continued public-private consultation to build the sector's competitiveness. While progress has been slower than originally expected, PGJDC, assisted by PISDAC, has taken important steps towards the implementation of the other initiatives.

In particular, international experts have been engaged to build local capacity to establish training programs at the planned Common Facility Training and Manufacturing Centers (CFTMCs). A gemstone mining/geology expert has being engaged to transfer appropriate technology to enhance the capacity of miners in high elevation gemstones mining locations of Pakistan to improve ventilation at their mines, enabling them to increase the depth of mine shafts while improving health safety for miners. Likewise, jewelry manufacturing experts, as well as gemstone cutting experts from Sri Lanka facilitated by PISDAC, have imparted training workshops to around 40 trainees from all over Pakistan (Punjab, Sindh, Balochistan, NWFP, Islamabad, FANA and FATA) as part of the efforts to create a pool of national master trainers.

Even before the opening of the CFMTCs, the training is starting to have an impact, as a few manufacturers reported that they had upgraded their facilities according to the practices demonstrated through these workshops. Additionally, PGJDC has rented out space to house the planned CFMTCs, as well as for the gem laboratories in Karachi, Lahore, Quetta and Gilgit, and the planned Gem Exchange in Peshawar should be opening soon.

AIGS-GGIP Affiliation

A memorandum of understanding was signed between Asian Institute of Gemological Sciences (AIGS) Bangkok and Gems and Gemological Institute of Pakistan. AIGS, a global leader in gemology training, has agreed to open up an affiliated campus in Pakistan. The technical collaboration agreement will improve the locally available skilled workforce though the offering of courses in gem identification (including synthetic and heated), diamond and color stones grading and pricing, and jewelry design will be offered. The G&J SWOG established during their missions to Thailand the critical links to establish this collaboration.

Lahore Centre of Excellence for Design Creativity

Through collaborations with the HEC, SMEDA, PGJDC and the Furniture and Gem and Jewelry SWOGs, PISDAC has encouraged the establishment of the Lahore Center of Excellence for Creativity and Design, which will provide a platform for industry, academia and technical institutions to join efforts in improving the competitiveness of the Gems and Jewelry industry of Pakistan though improvements to the workforce skills. PISDAC coordinated with the SWOG, academia and technical training institutions in Lahore to form a formal consortium, and has also facilitated the signing of a formal MOU between them. Under the MOU, the universities and colleges agreed to collaborate with the furniture and G&J private sector and PCSIR to develop curricula, exchange

information, upgrading course offerings, and share laboratory and technical facilities, to promote creativity and design skills among the students, which were both priority needs of the SWOG's workforce skill gaps identified through their strategic planning process. With PISDAC's technical assistance, machinery has been procured and curricula have been developed for 3 year degrees for a Bachelor's Degree in Furniture Design and Making, as well as a similar offering for Jewelry, starting in September 2008, with an expected initial enrolment of 40 students per year.

C. Marble and Granite

The Marble & Granite SWOG is composed by stakeholders from across the value chain, covering quarrying through processing, retail and export. The main clusters are situated in Buner, Mansehra, and Kohat in the NWFP province, with almost 450 processing and 400 quarries, while Khuzdar, Lasbela, and Chaghai districts in Balochistan host approximately 500 quarries and 75 processing units. Sindh and Punjab also have some quarrying activity while the processing cluster in Karachi is one of the largest with over 500 factories. The SWOG's work has benefited from the inclusion of participants from all major clusters, including stakeholders from Balochistan, FATA, Sindh, Punjab and NWFP. Active participation has also been registered from representatives of the provincial Director General of Mines and Minerals, SMEDA, the Trade Development Authority of Pakistan formerly known as the Export Promotion Bureau (EPB) and Geological Survey of Pakistan (GSP). R&D organizations and universities- such as the Center of Excellence in Geology at the University of Peshawar and University of Engineering and Technology (Peshawar) as well as the Institute of Management Sciences in Peshawar have also worked closely with the SWOG. Additionally, the EU's Financial Services Sector Reform Program (FSSRP) has also been a collaborator, supporting a marble-asset mapping project generated by the group.

With technical assistance from PISDAC, the industry was analyzed through a series of diagnostic tools, leading to the identification of constraints and opportunities for the sector as a whole. In 2005, the SWOG arrived at an overall strategy of *upgrading the entire value chain focusing on the extraction stage*, identifying initially 9 strategic initiatives as well as more specific initiatives to address policy constraints and skill gaps in the workforce.

The SWOG made formal presentations of its strategy to the Minister of Industries, Production and Special Initiatives, the Governor Balochistan and The President and Prime Minister of Pakistan. The SWOG also presented a FATA specific sector strategy to the U.S Ambassador. This led to the commitment of US $38 million over five years to implement the SWOG strategic initiatives, including funds for the operation of Pakistan Stone Development Company (PASDEC), a sector management company proposed by the SWOG to facilitate the implementation of the resulting strategic initiatives. PASDEC was incorporated on June 24 of 2006, with a Board of Directors comprised of 7 members from the private sector and another 5 from the public sector, and professional management from the private sector.

PISDAC has supported the work of PASDEC and the SWOG since its inception, which has included a natural prioritization, improvement, and optimization of the strategic initiatives originally identified. The forthcoming finance of other public and private funds also plays a role in this process, as well as the identification of suitable leading implementers that actively pursue the initiative. As a result of this process, at PISDAC III close-out, 6 SWOG strategic initiatives satisfy the criteria set forth for considering an

initiative as implemented or under implementation, and being funded by both public and private investment:[8]

1) Creation of a sector management company to facilitate strategy implementation and improve public-private dialogue coordination;
2) Establishment of 10 model quarries
3) Development of 5 Marble Cities
4) Upgrading 20 quarries
5) Establishment of 2 machinery pools, making equipment available at a reasonable cost
6) Opening 5 CMTFCs

Quantifiable Impacts and Results

MODEL QUARRIES AND QUARRY UP-GRADATION

Realizing that the weakest link in the marble and granite sector value chain occurs at the extraction stage, where 73 % of the potential volume of a non-renewable resource is wasted, one of the key strategies of the Marble and Granite SWOG has been the establishment of model quarries employing the latest technology to improve the availability and the quality of the marble and granite produced, and more importantly serving as a demonstration for the rest to follow and a source of hands on training to develop the skills of the available workforce. As reported in the PISDAC II Close-Out Report, a number of SWOG members jump-started the implementation of the initiative, and invested in developing five new quarries with improved practices and advanced technology.

For these investments to occur, PISDAC (and the SWOG process played an important role) by raising awareness of the investment opportunity; by enabling access to information generated among SWOG members regarding available machinery, technology, and best practices; and through a risk reduction effect through the provision of specialized technical assistance that advised on quarry development and validated general and specific feasibility studies presented to them (including on-site visits to the proposed quarries to be upgraded). The four investors (one company invested in the mechanization of two-quarries, making a total of 5 upgraded quarries) were interviewed in 2006 in preparation of the report to confirm these investments, and expressed the important role that PISDAC and the SWOG played in those terms of increasing their confidence to invest in upgraded machinery.[9] It is useful to mention that this industry is capital intensive, requiring large amounts of investments before obtaining returns, and as

[8] As a reminder, the criteria set forth are the availability of funds to implement the initiative, as well leading sponsors that have made progress towards implementation. Both are indications that the initiative is being actively pursued.

[9] The name of the enterprises that invested in quarry mechanization as a result of SWOG activities are Pak Rock Corporation, Marina Industries, Lepak Mining, and Resources Industries.

such risk is quite high, especially in Pakistan, since many advanced techniques for geological mapping are not available.

To calculate the benefits to the economy, we based the income stream on the expected earnings[10] of a feasibility study for one of the five quarries, which was shared with us and validated by PISDAC's international experts, and assumed that the other five investments would produce similar results. We have adjusted the model (details in Annex III) to reflect a shorter time horizon for the income stream (2006-2013, five years after PISDAC's close-out in 2008) and reduced the real discount rate used at that time (14.5 percent) to 10 percent, which is used more conventionally for assessing the impact of development programs. **The resulting NPV (2006) of additional incomes as a result of this initiative (returns to capital and labor) is US$3.1 million.**[11] While it is clear that PISDAC played, at the very least, an important role of accelerating these investments, and since is not unthinkable that those investments could have occurred without PISDAC's assistance, **we discounted 50% to calculate the adjusted NPV (2008) of net additional incomes, resulting in US$1.9 million.**

Further, the five quarries are employing altogether about **100 workers** (both PASDEC's general feasibility studies as well as the one from which this income stream is derived coincide in that employment needs number 20), many of them with improved wages as they are being trained in using modern technology such as the wire-rope cutting system. These wire operators can fetch double the PKR 4,000-6000 salary of an unskilled quarry worker.[12]

Beyond this jump-start, PASDEC has been working diligently in setting forth the selection process, criteria, and partners leading to the facilitation of 10 model quarries and 20 upgraded quarries, as well as promoting the program. The elements being examined from the private sector applications received (about 100 have been short-listed) for selecting the sites are the quarry cultivation business plan, the geological quality of the proposed quarry, the location within a cluster to maximize the demonstration effects, and the relative infrastructure on the site such as utilities and roads.

Reportedly, the first PASDEC model quarry is being installed and is expected to be operating by June 2008. The selected site is in Khuzdar, Balochistan. The general framework under which the model quarries are being established is that of public-private partnership, in which PASDEC as well as private investor would both have an initial equity stake. Later on, it is expected that the private investor buys PASDEC out. Every model quarry will entail a different arrangement of public-private participation, and given the presence of private investment in the deal, data on the precise arrangement for this model quarry was not shared at this time, although sources close to PASDEC's work

[10] Earnings before tax and royalty payments, the latter two being treated as benefits to the economy as well.

[11] The costs and people employed in each of the five quarries are similar. While each quarry will have different results according to the quality of the stone and its geology, the results are based on a conservative rate per ton of 2,500 rupees. Prices obtained per ton are expected to be much higher- especially if they are sold internationally.

[12] Interview, Faizi Jaffri, Natural Stone Development Company, April 2006.

believe that perhaps a 70-30 % ownership was agreed to. In any case, a fair estimate of the investment required for **each model quarry is PKR 80 million (about US$1.3 million), and its establishment would employ a technical, management and support staff of 20**. While the feasibility studies examined show positive cash flow from these operations, a time horizon of five years (like we used to estimate the impacts of other initiatives) is not sufficient to payback the original investment based on the utilization rates assumed. These are longer term investments which will produce excess returns over time, as well as the intended demonstration effects, including employment. Nevertheless, given these characteristics, the returns were excluded from the analysis as they will not fully materialize within five years of PISDAC's close-out.

MOSAIC TRAINING CENTERS

On the benchmarking international trips that the SWOG undertook with PISDAC's assistance, such as the Coverings Tradeshow in the USA and the Carara exhibition in Italy, the Marble and Granite SWOG members realized that Mosaic Handicrafts were a successful, ubiquitous, high-end product, which was essentially made from marble waste. The opportunity appeared very attractive, as the main entry-barrier is the skilled labor force itself. The SWOG thus decided that developing a workforce to compete in this segment of the industry should be promoted in Pakistan, particularly among women who generally have a better sense of aesthetics, color combinations, and attention to detail. Additionally, the work could be done effectively either at a factory or from home. Before the benchmarking tour, only one major firm in Lahore was focusing efforts on these products.

These training workshops fall under the training and workforce development activities planned by the SWOG. Originally, it was thought that they would be part of the Common Facility and Manufacturing Training Centers; however, the SWOG saw the possibility of jumpstarting the Mosaic component through these workshops.

Beyond being an initiative identified in the benchmarking tours organized by the project, PISDAC assisted the SWOG by preparing the proposal, identifying the appropriate technical assistance to impart and design the courses, as well as the machinery needed to mount an initial three-month workshop. Additionally, the project brought together several partners, including women's organizations to recruit participants in the training. The funding itself was provided by PASDEC's funds, and by the numerous local partners involved in the effort that were mobilized and coordinated by PISDAC.

The effort started in June 2007, when the initial 3-month workshop took place in Peshawar, effectively training 26 women which were issued certificates by PASDEC. The training content focused on craft making skills, design, as well as modules on entrepreneurship and product exhibition. The latter is particularly important, as the training program is designed to facilitate higher earning employment at a factory, but also to promote the establishment of new businesses at a rate that could also absorb more women that successfully complete the training program.

First Mosaic Handicraft Training Workshop in Peshawar

The good reception and results of the program led to a second 3-month workshop in Peshawar, as well as third one in Quetta. The details of how the training program will be institutionalized are being worked out by a support committee, composed of SMEDA, Aik Hunar Aik Nagar (AHAN) (One Product One Village), and PASDEC representatives. Additional initiatives are being discussed at the time that this report is being written, such as the establishment of a Women's Business Association of the Marble Mosaic Cluster, assistance to facilitate market linkages for recently created small business, and many others.

Reportedly, the marble processing factory in Lahore that had focused part of its resources to mosaic handicrafts employs a total of 70 women (full and part-time) and could extend its network. As this initiative was led and formed in response to a private sector initiative, the prospects of absorption into the workforce of certificate holders are likely and enhanced. Of the first 26 women trained, about 60 percent have been placed at a factory or within a small business. Of the first 50 women participating in the training, 17 were making an income ranging from PKR 3000 to 5000, while the rest reported no cash income source. Additionally, the total household income of the women participating ranged from PKR 6000 to 20,000.

To quantify the impact of additional incomes of the initiative, we assumed that 3 workshops will be conducted per year, training 78 women per year, as it occurred in 2007. We included as the initial outlays the machine that forms smaller and appropriately sized cubes from the wastage, a desktop computer and a CAD-CAM software package to scan designs, which are used in the training sessions. We further assumed that at least 50 percent of those women would have an income improvement of PKR 7,093 per month (which was derived by subtracting the weighted average of the income obtained by the first 52 women trained from the mid-point of the salary range paid by the Lahore factory). We deducted from the income stream operating costs per training program

(including the trainer fees). **The resulting NPV (2007) of additional incomes of the initiative is $0.7 million.**[13]

Women at the workshop learning to fabricate a mosaic medallion

Excluded from the analysis are the additional incomes to be obtained by the employers and the small businesses start-ups that the initiative is expected to produce. Additionally, it assumes that only fifty percent of the women trained would be employed[14], but this could be much higher as the focus on this industry expands, and the activity becomes more socially acceptable. It is a lower-bound estimate on these accounts.

MARMOMAC FAIR IN VERONA

As a result of the creation of PASDEC, the SWOGs deliberations resulted in a mandate for the sector management company to undertake the functions of consolidating, rationalizing and focusing resources for local and international marketing of Pakistan's dimensional stones and improving the country branding of the sector. Thus, PASDEC allocated some of the funding it received to this activity.

In October of 2007, PASDEC organized Pakistani exhibitors under one umbrella, resulting in a well designed country pavilion, assisted by PISDAC technical assistance. The way the products were exhibited got more attention from prospective buyers due to the promotion materials (including well-developed documentaries on the Pakistani industry, t-shirts, and souvenirs for pavilion visitors). The number of companies' attending the fair before PASDEC's efforts were estimated to amount to only 3 or 4, and

[13] Reportedly, a few of the women trained were not allowed to seek employment after completing the program. For this and other potential reasons for which the trainees will not be able work and derive the benefits of the training, we use a 50% absorption rate in our impact model.

mainly as machinery customers, not as exhibitors. However, PASDEC's efforts resulted in increasing the number of Pakistani exhibitors three-fold, as a total of 10 companies participated in the mission. Specifically, PISDAC supported the mission with logistical and technical advice, ranging from organizing the mission all the way to proper follow up with potential leads and contract signing.

PASDEC required from all exhibitors to report and provide feedback on the results of the mission. PASDEC's report states USD $8 million of confirmed sales obtained at the fair, not counting potential sales that could have been secured from subsequent interactions between the exhibitors and customers that attended the show. Further, the participation attracted around 4000 visitors of which almost 1250 were prospective customers. The reported results are even more impressive when considering that Pakistani exports of dimensional stone only amounted $23 million (in 2004).

Our impact model assumes that the joint country branding effort under PASDEC auspices, similar to the Gems and Jewelry initiative, will likely continue for the following five years. Thus, our impact model conservatively assumes that this level of sales will be sustained, although they could likely increase in subsequent years, as it has occurred with the G&J SWOG. The yearly income stream is reduced by the costs of attending fair as well as producing the merchandise, and payments to labor were added back assuming a 12.5 percent of production costs. **The resulting NPV (2007) of additional incomes (returns to capital and labor) is US $8.8 million** over a 6 year horizon to 2013, five years after PISDAC close out. However, to account for the possibility that these additional sales could have occurred without the collective effort and PISDAC's assistance, **our adjusted NPV (2008) results in US$4.8 million.**

As expressed earlier, about 12.5 of the costs of producing the sold merchandise represent wages payable to labor, resulting in a yearly figure of just over PKR 50 million (US$830 K). This figure, divided by an estimated annual wage of PKR 72,000, results in 698 employment opportunities supported by these sales.

Chairman PASDEC Mr. Ihsan Ullah Khan with Mrs. Azra Mujtaba, Commercial Consular in Italy accompanied by group of Importers/Exporters from Pakistan.

CFMTC FOR MICHNI CLUSTER (MOHMAND AGENCY, FATA)

PISDAC assisted members of the SWOG to secure matching grant funding from the CSF for the first CFMTC to be established in the Federally Administered Tribal Areas (FATA). The facility plans to have, at an initial stage, a capacity to cut and polish 800 and 1500 sq ft. per day, while deriving revenue of PKR 5 per sq ft for cutting, and PKR 5.5 for polishing. The facility thus would allow further processing to occur in FATA, and derive value-added locally by turning semi-processed stones (planks and sheets) into tiles. The current practice is that the semi-processed stone is shipped to Lahore, Karachi and Islamabad for its conversion into tiles. While essentially this means that the value-added opportunity shifts from Lahore (or the other cities) to FATA[15], there is a benefit to the economy whole, as transportation costs can be reduced significantly. Indeed, the FATA processor will now ship only 60% of the volume it used to before processing, allowing the factories in Lahore and elsewhere to procure the processed stone at a reduced price.

Thus, while the initial capital outlay for the machinery needed and other expenses for the CFTC is not fully recovered in a five-year horizon (based on the assumption from the proposal approved by the CSF), it will if those significant savings and the labor payments are added to the income stream, as our impact model in Annex 3 assumes. **The resulting NPV (2008) of net additional income of this activity is $0.1 million. In addition, the CFTMC will directly employ a staff of 11.**

[15] This shift, of course, has a social value of promoting regional economic development.

This pilot activity could be highly replicable if successful, while serving as platform for developing the processing skills of the local workforce.

MACHINERY POOLS

The establishment of two machinery pools that could enhance the access to appropriate and very costly machinery to quarry owners is one of the prioritized SWOG strategic initiatives and for which funds have been secured. The need is better understood when considering that of the 1225 registered quarries in Pakistan only 5% can afford to purchase appropriate machinery.

The first machinery pool is being established in Risalpur (NWFP), and should be operational in 2008 as the machine has been procured and the site prepared. It will directly employ **24 operators**, and benefit an estimated 15 quarry owners, depending on how machine-time is eventually allocated. This will be owned and operated by PASDEC. The machinery procured includes 3 loaders, 3 excavators, 3 compressors, 3 drilling stands, and 3 wire saws and 1 mobile crane, making it a total investment of PKR 74,000 million (about $1.2 million USD).

Like other Marble & Granite SWOG initiatives that involve large, up-front capital costs, this initiative does not have a payback period of 5 years and thus the NPV to 2013 is negative. However, the value added stems from facilitating access to the appropriate machinery to many quarry owners that do not have the capital to acquire it, but would use it if it was available for rent. It will also help improve and phase out the blasting practices that are so uneconomical and damaging to this industry's potential. It will also offer training on how to use the equipment. The overall goal is to make quarry owners familiar with the improved machinery at a reduced risk, and that at a later stage they'll invest in their own. At this point, though, there is no reasonable basis to estimate the magnitude of these benefits.

PAKISTAN STONE DEVELOPMENT COMPANY

The work of the Marble and Granite SWOG has notably improved public-private dialogue and coordination in this industry. The SWOG successfully advocated and obtained policy changes reducing the barriers for the acquisition and investment in advanced machinery and equipment to upgrade production and processing facilities, while simultaneously contributing to reduce indiscriminate blasting practices. Further, in the framework of PASDEC, public and private stakeholders will continue to work together to enhance the sector's competitiveness. The public private partnership is also evidenced by the joint investments that have started to materialize through the Model Quarry initiative. After the incorporation of the Pakistan Stone Development Company (PASDEC), the SWOG has evolved as an important advisory body to the Company. Dissemination of information on SWOG strategy and PASDEC planned projects are also a primary goal for the Company which are now being addressed through provincial extensions of the SWOG.

D. Furniture

PISDAC's work with the furniture sector started formally in May 2006, in partnership with SMEDA and building on their existing analysis. The SWOG is composed of a total of 27 members that include manufacturers, academia, retailers, exporters, importers, engineers, designers and the forestry department. To achieve faster decision-making and make faster progress, the SWOG decided to elect an Executive Committee (EC) that meets more regularly. It consists of participants from all 8 cluster cities with a Chairman as a 9th member. Five industry specific experts were mobilized by PISDAC to assist the SWOG in developing its industry diagnostics and strategic initiatives, including guidance in several benchmarking tours: Italy and Dubai in November 2006, Malaysia and Thailand in March of 2007 and to the USA in June of 2007.

Pakistan has five major furniture manufacturing clusters. The size of units, according to international standards, can be considered to range from very small (cottage) to medium scale. The five cities which are known for their furniture clusters are Chiniot (which combines with Faisalabad and Gojra), Peshawar (which combines with Dir), Gujrat, Karachi and Lahore. In this order, they move from the least advanced to the most mechanized. In addition to these furniture clusters, there are smaller sub-clusters at Gujranwala, Islamabad, and Sahiwal.

In the second half of 2007, the SWOG presented its strategy to the government and received the final approval of funds of PKR 590 million (about US$10 million) by Pakistan Industrial Development Corporation (PIDC) and the Minister of Industries, Production and Special Initiatives. As a result, 4 of the SWOG's strategic initiatives were prioritized, have funding forthcoming, and are under implementation:

1. Setting up the Furniture Pakistan Development Organization (FPDO, a sector management company with a public-private board of directors)
2. Establishing 2 CFMTCs in Chiniot and Peshawar
3. Increasing the supply of uniformly dried-wood through solar kilns
4. Market learning exercises, including market research and international exhibitions

In the first quarter of 2008, Furniture Pakistan received the first installment of the approved funds (PKR 70 million) to begin working on the implementation of the SWOG strategy. Additionally, PISDAC assisted the SWOG in securing funding from the CSF to jump start the establishment of 5 solar kilns.

Results and Impacts

The Pakistani furniture industry is predominantly a Sheesham (Rosewood) based industry. Especially the clusters of Chiniot, Gujrat and Peshawar use more than 90% Sheesham in their furniture production. The Kiln drying of timber before furniture manufacturing is an unquestioned standard to make a sustainable incursion in the

international market. Of about 8,000 wood manufacturers in Pakistan, less than 1% of them (i.e. less than 80) use properly dried wood.

The moisture content on wood upon cutting ranges from 50-80%, which must be lowered through drying to an 8-12% to be accepted in quality export markets. When furniture is produced without using properly kiln dried wood, the resulting furniture item moisture content is high and uneven, resulting in expansion and contraction of different parts of the item (i.e. legs, frame, etc.) under changing temperatures, causing the joints to crack. Even in the domestic market, this occurrence often results in retuned pieces of furniture and disgruntled customers. Thus, kiln drying is an absolute necessity to bring the moisture content down to an appropriate and uniform level and produce quality furniture. At this moisture level, the wood remains stable and does not change shape.

The Pakistani furniture manufacturers know the benefits of wood drying, as evidenced by the prevailing, but ultimately fruitless task of "seasoning" wood, which is carried out by small manufacturers. The prevailing practice consists of leaving out wood in the open to be dried by the sun for as long as 2 years. While the sun might in fact reduce the moisture content, the moisture content retained is at least 20%.

Wood is dried properly by using kilns. More conventional kilns use vacuums and boilers to dry the wood. In a week to 10 days this guarantees controlled moisture contents of 8-12%. Unfortunately, technologies such as vacuum kilns are very expensive. Some manufacturers in Pakistan have installed these at an extremely high expense (in the order of PKR 6 Million, about US $100,000). This cost is too high for almost all of the manufacturers in Pakistan; especially the smaller workshops in Chiniot, Gujrat, Peshawar and in parts of Karachi. Even if these were somehow acquired by the manufacturers, they would go underutilized because of their relatively higher capacity compared to the wood consumption requirements of the smaller manufacturers. An alternative, relatively newer, and affordable technology is that of solar kilns. They dry wood down to the required moisture content levels over a period of two weeks. At about a cost of only US$16,000, they are affordable and its smaller size compared to conventional kilns makes it much more flexible in terms of where it is placed.

In 2007, PISDAC assisted SWOG members to secure a matching grant for 5 pilot solar kilns from the CSF, to be installed in central locations of the leading clusters of furniture manufacturers in Pakistan: Chiniot, Gujrat, Peshawar, Lahore and Karachi. The matching grant will be provided to the Joint Committee for Enterprise, composed of members of the SWOG, which will match the grant providing the land for the solar kilns, and assuming the operational costs of the facility for three years. The installation of the kilns should take 2-3 months once the CSF disburses the funds. And, as discussed in the preceding section, Furniture Pakistan Development Organization (the sector management company) has prioritized the initiative and plans to use its funds for the installation of 75.

Annex III contains the details of two impact models to estimate the benefits of this initiative. The first impact model, used to derive the benefits from the 5 solar kilns to be installed with CSF funding, assumes the 5 kilns will be installed by the end of 2008, at a

capital cost of PKR 950,000 (just under $16,000). The second impact model derives the benefits from 75 solar kilns, with an installation rate of 25 per year. The rest of the assumptions are identical, except for a reduction in the latter regarding the capital costs of kilns, since Furniture Pakistan Development Organization (FPDO) is likely to obtain a better price if the kilns are ordered in bulk.

The benefit streams are based on a value added of PKR 130 (sale price-cost of the plank), which is a lower-bound price at which a few manufacturers with access to wood drying technology charge for the drying service. The selection process for ownership of the kilns will be based on the amount of wood requirements that would ensure that the kiln will be used at a 100% of its annual output capacity (or a combination through which the neighboring manufacturers would use the remainder capacity). To err on the conservative side, our model assumes only 22 bi-weekly cycles out of a potential 26.

Importantly, due to the prevailing "seasoning" practice, manufacturers have working capital tied up in the wood being seasoned for up to 2 years in some cases. Thus, the benefit stream includes a conservative assumption of 1 year worth of working capital savings, calculated in the impact model by assuming that the value of the wood now being dried in solar kilns would have been tied up in the seasoning practice and thus unable to earn at least the opportunity cost of capital (i.e. the discount rate). Additionally, the annual salary of the kiln operator, estimated at PKR 6,000 per month, is added back to the revenue stream. However, the analysis excludes the potential wastage reduction from using a more stable raw material for furniture production (i.e. the same quantity of wood creates greater output).

The resulting NPV (2008) over a five year horizon of net additional incomes (including labor) combining the CSF and FPDO solar kilns is US$4.2 million. The initiative was identified as part of the SWOG strategic planning process and became an integral part of its strategy. While a few factories in Pakistan had solar kilns, the technology is still far from being massively adopted. The technology was being close guarded by a few industry players, and it was definitely not available. PISDAC industry expert, Peter Rayner, identified this technology as having the potential to give a much needed competitiveness impetus to the Pakistani furniture industry. However, since there is still some uncertainty regarding implementation (stemming more from the point of view of timing than from fund availability), **our adjusted NPV (2008) results in US$3.1 million**, reflecting a 25% discount to account for it.

Similar to the cooling tank initiative, the solar kiln project is an "enabler" program, designed to improve the quantity and quality of available raw material, and as such, the initiative can be expected to have notorious impacts throughout the rest of the value chain. As discussed, not using properly dried wood is a key impediment in boosting wood furniture export growth from Pakistan. Even further, it is allowing imports to aggressively gain market share in the domestic market (in 2005, foreign imports captured 12.5% of total domestic market share, from nearly 0% before 2004).

Table 1 below presents a price comparison for wood and furniture items all converted into cubic feet equivalents.[16] While it would be tempting to assume that manufacturers which would now have access to properly dried wood could, at the very least, obtain the price that a cubic feet equivalent fetches in the local market (PKR 5650 versus 2000 PKR obtained previously), this result is not likely. Indeed, the use of properly dried wood, while a pre-requisite to obtain a quality product, is not the only element that determines the price the market would pay (many other factors are in play, such as skill, type of furniture item, design, among many others).

Table 1. PRICE COMPARISON FOR WOOD AND FURNITURE

Item	Price per Cubic Feet or Equivalent (PKR)
Log	700
Plank (Post Sawing)	1000
Kiln Dryed Plank	1130
Furniture Item Local Retail (Wood Not Properly Dried)*	2000
Funriture Item Exported (Wood not properly Dried) ***	3000
Furniture Item Local Retail (Dried)**	5650
Export quality Furniture (Properly Dried Wood) ***	7910

*Most of this furniture is sold as semi finished. Because the sellers do not give ANY guarantee about the quality of the furniture, the sale price is not that high and gives a small mark up above the average cost.
** Larger retailers and manufacturers that do have kiln drying facilities are able to sell the same furniture for a much larger profit. The smallest return is on chairs and that too can range from 5-10 times of material cost. Overall revenue is hence decided by the cost of overheads.
*** Export return is higher. Again without the guarantee of quality, return orders are not expected and overseas re-sellers are hesitant to buy furniture without any concrete guarantees.

Nevertheless, with access to kiln dry wood, a producer will have less product rejections, the ability to turnover its inventory faster and thus increase sales, enter into more sophisticated business relationships and markets, and sell at a higher price since he will be able to manufacture an improved product. As such, we used in our impact model a 50% price improvement over the market price for a furniture item manufactured with unevenly dried wood (PKR 2000, per cubic feet equivalent). To obtain this price improvement, the only associated extra cost would be that of procuring kiln dried wood (at a 13% higher cost than the plank, at even then, this is questionable since the more stable material would reduce wastage). Even so, our income stream is reduced by this additional cost. Under these assumptions, **the resulting NPV of additional income due to price improvements stemming from manufacturing furniture from the wood made available by the solar kilns initiative is US$21.2 million.** For our adjusted NPV calculation, we discounted 25% for uncertainty (the same reasons described earlier), and a further 25% was discounted to account for the fact that this impacts are to be expected in downstream activities. **The adjusted NPV results in US$10.5 million.**

[16] Source: These are estimates provided by a mini-survey of furniture manufacturers conducted between Aug 2007 and April 2008.

The increased sales and business activity enabled by the solar kiln program will also result in additional payments to labor. These ones were not added to the benefit stream described above. Using data from a survey administered by PISDAC to 15 furniture companies participating in the SWOG[17], labor costs amounted to 30% of sales and the annual average salary to PKR 75.272. Using these figures, and assuming that at least 25 solar kilns are installed toward the end of 2008, the increased level of sales expected would produce around PKR 46.2 million in payments to labor, enough to support 614 jobs at the annual average salary indicated by the firm level survey. These results need to be interpreted with caution, and are not necessarily conclusive, given the limited sample size, but can be taken as indicative.

Solar Kilns are an inexpensive, accessible way of reducing the required time to dry wood from 2 years to a mere two weeks, while achieving uniform moisture levels

E. Horticulture

PISDAC began engaging farmers, growers, processors, exporters, academia, equipment makers, and representatives from the public sector as well as various donor agencies involved in the horticulture sector May 2006. The leadership of the sector came together in two main wings according to their production patterns (which dictate their needs and priorities): the Balochistan wing, which is focusing on improving apple and grape production, and the Multan and Sindh producers who are focusing on improving mango production. PISDAC continued to assist the SWOG to broaden its membership through referrals by the existing SWOG members, Pakistan Horticulture Development & Export Board (PHDEB), and ASLP (ACIAR). Each SWOG wing, as described above, held regular meetings in Islamabad and Quetta (Balochistan apple/grape wing) and Lahore and Multan (Mango Wing) to analyze their industry through diagnostics such as value chain analysis, benchmarking against competitors, market analysis, to identify strengths and weaknesses and develop its strategy.

During the strategic planning process facilitated by PISDAC, the key challenges identified to increase the competitiveness of the mango producers were the almost non-existence of post-harvest infrastructure and a poorly developed marketing system that resulted in poor quality mango and losses ranging from 30-40% from harvest to market. Additionally, the value chain analysis conducted by the SWOG revealed that Pakistani mangoes in foreign markets have a reputation of poor quality, with exporters having a tendency of dumping the fruit in markets such as the UAE in some cases, or selling in ethnic markets in the UK as opposed to more sophisticated outlets such as supermarkets where the fruit can be sold at higher prices. Additionally, PISDAC sponsored a benchmarking tour to the Fruit Logistica fair in Berlin in February of 2007, which increased the awareness among SWOG members of the importance of EurepGAP (now GlobalGAP) certification and contacts with UK modern retailer importers were established. The latter confirmed to the SWOG the market opportunity that existed in UK markets if the quality of production improved.

To address the challenges and respond to the market opportunity resulting from the strategy development process, the Mango wing is currently implementing 3 related strategic initiatives: development of more sophisticated export markets for mango (from ethnic to modern retail in the UK and other markets in Europe and the US); improving quality of its production through the establishment of post harvest infrastructure; and meeting international quality standards (i.e. complying with EurepGAP certification).

The Balochistan wing strategic planning process identified as the key challenges to overcome to improve its domestic and export competitiveness are outdated and weak plant varieties in grapes, absence of mechanization and poor crop management, inadequate knowledge of appropriate techniques for plant pruning and poor post-harvest management skills. The introduction of better grape varieties could not only improve yields at the farm level by 66% percent, but also improve the shelf-life of the product and open up the possibility of exports. Likewise, mechanization and good agricultural

practices at the pre and post harvest can increase production by another 25% (of both apples and grapes). The strategic planning process was supported by two benchmarking tours facilitated by PISDAC to Australia and California, which were decisive in shaping and prioritizing the SWOG strategic orientation: the main strategic focus should be on introducing new varieties to become more competitive in both domestic and international markets and good agriculture practices must be followed.

SWOG members learn about higher yielding grape varieties in California

The Balochistan Wing decided to address those challenges initially through 2 prioritized strategic initiatives which are currently under implementation: the development of 4 model commercial farms (including nurseries), and strengthening the linkages in the sector among the private sector itself to create a platform that could interact with other stakeholders, such as academia and the government, in the development of initiatives to improve the sector's competitiveness.

Results and Probable Impacts

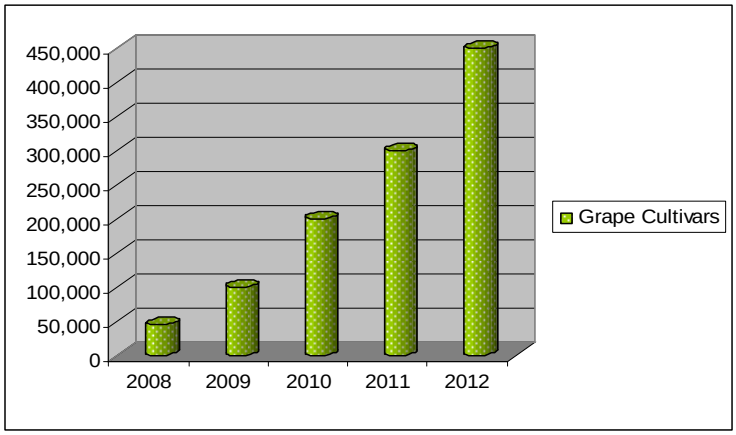
Balochistan Grape/Apple Wing

Facilitated by PISDAC, the Balochistan Horticulture Cooperative Society (BHCS) was founded and registered by SWOG members in May 2007, with the purpose of the advancement and development of horticulture in Balochistan. It has an active membership of 12 private stakeholders and is making efforts to attract additional members. The society is serving as a platform to improve and implement the SWOG strategy, and as such is working for the propagation of plants in nurseries, the training of a local workforce for good agricultural practices through nurseries and model farms, and developing tissue culture facilities for nurseries. Together with the government and donor agencies BHCS plans to initiate R&D activities not only restricted to grapes and apples, but will cover other crops as well. It is becoming a key platform as well for sharing information and transferring skills among its members.

Under the auspices of the work of the BHCS, the first steps towards the development of the four model commercial farms took place in the second half of 2007. Through a cost-sharing arrangement between PISDAC and four society members, 2,100 plants of the varieties identified in the benchmarking tours were imported to Pakistan for propagation and transported to Quetta, at a total cost of PKR 600,000 (US $10,000). While it is early in the process to estimate the full potential impact of model commercial farm initiative, it is possible at this point to partially measure some probable impacts under certain assumptions.

As discussed in the preceding section, grape varieties in Pakistan have lower yields, pest resistance and shelf-life than those being cultivated internationally. The current varieties in Pakistan have a yield of 6 kg per plant[18], while the ones recently imported yield on average 10 kg per plant (a 66% percent improvement). The 2,100 new plants are expected to propagate and make available cultivars for sale 45,000 by the second year, 100,000 by the third year, and 200,000 by the fourth year (See Figure E.1 below). The cultivars sold and planted would in turn reach their yield potential three years after being planted.

Figure E.1: Grape Cultivar Propagation



The options for using the new cultivars are basically two: either planting them on new land, or grafting them to existing plants to obtain the benefits of the higher yields (and lower production costs). Given that the former represents investment that is unlikely to occur at an early stage given that the new variety has not been fully tested in the domestic market (which is where current producers sell), our impact model assumes that the cultivars made available will be grafted on existing plants, and fetch a price at least equal to the existing variety (to err on the conservative side), PKR 45 per kilo, although it could be higher, and as mentioned, there is the possibility of export but these are not considered

[18] 6 kg per plant is the SWOG estimate, although government statistics indicate even lower yields, of 2 kg per plant.

in our attempt to measure the impact.[19] The grafts should reach the additional yields by the second year, which would have the effect of increasing production from 6 kg to 10 kg, and thus reducing the current average cost of producing 6 kg (from PKR 22 per kilo to PKR 17). The additional costs of grafting would be PKR 50 per cultivar, which is the estimated sale price per plant. Under these assumptions, and using the original $10,000 as the initial capital outlay and including benefits until 2013, **the NPV (2007) of additional incomes of this initiative is US$0.8 million.**

The benefits of the initiative are invariably a result of the SWOG's collective action and PISDAC's support and technical assistance in identifying and carrying on collectively the introduction of the new varieties in Pakistan. However, as mentioned, they are still a few uncertainties on how the varieties will be used, as well as market and farmer acceptance of the new varieties. **Thus, the benefits are discounted 25% discount for uncertainty and the adjusted NPV in 2008 results in $0.6 million.**

The impact model developed for this initiative is intended to provide partial measurement of the value of this particular SWOG strategy, and it assumes that after the 3rd year no more cultivars are being offered for planting (which is probably not the case). Additionally, it does not measure the effects that complementary initiatives of the SWOG, such as improved agricultural practices when the four model commercial farms are fully developed, could have. So in addition of using conservative estimates, it is a lower-bound estimate in these respects as well.

Punjab/Sindh Mango Wing

Following the visit to the Fruit Logistica Fair in Germany, PISDAC followed up its assistance to implement the SWOG strategy with a seminar held in Lahore designed to further promote awareness of the critical importance of EurepGAP and the related marketing opportunities in Europe. The seminar was attended by SWOG growers and exporters, certifying entities, as well as importers and experts invited by PISDAC from Germany and Britain. The seminar proved to be a success, creating the necessary awareness and transferring knowledge to the participants of the various requirements that have to be fulfilled for Pakistani mangoes to be exported to Europe, in particular to the higher value markets.

These events resulted in 8 applications for EurepGAP certification (four by individual farmers, and 4 applied as PMOs (Produce Marketing Organizations). Two individual farmers (with 250 and 200 acres under production) successfully obtained certification in late 2007, and invested a total of PKR 3.5 million (about US $60,000) in improving their harvest and post-harvest facilities to comply with the standard, and the tests and fees required for the annual certification. The remaining six should receive certification in 2008.

[19] One could expect higher prices from a better variety, but taste and consumer habits are important to consider here.

Meanwhile, PISDAC has helped link mango producers with importers that serve modern retailers such as Asda and Tesco in the UK, to test the possibility of selling to higher value markets (modern retail) as opposed to the ethnic markets. These sample shipments have been very well received by the importers, who have sent positive feedback to the SWOG, as well as further encouragement to obtain EurepGAP certification so they could buy the product on behalf of the modern retailers. Additionally, PISDAC has assisted the Mango Wing of the SWOG to submit a matching grant request from the CSF to establish a packing house, pre-cooling and storage facility that will improve quality and reduce post-harvest losses. At PISDAC III close out, the CSF's decision was still pending.

As with the new cultivar initiative of the Balochistan wing, it is a bit early to measure the full benefits that could accrue from the Mango Wing strategic initiatives as they are at the initial phases of their implementation. Nevertheless, the 2 SWOG members that successfully obtained EurepGAP certification already have the post-harvest infrastructure (packing house, storage, and pre-cooling) required to insert themselves into the value chain that is able to reach the modern retailers in the UK, and they upgraded it in 2007 to comply to the required standard.

To measure the benefits for these two farms stemming from the investments made in obtaining EurepGAP certification, our model uses as the initial capital outlay the amount used to upgrade the packing houses and the necessary tests and fees (the latter are deducted each year). It further assumes that these two farmers are initially selling 75% of their mangoes to the domestic wholesale market, and 25% to exporters, and gradually are able to shift 10 percent annually from the domestic wholesale market to the exporters until in YR 5 the marketing channel shifts to 60% sold to exporters while 40% is in the domestic market. By following EurepGAP standards, our impact model assumes that the farmer will obtain an improved quality product that will command a slight premium in the domestic wholesale market, as well as gradual shift in the quantity of fruit that makes the export grade, and as such he would sell more to the exporter. This marketing channel has several benefits for the producer, since he not only obtains a slightly higher price (even with no certification at all), but he also avoids a 7% transaction commission assessed when selling in the domestic wholesale.

Since a two year time lag is likely for either the current exporter to test the fruit with the modern retailer (or for the producer to sell to a new exporter, for that matter), our impact model assumes that additional premiums to the producer form the export market would start occurring until year 3, to err on the conservative side. It also assumes a packing house post-harvest process capacity of 50 tons of mango per day, operating at a 35% potential, over 90 days. The base prices used in our impact model are those on Fig. E.2. below, which in our impact model (detailed in Annex III) are adjusted to reflect the approximate amount the farmer could be expected to obtain from premiums and shifting sales from the domestic wholesale markets to the exporter, avoided commissions, extra handling costs, and the percentage that the exporter would pass along to the producer if he is able to sell to the modern retailers in the UK.[20]

[20] Our impact model assumes 40% will be passed along, as the producer now becomes a strategic partner in maintaining the product quality.

Fig. E.2: Mango Prices in Different Markets, 2007

Market	Without EurepGAP	EurepGAP Certified
Domestic Wholesale	32	37
Dubai	83	90
UK	360	385

Source: PISDAC Technical Assistance mobilized to assist the SWOG

Under these assumptions, **the NPV (2007) of two farms of the size and capabilities as those that successfully obtained EurepGAP certification in 2007 as a result of the SWOG process amounts to US$1.5 million.** The effects measured here only include the improvement stemming from improvement in price due to a product of a superior quality, but excludes potential higher yields and reduced post-harvest losses from following the prescribed EurepGAP practices.

For the adjusted NPV calculation, 25% is discounted to account for the uncertainty that the product will effectively be sold to modern retailers in the UK[21] and that the gradual shift will effectively take place. While the SWOG process contributed significantly in increasing awareness and facilitating the certification, as well as the encouragement that the market tests produced, a further 25% is discounted to account for the possibility that these two farmers could have obtained EurepGAP certification on their own, especially since they are more advanced than the other SWOG members, evidenced by their post-harvest infrastructure. **Thus, the adjusted NPV (2008-2013) of additional net earnings deriving from this initiative results in US$0.8 million.**

As discussed earlier, this initiative is still too early in its implementation to be fully and more accurately measured, as our impact model only covers what can be expected from those two farms that successfully obtained certification in 2007. Nevertheless, it is a lower-bound indication of the benefits that could accrue if the rest of the producers that applied for certification are successful. The current marketing channel mix for the other, less capable producers is not only more unfavorable with respect to the amount sold at the wholesale market vs. the amount of product sold to exporters, but also includes product sold to middle-men which further reduce the price that these producers currently receive for their products. Additionally, they lack access to the post-harvest infrastructure that the 2 certified farmers enjoy. Thus, these producers stand to benefit much more from the full implementation of the initiatives, including much more significant gains from reduced post-harvest losses if certification is accompanied by access to a packing, pre-cooling and storage facility, and the improved marketing ability it brings.

[21] While the market acceptance tests have been encouraging, the importers also noted that a certificate of socially responsible production would also be required for sale to modern retailers. These certificates should not represent a huge hurdle, but it is still an unfulfilled requirement.

F. Surgical Instruments

PISDAC began to engage with the surgical instruments sector in May 2006. The core of the Surgical Instruments and Medical Devices SWOG include about 50 leading manufacturers and exporters of surgical instruments and medical devices, who are part of SIMAP (Surgical Instruments Manufacturers Association of Pakistan). The core SWOG has included in its meetings, discussions, and strategic planning sessions vendors, forgers, surgeons, office bearers of the Sialkot Chamber of Commerce, Institute of Business Administration (IBA) Karachi, Hamdard University, Ghulam Ishaq Khan Institute (GIKI), NED University, SMEDA, the International Labor Organization (ILO), Pakistan Council for Scientific and Industrial Research (PCSIR), Engineering Development Board (EDB) and the Trade Development Authority of Pakistan (TDAP).
An executive committee was formed, composed of 10 stakeholders, who have been meeting on a more regular basis to develop a strategy to reposition the surgical instruments industry to a more sustainable competitive basis.

The full SWOG held about 15 meetings, and numerous other meetings took place to work on industry diagnostics and the resulting strategy. A SWOT analysis, benchmarking versus competitors (including PISDAC facilitated benchmarking tours to Germany and Sweden), cluster map and value chain analysis, as well as market and industry trend analyses were completed. As a result, during the first half of 2007, *the SWOG agreed on a common strategy, with the goal of producing a shift from conventional low value products to high tech, higher value products by improving the capabilities of the workforce at basic and advanced levels and developing close linkages with end-users, local and international research & training institutes and related industries.*

The SWOG presented the final draft of their strategy to the Minister of Industries, Production and Special Initiatives, Jehangir Khan Tareen on September 15, 2007. The Minister gave a verbal commitment for PKR 1.7 billion government co-financing for the strategy (about 28.3 million USD). Subsequently, the PIDC board agreed to fund the first three years' operational costs for the creation of the SWOG's sector management company, SIMDEP (Surgical Instruments & Medical Devices Pakistan), and also approved PKR 700 million to fund the implementation of the SWOG's strategic initiatives.

As a result of this process, the Surgical Instruments SWOG has prioritized 5 strategic initiatives that are currently being implemented:

1) Creation of a sector development organization to provide a platform for the implementation of the SWOG strategy and improve public-private dialogue
2) Introduction of a code of conduct incorporating globally accepted standards for manufacturing surgical instruments and medical devices
3) The establishment of a Medical Devices Training and Research Center (MDTRC)
4) Establish linkages with end-users and academia for new product development
5) Establishing internationally accredited validation laboratories

The SWOG studied the global surgical instruments value chain in Germany; learning from minimum procedures to more complex ways to add value

Results and Probable Impacts

With facilitation provided by PISDAC, the Surgical Instrument SWOG was able to have a more significant and extensive interaction with their sector counterparts in Germany and Sweden that were decisive to craft their overall strategic orientation. These interactions extended beyond a simple attendance to a tradeshow or fair. For example, the SWOG was able to observe strong industry-academia-government coordination prevailing in Germany and Sweden. Likewise, the SWOG developed important linkages with the Karolinska Hospital Institute and the Tuebingen University Hospital in Germany; service providers that add value to surgical and medical device products, such as the Central Sterilization & Service Department of Tuebingen University Teaching Hospital and the SMP Gmbh testing and validation lab in Tuebingen, to name a few.

Thus, the SWOG now has a direct appreciation of the importance of quality standards and vibrant related industries, such as sterilization, coating facilities, calibration, packaging and sealing providers and validation laboratories; and have made these largely missing elements in the Pakistan industry an integral part of its strategy to reposition the sector.

The interactions with global industry stakeholders made very clear the need for a code of conduct if Pakistan is to increase the volume and value of its exports, and attract foreign partners for investment in the sector. As a result, a process to develop a voluntary code of conduct was jump-started, including the adoption and of globally accepted quality and manufacturing standards, intellectual property rights protection, quality raw material

usage, assisting smaller Pakistani manufacturers in enhancing quality and observing the code, and the potential development of a quality seal for firms. Although it cannot be quantified at this time, the completion and observation of the code of conduct can have a huge impact in the sector's exports and foreign direct investment attraction.

The benchmarking tour also increased SWOG member knowledge of modern equipment, and prompted a couple of SWOG members to upgrade their manufacturing facilities with it. Specifically, these members invested **US$1.5 million** in ETO Sterilization equipment and CNC machining centers and related equipment.[22] This equipment enables the manufacturer to produce at reduce cost higher quality, uniform instruments. Their successful use in Pakistan is likely to be followed by others.

PISDAC assisted the SWOG in the organization of two meetings between health professionals and the surgical devices industry, with a view of developing a collaborative relationship that can help manufacturers improve their production according to end users needs. SIMDEP plans to continue the development of this collaboration.

Finally, the SWOG has been making use of those linkages established with foreign training institutes, notably JIBS (Jönköping International Business School, Sweden), with which the SWOG sign an MOU establishing technical collaboration in business education to industry executives and middle management, and the facilitation of linkages with allied industries and other training institutes in Sweden.

[22] The companies reporting to and relating these investments to PISDAC's assistance are Tecno Instruments (Pvt) Ltd and Medical Devices (Pvt.) Ltd.

CNC machinery identified and subsequently procured by members of the surgical instruments SWOG.

IV. Benefit-Cost Ratio

This section summarizes the results of our impact models and sets against the total budget of the PISDAC program to derive the resulting benefit-cost ratio. Table VI below summarizes the resulting NPV of additional incomes of those activities that satisfy the criteria detailed in Section II, and adjusting the NPV of additional incomes to reflect current and expected incomes in 2008 dollars, using the same rate as the one used to discount the expected benefits. All the benefit streams reflect a time horizon to 2013, providing a measure of current and expected benefits limited to five years after the life of the PISDAC project.

As discussed earlier, the "economic impact" of the SWOG initiatives is defined here as the current and expected net present value of additional incomes generated by the implementation of the SWOG initiatives. For the thirteen activities examined in detail, the NPV (2008) of net additional income totals US $270.2 million. **Applying the discounts under the criteria set forth in the methodology, the adjusted NPV (2008) results in US $209.4 million.** The total budget of the PISDAC program amounted to US $11.3 million, which represents the amount of USAID's funding.

Thus, each $1 of USAID funding for PISDAC's SWOG initiatives is expected to generate at least $19 of economic benefits for the economy of Pakistan, a 19:1 ratio under this measure.

We must reiterate that this is a **lower-bound** estimate of the expected economic impact of PISDAC III, on four accounts at least. First, the analysis only includes benefits for initiatives that are all ready implemented or highly probably, attributable, and quantifiable using data available at this time. Second, conservative assumptions have been used when data is uncertain in quantifying the additional income. Third, the analysis excludes indirect benefits that may arise through inter-industry linkages and multiplier effects. Finally, discounts were applied in the cases where there existed uncertainty of full implementation or in PISDAC's role and activities was indirect. **The ultimate economic benefit of PISDAC supported initiatives is thus likely to largely exceed this estimate.**

Table VI:

Economic Impact of Activties Supported by PISDAC				
		NPV	Adjusted	
Sector	Intiative	2008-2013	NPV	Discount
		US$ millions		
Dairy	Model Commercial Farm	$ 106.3	$ 106.3	0%
Dairy	Farm Cooling Tanks	$ 38.7	$ 38.7	0%
Dairy	Balochistan Cooperative	$ 0.2	$ 0.2	0%
Dairy	Impacts in Dairy Processing	$ 68.4	$ 34.2	50%
Furniture	80 Solar Kilns	$ 4.2	$ 3.1	25%
Furniture	Furniture Manuf.	$ 21.2	$ 10.6	50%
Gems and Jewelry	Marketing/Branding	$ 14.3	$ 7.2	50%
Horticulture	New Grape Cultivars	$ 0.9	$ 0.6	25%
Horiticulture	EUREGAP Certification	$ 1.7	$ 0.8	50%
Marble and Granite	Mosaic Workshops	$ 0.8	$ 0.8	0%
Marble and Granite	Marketing/Branding	$ 9.7	$ 4.8	50%
Marble and Granite	FATA CFTC	$ 0.1	$ 0.1	0%
Marble and Granite	5 Quarries Upgraded	$ 3.7	$ 1.9	50%
Total NPV 2008-2013		**$ 270.2**	**$ 209.4**	

V. Employment Generation

The activities PISDAC supported from 2004 to 2008 created many direct and indirect jobs. While no reliable baseline nor data source is available in Pakistan to measure increased employment in the sector's PISDAC focused its activities in (and even if it existed, the attribution of the increase to a program such as PISDAC would be quite controversial and complex), and absolute job creation as complex to demonstrate, it is possible to measure gross job creation**,** defined here as employment opportunities that were created or sustained from expanded business activity supported by PISDAC.

In this respect, PISDAC contributed to increased employment through three main types of activities: the direct creation of business opportunities stemming from the implementation of the SWOG strategies; the facilitation of increased scope and/or scale of existing businesses; and through training and workforce development programs that made the beneficiaries acquire skills that lead to their employment.

In the period 2004-2008, **the estimated number of jobs that PISDAC activities generated under this definition was 7,902.** Figure V.1 below presents the breakdown on the number of employment opportunities that were generated though the different activities that PISDAC supported, which are narrated in detail in the impact sections for each SWOG.

This figure is also likely to represent a lower-bound estimate of employment generated through PISDAC activities, on two accounts. Like the impact models created to measure additional incomes accruing from the implementation of the SWOG strategic initiatives, the estimates used are conservative and no assumed multipliers were used[23]. Additionally, and unlike the impact models, which measure current and potential benefits over a five year horizon after PISDAC III close out, these estimates only account for those employment opportunities expected to have been generated by the end of 2008. Indeed, the estimates have been adjusted to reflect the expected degree of implementation of the initiative by the end of 2008 (i.e. only 30 out of 80 planned solar kilns are expected to be operational). It assumes projects approved by the CSF will be funded no later than mid-2008. Finally, the estimates exclude other beneficiaries from PISDAC activities that have seen their incomes increased due to its activities.

[23] For example, a few stakeholders indicated that each cooling tank supported at least 5 other jobs in milk transportation.

Figure V.1:

Gross Job Creation thorugh activities supported by PISDAC			
Sector	**Intitiative**	**Estimated Jobs (2004-2008)**	
Dairy	1000 Farm Cooling Tanks		1,500
Dairy	Balochistan Cooperative		12
Dairy	Processing		4,473
Furniture	30 Solar Kilns		30
Furniture	Manufacturing		614
Gems and Jewelry	Marketing and Branding		480
Marble and Granite	Mosaic Handicraft Workshops		40
Marble and Granite	PASDEC Marketing/Branding		698
Marble and Granite	FATA CFTC		11
Marble and Granite	Machinery Pool (1)		24
Marble and Granite	1st Model Quarry		20
Total			**7,902**

VI. Policy Reforms

The SWOGs and the sector management companies have been engaged in an ongoing process to identify second generation policy reforms that have been fine tuned with technical assistance and other inputs, advocacy skills facilitated by the PISDAC project. The process has involved extensive dialogue between SWOG members with the Federal Bureau of Revenue (FBR) (formerly known as Central Bureau of Revenue (CBR)), the Ministry of Finance and the Ministry of Industries, Production and Special Initiatives. Work in this area has also been coordinated with SMEDA.

Each SWOG has had to defend its second generation policy reform recommendations in one-on-one meetings with the relevant and corresponding authorities. PISDAC staff facilitated the setting up of these meetings and participated in them. At these sessions, both parties remained very responsive to each other's points of views. As a result, the government understood and was in many cases convinced of the potential benefits that justified each recommended policy measure advocated by the SWOGs. PISDAC has facilitated technical assiatnce to support the SWOG in arguing their position with objective analysis, and improved the advocacy skills in the private sector demonstrating the usefulness of unified positions.

The Government of Pakistan (GOP) approved 33 second generation policy reforms across all six SWOGs A significant share of policy and institutional reforms proposed for Dairy, Gems and Jewelry, and Marble and Granite were approved by the GoP during the year 2006, and in the budget for 2007-2008 (June 7, 2007), the Government of Pakistan (GOP) approved policy measures for Furniture, Marble & Granite, Gems and Jewelry, Horticulture, and Surgical sectors including the designation of them as priority sectors, which means that the GoP would attach a higher priority to development of these sectors vis-à-vis other sectors. Some policy measures were approved via amendments to the existing Statutory Regulatory Orders (SROs) and some were made a part of the customs tariff guide. All of the reforms approved are detailed in Annex II.

The policy reforms approved under PISDAC III allow the above mentioned sectors to import equipment and most of their raw material without any customs duties. This reduction in duties is intended to encourage sectors to import and invest in equipment, parts, machinery and raw materials that contribute to improved product quality, production with reduced wastage and higher efficiency. Further, a strong linkage has developed between the SWOGs, FBR, EDB and the level of engagement has gone up significantly thus eliminating a previous air of distrust and isolation.

Given the recent approval of many of the measures, it is too soon to measure the size of the investment impact through macroeconomic data. Nevertheless, a firm level survey administered by PISDAC to 60 firms participating in the SWOGs, 50% attributed recent purchase of either new machinery or upgrades to the reduction of tariffs and duties resulting from the approved reforms. This is an indication that the reforms have been relevant and are resulting in increased investment.

Finally, during PISDAC III, in collaboration with the World Bank, the project also assisted the SWOG in identifying and proposing policy reforms submitted to the GoP in the areas of: mining leases, royalties, trade and exports, currency management, temporary exports, imports/exports for jewelry manufacturing, export incentives, and proper logistic arrangements for which approval is pending.

Annex I- Calculating the NPV of additional incomes

For each activity, the net income flow is calculated using actual or (conservatively) estimated values for the initial capital outlay for each activity, and the net cash flow (before tax) over the specified projection period in the impact model. The residual asset value at the end of the projection period is included when known and appropriate.

The income flow is defined in constant prices, with the net present value calculated at a 10% discount rate. At PISDAC II close out, we used a real discount rate to discount the benefit stream to accurately reflect the opportunity cost of capital or the risk-adjusted hurdle rate for private investments. However, a 10 percent is more commonly used in measuring the impact of economic development programs. Payments to labor (i.e. wages) are also included as additional net income to the economy when known.

The estimates undertaken for calculating the NPV of additional incomes exclude indirect effects through inter-industry linkages or multiplier interactions, as well as possible dynamic benefits that may arise as investors and producers respond to higher profits or new market opportunities. In essence, the economic benefit as measured here is determined by the net additional value added (including returns to labor) from the SWOG activity.

Annex II- Policy Reforms Approved Under PISDAC III

No.	Policy Reform Proposals Accepted	Sector
1	Elimination of customs duty on processing equipment, plants and machinery, and lab and veterinary equipment for the dairy industry	Dairy
2	Elimination of customs duty on breeding animals and semen	Dairy
3	A further reduction in customs duty on packaging material for dairy	Dairy
4	Zero-rating of sales tax on dairy products	Dairy
5	Elimination of customs duties and sales tax for the gemstone sector	G&J
6	Elimination of customs duty for gem testing equipment	G&J
7	Elimination of customs duty on import of rough gemstones (other than diamond)	G&J
8	Zero-rating duty on G&J machinery and raw materials (Considered as a priority export sector)	G&J
No:	**Policy Reform Proposals Accepted**	**Sector**
9	Tools and equipment which either are not available in Pakistan or are substandard will be allowed imports to improve product quality.	G&J
10	Value addition requirements for the export of gold jewelry made from *imported* gold have been reduced to 9% for stone studded jewelry, 6% for plain gold jewelry and 4% for plain gold bangles	G&J
11	Import of silver and platinum for the manufacture and export of jewelry made there from allowed	G&J
12	Elimination of customs duties and sales tax on machinery and equipment for Marble & Granite	M&G
13	HS Code 84.29 Excavators should be included in the list of zero rated machinery. Zero rated customs duty on various machines, tools and attachments used in marble processing & quarrying	M&G
14	Zero rating on imports of all tools, machinery and attachments used in marble and granite processing & quarrying, specifically for training purposes	M&G

15	Elimination of customs duty on import of hand tools used by stonemasons	M&G
16	Zero rated imports of equipment and apparatus for testing of physical and chemical properties of dimensional stone	M&G
17	Zero customs duty on pickling preparations for metal surfaces	M&G
18	Elimination of customs duty on millstones, grindstones, grinding wheels and the like, without frameworks, for grinding, sharpening, polishing, truing or cutting, hand sharpening or polishing stones, and parts thereof, of natural stone, of agglomerated natural or artificial abrasives, or of ceramics, with or without parts of other materials	M&G
19	Elimination of duty on import of seeds and planting material	Horticulture
20	Elimination of duty on import of plant growth regulators	Horticulture
21	Elimination of duty on high-tech fertilizers (e.g. soluble fertilizers sold in retail packaging)	Horticulture
No:	**Policy Reform Proposals Accepted**	**Sector**
22	Elimination of duty on pesticides, herbicides, phosphatic insecticides, and anti-sprouting products	Horticulture
23	Elimination of duty on mineral or chemical fertilizers containing two or three of the fertilizing elements nitrogen, phosphorus and potassium; other fertilizers in packages of gross weight not exceeding 10kg.	Horticulture
24	Zero rated import of cool chain raw material, components and equipment	Horticulture
25	Reduction of duty to 15% and sales tax (currently at 20% and 15%) on pruning equipment (e.g. loppers, seceteur, shears etc)	Horticulture
26	Reduction of duty on import of wood boards, ply and laminated boards, and particle boards from 20% to 15%	Furniture
27	Elimination of customs duty on import of solid wood	Furniture

28	Elimination of customs duty on screws, bolts, nuts, coach screws, screw hooks, rivets, cotters, cotter-pins, washers (including spring washers) and similar articles, of iron or steel	Surgical Instruments
29	Elimination of customs duty on forgings of surgical & dental instruments and on copper-zinc base alloys (brass)	Surgical Instruments
30	Subsidy @ 25% of inland freight on finished products of furniture, marble and granite allowed, provided that the factories are located beyond 250 km from exporting sea ports	Furniture, M&G
31	Food Safety Standards to ensure the safety and suitability of milk and milk products to protect consumers' health and to facilitate trade. Standard will be applied to milk and its products' for production, storage, transportation, analysis, processing and handling of milk and milk products by farmers, dhodhies, middlemen, milk processors, distributors and retailers where applicable	Dairy
32	Free Trade Area between China & Pakistan: all the core products of Pakistan such as textiles, fruits and vegetables, gems & jewelry, engineering goods, leather products and sports goods, surgical goods, marble products and industrial alcohol can enter the Chinese markets at zero duty or concessionary duties	Horticulture, G&J, Surgical Instruments, M&G
33	CBR's decision to use the sector management companies as "regulators" for monitoring reforms	All – Horticulture, Surgical Instruments, G&J, M&G, Dairy

Annex III- Impact Models Assumptions and Results

DAIRY SWOG Model Commercial Farm			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**	percent	
Investment Costs per farm	**200,000**	rs	184,000 rs before, now 213,000
Number of farms installed	**425**	farms	Mid-point between target for end 2008 (600) and 250 by April 2008
Number of farms installed each subsequent year	**525**	farms	DP Target is 600, but used 525
Increase in milk production due to intervention	**50%**	percent	Could be as high as 400%; DP cited 50% as a lower bound
Number of animals per farm	**56**	animals	From a survey of 128 farms coducted by DP, JAA, Nestle
Average milk price per liter	**21**	rs per liter	DP: Price at farm gate
Production costs per liter before intervention	**14**	rs per liter	DP
Production costs per liter after intervention	**9**	rs	35 percent decrease on a per liter basis; source Dairy Pakistan
Average production per animal before intervention	**4.9**	liters per day	On an annual basis, animals produce 300 out of 365 days
Average production per animal after the intervention	**7.4**	liters per day	50% increase taken as conservative, lower bound estimate
Number of days a year an animal produces milk	**305**	days	
Initial Capital Outlay	**10%**	percent	5 year interest free loan to be borne by DP
Interest rate on loan	**0.124**	percent	KIBOR + 2 April 2008; absorbed by DP but subtracted anyway
Residual Net Asset Value	**None**	rs	
Time Horizon of Cashflows	**6**	years	Benefits started accruing in 2007
NPV of additional earnings 2007 (US$ Millions)	**$ 96.6**		

DAIRY SWOG Farm Cooling Tanks			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**	percent	
Investment Costs per Cooling Tank	**468,000**	rs	Revised upward; steel costs are a factor pressuring the costs
Number of colling tanks installed	**500**	tanks	Mid-point between end 2006 (133) and end of 2007 (748)
Number of farms installed each subsequent year	**500**	tanks	DP Target, sufficient demand and capacity is in place
Tank Capacity per day	**1000**	liters per tank	
Gross Margin from collecting and cooling milk	**2**	rs per liter	Deeemed by DP as reasonable estimate, excludes potential premiums
Operating costs per liter (including labor)	**1**	rs per liter	Original model used 0.90, but adjusted for lower tank utilization
Capacity of Tank Utilization	**50%**	percent	According to DP data collection
Reduced rate of spoilage throughout the supply chain	**3%**	percent	Reassessed from 15-19% to a more realistic 3-5%
Number of tank operators	**1.5**	op. per tank	Many tanks are being operated by two workers
Labor costs per year per operator (dded back to the income stream)	**54,000**	rs	Minimun salary is now 6000rs; used 4500rs/month
Price of milk for calculating wastage reduction	**23**	rs per liter	Gross margin minus costs including labor
Initial Capital Outlay	**20%**	percent	5 year interest free loan to be borne by DP
Interest rate on loan	**0.124**	percent	KIBOR + 2 ; absorbed by DP but subtracted anyway
Residual Net Asset Value	**Variable**	rs	Starightline 15% yearly depreciation
Number of days per year the tank operates	**360**	days	
Time Horizon of Cashflows	**7**	years	Benefits started accruing since 2006
NPV of additional earnings 2006 (US$ Millions)	**$ 32.0**		

Dairy SWOG: Impacts at Processing Stage			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**	percent	
Annual amount of extra chilled milk available	**180,000,000**	liters per year	Assuming 1000 tanks (May 2008)
Net margin (pre-tax)	**2**	rs per liter	DP and Processor interviews; lower bound
Net margin as a % of sales	**26.8%**	percent	PISDAC firm level survey said 26.8%
Level of sales given the net margin	**7**	rs per liter	Derived; Lower bound estimate
Costs as a % of sales (including labor)	**73.2%**	percent	PISDAC firm level survey
Yearly Sales	**1,343,283,582**	rs	Derived
Labor costs as a % of sales	**37.0%**	percent	PISDAC firm level survey
Payments to Labor, yearly	**497,014,925.37**	rs	Added back to the income stream
NPV of additional earnings 2008 (US$ Millions)	**$ 68.4**		

DAIRY SWOG Balochistan Wing: Value Added of Balochsitan Dairy Cooperative (CSF Approved)			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**	percent	
Milk purchased and sold	**1700**	liters per day	1,200 from Pichin and 500 from Kucklak
Milk purchasing price	**19**	rs per liter	17.00 rs as per PISDAC survey plus a 2 rs premium
Price of milk in Quetta retail market	**27**	rs per liter	Could be as high as 28 , used a conservative 27 as per project proposal
Machinery Costs	**342,500**	rs	Source: Quotations obtained for financiall feasibility study (X 4)
Civil Works and other equipment	**1,359,750**	rs	Vehicles, furniture, milk tanker, telcom
Staff Training and Business Development Costs	**325,000**	rs	Social mobilization, marketing, and others
Annual Operating costs (excluding milk purchases)	**2,790,000**	rs	
Annual Wages (labor costs)	**1,200,000**	rs	Included in operational costs; added back to income stream
Premum Paid to Producers	**2**	rs per lt	Amount above prevailing price in Pishin/Kuchlack paid by the cooperative
Residual Net Asset Value	**85,620**	rs	Added to Year 5 stream (x 4) ; straight line depreciation @ 15% annually
Time Horizon of Cashflows	**5**	years	Doesn't include effects of a likley strong supply response
NPV of additional earnings (USD) 2008	**$ 0.2**		

Marble and Granite SWOG: Investment(s) in Upgrading Quarries								
Assumptions		**Units**		**Notes**				
Exchange Rate	**60**	rs per USD						
Discount Rate for NPV	**0.10**							
Capital Costs	**27,080,000**	rs						
Earnings before tax and royalty (Y1; Y2; Y3)	**4,584,000**	11,836,000	13,300,000	Rs.; taken from feasibility study; years 1-3				
Time Horizon for Cash Flow	**7**	years		Years 1-3 from feasibility study then constant				
Labor Costs, annual	**1,752,000**	rs		Added to income stream and assumed constant				
NPV of additional net earnings (US$ Millions) 2006	**$ 0.6**							
NPV of 5 Quarries (US$ Millions)	**$ 3.1**							

Marble and Granite SWOG: PASDEC Country Branding			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**		
Public and Private investment for Verona Fair	**5,880,000**	rs per show	Stall and pavillion, promotional material, travel and lodging
Sales achieved in 2007	**480,000,000**	rs	Source: PASDEC mission report
Sales in Sq. Meter Equivalent	**518,919**	sq meters	Based on lower-end material; 3 fair attendants interviewed
Selling price per sqm	**925**	sq meters	Ibid
Cost per square meter	**775**	rs per sqm	Varibale cost excluding incidentals and machinery depreciation
Income based on new sales (Sale Price-Cost)	**77,837,838**	rs	Derived
Labor Payments as a percentage of cost	**12.5%**	percent	Interviews with 3 Fair Attendants; added back
Annual Payments to Labor	**50,270,270**	rs	Derived
Time Horizon for Cash Flow	**6**		
NPV of additional net earnings 2007 (US$ Millions)	**$ 8.8**		

Marble and Granite SWOG: FATA CTFC			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**		Source: CSF feaibility study except where noted
Machinery Costs	**2,860,000**	rs	Resizers, splitters, calibrators, etc.
Civil Works and Layout Design	**3,500,000**	rs	Source: PASDEC mission report
Revenue per year (based on 300 days per year)	**3,675,000**	rs	Based on lower-end material; 3 fair attendants interviewed
Cutting Capacity	**800**	sq ft per day	
Polishing Capacity	**1,500**	sq ft per day	
Rate for Cutting	**5**	rs per sq ft	
Rate for Polishing	**5.5**	rs per sq ft	
Operating Costs and Expenses (excluding depreciation)	**3,106,000**	rs	
Labor Payments (per year)	**1,056,000**		Added back to the income stream; 11 positions
Tranportation Cost savings (shipping less material to end markets)	**40%**	percent	Wastage is estimated at 40%
Transportation Costs to FATA-LAHORE per ton	**1,350**	rs	Karachi and Islamabad are the other main destinations
Tons to sq. ft equivalency	**195**	sq ft per ton	Approximate
Planks processed into tiles per day in tons	**8**	tons per day	Derived
Number of tons to be tranported w/o CFTC	**13**	tons	Exemplifies savings of 5 tons in transportation costs per day
Tranpostation Savings due to processing allowed by CFTC	**2,076,923**	rs per year	
Time Horizon for Cash Flow	**5**		
NPV of additional net earnings 2008 (US$ Millions)	**$ 0.1**		

Marble and Granite SWOG: Mosaic Training Workshops			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**	percent	
Women participating in each workshop	**26**	women	
Number of 3-month workshops per year	**3**	workshops	
Absorption rate	**50%**	percent	60% as a result of 2 worskshops, used 50%
CAPEX (Cube-making machine, desktop, CAD-CAM software)	**90,000**	rs	One time investment
Lease of venue (opportunity cost) per workshop	**90,000**	rs	Likely to be provided free of charge by PCSIR
Trainer's fee per workshop	**45,000**	rs per wkshp	
Support staff (2 positions) per workshop	**21,600**	rs per wkshp	Times three on a yearly basis
Utilities and unforeseen expenses (per workshop)	**30,000**	rs	Times three on a yearly basis
Women Income before the workshop (weighted average)	**1,307**	rs per month	Source: workshop data
Estimated Income of women upon program completion	**8,400**	rs per month	Salary range at factory (benchmark): 6000-10,800
Expected Income Improvement	**7,093**	rs per month	
Time Horizon	**6**	years	
NPV of additional earnings 2007 (US$ Millions)	**$ 0.7**		

Gems and Jewelry SWOG: Branding Strategy and Improved Marketing			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**		
Investments in Show Participation (per show)	**9,000,000**	rs per show	Branding, expert advice, airfare, lodge, pavillion (17-20 companies)
Additional Sales achieved in 2005	**240,000,000**	rs	After-show survey and follow-up by PISDAC
Additonal Sales achieved in 2006	**600,000,000**	rs	Ibid
Additonal Sales achieved in 2007	**1,200,000,000**	rs	An additional $10m USD were reported from Dubai show
Costs of Gold as a % of sales	**86%**	percent	Industry representatives
Labor Costs, annual, as percentage of cost of gold	**6.9%**	rs	SWOG estimates; based on 3X turnover per month (added back)
Costs of Financing Gold, annually	**9%**	percent	SWOG estimates
Time Horizon for Cash Flow	**9**		
NPV of additional net earnings (US$ Millions) 2005	**$ 10.8**		

Furniture SWOG: Value Added of 5 Solar Kilns (CSF Approved)			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**	percent	
Number of kilns	**5**	kilns	
Capital Costs per Kiln	**950,000**	rs	Source: Quotations for CSF proposal
Other Capital Costs (Machinery & Civil Works)	**55,000**	rs	CSF project proposal
Value added on kiln drying (sale price - cost of plank)	**130**	rs per cft	Derived
Value of wood after drying process	**1,130**	rs	Market rate 130-160; transfer price 110; use lower bound estimate
Years of Supply wood tied up in working capital	**1**	years	SWOG estimate 2-5 years, used a conservative 1
Value of Plank entering drying process (post-sawing stage)	**1,000**	rs per cft	Based on interviews with 5 SWOG members
Annual Salary of Operator	**72,000.00**	rs	Estimated @ 6,000 rs per month; added to the revenue stream
Drying Capacity per Klin per cycle	**280**	cft	350 cft. total capacity reduced by 20% due to airgaps
Electricity Costs (annual)	**120,000**	rs	CSF project proposal
Land lease (annual)	**120,000**	rs	CSF project proposal
Training/Orientation Session by Furniture Pakistan (annual)	**20,000**	rs	Per session
Number of cycles per year	**22**	cycles	Solar kilns dry wood in 2 weeks time; reduces yearly total by 2
Time horizon of cashflows	**5**	years	
Residual Net Asset Value	**0**	rs	Unknown
NPV of additional earnings 2008 (US$ Millions)	**$ 0.3**		

Furniture SWOG: Value Added of 75 Solar Kilns by Furniture Pakistan			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**	percent	
Number of kilns per year	**25**	kilns	Over 3 years until reaching 75
Capital Costs per Kiln	**800,000**	rs	Bulk Purchasing should translate in lower costs
Other Capital Costs (Machinery & Civil Works)	**55,000**	rs	CSF project proposal
Value added on kiln drying (sale price - cost of plank)	**130**	rs per cft	Derived
Value of wood after drying process	**1,130**	rs	Market rate 130-160; transfer price 110; use lower bound estimate
Years of Supply wood tied up in working capital	**1**	years	SWOG estimate 2-5 years, used a conservative 1
Value of Plank entering drying process (post-sawing stage)	**1,000**	rs per cft	Based on interviews with 5 SWOG members
Annual Salary of Operator	**72,000**	rs	Estimated @ 6,000 rs per month; added to the revenue stream
Drying Capacity per Klin per cycle	**280**	cft	350 cft. total capacity reduced by 20% due to airgaps
Electricity Costs (annual)	**120,000**	rs	
Land lease (annual)	**120,000**	rs	
Training/Orientation Session by Furniture Pakistan (annual)	**20,000**	rs	
Number of cycles per year	**22**	cycles	Solar kilns dry wood in 2 weeks time; reduces yearly total by 2
Time horizon of cashflows	**5**	years	
Residual Net Asset Value	**0**	rs	Unknown
NPV of additional earnings 2008 (US$ Millions)	**$ 3.8**		

Furniture SWOG: Furniture Price Improvement from Using Kiln Dried Wood (5 CSF Kilns)			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**	percent	
Amount of kiln dried wood made available by 5 kilns	**30,800**	cft.	Yearly
Price of furniture made with not properly dried wood	**2,000**	rs per cft	
Price Improvement by using kiln dried wood	**50%**	percent	Conservative assumption
Additional Cost from procuring properly dried wood	**130**	rs per cft	13% increase per plank cft
NPV of additional earnings 2008 (US$ Millions)	**$ 1.7**		

Furniture SWOG: Furniture Price Improvement from Using Kiln Dried Wood (75 Kilns)				
Assumptions		**Units**	**Notes**	
Exchange Rate	**60**	rs per USD		
Discount Rate for NPV	**10%**	percent		
Kiln dried wood made available by 25 kilns per year	**154,000**	cft.	At the assumed installation rate	
Price of furniture made with not properly dried wood	**2,000**	rs per cft		
Price Improvement by using kiln dried wood	**50%**	percent	Conservative assumption	
Additional Cost from procuring properly dried wood	**130**	rs per cft	13% over cost of cft of plank	
NPV of additional earnings 2008 (US$ Millions)	**$19.5**			

Horticulture Mango Multan/Sindh Wing: EUREGAP Certification			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**	percent	
Lab, Tests and EUREGAP fees per farm	**380,000**	rs per farm	Assumed to be incurred each year to maintain certification
Other invetsments to upgrade to the standard	**2,800,000**	rs	This were actual costs of the 2 farms; different farms would have other needs
Number of farms complying	**2**	farms	The first two cases already had packing houses facilities
Percentage of mango sold to exporters	**25%**	percent	Initially and YR 1. Increased by 5% in YR 2, by 10% in YR 3 and 10% in YR 4
Percentage of mango sold to domestic wholesalers	**75%**	percent	Decreased as a % sold to exporters increases
Price at Domestic Wholesale Market for non EUREGAP Mango	**31.2**	rs per kg	Source: PISDAC TA survey; based on 2007 average prices
Adjusted Domestic Wholesale Market Price for non-EUREGAP Mango	**26.0**	rs per kg	The price the farmer actually gets: Market price - commision-transportation
Price at Domestic Wholesale Market for EUREGAP certified Mango	**36.6**	rs per kg	Source: PISDAC TA based on 2007 prices
Adjusted Domestic Wholesale Market Price for EUREGAP certified Mango	**30.5**	rs per kg	Includes a reduction for extra handling costs (10% of the price increase over non-Euregap)
Price obtained selling to an exporter (with no EUREGAP certificate)	**34.0**	rs per kg	8 rs premium over adjusted wholesale market price; commission/transport costs avoided
Difference between selling to ethnic and modern retailers in the UK	**25.0**	rs per kg	Source: PISDAC Int'l Marketing Consultant; based on 2007 prices; see chart in the report
Percentage the exporter would pass along to the farmer for certified mango	**40%**	percent	The farmer becomes key in continued supply and compliance
Price the exporters will be willing to pay for EUREGAP certified mango	**44.0**	rs per kg	Derived; occuring in YR 3 (i.e. 2009) once the UK market has accepted the fruit
Farmer additional handling costs to sell for exports	**1.0**	rs per kg	Extra handling costs that exporter might require; assumed to be 10% of premium payed
Price the farmer obtains from the exporter, net of additional handling costs	**43.0**	rs per kg	Derived
Mango harvesting season	**90**	days	
Packing House Processing Capacity	**50,000**	kg per day	
Capacity Utilization of packing house	**35%**	percent	Lower bound estimate; packing house could be fed with other fruits
Time Horizon	**6**	years	
NPV of additional earnings 2007 (US$ Millions)	**$ 1.5**		

Horticulture SWOG Balochistan Grape Wing: New Grape Cultivars (Grafting)			
Assumptions		**Units**	**Notes**
Exchange Rate	**60**	rs per USD	
Discount Rate for NPV	**10%**	percent	
Initial Investment in 2,100 cultivars	**60,000**	rs	PISDAC covered 70%; 30% by the private sector
Yield of old (existing) varieties	**6**	kg per plant	Source: SWOG estimates; gov't data indicates even lower yields (2 kg)
Yield of new varieties	**10**	kg per plant	Source: California Benchmarking Tour
Sale price of existing cultivars	**25**	rs per plant	Source: Dr. Nasser Kazi; nursery owner and farmer
Estimated sale price of new variety cultivars	**50**	rs per plant	Ibid. This represents the additonal investment to do grafting
Domestic Price of Grape (without employing GAP)	**45**	rs	Source: Average for 2007, Fruit and Vegetable Wholesale Market
Price of the new variety	**Unknown**	rs	Expected to be higher; some domestic market receptivity has been done
Input costs per grape of kg (cost of production)	**22**	rs per kilo	Includes labor but excludes land costs
Cost reduced due to economies of scale	**17**	rs per kilo	JAA calculations based on costs of production for 6 kg
Cultivars planted and availbale to be sold as shoots for grafting	**Variable**		45,000 YR 1, 100,000 YR 2, and 200,000 YR 3
Expected time frame for fruit yields	**2**	yrs	
Time Horizon of Cashflows	**6**	years	
NPV of additional earnings (US$ Millions) 2007	**$ 0.8**		

Marble and Granite SWOG: Investment(s) in Model Quarry												
Assumptions				**Notes**								
Exchange Rate	60	rs per USD										
Discount Rate for NPV	0.145											
Capital Costs	27,080,000	rs										
Earnings before tax and royalty (Y1; Y2; Y3)	4,584,000	11,836,000	13,300,000	Rs.; taken from feasibility study; years 1-3								
Time Horizon for Cash Flow	10	years		Years 1-3 taken from feasibility study; assumed constant for years 6-10								
Labor Costs, annual	1,752,000	rs		According to salary account in feasibility study; added to income stream and assumed constant								
Results												
NPV of additional net earnings (USD)	$ 686,595.51											
Five quarries with similar results	$ 3,432,977.55											