



FINAL REPORT

Evaluation of Medicine Local Production vs. Importation in Afghanistan

Grant No: 1619-AFG-10a-Y
AFG#: 370834
Project ID: MoPH-GAVI-HSS3-07
Contract No: MOPH-GAVI-HSS3-Con # 45

January 2020

Table of Contents

A. Acronyms.....	3
B. Acknowledgement.....	4
C. Executive Summary	5
a) <i>Background and Purpose</i>	5
b) <i>Methodology and Approach</i>	5
c) <i>Analysis</i>	5
d) <i>Conclusions</i>	6
e) <i>Recommendations</i>	6
D. Background and Literature Review	7
<i>Afghanistan and the Local Production of Drugs and Medicines</i>	8
E. Selected Drugs and Vaccines.....	9
F. Main Study Activities:	10
f) <i>Identification of key economic questions</i>	10
g) <i>Methods and approach</i>	11
h) <i>Study Sample and Data collection process</i>	12
i) <i>Participation Rate, data entry and cleaning</i>	14
j) <i>Focus Group Analysis and Interpretation</i>	14
k) <i>Economic analysis and interpretation</i>	19
l) <i>Economic results</i>	19
m) <i>Conclusion</i>	26
n) <i>Study Recommendations</i>	26
o) <i>Study Limitations</i>	27
p) <i>Annexes</i>	27

A. Acronyms

APE	Avicenna Pharmaceutical Enterprise
BCR	Benefit Cost Ratio
FGDs	Focus Group Discussions
GDPA	General Directorate for Pharmaceutical Affairs
GLICS	Global Innovations Consultancy Services
GMP	Good Manufacturing Practices
HPIC	Health Partners International of Canada
IRR	Internal rate of return
IRR	Internal Rate of Return
LMICs	Low- and middle-income countries
MoPH	Ministry of Public Health
NMHRA	National Medicine and Healthcare Products Regulatory Authority
NPV	Net Present Value
UHC	Universal health coverage

Acknowledgement

This study regarding the Economic Evaluation of Medicine Local Production and Importation in Afghanistan comes at a critical time when Afghanistan is considering important questions regarding pharmaceutical delivery and future markets for medicines and vaccines to ensure the health and welfare of the citizens of Afghanistan. The recommendations from this study provide the foundation for careful steps required towards quality local production of some drugs and medicines with consideration for the need for appropriate standards within the current context and actual capacity of Afghanistan.

I sincerely thank my colleagues, Dr. Mohammad Hassan, Dr. Syed Nasir Hashimi, Dr. Mohammad Nawrozuddin Noorzad, in GCMU for offering contractual/administrative support to this project. The project was funded by GAVI under Health System Strengthening (HSS) program of the MoPH. Their financial support is appreciated.

My special thanks go to HEFD Director, Dr. Farhad Farewar and NHMRA CEO, Dr. Ghulam Sayed Rashid for their leadership and support. I would also like to express my appreciation to MoPH colleagues namely (in alphabetical order) Mr. Abdul Hafiz Quraishi, Dr. Abo Ismael Foshanji, Dr. Arezoo Rahimi, Dr. Khawja Mir Ahmad Saeed, and Dr. Najia Dehzad for their valuable support during the planning, development and implementation of this study.

I would like to express my immense gratitude and appreciation to the research team of Global Innovations Consultancy Services (GLICS), Aaron Philip Blaakman (Principle Investigator), Ahmad Omid Rahimi, Mohammad Hamid Shirzad and study enumerators for implementing this study and producing valuable outcome. The leadership of Dr. Ahmad Shah Salehi in this process is much appreciated.

Last but not least, I would like to sincerely thank the study participants for their useful input and constructive support.

The Ministry of Public Health takes the outcome of this study to the next step to ensure the recommendations of the study is translated into applied action points.

Dr. Bashir Noormal

Deputy Minister of Policy and Planning

Ministry of Public Health

C. Executive Summary

a) Background and Purpose

Globally, low- and middle-income countries (LMICs) are becoming increasingly interested in developing the local production of quality-assured medicines and other health technologies.¹ This study of Economic Evaluation of Medicine Local Production vs. Importation in Afghanistan (MOPH-GAVI-HSS3-07) builds upon previous work of the Ministry of Public Health and explores the main economic question of “Should Afghanistan produce some pharmaceuticals (15 of the most used drugs and 4 vaccines) for domestic consumption or should the country pursue a longer-term strategy/model of importing these pharmaceuticals to support the health sector? Therefore, what are the associated costs and benefits of both models?”

b) Methodology and Approach

Five main data collection tools were developed to administer to importation companies and local producers including general characteristics questionnaire, cost and revenue analysis, benefit analysis, market analysis, and focus group questionnaires, administered to both public and private sector representatives. GLICS was assigned to conduct the data collection with 60 importer and 15 producer companies. The data collection was conducted over a one-month period. Finally, we completed the data collection with 68 importers and 13 local producers. In order to summarize the estimated costs and benefits for local production, importation, or a mixture of market-share over a medium and longer term, we estimated the internal rate of return, net present value of economic benefits, and benefit-cost ratio of both and mixed market-share approaches.

c) Analysis

The total estimated annual market for pharmaceuticals in Afghanistan is \$850 Million USD. Based on literature estimates, the market for the 15 drugs and 4 vaccines in this study represents 15-20% of the pharmaceutical market in Afghanistan. Revenue estimates have been generated from the study sample of importers and local producers, and the relationship between spending and revenues, averaged 59% above cost for importers and estimated at 24% net revenues for local producers in the future market. These estimates have impact on the internal rate of return. Given the possibility of various strategies for the MoPH to follow regarding market share of importation and local production, a sensitivity analysis was conducted to examine the costs and benefits under different levels of market share (85/15, 90/10, 95/05) and under a varying discount rate (15%,10%) for 5 and 10 years. The internal rate under 95 importation and 5 percent local production yielded the highest

¹ Ewen et al. Journal of Pharmaceutical Policy and Practice (2017) 10:7
DOI 10.1186/s40545-016-0095-1

internal rate of return over 5 years (1.43), while the IRR for 90/10 and 85/15 was 1.41 and 1.40 respectively. It should be noted that the question of importation and local production in Afghanistan is not only economic, but also political, administrative, and there are a variety of interests are at stake in the public health sector and market.

d) Conclusions

The economic analysis conducted in this study indicates there are several economic indicators which direct towards continuing with importation of these drugs and vaccines on a large scale inclusive of economies of scale and import revenue benefits. This is specifically highlighted by the internal rate of return investment measures.

However, it must be noted that local production has other intangible benefits in Afghanistan that are not necessarily reflected in the economic model including responsibility and ownership by the Afghans, self-governance and direction, and potential for local economic growth. The Afghanistan MoPH must work towards balancing these economic, social and political factors to ensure the right strategy and direction for the country with some reliable and sustainable proportion of local production.

e) Recommendations

As a result of this study, several recommendations are in order inclusive of the following:

1. The economic framework of investment assessment (IRR, Net Present Value of Economic Benefits, and Benefit Cost Ratio) should be advanced and updated for detailed consideration for the broader pharmaceutical market.
2. If Local production is deemed to be encouraged and supported by the Ministry of Public Health, the following factors should be seriously considered by the MoPH:
 - Start-Up costs, capabilities and volume of production (inclusive of economies of scale) should be projected and monitored in detail.
 - The abolishment of taxes on raw materials importation should be considered in order to stimulate investment in local production.
 - Steps need to be taken to encourage and support or even subsidize good manufacturing and laboratory practices in Afghanistan. This would establish the necessary foundation for sustainable local production, especially if there is intent to expand the market share.
 - Industrial parks should be considered for local production but will incur significant start-up costs which should be examined and monitored closely.

- There should be investment in quality control. This includes expanding government capacity in supervision, monitoring to strengthen quality control and good manufacturing practices.
- Public-private partnerships should be explored in order to jointly benefit both the public and private sectors and to maximize efficiency and quality of local production.
- Anti-smuggling initiatives needs to be addressed by the MoPH in order to strengthen the overall balance between importation and local production.

D. Background and Literature Review

Globally, low- and middle-income countries (LMICs) are becoming increasingly interested in developing the local production of quality-assured medicines and other health technologies.² This is due to its potential to assist LMICs in improving access to quality-assured medicines and other health technologies, achieving universal health coverage (UHC), and reaching the health-related targets and broader developmental objectives of the Sustainable Development Goals.³

The economic, social and industrial issues related to the local production of quality-assured medicines have been well described in previous research.⁴ In this regard and generally, national governments have been faced with multiple responsibilities with regard to procurement, quality control, and dissemination of pharmaceuticals.

Furthermore, there are important practical and policy distinctions which arise which include the following: a) can the government and private market make available necessary medicines to the population at a reasonable cost? b) Importation generally experiences economies of scale (how much is this a priority under government policy?) c) is there an industrial base to make medicines locally targeting a reasonable market share? These goals may, or may not, be aligned with each other and tensions should be assessed and eventually managed accordingly. Understanding some of those tensions is part of this study.

In developing countries there is a great disparity between the demand for medicines to treat endemic diseases and the lack of purchasing power of (or for) patients most at risk. The idea that local production of medicines should be encouraged in developing countries to

² Ewen et al. *Journal of Pharmaceutical Policy and Practice* (2017) 10:7
DOI 10.1186/s40545-016-0095-1

³https://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2019/may/20190524_local-production-medicines

⁴ Kaplan W., and Laing, R. (2005) *Local Production of Pharmaceuticals: Industrial Policy and Access to Medicines: An Overview of Key Concepts, Issues and Opportunities for Future Research Health, Nutrition, and Population*, The World Bank

provide increased access is attractive since we might expect that many of the costs involved will be lower than in developed countries. It is clear, however, that investments in local medicine production will be efficient only if pharmaceuticals can be produced more cheaply locally than they can be imported on the open market. This sets up the inherent tension between a health policy directed to the access problem of making available low cost and quality-assured medicines and an industrial (primarily private sector) policy of optimizing profits and growth by promoting a local industry whose products may be more expensive than those on the international market. Certain national drug policies, notably those of Bangladesh, have included recommendations on promotion of local pharmaceutical production as a means to achieve national self-sufficiency.

But the decision as to whether pharmaceuticals should be imported solely or partially or should be supplied through local production is complex and simultaneously involves health policy, industrial policy, and development. It is part of the debate about how best to provide needed medicines to those least likely to afford them. In various countries, this particular debate has sometimes suffered from a lack of clear objectives in national drug policy.

Afghanistan and the Local Production of Drugs and Medicines

As with many industries in Afghanistan, the pharmaceutical manufacturing industry has been severely impacted by decades of war. Afghanistan once had the capacity to produce most medicines required in the country and was beginning to develop an export market for pharmaceuticals. Avicenna Pharmaceutical Enterprise (APE), a public institution established in 1970s, was at the forefront of these activities. Recently, the Ministry of Public Health's (MoPH) General Directorate for Pharmaceutical Affairs (GDPA) conducted a thorough assessment of local manufacturing in Afghanistan and subsequently wrote a Strategic Plan outlining a number of critical issues regarding this sector. Several concerns were expressed including a lack of access to quality essential medicines, poor quality of available pharmaceuticals, multiple and largely uncoordinated streams of medicines supply, a mostly unregulated private sector, and uncertain prospects for the pharmaceutical manufacturing sector in Afghanistan.

In order to further explore the potential for investment and growth of pharmaceutical production in 2014, the MoPH, along with Health Partners International of Canada (HPIC) commissioned an economic evaluation of APE and a small sample of private sector producers to assist in determining the economic tradeoffs of such an endeavor. The study aimed to analyze the costs and benefits, and necessary investment required for the local production of pharmaceuticals at APE and in the current private sector companies in Afghanistan.

Main conclusions from that study can be summarized as the following:

The research team recommended that if the Government of Afghanistan decides to take further steps towards investing in the local production of pharmaceuticals, explicitly to support local manufacturing, that it does so with limited investment and to achieve a relatively small portion of market share (5-10%).⁵

Furthermore, the following pre-requisites should be taken into account before further pursuing and investing in local production:

- The MoPH, GDPA must further establish a 5-10 year strategy for local production albeit within a context of strong economic arguments for importation to maximize economic efficiency (by taking into consideration the long run average costs.)
- Further analysis of potential market pricing (for the suggested product list) and associated demand and revenue forecasts should be conducted in order to understand the possible financial benefits and mixture of importation and local production (if strengthened).
- There must be a clear plan for quality advancement of standard medications if they are to be produced locally in Afghanistan. It should be noted that no local production facilities currently meet “Good Manufacturing Practices (GMP)” as expected in the global pharmaceutical manufacturing industry.

This study of Economic Evaluation of Medicine Local Production vs. Importation in Afghanistan (MOPH-GAVI-HSS3-07) builds upon previous work of the Ministry of Public Health and aims to provide important economic data to policy-makers related to both the costs and benefits of both importation and local production of 15 of the most used drugs and 4 vaccines for domestic consumption in Afghanistan.

E. Selected Drugs and Vaccines

At the commencement of the study, the Afghan Ministry of Public Health identified 15 key drugs, mainly comprised of antibiotics, and 4 vaccines to be examined for either importation or local production in Afghanistan. This list of drugs and vaccines is indicated as follows:

List of Drugs:

- | | |
|------------------|------------------|
| 1. Cefixime | 6. Omeprazole |
| 2. Ceftriaxone | 7. Metronidazole |
| 3. Ciprofloxacin | 8. Multivitamin |
| 4. Paracetamol | 9. Diclofenac |
| 5. Amoxicillin | 10. Ibuprofen |

⁵ Economic Evaluation of the Potential for Local Pharmaceutical Production in Afghanistan, February 2014.

11. Sulfamethoxazole
+Trimethoprim (Co-trimoxazole)
12. Ferrous sulfate 200mg+Folic acid
(Vit B9) 0.25mg Tab
13. Azithromycin
14. Ringer's lactate/Iv fluids
15. Ethinylestradiol + levonorgestrel

List of Vaccines:

1. Hepatitis B
2. Rabies
3. Influenza
4. Meningitis

F. Main Study Activities:

The primary activities conducted over the course of the study include the following actions to undertake the necessary steps in providing evidence and engaging with key government stakeholders regarding the overall research and to address the key economic and study questions.

- a) Identification of key economic questions
- b) Methods and approach
- c) Data collection process
- d) Participation rate, Data entry and Data cleaning
- e) Focus group analysis and interpretation
- f) Economic analysis and interpretation
- g) Economic Results
- h) Conclusions
- i) Study Recommendations
- j) Study limitations

The activities and achievements are described in detail in the subsequent paragraphs of this report.

f) Identification of key economic questions

First, the key economic questions, in alignment with the Terms of Reference are as follows:

- 1) Should Afghanistan produce some pharmaceuticals (15 of the most used drugs and 4 vaccines) for domestic consumption or should the country pursue a longer-term strategy/model of importing these pharmaceuticals to support the health sector? Therefore, what are the associated costs and benefits of both models?

ECONOMIC AND POLICY SUB-QUESTIONS

- 2) According to the current Afghanistan National Health Accounts and the Afghan GDPA, what is the current and market value for pharmaceuticals in Afghanistan? What is the current annual investment in local production and the private sector importers for pharmaceuticals?
- 3) What are the proposed types of drugs and vaccines that would be produced in Afghanistan over the next 5-10 years by APE and private sector producers?
- 4) What are the estimated costs of producing these drugs and medicines in Afghanistan at local producers and in the private market including the following key resource inputs: infrastructure, equipment, raw materials, salaries, recurrent costs such as electricity, etc. annually and over the course of the next 5-10 years? What are the estimated benefits of this production over this period?
- 5) What is the estimated start-up investment required for the local production of quality, standard medicines over the next 5-10 years at various levels of market share under good manufacturing practices?
- 6) How will local production of these pharmaceuticals compare with importation, particularly as related to economies of scale, unit pricing, and the impact of cost to the household?
- 7) What market share scenarios, if any, produce the optimum internal rate of return, net present value of economic benefits and benefit-cost ratio?

g) Methods and approach

When considering the expansion of the local production of pharmaceuticals, it is important to consider the current and future vision of local production as related to meeting demand for access to medicines, stimulation of the local economy and manufacturing and pricing within a health sector context where out of pocket expenditures are high.

The overall economic assessment applied for this study included four critical steps to evaluating local production versus an importation strategy of a limited list of drugs and vaccines in Afghanistan.

The first step was to examine the broad economic and health systems context for the supply of pharmaceuticals in Afghanistan including considerations from the MoPH, GDPA, development partners, and the international and domestic literature. In this first step, focus groups were also held with key stakeholders from the public and private sectors.

The second step included an assessment of institutional and societal costs of local

production and importation of the limited list of drugs and vaccines.

The third step included an assessment of institutional and societal benefits of local production and importation of the limited list of drugs.

Lastly, a market analysis including reviewing key documents was conducted that includes a production and supply analysis and demand analysis and potential benefit of the private producers in term of their economic contribution like employment, increasing income and improving medical technology.

The discount rate applied to both costs and benefits was approximately 10%. A sensitivity analysis was also conducted using a 15% given the current financial market and estimated interest rates in Afghanistan.⁶

The time perspective for all analyses includes annual costs and benefits estimation within the first five years, and a longer-term 10-year forecast of costs and benefits is provided in the annex.

Finally, in order to summarize the estimated costs and benefits for local production, importation, or a mixture of market-share over a medium and longer term, we estimated the internal rate of return, net present value of economic benefits, and benefit-cost ratio of both and mixed market-share approaches. The internal rate of return (IRR) is a metric used in capital budgeting to estimate the profitability of potential investments. The Net Present Value of Economic Benefits is equal to the present value of benefits minus the present value of costs. Generally speaking, the higher a project's internal rate of return, the more desirable it is to undertake. In this case, it refers to the optimal combination of importation and local production market value over the course of 5-10 years. IRR is uniform for investments of varying types and, as such, IRR can be used to rank multiple prospective projects on a relatively even basis. Assuming the costs of investment are equal among the various projects, the project with the highest IRR will be considered the best value for money and be undertaken first.

h) Study Sample and Data collection process

In the initial phase of the study, five main data collection tools were developed to administer to importation companies and local producers including general characteristics questionnaire, cost and revenue analysis, benefit analysis, market analysis, and focus group questionnaires (administered to both public and private sector representatives). Under the contract Terms of Reference, GLICS was assigned to conduct the data collection with 60 importer and 15 producer companies. The data collection started on September 22, 2019

⁶ <https://tradingeconomics.com/afghanistan/interest-rate>

and was completed on October 31, 2019. Finally, we completed the data collection with 68 importers and 13 local producers. Two local producers rejected to be interviewed for the study. Though we already reached to the saturation point in our 60 planned importers, we interviewed 68 participants to ensure reliability of data. Table 1 in Annex represents the total number of importers and local producers interviewed and is followed by Table 2 showing a few photos from the field interviews.

In summary, data collection was a challenging process due to several factors including respondent concerns about increased taxation, illegal practices, and the fear of dramatic increases in local production. Moreover, there were even rumors in the pharmaceutical market that made this process complicated.

Some of the comments listed below reflect some of the challenges experienced:

- One respondent stated, “Some senior employees of the MoPH want to monopolize the market of medicines, it’s the only reason of this survey”.
- Another respondent stated, “The survey is regarding few numbers of medicines and vaccines, why we should provide information regarding annual expense and income of whole medicines imported by the company”?
- A respondent stated, “Most of the people smuggling medicines and vaccines, government should follow the procedures for arresting such people instead of implementing surveys”.
- One respondent stated, “Such information should be taken from National Medicines & Healthcare Products Regulatory Authority where each company has specific registered form which clearly indicates the details of medicines importing particular companies”.
- Another respondent stated, “Many times we suggested MoPH for supporting us on growing home products, unfortunately, they never collaborated.”
- A respondent stated, “It was better if MoPH was providing training to the targeted companies regarding such study, then surely, I can say everyone would provide full information.”.
- Finally, another respondent stated, “Due to security reasons, we cannot respond about personal information, especially related to the financial component.”

Furthermore, some of the additional challenges faced in the data collection process are summarized below:

- The current list of importers/producers is outdated and as a result, provided a weak and not well-understood sample frame. Some companies have stopped functioning since six years ago.

- Moreover, the actual address of many of the indicated companies did not match with what we have in the list. In some instances, especially in Kabul, it might take one full day for our data collectors to locate the exact location of a company.
- In Kabul and in some provinces, several companies were not cooperative at all and some outright rejected to be interviewed.
- Finally, some respondents were concerned about providing responses to income and revenue related questions.

Several mitigation strategies were attempted to tackle these issues. For example, we conducted different meetings between association importers director and NMHRA in order to promote understanding of study goals and objective. Furthermore, the NMHRA issued different supporting letters for companies. Hence, we were able to finalize the process, but it took 19 more days to be complete.

i) Participation Rate, data entry and cleaning

As previously indicated, the GLICS team managed to complete the data collection of 68 importers and 13 producers. Completed questionnaires were sent to GLICS main office in Kabul and edited, cleaned, and managed in Excel spreadsheets pre-designed for this purpose. Data editing took place simultaneously with the data collection process during which a random sample of companies was called back by phone to verify field implementation and quality of work. Data entry and consistency checks were completed, and the final dataset was shared with the project PI for data analysis. Focus Group Discussions (FGDs) were transcribed, translated and their translations were shared with the project PI.

j) Focus Group Analysis and Interpretation

Two focus Groups were held in Kabul, Afghanistan on October 2019, one with private sector participants and one with public sector participants. Several critical questions were posed to the participants of both focus groups including the following:

1. What are the costs to importation of drugs?
2. What are the benefits to importation of drugs?
3. What are the costs to the local production of drugs?
4. What are the benefits to the local production of drugs?

Key messages and themes arising from both groups were assessed from the transcripts as follows:

Private sector respondents:

1. What are the **costs to importation of drugs** (according to the respondents)?

Key messages identified:

- The decision to import drugs and vaccines legally or illegally depends on the cost difference financially and in terms of time. (For example, importing might legally take 3 years, but if illegal practices could effectively take 25 days)
- There are illegal checkpoint costs
- There may be some higher prices to the consumer, relative to local production.
- There are costs related to money transfer, shipping, transport, customs, etc.
- Quality may be reduced due to long transportations, security delays, and weather
- There is the potential for fraudulent products or incomplete orders.
- International companies from which drugs and vaccines are supplied might be concerned simply about profit and not the quality of the product and services
- Inadequate transportation is a burden to overall drug importation.

2. **What are the benefits to importation of drugs (according to the respondents)?**

Key messages:

- Afghanistan does not have the right technical and manufacturing conditions to produce some drugs. As a result, it is easier to produce capsules outside of Afghanistan under quality standards.
- Importation produces higher quality products on the international market relative to local production.
- Industrial parks are highly developed and able to produce drugs efficiently.
- Afghanistan does not have to import raw materials, and can just concern itself with the final product.
- There is faster lab analysis time for products that the country would like to bring to market.
- The process of importation allows for 3rd party manufacturing.
- Imported vaccines are of better quality and efficiently produced.
- Imported drugs are readily available.
- There are no advertising or marketing costs.

3. **What are the costs to the local production of drugs (according to the respondents)?**

Key messages:

- There are security issues that can impact the cost and delivery of locally produced drugs and vaccines.
- At present, there is low quality, limited products, and regulation is required.

- Taxes related to local production are high.
- There are additional production costs including marketing, electric, land, etc.
- The cost to import raw materials is high and a large proportion of resources required for local production.
- At present, local producers are unable to replace or serve as an alternative for highly demanded drugs that aren't allowed in the country (or banned).
- Local production machines often malfunction and there is limited knowledge regarding maintenance.
- Most local producers can only produce syrups.
- There is often delayed local production practices and these producers cannot generally meet demand.
- Combined drugs are not included in local production process at present.
- Local producers are highly dependent on government support, inclusive of subsidies for effective operation.
- There is a limited vision for local production of key drugs and vaccines in Afghanistan, inclusive of the 15 drugs and 4 vaccines indentified.

4. What are the benefits to the local production of drugs (according to the respondents?)

Key messages:

- If there is an increase in market share of local production, it will benefit the local economy.
- Local production helps the economy and supports the local government.
- Ultimately, with greater local production, there are limited external factors which have to be managed.
- Local production limits transport risks due to humidity, sun, freezing temperatures.
- Local production creates jobs for people in the local community.
- Local producers could easily produce drugs which are not vaccines.
- Local producers will have less of a gap in price relative to cost.
- Local production will increase the availability of some drugs and medicines.
- There is the possibility of higher quality with lower prices.
- Under local production, more people may buy locally produced vaccinations since they know where they are from.

Public sector respondents:

Key messages:

1. What are the costs to importation of drugs (according to the respondents)?

Key messages:

- There is a significant cost to maintaining the Cold chain system for vaccines.
- Weather factors while transporting can impact delivery and costs
- There is the possibility of importers showing a quality product to quality control and then actually importing a lesser quality product.
- There is the chance of importing counterfeit drugs
- There is a waste of resources when drugs are imported incorrectly or not following protocol (human resources, financial resources, time).
- Illegal smuggling of drugs without quality control, registration, proformas can occur and present a cost to the entire system.
- Quality reduction due to production and transportation and temperature
- Importers may be tempted to smuggle illegally because its cheaper for them than to import legally.
- There may be an increase in price depending on other country markets.
- There are multiple brands of drugs whereby it is difficult to control.
- There are importation costs and tariffs at the border which must be paid.

2. What are the benefits to importation of drugs (according to the respondents)?

Key messages:

- Importation provides jobs for those involved in the transportation of drugs and medicines and vaccines.
- There is greater accessibility to international markets.
- Advanced technology in the production of drugs is accessible in the international markets.
- Markets for drugs for which there is limited production are accessible.
- Importers do not have to pay additional business costs as is associated with local production (raw materials, electricity, land, etc.)

3. What are the costs to the local production of drugs (according to the respondents)?

Key messages:

- Financially, the cost of local production is approximately \$100 million US dollars per year relative to \$800 US million dollars for importation.
- Quality control lacks the microbiology laboratory for drugs and vaccines which is essential for quality product and control.

- There is a limited number of tests which local producers are able to conduct on drugs due to the lack of equipment.
- Quality control overall is very limited and not regulated at present for local producers.
- Local producers cannot immediately produce all drugs, but could start with some essential drugs.
- There is the possible increase of drug and anti-microbial resistance, particularly since production factories are in residential areas instead of industrial parks.
- There is a lack of real investment vision at the present moment in local production.
- Local producers still have to import raw materials for overall production.
- There are customs costs and taxes related to raw material importation.
- Respondents are skeptical of the cheaper price of local drugs.
- There are additional costs for land, electricity, etc. under local production.
- There is the concern for the possible creation of a monopoly for drugs and medicine production in Afghanistan.
- There is a lack of awareness of the standards for production.

4. What are the benefits to the local production of drugs (according to the respondents?)

Key messages:

- Local production can improve accessibility and reduce availability challenges of importation.
- The Government would set the final price for locally produced drugs so there isn't a large variation in price and cost to consumers.
- There are limited transportation costs under local production.
- There is job creation in local communities under local production.
- Local production offers opportunities for investment.
- Under local production, there should be an increased focus on the essential drug list.
- Local production will strengthen the stewardship and sustainability for Afghanistan

Some additional key points include the following:

1. At present, local producers are not producing the list of 15 drugs and medicines and 4 vaccines, Respondents provided very little vision for this at the present moment. Respondents indicated that any vision should be provided and led by the Ministry of Public Health.

2. There will be a need to increase technology, standards and capacity for local production.
3. Most of the respondents indicate a future of 70% importation/30% local production in Afghanistan.
4. Respondents foresee an increase in income in the next 5-10 years, less than 5% (30% of respondents), 5-10% (30% of respondents), 10-15% (30% of respondents).

k) Economic analysis and interpretation

Finally, in order to summarize the estimated costs and benefits for local production, importation, or a mixture of market-share over a medium and longer term, we estimated the internal rate of return, net present value of economic benefits, and benefit-cost ratio of both and mixed market-share approaches. The challenge in conducting this analysis was that there is limited information about the sample frame and associated characteristics of importers and local producers, which is generally required.

These analyses will be extremely informative for decision-making and guiding any local production strategy for the Afghanistan Ministry of Public Health.

As a reminder to the reader, the internal rate of return (IRR) is a metric used in capital budgeting to estimate the profitability of potential investments. In this case, we are looking at estimating importation versus local production investments in health and market share in Afghanistan.

Technically, the Net Present Value of Economic Benefits is equal to the present value of benefits minus the present value of costs. Generally speaking, the higher a project's internal rate of return, the more desirable it is to undertake. IRR is uniform for investments of varying types and, as such, IRR can be used to rank multiple prospective projects on a relatively even basis. Assuming the costs of investment are equal among the various projects, the project with the highest IRR will be considered the best value for money and should be undertaken.

Sensitivity Analysis

Given the possibility of various strategies for the MoPH to follow regarding market share of importation and local production, a sensitivity analysis was conducted to examine the costs and benefits under different levels of market share (80/20, 90/10, 95/05) and under a varying discount rate.

l) Economic results

Table 1 presents the spending estimates as described in the Afghanistan Pooled Pharmaceutical report and Afghanistan National Health Accounts 2017. These estimates are critical for understanding the broader pharmaceutical market.

The total estimated annual market for pharmaceutical in Afghanistan is \$850 Million USD. Annual Government Health Expenditures are equivalent to \$273 Million USD (with an estimated adjusted \$71.5 Million for pharmaceuticals). Total adjusted Defense spending for health in Afghanistan is \$183.4 Million USD, which totals \$254.9 Million for the Government annual pharmaceutical budget for Afghanistan.

Table 1. Summary of Spending Estimates	
Summary Estimates from Pooled Pharmaceutical Report and Afghanistan National Health Accounts 2017	
Total Afghanistan Economy for Pharmaceuticals	USD Estimates
	\$850,000,000
Government Health Expenditures	\$273,000,000
Estimated Pharmaceutical Annual Spending by MoPH	\$71,526,000
Defense Expenditure on Pharmaceuticals	\$183,400,000
Total Government Pharmaceutical Budget	\$254,926,000

Given the overall annual market for pharmaceuticals in Afghanistan, one can estimate the overall market share for importation and local producers as the following most likely scenarios under importer/local producer scenarios of (95%/5%), (90%/10%), (85%/15%), etc. The table below indicates those estimates for each of these scenarios and amounts in US Dollars for importation and local production.

Table 2. Market Share Scenarios Estimates and Overall Market Allocation in US Dollars		
Approach	Potential Overall Market (\$USD)	Market Share
Local Production	\$42,500,000	5%
Importation	\$807,500,000	95%
Local Production	\$85,000,000	10%
Importation	\$765,000,000	90%
Local Production	\$127,500,000	15%
Importation	\$722,500,000	85%

Table 3 indicates the estimated national spending and revenues for the associated 15 drugs and vaccines. Based on literature estimates, this is between 15-20% of the pharmaceutical market in Afghanistan. Revenue estimates have been generated from the study sample of importers and local producers, and the relationship between spending and revenues,

average 59% above cost for importers and estimated 24% net revenues for local producers in the future market. These estimates have impact on the internal rate of return.

Table 3. Estimated National Spending and Revenues for 15 Drugs and 4 Vaccines		
Estimated National Spending of identified drugs and vaccines (\$USD)	Estimated Benefits - Based on Study Data Relationship between Costs and REVENUES (\$USD)	Proportion Net Revenue
\$ 8,500,000	\$10,540,000	24% Estimated
\$ 161,500,000	\$256,785,000	59% from Study
\$ 170,000,000	\$267,325,000	Combined
\$ 17,000,000	\$21,080,000	24% Estimated
\$ 153,000,000	243,270,000	59% from Study
\$ 170,000,000	264,350,000	Combined
\$ 25,500,000	\$31,620,000	24% Estimated
\$ 144,500,000	\$229,755,000	59% from Study
\$ 170,000,000	\$261,375,000	Combined

Table 4 presents the average importer and local producer costs and revenues and generated from the field data collection in Afs and USD. Average costs among all importers was 14,260,503 Afs (\$180,513 USD), while average revenues reported were 1,991,606Afs or (\$25,210 USD). We believe these revenues were largely under reported and as a result, limited the analysis also to those that reported a profit. For those importers showing a profit, average costs were 18,400,000 Afs or \$232,911, and average revenues were 29,352,381 Afs or \$371,549, a 59% profit margin.

Table 4. Average Importer and Local Producer Costs and Revenues		
Importer Average Costs and Revenues		
	Average Costs	Average Revenues
All Importers (Afs)	14,260,503	1,991,606
USD	\$180,513	\$25,210
Limited Importers (Afs) with profit	18,400,000	29,352,381
USD	\$232,911	\$371,549
Local Producers Average Costs and Revenues		
	Average Costs	Average Revenues
Total Costs AFS	20,549,414	20,566,667
Total Costs USD	\$260,119	\$260,337

Table 5 presents the proportional distribution of costs for importers and local producers based on the field data collection, Human resource costs are reflected in a higher proportion of costs by local producers (21.97%) relative to importers (10%). As expected, medicines costs (70%) are higher under importers, while raw materials costs (60.34%) are higher under local producers. We had expected that infrastructure and equipment costs would be higher under local producers, and we attribute the lower costs to their limited understanding of the required start-up costs for producing the indicated list of drugs and vaccines.⁷

Table 5. Proportional Distribution of Costs for Importers and Local Producers		
Resource Category	Importer Costs	Local Producer Costs
HR	10.00%	21.97%
Equipment	2.00%	0.24%
Infrastructure	2.00%	0.07%
Vehicles	2.00%	0.15%
Raw Materials	0.00%	60.34%
Transport	5.00%	2.95%
Distribution	4.00%	10.80%
Security	1.00%	2.78%
Recurrent	4.00%	2.73%
Medicines	70.00%	0.00%

Tables 6-8 present the estimations of the internal rate of return, net present value and the benefit cost ration under 3 scenarios inclusive of the following over a five-year period with 10% discount rate and 5% estimated inflation rate:

1. Importation (95%), Local Production (5%)
2. Importation (90%), Local Production (10%)
3. Importation (85%), Local Production (15%)

⁷ Examining these costs further are recommended in Section I.

Table 6. INTERNAL RATE OF RETURN (IRR), NET PRESENT VALUE (NPV) and BENEFIT COST RATIO (BCR), \$USD – 5 Years

Importation (95%), Local Production (5%)					
YEAR	INVESTMENT COST	PRESENT VALUE COSTS	TOTAL ECONOMIC BENEFITS	PRESENT VALUE BENEFITS	PRESENT VALUE NET ECONOMIC BENEFITS
0	170,000,000	170,000,000	0	0	(170,000,000)
1	178,500,000	162,272,727	267,325,000	243,022,727	80,750,000
2	187,425,000	154,896,694	280,691,250	231,976,240	77,079,545
3	196,796,250	147,855,935	294,725,813	221,431,865	73,575,930
4	206,636,063	141,135,211	309,462,103	211,366,780	70,231,569
5	216,967,866	134,719,974	324,935,208	201,759,199	67,039,225
6	-	0	341,181,969	192,588,327	192,588,327
	1,156,325,178	822,350,561	1,818,321,343	1,302,145,139	391,264,596
Total					
IRR		43.0%			
NPV (USD)		\$391,264,596.50		NPV (Afs)	
				30,909,903,123	
BCR		1.430			

Table 7. INTERNAL RATE OF RETURN (IRR), NET PRESENT VALUE (NPV) and BENEFIT COST RATIO (BCR), \$USD – 5 years					
Importation (90%), Local Production (10%)					
YEAR	INVESTMENT COST	PRESENT VALUE COSTS	TOTAL ECONOMIC BENEFITS	PRESENT VALUE BENEFITS	PRESENT VALUE NET ECONOMIC BENEFITS
0	170,000,000	170,000,000	0	0	(170,000,000)
1	178,500,000	162,272,727	264,350,000	240,318,182	78,045,455
2	187,425,000	154,896,694	277,567,500	229,394,628	74,497,934
3	196,796,250	147,855,935	291,445,875	218,967,600	71,111,664
4	206,636,063	141,135,211	306,018,169	209,014,527	67,879,316
5	216,967,866	134,719,974	321,319,077	199,513,867	64,793,892
6	-	0	337,385,031	190,445,054	190,445,054
Total	1,156,325,178	910,880,542	1,798,085,652	1,287,653,857	376,773,315
IRR		41.4%			
NPV (USD)		\$376,773,31		NPV (Afs) 29,765,091,897	
BCR		1.414			

Table 8. INTERNAL RATE OF RETURN (IRR), NET PRESENT VALUE (NPV) and BENEFIT COST RATIO (BCR), \$USD – 5 years					
Importation (85%), Local Production (15%)					
YEAR	INVESTMENT COST	PRESENT VALUE COSTS	TOTAL ECONOMIC BENEFITS	PRESENT VALUE BENEFITS	PRESENT VALUE NET ECONOMIC BENEFITS
0	170,000,000	170,000,000	0	0	(170,000,000)
1	178,500,000	162,272,727	261,375,000	237,613,636	75,340,909
2	187,425,000	154,896,694	274,443,750	226,813,017	71,916,322
3	196,796,250	147,855,935	288,165,938	216,503,334	68,647,399
4	206,636,063	141,135,211	302,574,234	206,662,273	65,527,062
5	216,967,866	134,719,974	317,702,946	197,268,534	62,548,559
6	-	0	333,588,093	188,301,782	188,301,782
7	-	0	0	0	-
Total	1,156,325,178	910,880,542	1,777,849,961	1,273,162,576	362,282,034
IRR		39.8%			
NPV (USD)		362,282,034		NPV (Afs) 28,620,280,670	
BCR		1.398			

In summary, as local production takes on a larger role, the internal rate of return slightly decreases along with the net present value of economic benefits and the benefit-cost ratio. This is reflective of the greater amount of revenues (reflected as benefits) under the importer model, relative to local production.

Tables 9 and 10 show the results of a sensitivity analysis when changing the discount rate to 15%. This impacts both the estimated stream of costs and benefits and effectively slightly lowers the internal rate of return, net present value of economic benefits and the benefit cost ratio.

Table 9. Sensitivity Analysis - IRR, NPV, and BCR - USD			
Minimum (10% Discount Rate) – 5 Years			
Economic Measure	95/05	90/10	85/15
Internal Rate of Return	42.95%	41.36%	39.77%
Net Present Value of Economic Benefits (USD)	\$391,264,596	\$376,773,315	\$362,282,034
Net Present Value of Economic Benefits (Afs)	30,909,903,123	29,765,091,897	28,620,280,670
Benefit Cost Ratio	1.43	1.41	1.40

Table 10. Sensitivity Analysis - IRR, NPV, and BCR			
Minimum (15% Discount Rate) – 5 Years			
Economic Measure	95/05	90/10	85/15
Internal Rate of Return	36.74%	35.22%	33.70%
Net Present Value of Economic Benefits (USD)	\$302,124,445	\$289,610,415	\$277,096,385
Net Present Value of Economic Benefits (Afs)	23,867,831,188	22,879,222,796	21,890,614,403
Benefit Cost Ratio	1.37	1.35	1.34

m) Conclusion

The question of importation and local production in Afghanistan is not only economic, but also political, administrative, and there are a variety of interests at stake in the public health sector and market. The economic analysis conducted in this study indicates there are several economic indicators which direct towards continuing with importation of these drugs and vaccines on a large scale inclusive of economies of scale and import revenue benefits. This is specifically highlighted by the internal rate of return investment measures.

However, it must be noted that local production has other intangible benefits in Afghanistan that are not necessarily reflected in the economic model including responsibility and ownership by the Afghans, self-governance and direction, and potential for local economic growth. The Afghanistan MoPH must work towards balancing these economic, social and political factors to ensure the right strategy and direction for the country with some reliable and sustainable proportion of local production.

n) Study Recommendations

As a result of this study, several recommendations are in order inclusive of the following:

3. The economic framework of investment assessment (IRR, Net Present Value of Economic Benefits, and Benefit Cost Ratio) should be advanced and updated for detailed consideration for the broader pharmaceutical market.
4. If Local production is deemed to be encouraged and supported by the Ministry of Public Health, the following factors should be seriously considered by the MoPH:
 - Start-Up costs, capabilities and volume of production (inclusive of economies of scale) should be projected and monitored in detail.
 - The abolishment of taxes on raw materials importation should be considered in order to stimulate investment in local production.
 - Steps need to be taken to encourage and support or even subsidize good manufacturing and laboratory practices in Afghanistan. This would establish the necessary foundation for sustainable local production, especially if there is intent to expand the market share.
 - Industrial parks should be considered for local production but will incur significant start-up costs which should be examined and monitored closely.

- There should be investment in quality control. This includes expanding government capacity in supervision, monitoring to strengthen quality control and good manufacturing practices.
- Public-private partnerships should be explored in order to jointly benefit both the public and private sectors and to maximize efficiency and quality of local production.
- Anti-smuggling initiatives needs to be addressed by the MoPH in order to strengthen the overall balance between importation and local production.

o) Study Limitations

Some challenges and limitations have been in experienced in the study and should be noted. These limitations include the following:

1. There are some inconsistencies in the budgetary and cost data obtained which make it challenging to ascertain a clear picture based on unit costs and estimated importation and local production counts.
2. There is a vision of importers and local producers to move from a market mix of 95/05 to 90/10 and longer term 85/15, but not necessarily with the indicated 15 drugs and 4 vaccines. Notably, the local producers did not predict much local production of these drugs and vaccines in the coming years based on their respective responses.
3. The more advanced economic analysis (internal rate of return, benefit-cost ratio, etc.) has required the use of “top-down data” based on a combined of provided data from the surveys and series of assumptions, based on the pharmaceutical literature.
4. Additional benefits could not be reflected in full analysis due to limited data collection constraints.

p) Annexes

- Annex 1: List of Importers and Producers Companies Interviewed
- Annex 2: Photos from Data Collection and Training
- Annex 3: IRR, NPV, and BCR, \$USD – 10 Years, Importation (95%), Local Production (5%)
- Annex 4: IRR, NPV, and BCR, \$USD – 10 Years, Importation (90%), Local Production (10%)
- Annex 5: IRR, NPV, and BCR, \$USD – 10 Years, Importation (15%), Local Production (15%)

Annex 1. List of Importers and Producers Companies Interviewed

S/N	Name of the Company	Type of Compa	Location of the Company (including Province)	Company Contact
1	Global Pharma	Importer	Kabul, Airport Road, Infront of Power Junction	786222296
2	Saqib Umar Pharma	Importer	Kabul, Airport Road, Infront of Power Junction	786000130
3	Umar Bangash	Importer	Kabul, Airport Road, Infront of Power Junction	772101010
4	Sayed Obaidullah Sayedzade	Importer	Kabul, Infront of Parwan Hotel, shop No. 10	781329660
5	Sadri Dawa Co	Importer	Kabul, Parwan Hotel, Back of Qader Bakhshi Market, Hanifi Market, Hesai 3, Khairkhana	781542547
6	Kamma Limited	Importer	Kabul, Parwan Hotel, Office No. 42, Second Floor, Khalid Taraki Market	799560566
7	Mayar Brothers	Importer	Kabul, Parwan Hotel, Khair Khana	700704082
8	Sistan Pharma	Importer	Kabul, Parwan Hotel, Hesai 3, Khair Khana, Khalid Taraki Market, 4th floor	793199494
9	Omar Salah LTD	Importer	Kabul, Shamsad Market, Khairkhana	700275394
10	Faqir Zaman	Importer	Kabul, Khair Khana, Alshefa Market	779403404
11	Sadan Rahim	Importer	Kabul, Hesai 3 Khairkhana, Parwan Hotel, Shamsad Market	799319134
12	Sabzwar Ishagzai	Importer	Kabul, PD11, Alshefa Market, 3rd floor, Office No. 4	796006700
13	Rohullah Nasrat	Importer	Kabul and 17 other provinces	790090001
14	Ghaiur Ameer Zoi Co.Ltd	Importer	Kabul, Qadir Bakhshi Market, Hesai 3 Khairkhana	799358931
15	Rugh Sehat	Importer	Kabul, PD11, Hesai 3, Khairkhana, Parwan Hotel	786370011
16	Aftab Altaf LTD	Importer	Kabul, Parwan Hotel, Qader Bakhshi Market, 3rd Floor	790446699
17	Basir Murid LTD	Importer	Kabul, Khair khana, Parwan Hotel	700041816
18	Ulfat Safi LTD	Importer	Kabul, Parwan Hotel, Muhsen Plaza, Infront of Masjid Sarwar Kayenat	700282454
19	Silab Bahar LTD	Importer	Kabul, Karte Naw, 3rd Street	799614132
20	Afghan Health	Importer	Kabul, Parwan Hotel, Hanafi Market, Khair Khana	778291212
21	Muwaffaq Safi LTD	Importer	Kabul, Khair khana, Parwan Hotel	703636925
22	Ayubi Najeb LTD	Importer	Kabul, PD11, Parwiz Market, Parwan Hotel, 5th floor, Room No. 6	700088451
23	Edris Saber LTD	Importer	Kabul, Hesai 3 Khairkhana, Parwan Hotel, Qader Bakhshi Market	799206572
24	Omar Arsalan LTD	Importer	Kabul, Parwan Hotel	700770088
25	Hashmatullah Aami	Importer	Kabul, Parwan Hotel, Qader Bakhshi Market	706124211
26	Mawlana Sehat, Lite Life LTD	Importer	Kabul, Parwan Hotel	770009009
27	Adnan Faisal LTD	Importer	Kabul, Hesai 3 Khairkhana, Khalid Taraki, 2nd Floor	773899358
28	Euro Med LTD	Importer	Kabul, Parwan Hotel, Nejrab Market	785117117
29	Galaxy Pharma	Importer	Kabul, Parwan Hotel, Qader Bakhshi Market, 1st floor	771727567
30	Abdullah Wali Rahman LTD	Importer	Kabul City	799328029
31	Daqiq Asri LTD	Importer	Kabul, Hesai 3, Sarwar Kayenat square, Qader Bakhshi Market, 3rd floor	781585870
32	Derma cure LTD	Importer	Kabul, PD 11, Parwan Hotel, Basharat Pharmacy	799349309
33	Saif Noori	Importer	Kabul, Jadai Maiwand, Sakhi Zada Plaza	784535854
34	Lalandar LTD	Importer	Kabul, Parwan Hotel, Khalid Taraki Market, 4th Floor, Office No. 15	788649694
35	Zekrullah Mominzada LTD	Importer	Kabul, Khair Khana, Parwan Hotel, Hanafi Market	799636392
36	Fawad Ghawsi LTD	Importer	Kabul, Khair Khana, Qader Bakhshi Market	787811811
37	Jawad Asia	Importer	Kabul, Khair Khana, Parwan Hotel, Khalid Taraki Market	779756185
38	Hekmat Dawar LTD	Importer	Kabul, Parwan Hotel, Nejrab Market	783468694
39	Zuhoor Ilham LTD	Importer	Kabul, Khair Khana, Shamsad Market	708951393
40	Yaser Wares	Importer	Kabul, Qader bakhshi Market, 3rd floor	730222876
41	Sulaiman Shekib Amiri LTD	Importer	Kabul, Parwan Hotel, PD11	700604914
42	Kabul Darmal	Importer	Kabul, Hesai 3, Khairkhana, PD 15	749050505
43	Imranullah Niazi LTD	Importer	Kabul, Khairkhana, Parwan Hotel, Shamsad Market, Office No. 410, 4th floor	786203592
44	Monibullah Hasib LTD	Importer	Kabul, Parwan Hotel, Qader Bakhshi Market	785188885
45	Haroon Masoud	Importer	Kabul City	700234936
46	Jan Agha Niaz LTD	Importer	Kabul, Khairkhana, Parwan Hotel	781276260
47	Shams Amiri LTD	Importer	Kabul, Khair Khana, Parwan Hotel	799333015
48	New Faqiri LTD	Importer	Kabul City	799328029
49	Noor Asri LTD	Importer	Nangarhar, Jalalabad, Akakhail Plaza, Block B, Plot No. 25-27	787590038
50	Sarbeland Baba LTD	Importer	Nangarhar, Jalalabad, Akakhail Plaza, Plot No. 47-48	788191874
51	Asia Nariwal LTD	Importer	Nangarhar, Jalalabad, Shirindil plaza, Shop No. 52	787778070
52	Roohullah Nasrat	Importer	Nangarhar, Jalalabad, shirindil plaza, Shop No. 63-64	785485586
53	Anwar Najib LTD	Importer	Nangarhar, Pashtonisan Watt, Haji Gul Plaza, 2nd floor, Shop No. 10-11	777577775
54	Ahmad Aba LTD	Importer	Nangarhar, Jalalabad, Khan Taraki Plaza, Shop No. 47	700602203
55	Shayeq Nalwal LTD	Importer	Nangarhar, Jalalabad	700611520
56	Monir Omid	Importer	Balkh, Mazar-e-Sharif, Arya Market	700500162
57	Najib Mohib	Importer	Balkh, No longer with a physical address (got fired!)	700500126
58	Jamil Qanai LTD	Importer	Herat, Waris Passage, Shahr-e-Naw, Second floor	796466000
59	Khalid Baradaran	Importer	Herat, Eidgah road, Abo Alisina Market	402224734
60	New Hariwa	Importer	Herat City	784541652
61	Umar Bangash	Importer	Herat City	700403751
62	New Kakar LTD	Importer	Herat, Eidgah road, Darwishi Market	794193323
63	Hari Pharma	Importer	Herat, Eidgah Road, Miral Market	787088350
64	Ishaq Omarzai	Importer	Kandahar, Awal Ansari Market	704630400
65	Said Shiragha LTD	Importer	Kandahar, Roghtya Market, shop 41	700363252
66	Zahed Ezat LTD	Importer	Kandahar, Ayobi Darmal Market, Shop No. 2	700676834
67	Rahim Khair Mohammadzada	Importer	Kandahar, Ayobi Darmal Market, New Road	700367981
68	Muwaffaq Safi LTD	Importer	Kandahar, Ayubi Shefa Market, Shop No. 5	795593031
69	Afghan Darugar	Producer	Kabul, Industrial parks, Former PD 9 street, beside electricity tower	788159509
70	Asia Noor LTD	Producer	Kabul, Bostaan Kabul, PD17	766106666
71	Standard Pharma	Producer	Kabul, PD 17, Sar-e-Kotal, Khairkhana	782657535
72	Trajmir Pharmaceutical LTD	Producer	Kabul, PD15, Qasaba, Global City, 4th Street	788054505
73	Pamir Production Company	Producer	Kabul, Hesai 3 Khairkhana, Parwan Hotel	702400505
74	Bakhtar Afghan Pharma	Producer	Nangarhar, Jalalabad	780263743
75	Abwar Pharma	Producer	Nangarhar, Chaparhar, Dawlat Zai Families	777600833
76	Loy Nangarhar Oxygen and Nitrogen Production Co.	Producer	Nangarhar, Jalalabad, PD1, Haji Lahor Khan Meena	787146525
77	Zafran Pharma	Producer	Balkh, Mazar-e-Sharif, Amir Ali Shir Nawai Industrial Parks, infront of Ghazanfar city	793616569
78	Oisen Pharma	Producer	Herat, Eidgah road, Miral Alam Market	797147878
79	Asia Pharma	Producer	Herat, Industrial Parks, 2nd Phase, Shogofa Boulevard	794482524
80	Afghan Kakhshan	Producer	Herat, Industrial Parks	799416655
81	Amico pharma	Producer	Kandahar, Shorandam industrial parks, Kabul Bypass	700340148

Annex 2. Photos from Data Collection and Training



Annex 3. INTERNAL RATE OF RETURN (IRR), NET PRESENT VALUE (NPV) and BENEFIT COST RATIO (BCR), \$USD – 10 Years, Importation (95%), Local Production (5%), Discount Rate 10%, Inflation 5%

Annex 3 Table. INTERNAL RATE OF RETURN (IRR), NET PRESENT VALUE (NPV) and BENEFIT COST RATIO (BCR), \$USD – 10 Years					
Importation (95%), Local Production (5%)					
YEAR	INVESTMENT COST	PRESENT VALUE COSTS	TOTAL ECONOMIC BENEFITS	PRESENT VALUE BENEFITS	PRESENT VALUE NET ECONOMIC BENEFITS
0	170,000,000	170,000,000	0	0	(170,000,000)
1	178,500,000	162,272,727	267,325,000	243,022,727	80,750,000
2	187,425,000	154,896,694	280,691,250	231,976,240	77,079,545
3	196,796,250	147,855,935	294,725,813	221,431,865	73,575,930
4	206,636,063	141,135,211	309,462,103	211,366,780	70,231,569
5	216,967,866	134,719,974	324,935,208	201,759,199	67,039,225
6	227,816,259	128,596,339	341,181,969	192,588,327	63,991,988
7	239,207,072	122,751,051	358,241,067	183,834,312	61,083,261
8	251,167,425	117,171,458	376,153,120	175,478,207	58,306,749
9	263,725,797	111,845,482	394,960,777	167,501,925	55,656,442
10	276,912,087	106,761,597	414,708,815	159,888,201	53,126,604
			435,444,256	152,620,555	152,620,555
			0		
	2,415,153,818	1,498,006,469	3,797,829,378	2,141,468,338	643,461,869
Total					
IRR	39.6%				
NPV (USD)	\$643,461,869.48		50,833,487,689		
			NPV (Afs)		
BCR	1.430				

Annex 4. INTERNAL RATE OF RETURN (IRR), NET PRESENT VALUE (NPV) and BENEFIT COST RATIO (BCR), \$USD – 10 Years, Importation (90%), Local Production (10%), Discount Rate 10%, Inflation 5%

Annex 4 Table. INTERNAL RATE OF RETURN (IRR), NET PRESENT VALUE (NPV) and BENEFIT COST RATIO (BCR), \$USD – 10 Years					
Importation (90%), Local Production (10%)					
YEAR	INVESTMENT COST	PRESENT VALUE COSTS	TOTAL ECONOMIC BENEFITS	PRESENT VALUE BENEFITS	PRESENT VALUE NET ECONOMIC BENEFITS
0	170,000,000	170,000,000	0	0	(170,000,000)
1	178,500,000	162,272,727	264,350,000	240,318,182	78,045,455
2	187,425,000	154,896,694	277,567,500	229,394,628	74,497,934
3	196,796,250	147,855,935	291,445,875	218,967,600	71,111,664
4	206,636,063	141,135,211	306,018,169	209,014,527	67,879,316
5	216,967,866	134,719,974	321,319,077	199,513,867	64,793,892
6	227,816,259	128,596,339	337,385,031	190,445,054	61,848,715
7	239,207,072	122,751,051	354,254,283	181,788,461	59,037,410
8	251,167,425	117,171,458	371,966,997	173,525,349	56,353,892
9	263,725,797	111,845,482	390,565,347	165,637,833	53,792,351
10	276,912,087	106,761,597	410,093,614	158,108,841	51,347,244
			430,598,295	150,922,075	150,922,075
	2,415,153,818	1,498,006,469	3,755,564,186	2,117,636,417	619,629,948
Total					
IRR	37.9%				
NPV (USD)	\$619,629,948.39				
				NPV (Afs)	48,950,765,922
BCR	1.414				

Annex 5. INTERNAL RATE OF RETURN (IRR), NET PRESENT VALUE (NPV) and BENEFIT COST RATIO (BCR), \$USD – 10 Years, Importation (85%), Local Production (15%), Discount Rate 10%, Inflation 5%

Annex 5 Table. INTERNAL RATE OF RETURN (IRR), NET PRESENT VALUE (NPV) and BENEFIT COST RATIO (BCR), \$USD – 10 Years					
Importation (85%), Local Production (15%)					
YEAR	INVESTMENT COST	PRESENT VALUE COSTS	TOTAL ECONOMIC BENEFITS	PRESENT VALUE BENEFITS	PRESENT VALUE NET ECONOMIC BENEFITS
0	170,000,000	170,000,000	0	0	(170,000,000)
1	178,500,000	162,272,727	261,375,000	237,613,636	75,340,909
2	187,425,000	154,896,694	274,443,750	226,813,017	71,916,322
3	196,796,250	147,855,935	288,165,938	216,503,334	68,647,399
4	206,636,063	141,135,211	302,574,234	206,662,273	65,527,062
5	216,967,866	134,719,974	317,702,946	197,268,534	62,548,559
6	227,816,259	128,596,339	333,588,093	188,301,782	59,705,443
7	239,207,072	122,751,051	350,267,498	179,742,610	56,991,559
8	251,167,425	117,171,458	367,780,873	171,572,492	54,401,034
9	263,725,797	111,845,482	386,169,917	163,773,742	51,928,260
10	276,912,087	106,761,597	405,478,412	156,329,481	49,567,884
			425,752,333	149,223,595	149,223,595
	2,415,153,818	1,498,006,469	3,713,298,995	2,093,804,496	595,798,027
Total					
IRR		36.1%			
NPV (USD)		\$595,798,027		NPV (Afs)	
		47,068,044,156			
BCR		1.398			