



**Islamic Republic of Afghanistan  
Ministry of Public Health**

**Economic Evaluation of the Potential for  
Local Pharmaceutical Production in Afghanistan**

**Health Economics and Financing Directorate (HEFD)  
in partnership with  
Health Partners International of Canada (HPIC)**

**Final Report**

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## **Abbreviations and Acronyms**

APE	: Avicenna Pharmaceutical Enterprise
AREU	: Afghanistan Research and Evaluation Unit
GDPA	: General Directorate for Pharmaceutical Affairs
GMP	: Good Manufacturing Practices
GoIRA	: Government of the Islamic Republic of Afghanistan
HEFD	: Health Economics and Financing Directorate
HPIC	: Health Partners International of Canada
IHMR	: India Institute of Health Management Research
MoPH	: Ministry of Public Health
NHA	: National Health Accounts

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## Executive Summary

### ***Background***

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-assured 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 the MoPH, along with Health Partners International of Canada (HPIC) commissioned an economic evaluation of APE and a sample of private sector producers to assist in determining the economic trade-offs of such an endeavour. This report serves as the final report of the economic evaluation. The study aims to analyse 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. It also provides a comparative framework of pursuing a strategy for expanding local production with a strategy of importing pharmaceuticals. Procedures and impacts of these two models are considered as they relate to Afghanistan's local economic development, health of the Afghan population and access to medicines within the current context of health financing.

### ***Methods***

The overall economic model applied for this study begins by examining the broader economic context for pharmaceuticals in the health sector and then includes a detailed cost analysis of the current resource inputs at APE and the private sector, along with an estimate of current market share. Furthermore, future resources required for the revitalization of the APE production facility in Kabul including infrastructure, equipment, human resources, technical assistance and training, raw materials, recurrent costs, etc. over a 5-10 year period are assessed.

For the purpose of the local domestic production analysis (current and future planned), a questionnaire for domestic production was designed to examine specific resource inputs (human resources, raw materials, recurrent costs, etc.) In addition, a private market questionnaire was also developed and administered to four private companies in Afghanistan. The questionnaires were designed to address all aspects of

pharmaceutical market in Afghanistan such as price of pharmaceuticals, problems within importation and distribution of pharmaceuticals and main countries that export pharmaceuticals to Afghanistan.

### ***Results***

The total annual cost of operation of APE during 1392/2013 is estimated as 110,074,690 (Afs) of \$2,001,358 USD. The average cost of local production by a private company is \$850,000 USD or 46,750,000 Afs. Together, for APE and 12 private companies, this totals \$12,201,358 USD or 671,074,690 Afs per year or 2.7% of the pharmaceutical market in Afghanistan.

The total investment cost for land, building, and equipment is estimated at \$8,920,454 USD or 490,625,000 Afs. When amortized, this amounts to \$599,594 USD or 32,977,706 Afs.

Within 5 years, total annual costs are estimated at \$24,890,048 to achieve approximately 5% of market share. Raw materials (\$ 4,096,074 USD or 225,284,070 Afs) and human resources (\$ 1,671, 120 USD or 91,911,600 Afs) continue to represent the largest proportion of estimated costs at APE (together over 80% of costs) but at a significantly higher level of investment.

Other benefits to expanded local production include increased employment at both APE and in the private sector and may encourage the improvement in quality production.

Alternatively, it is important for Afghanistan to consider the long run costs of production within a stable pharmaceutical market and possible economies of scale as related to imported products relative to local production.

### ***Recommendations and Discussion***

The research team strongly recommends 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%).

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.

## 1. Background

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. It began manufacturing pharmaceuticals in 1975 with financial and technical support from the French Government. The Government of the Islamic Republic of Afghanistan (GoIRA) subsequently invested in APE to further develop its capacity. APE produced various types of drugs in the forms of injections, capsules, tablets, syrups, and creams, as well as alcohol and vaccines. At the time, APE had the capacity to produce approximately 120 types of pharmaceuticals.

Due to decades of conflict and shifts in priorities, the production of pharmaceuticals has drastically reduced from its high point in the 1970's to today where less than 5% of pharmaceuticals are manufactured in country. Currently, APE functions at a much lower capacity, with its 35 technical and non-technical staff members are producing 10 types of drugs<sup>1</sup>. However, with recent rebuilding efforts, there is a growing question about whether or not Afghanistan should invest to expand local production of pharmaceuticals to just over 100 products including tablets (such as paracetamol, and co- trimexazol) capsules (such as Amoxicillin), pomade-creams (such as tetracyclin), syrups, and solutions<sup>2</sup>.

Furthermore, in an earlier study of the market for pharmaceuticals in Afghanistan, Afghanistan Research and Evaluation Unit (AREU) describes that the German Hoechst Corporation opened a pharmaceutical factory in Kabul in 1968, in which the government held a 51 percent ownership. This factory, located on Jalalabad Road in Kabul, produced 130 medicines, covering a wide range of Afghan domestic needs and also exports to neighbouring countries. In 1991, the German partners withdrew from Afghanistan and in 1997 stopped formal production. The Hoechst brand left a strong influence on Afghan consumers and was positively described by customers and trusted by the public. Today, 12 private producers of pharmaceuticals remain in the market for local production of some products and for distribution of imported items.

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-assured 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.

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<sup>1</sup> The complete list of these drugs is included in annex 1.

<sup>2</sup> The complete list of these drugs is included in annex 2.



The GDPA's assessment study, along with the National Health and Nutrition Policy 2013-2020, recommends that the MoPH should support an environment for local manufacturers to produce quality pharmaceuticals and medical products in Afghanistan. More specifically, the report highlights that GoIRA should support APE rebuild its capacity to produce high quality drugs for the population of Afghanistan. In order to further explore the potential for investment and growth of pharmaceutical production the MoPH, along with Health Partners International of Canada (HPIC) commissioned an economic evaluation of APE and a sample of private sector producers to assist in determining the economic trade-offs of such an endeavour.

In summary, this economic evaluation aims to analyse 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. It will also provide a comparative framework of pursuing a strategy for expanding local production with a strategy of importing pharmaceuticals. Procedures and impacts of these two models are considered as they relate to Afghanistan's local economic development, health of the Afghan population and access to medicines within the current context of health financing.

This document is the final report related to the economic evaluation.

### **Main Economic and Policy Questions to be Addressed**

In order to structure the study for the above-described purposes, key economic questions have been developed to guide the investigation and analysis.

#### **Primary economic question:**

a. Should Afghanistan produce pharmaceuticals for domestic consumption or should the country pursue a longer-term strategy/model of importing pharmaceuticals to support the health sector? What are the associated costs and benefits of both models?

#### **Key economic and policy sub-questions:**

b. According to the Afghanistan National Health Accounts (NHA), what is the current and future market (financial value) for pharmaceuticals in Afghanistan? What is the current annual investment in APE and the private sector?

c. What are the proposed types of pharmaceutical products that would be produced in Afghanistan over the next 5-10 years by APE and others?

d. What are the estimated costs of expanding pharmaceutical production in Afghanistan at APE and in the private market including infrastructure, equipment, raw materials, salaries, recurrent costs such as electricity, etc. under the current investment strategy for 5-10 years? What are the estimated benefits of this production over this time period?

e. What are the estimated investments required for the local production of quality, standard medicines over the next 5-10 years at various levels of market share?

f. How does local production of pharmaceuticals compare with importation, particularly as related to economies of scale?

g. If Afghanistan views the production of pharmaceutical products in Afghanistan as a viable option, what should be the role of the public and private sectors in purchasing, providing, regulating, financing, and maintaining the quality assurance of production? Should there be a public-private partnership? Should the production be sold to the private sector? What are the market failures now and expected in the future? Can these risks be mitigated?

## 2. Methodology

In order to address the above questions, a detailed economic model and data collection methodology was required.

### a. Economic Model

#### *Cost and Benefit Analysis of Alternatives*

The overall economic model applied for this study begins by examining the broader economic context for pharmaceuticals in the health sector and then includes a detailed cost analysis of the current resource inputs at APE and the private sector, along with an estimate of current market share. Furthermore, future resources required for the revitalization of the APE production facility in Kabul including infrastructure, equipment, human resources, training, raw materials, recurrent costs, etc. over a 5-10 year period are assessed. Cost centers examined include overhead and management, support centers, and direct production materials (associated with a proposed list of medicines to be produced, see Annex 2). A cost allocation model was used as necessary and international data estimates were applied in the case of missing data from Afghanistan.

Ideally, one would be able to analyze the cost of importing the exact comparable proposed list of drugs and medicines to be produced locally in Afghanistan, but this was not feasible within the limited time available to conduct this study within the complex and diverse market for pharmaceuticals in Afghanistan and the Central Asia region. Alternatively, in this study, we examined the international literature and the key economic tradeoffs related to the local production of pharmaceuticals and importation for a country such as Afghanistan.

Furthermore, benefits were identified and described for both alternatives, but not in the traditional benefit-cost analysis approach of examining benefit-cost ratios. It is clear that Afghanistan must obtain pharmaceuticals to assure access to quality medicines by

the Afghan population, but the broader economic question relates to which course of action (local production or importation) should be implemented and/or to what extent?

## **b. Costing Instruments and Data Collection Sources**

The primary instrument to conduct the cost analyses includes an Excel-based spreadsheet model used to conduct multi-cost center analysis focusing on achieving total costs of local production. A societal perspective was applied as much as possible to gather both economic and social costs. Finally, in this instrument, as most of the resources would require investment from current levels, the analysis focuses on costing from a financial perspective. This includes estimated financial outlays as well as the market value of all donated resources. The financial perspective is more narrowly defined than an economic perspective and includes the needed financial outlays over a 5-10-year forecast of local production.

### **Local production questionnaire at APE**

For the purpose of the local domestic production analysis (current and future planned), a questionnaire for domestic production was designed on basis of the earlier described Excel-based costing tool. Specifically, there were seven main cost centers addressed in the questionnaire as follows:

- Infrastructure (building)/land
- Machinery and equipment
- Human resources
- Raw materials
- Technical assistance (Training/Capacity Building)
- Quality control
- Miscellaneous recurrent expenditure; water, electricity, machinery maintenance, depreciation, etc.

### **Market analysis questionnaire**

Based on a previously developed methodology, the Health Economics and Financing Directorate (HEFD) team developed a private market analysis questionnaire. The questionnaires were designed to address all aspects of pharmaceutical market in Afghanistan such as price of pharmaceuticals, problems within importation and distribution of pharmaceuticals and main countries that export pharmaceuticals to Afghanistan. Qualitative and quantitative aspects of the pharmaceutical market were addressed in the questionnaires.

Detailed information was requested in each of the above-mentioned categories from a variety of stakeholders including MoPH staff, APE, and private sector representatives. The main recipient of the questionnaire was APE. Representatives from APE were instructed on how to complete the questionnaire within two weeks. Most of the questions were completed, although some of the questions were referred to other

involved institutions and the international literature. In addition, questionnaires were distributed to private sector representatives who are affiliated with four private manufacturing companies in the country. The private sector representatives were requested to fill the questionnaires within two weeks. Once received, the HEFD team followed up with respondents to discuss any inconsistent or ambiguous points within the questionnaires to provide clarification. Both market analysis and domestic production questionnaires were developed in English and then translated into Persian by the HEFD team.

Finally, other data sources examined include: MoPH, Ministry of Finance (MoF), and reports including “An Assessment of the Pharmaceutical Manufacturing Industry in Afghanistan 2011” by the India Institute of Health Management Research (IIHMR), and additional reports including:

*Development Studies Associates, 2008. Project Profile of the Establishment of Pharmaceuticals Formulating Plant, Development Studies Associates, Addis Ababa, Ethiopia*

*Taylor, J., Bate, R., Putze, E., and Tren, R. 2009. The push for local production costs and benefits: A case study of Uganda’s Quality Chemicals.*

*Paterson, A., and Karimi, A. (2005). Understanding Markets in Afghanistan: A Study of the Market for Pharmaceuticals, Afghanistan Research and Evaluation Unit (AREU), Kabul, Afghanistan.*

With regard to the study timeline, data collection took place from October – December 2013. Analyses and reporting took place in January and February 2014. A full list of references is presented at the end of this report.

### **c. Data Analysis and Assumptions**

The data analysis focused on estimating the overall costs of local production and the necessary investment needed to achieve certain levels of market share within the pharmaceutical market in Afghanistan. The analysis was conducted on a 5-year and 10-year basis. Throughout the analysis, an exchange rate of 55 Afs=\$1USD was applied, reflecting the rate of exchange during the analysis period. The following is a list of assumptions applied in the analysis.

#### *Local Production Analysis Assumptions*

- **Infrastructure (building)/land (fixed cost)**– The analysis includes construction of a building sized of 3750 square meters for pharmaceutical local production. The estimated cost per square meter is \$400 USD or approximately 22,000 Afs. The life span of the building for production purposes is 20 years and an amortization rate of 3% is applied based on data received from Pharmaceutical Enterprise. The proposed size of

the land is 120,000 sq. meters, while the cost is estimated at \$54.55 USD per square meter or 3,000 Afs.

- **Machinery and equipment (fixed cost)**– Machinery and equipment costs are estimated based on the list of equipment identified in the questionnaires and reported by the representatives. The original market value and remaining life years of each item were identified. An amortization rate of 3% was applied over the course of the life years.
- **Human resources (fixed cost)** –Thirty-five staff support current production of pharmaceuticals at APE. For future production, a full list of human resources (see annex 2) and associated costs was developed with key stakeholders in order to ultimately support full production of the 52 proposed items. The staffing model is assumed to be a fixed resource until this production level is achieved. A 3% inflation rate is applied.
- **Raw materials (variable cost)** – Raw materials costs were obtained from a variety of sources and are generally estimated to be between 65% and 85% of the total annual costs of production. A study of local production costs in Ethiopia conducted by Development Studies Associates (2008) was used as reliability estimate for estimating the costs of raw materials in Afghanistan. A 3% inflation rate is applied to raw materials. Based on discussions with stakeholders, we assume that this cost includes customs fees for the importation of raw materials in Afghanistan.
- **Technical Assistance and Training (fixed cost)** – Training costs are estimated to be incurred every two years as refresher trainings provided to existing staff and initial trainings for new staff. These costs are estimated from both economic and financial perspectives.
- **Quality control (fixed cost)** – Quality control is an important factor in upgrading the APE and private factories in the local production of pharmaceuticals in Afghanistan to an acceptable or standard level. These costs include annual technical assistance and quality control processes.
- **Miscellaneous recurrent costs (variable costs)**; water, electricity, machinery maintenance, etc. – These costs are estimated to be approximately 5% of the total cost of operation.

#### *The Current Market for Pharmaceuticals in Afghanistan*

According to the Afghanistan National Health Accounts 2011-2012, pharmaceutical spending accounts for 26% of total annual health spending, amounting to over \$450 million USD (NHA 2011-2012). At present, 97% of pharmaceuticals are imported, while APE and 12 primary local producers produce 3% of the market locally. When considering the expansion of the local production of pharmaceuticals, it is important to consider the future vision of local production as related to meeting a portion of needs for access to medicines and stimulation of the local economy and manufacturing. If local production of pharmaceuticals is supported, to what extent should there be investment in this sector and what level of market share is the target? Moreover, among these economic considerations, on the demand side, it is critical to acknowledge that most of

this spending is coming from private households' out-of-pocket payments, which is the financing source for over 2/3rds of all health spending in Afghanistan.

### 3. Economic Analysis Results

The results of the economic evaluation are organized in a stepwise manner.

Table 1 shows the current costs of Avicenna Pharmaceutical Enterprise and Private Local Pharmaceutical Producers in Afghanistan. For APE (and the private sector organizations), it should be highlighted that raw materials generally represent the highest proportion of costs annually, while other cost drivers primary include human resources. Maintenance, utilities, and depreciation costs are relatively low. The total annual cost of operation of APE during 1392/2013 is estimated as 110,074,690 (Afs) of \$2,001,358 USD. The average cost of local production by a private company is \$850,000 USD or 46,750,000 Afs. Together, for APE and 12 private companies, this totals \$12,201,358 USD or 671,074,690 Afs per year or 2.7% of the pharmaceutical market in Afghanistan.

**Table 1. 1392/2013 Current Costs of APE and Private Local Pharmaceutical Producers in Afghanistan**

Avicenna Pharmaceutical Enterprise					
Resources	Proportion of Avicenna Cost	Annual Estimated Costs - Afs		Annual Estimated Costs - USD	
Human Resources	26.3%	28,894,800	\$	525,360.00	
Raw Materials	68.2%	75,094,690	\$	1,365,358.00	
Maintenance	2.8%	3,058,000	\$	55,600.00	
Utilities	1.8%	1,982,200	\$	36,040.00	
Depreciation	0.9%	1,045,000	\$	19,000.00	
<b>Total Costs</b>	<b>100.0%</b>	<b>110,074,690</b>	<b>\$</b>	<b>2,001,358.00</b>	
Local Production Private Company					
Average Cost	Number of Companies	Average Annual Estimated Cost - Afs		Average Annual Estimated Cost - USD	
	1	46,750,000	\$	850,000.00	
	12	561,000,000	\$	10,200,000.00	
Total Annual Costs		<b>671,074,690</b>	<b>\$</b>	<b>12,201,358.00</b>	
<b>Current Market Share</b>					<b>2.7%</b>

Table 2 shows the estimated infrastructure and equipment costs for the local production of pharmaceuticals in Afghanistan at APE under the new proposed model of production of 52 items. The total investment cost for land, building, and equipment is estimated at \$8,920,454 USD or 490,625,000 Afs. When amortized, this amounts to \$599,594 USD or 32,977,706 Afs. This amount is added for annual cost calculations in Table 3.

**Table 2. Infrastructure and Equipment Cost/Investment Estimate for APE in Afghanistan under currently proposed plan for Pharmaceutical Production**

Estimated Land Area	SQ meters	
	120,000	
	<b>USD</b>	<b>Afs</b>
Cost Per SM	\$ 54.55	3,000
Total Estimated Land Cost	\$ 6,545,454.55	360,000,000
Total Equipment Cost	\$ 875,000.00	48,125,000
Total Building Cost	\$ 1,500,000.00	82,500,000
Total Investment	\$ 8,920,454.55	490,625,000

**Table 3. Estimated costs of APE and Private Local Pharmaceutical Producers - 5 Years**

Avicenna Pharmaceutical Enterprise - 5 year plan					
Resources	Proportion of Avicenna Cost	Annual Estimated Costs -		Annual Estimated Costs - USD	
		Afs			
Human Resources	24.3%	91,911,600	\$	1,671,120.00	
Raw Materials	59.4%	225,284,070	\$	4,096,074.00	
Maintenance	2.2%	8,395,200	\$	152,640.00	
Utilities	1.6%	5,946,600	\$	108,120.00	
Depreciation	0.9%	3,437,500	\$	62,500.00	
Infrastructure and Equipment	8.7%	32,977,707	\$	599,594.66	
Technical Assistance and Quality Control	2.9%	11,000,000	\$	200,000.00	
<b>Total Costs</b>	<b>100.0%</b>	<b>378,952,677</b>	<b>\$</b>	<b>6,890,048.66</b>	
Local Production Private Company	Number of Companies	Average Annual Estimated Cost - Afs		Average Annual Estimated Cost - USD	
	1	82,500,000	\$	1,500,000.00	
	12	990,000,000	\$	18,000,000.00	
Total Estimated Annual Costs		<b>1,368,952,677</b>	<b>\$</b>	<b>24,890,048.66</b>	
<b>Estimated Market Share within 5 years</b>					<b>4.98%</b>

Table 3 shows the key cost drivers for the cost of local production that would be achieved within a 5-year period at APE and at 12 local production private companies. Raw materials (\$ 4,096,074 USD or 225,284,070 Afs) and human resources (\$ 1,671,120 USD or 91,911,600 Afs) continue to represent the largest proportion of estimated costs (together over 80% of costs) but at a significantly higher level of investment at APE. Costs would increase slightly over 100% to achieve a new scope of produced products, increasing from the 10 currently produced at APE to 52 (estimated under the proposed plan). Total annual costs are estimated at \$24,890,048 within 5 years to achieve approximately 5% of market share.

**Table 4. Annual Costs Required to Achieve Varying Levels of Market Share**

Currency	Local Production Market Share and Estimated Annual Costs		
	4.98%	10%	20%
Afs	1,368,952,677	2,750,000,000	5,500,000,000
USD	\$24,890,048.66	\$ 50,000,000.00	\$ 100,000,000.00

Table 4 represents a comparison of the estimated annual average local production costs under varying additional proportions of market share. For example, as previously indicated, to achieve an estimated level of market share at 10%, annual costs of local production would reach approximately \$50,000,000 USD or 2,750,000,000 Afs. Notably, this figure would be doubled to achieve approximately 20% of the market share relative to importation. It should be noted that this analysis presumes that the pharmaceutical market in Afghanistan would reach approximately \$500,000,000 USD in 5 years.

**Table 5. Possible Phased Plan for 10% of Market Share in 10 Years**

	4.82%	7.50%	10%
Afs	1,324,974,970	2,062,500,000	2,750,000,000
USD	\$24,090,454.00	\$ 37,500,000.00	\$ 50,000,000.00
Average Annual Cost Difference Afs		737,525,030	1,425,025,030
Average Annual Cost Difference USD	\$	\$ 13,409,546.00	\$ 25,909,546.00

Table 4 represents a more limited spending effort for local production to achieve 10% of market share within 10 years. If the MoPH and associated stakeholders decide to further invest in local production of pharmaceuticals, a more realistic approach maybe to achieve 5% and then 7.5% of the market. This would keep local production at a relatively small proportion of market share, but also stimulate a level of local manufacturing of specific products.

**1. Considerations of benefits to local production of pharmaceuticals and a comparison of expanded local production with importation**

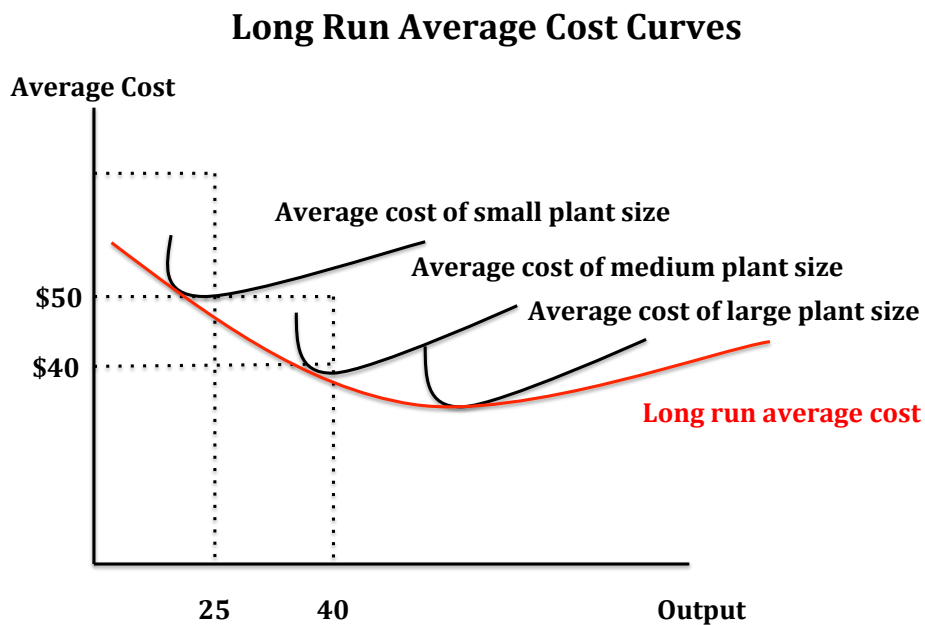
Several benefits can be noted in terms of further developing the local production of pharmaceuticals in the Afghan context. These are as follows:

- First, an additional 67 full time staff would be hired to support the production of new medicines at APE.
- In addition, the above economic modeling suggests that private sector companies would expand their operations and also conduct additional hiring to support their production processes.
- Lastly, local production may encourage research in the Afghan community to further advance the quality of medicines provided in Afghanistan.



In addition, it is important to consider investment in local pharmaceutical manufacturing in the context of the broader global market for importation. Figure 1 below provides an example of the long run average cost curves for three sized production plants (small, medium, and large) and is derived from microeconomic theory as described by Lipsey (1975). Global production of pharmaceuticals would most likely operate at a level of efficiency similar to the large manufacturing plant size indicated in Figure 1 (indicating high levels of output and lower levels of average cost). Alternatively, over time, local manufacturing of pharmaceuticals in Afghanistan would most likely operate a level closer to small or medium manufacturing plant size indicated in Figure 1 (indicating lower levels of output and higher levels of average cost). As a result, even if producing quality medicines, this situation would most likely translate into higher unit prices for medicines produced in Afghanistan, relative to those produced internationally. It should be noted that the figure below assumes a relatively stable market. As outlined by AREU (2005) the pharmaceutical market in Afghanistan is relatively unstable due significant amounts of illegal importation, price mark-ups, etc. Consequently, it is difficult to estimate the long run average cost curves in this context.

**Figure 1. Long Run Average Cost Curves related to plant size for manufacturing**



## 4. Discussion and Recommendations

Based on the above economic evaluation, we strongly recommend 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%). This is to keep pharmaceutical prices relatively low in the combined locally produced and imported pharmaceutical market, which is paid mostly out-of-pocket by Afghan households.

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.

Within the context, a few considerations should be given to some issues of uncertainty. First, from stakeholder interviews, it is worth highlighting the fact that customs procedures for raw materials can be very long and cumbersome, which can add to the societal cost of local production. Secondly, questions remain about the quality of medicines and raw materials being imported into Afghanistan. These questions can pertain to importation of both finished pharmaceutical products and raw materials. The costs of raw materials under local production in Afghanistan are assumed to capture the cost of standardized, international quality raw materials for the production of pharmaceuticals. Although difficult to quantify, it should be noted that logistical, supply-chain delays can equally impact the cost of importing pharmaceuticals or raw materials and must be minimized to reduce these hidden costs. Lastly, one of the major costs associated with local production is estimated to be human resources. Although the rates of pay represent the market rate for qualified experts and staff, Afghanistan may have difficulty staffing these positions based on current levels of capacity in country, and in this case, it would require attracting qualified staff from abroad.

In addition, it is important to note that local production of pharmaceuticals may be difficult to realize in Afghanistan without a national regulatory structure. This structure would be necessary to oversee the production of standardized drugs and medicines for domestic consumption throughout Afghanistan. We recommend a review of the existing structure, policies, and supervision procedures of the GDPA in the MoPH in order to identify and plan for an adequate regulatory framework for any local production.

In order to make any additional local production of pharmaceuticals a sustainable reality in current-day Afghanistan, it will require the development of a flexible, detailed 5-10 year business plan reflecting the roles and strengths of both the public and private sector. A public only model would most likely put the burden on the MoPH for all the roles of providing, purchasing and regulation, while a public/private partnership would provide a more balanced approach. The public sector could provide the necessary regulatory framework, while the private sector, given its experience in the importation market, could assist to identify qualified personnel, secure quality raw materials, and price drugs and medicines appropriately within a competitive pharmaceutical market.

It should be noted that varying organizational models of production of pharmaceuticals have existed in other country contexts including public production, public/private partnerships and not-for-profit operations (such as in Ethiopia and Uganda). Ministry of Public Health should consider the strengths and weaknesses of alternative models in order to maximize cost-efficiency in local production of drugs and medicines and strengthening this component of the health system.

## 5. Data Collection and Analysis Team and Staffing, Roles

**International Advisor:** Aaron Philip Blaakman, PhD led the investigation, organized the workplan, data collection, and analysis. He coordinated directly with HEFD and HPIC.

**HPIC Staff:** Dr. Nasratullah Rasa supported the investigation, particularly on methodology and interpretation of results. Maryanne Mutch and Alexandra Wilson provided comments and edits on the final report.

**HEFD Staff:** Mr. Mohammed Younus Zawoli, Dr. Ahmad Reshad Osmani, and Dr. Shuhrat Munir were all involved in components related to data collection, cost and market analysis, and final reporting of the study results. Drs. Ahmad Shah Salehi and Dr. Mohammad Saber Perdes guided the entire process from the HEFD management end.

## 6. Annexes

### Annex 1 – Current Production List for APE 1393/2013

#### APE - Production List

Syrup B complex 240ml	Pomade Ichtyl 20mg
Syrup Diphin hydramin 120ml	Solution Povidon Iodine 60ml
Pomade Analgesic 20mg	Solution Alcohol 60ml
Pomade Oxide zinc 20mg	Vaseline for adult 100mg
Pomade Tetracycline 20mg	Vaseline for child 100mg

## Annex 2 – APE Proposed Expanded Local Production List

APE Proposed Expanded Local Production		
Type	Product	Dosage
Tablet	Paracetamol	500mg
Tablet	Co trimexazol	480/960mg
Tablet	Metronidazol	400/200mg
Tablet	Paracetamol compund	Mix
Tablet	Anti acid	Mix
Tablet	Vitamin B1-B6-B12	Mix
Tablet	Vitamin B1-B6-B12+	Mix
Tablet	Paracetamol	Mix
Tablet	Benzyl konuimchlorid	Mix
Tablet	B complex fort	Mix
Tablet	Cal – D - C	Mix
Capsule	Amoxicillin	500mg
Capsule	Amoxicillin	250mg
Capsule	Cefixim	400mg
Capsule	Cefixim	200mg
Capsule	Azethramycin	500mg
Capsule	Azethramycin	250mg
Capsule	Ampiclax	500mg
Capsule	Ampiclax	250mg
Capsule	Ampicilline	500mg
Capsule	Ampicilline	250mg
Capsule	Cephradine	500mg
Capsule	Cephradine	250mg
Capsule	Cephloxin	500mg
Capsule	Cephloxin	250mg
Capsule	Tetracycllin	250mg
Pomade - Cream	Analgesic	
Pomade - Cream	Diclofinac	
Pomade - Cream	Oxid zinc	
Pomade - Cream	Ichtyal	
Pomade - Cream	Bethametason	
Pomade - Cream	Bethametason+N	
Pomade - Cream	Hydrocortison	
Pomade - Cream	Tetracycllin 3%	
Pomade - Cream	Tetracycllin 1%	
Pomade - Cream	Dexamethason+N	

APE Proposed Expanded Local Production

<b>Type</b>	<b>Product</b>	<b>Dosage</b>
Syrup	Anti acid	Mix
Syrup	B complex	Mix
Syrup	Diphinhydramin	Mix
Syrup	Amunium chloride Exp	Mix
Syrup	Paracetamol	120 mg/5ml
Syrup	Paracetamol compound	Mix
Syrup	Metronidazol	200mg/5ml
Syrup	Co trimexazol	240mg/5ml
Syrup	Co trimexazol	480mg/5ml
Syrup	Iron+fer B lever	Mix
Syrup	Brufin	120mg/5ml
Syrup	Mutivit+ Mineral	Mix
Solution	Povdin Iodin	
Solution	Dittol	
Solution	Chlorin	
Solution	Alcohol	
Solution	Chlorhexadin	

**Annex 3 - Proposed Future Human Resource Costs of Avicenna Pharmaceutical Enterprise (within 5 years)**

<b>Future APE Personnel Estimation</b>	<b>Average Monthly Salary - USD</b>	<b>Number of Positions</b>	<b>Monthly Total</b>
1- Pharmacists and Managers 30	\$ 2,000.00	30	\$ 60,000.00
2- Production workers 60	\$ 1,000.00	60	\$ 60,000.00
3- Mechanic, Electricians and plumber 4	\$ 800.00	4	\$ 3,200.00
4- Gardeners 2	\$ 400.00	2	\$ 800.00
5- Guards 4	\$ 400.00	4	\$ 1,600.00
6- Admin 2	\$ 500.00	2	\$ 1,000.00
Monthly Salaries		102	\$ 126,600.00
Monthly Benefits			\$ 12,660.00
<b>Annual HR Estimated Costs</b>			<b>\$ 1,671,120.00</b>

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