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AFGHANISTAN

REPORT ON

AGRI-BUSINESS RESEARCH STUDY

Prepared under USAID Contract Nesa-526

CHECCHI AND COMPANY

Washington, D.C.

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AGRI-BUSINESS RESEARCH STUDY

CONTENTS

PREFACE

This agri-business research study, by Robert Manly of Checchi and Company, was prepared under the AID-Checchi Contract Nesa-526. The scope of the services to be covered as set out in the contract are·

> "Agri-business research to support policy recommendations to relate private industrial promotion with other national goals. The contractor shall study the agri-business content of private industrial development with the aim of identifying and increasing the local raw material content in local private industry. The contractor shall provide research assistance in support of policy recommendations for the encouragement of private industrial investment outside of the Kabul area."

The structural nature of this assignment is the successive relationships in the economy and society reaching from the national goals down to the level of locating a private industrial establishment.

Afghanistan's national goals were expressed by President Daoud in his Address to the Nation on August 23, 1973.[1] The following is a summary of that address with some commentary included.

> The goals are based on economic and social progress with justice and independence. In this context Afghanistan, a country in which different brother tribes are living, must strive to create a real moral and material unity based on equality, brotherhood and friendship without discrimination. And further, at the present time, there is a need for basic changes based on planning, modern science and technology to overcome economic backwardness and to bring about an independent and well-coordinated national economy. In addition, social changes are needed to improve working and living conditions through better morals, education,

health services, equal opportunities for women, and the development and preservation of Afghan art and culture.

The means of achieving these goals divide quite naturally into:

- administrative reforms
- economic reforms
- social reforms

In turn, the economic reforms divide into five general activities:

- fiscal policy
- monetary policy
- industry
- agriculture
- commerce

It is through the last three activities above plus better living conditions attained through social reform that the agri-business research can be most effectively related to the national goals and the promotion of rural living conditions through income and employment outside of the Kabul area. The five general areas of activity given above have been, in the address, further separated and described.

> Fiscal policy and revenue — the present system of taxation will be modified on the basis of preference of direct taxation to indirect taxation. Expenditures — improvements will be made in the many forms of the social infrastructure as well as in expanding industry and agriculture. Monetary policy — establish control of foreign exchange so as to prevent circulation of money in "black markets" at exhorbitant profits, encourage and guarantee deposits and savings in banks, ensure cooperation between private and state capital for progress, coordination and balanced economic growth. Industry — the state sector of the economy ought to be strengthened and the country industrialized by establishing national industries. Great importance is attached to heavy industry such as mining, smelting of metallic ores, manufacturing of machinery, chemical industries, and electric power. The State will encourage, protect, guide and control private investment and enterprise in the fields of light and medium industries as well as in handicrafts. Home industries will be protected against competing foreign products and capital. Agriculture — land reform in the interest of the majority of the people will be instituted. Cooperatives and cooperative companies for agriculture, for production and for consumption will be established with participation of a

majority of farmers and in their interest. Where possible, arid land will be reclaimed and irrigation facilities provided. Also, scientific measures for expanding and developing animal husbandry will be adopted. Further, steps will be taken for resettling nomads and allotting land to the landless people. Commerce — the State will guide the country's foreign trade on the principle of guided commerce based on national interest. Commercial enterprises will be protected against competing foreign products and capital.

From the above summary, the purpose of the agri-business research study can be stated as a series of relationships in the following order:

— National goals.

Better standard of living
Rural income and development

— The private industry content within the national goals.

— The agri-business and cooperative content within the private industry sector.

— The local raw material content within the above enterprise categories.

— The location of private industry establishments in rural areas.

Placing these relationships in a dynamic system capable of producing policy recommendations on a sustaining basis is thus the focus of the agri-business research study. As with most complex problems, the approach adopted is the one of considering separately the various recognized parts of the system making up the area of interest.

In the preparation of this agri-business research study, a number of contributions were made to the overall effort. The organization and measurement of the planning data of investment projects under the Foreign and Domestic Private Investment Law was ably carried out by Mohd. Arif Azizpour, Statistical Analyst in the Research Section of the Investment Promotion and Development Department, headed by President Younis Rafik in the Ministry of Planning. Mohd. Hashim Hassani, Agricultural Engineer, worked faithfully and well in preparing the regional, sub-regional, administrative-center and mineral maps for the study. Miraqa Kabiri, Economist, tabulated and summed up the base data by the 325 administrative-centers. Miraqa Kabiri and Hashim Hassani, also members in the Research Section, teamed up in the survey of commodity, representative price differentials for the sub-regions. Thurston Teele and Lawrence Morrison of the Checchi team contributed their assistance in editorial comment and project development.

The present report brings together the results of these efforts. It is divided into seven chapters. Chapter I sets out the economic framework or theory behind the approach advocated. The second chapter, on the Rural-Urban Duality, brings into sharper focus the fundamental differences between these two parts of any society and the consequences for economic advancement of the rural sector. The third chapter looks at industrial projects in Afghanistan in order to distill meaningful measures of economic-effect of various kinds of projects, materials which make a contribution later in the study. The next chapter outlines various methods in use fo encouraging industrial investment and development in the rural or less-privileged areas. The fifth chapter concentrates on Afghanistan and provides detailed information about the location of resources and income of 45 areas in Afghanistan. Chapter VI is devoted to methods and approaches of agri-business project analysis. The final chapter sets out a proposed program whereby agri-business can increase rural incomes and well-being in Afghanistan.

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CHAPTER I

AN ECONOMIC FRAMEWORK FOR AGRI-BUSINESS DEVELOPMENT

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CHAPTER I

AN ECONOMIC FRAMEWORK FOR AGRI-BUSINESS DEVELOPMENT

1.1 Introduction

This research study focuses on the means of employing agri-business for the purpose of increasing rural incomes and employment within the overall Afghan system of income-distribution. The complexities of such an approach are many but they reflect the real world in which our purpose must be achieved. Consequently, these complex relationships as part of agri-business cannot be ignored except at the risk of failing to achieve the desired ends.

How the parts of such systems work together can be analyzed in various ways. One approach is to identify the principal parts and develop them individually with the expectation that they will later fit together in a complete and smoothly working process delivering the desired benefits. Alternatively, we can recognize the on-going nature of the economic system and that our goal is to modify its effect while being unable to either start or stop it. Such an approach requires that we devote as much effort to the relationships in the system as we devote to the development of the parts and that we proceed from the relationships to the parts and not in the reverse order.

The choices between the two approaches pose problems for policy makers. It is tempting for them to consider the effects of policy change by concentrating upon the part where the impact is centered, while at the same time supposing that induced secondary changes are so small and unimportant that they can be neglected. For example, agricultural projects are often so concerned with the impact of new inputs giving greater yields and production that the secondary effects are assumed to be equally beneficial. The analysis may, therefore, run as follows: fertilizer and proper methods - higher yields - more production - greater sales - increased income - expanded consumption - greater welfare. The possibility that this chain of cause and effect can have a quite different ending is judged to be minor and so is passed over.

However, the accumulative importance of the secondary effects is considerable. What is overlooked in the above example is the fact that a change in aggregate expenditures on a new farm product by consumers is an implied shift of aggregate expenditures from other commodities. As a consequence, prices and production of competing commodities will be changed by their producers and dealers so as to maintain their share of the aggregate income. One is thus forced to consider the secondary effects resulting from new agricultural inputs and might change the argument with equal logic to give a quite different analytical outcome: fertilizer and proper methods - higher yields - more production - greater quantity of sales - lower prices - no change in effective farm income - stagnant consumer expenditures - farmers cut back production to raise prices - and no real welfare benefit.

Approaches that can produce such opposite results according to the point of view adopted by the analyst will have trouble providing unambiguous policy recommendations. The policy maker will be caught between the opposite points of view and will have to fall back on his own intuition to settle the matter. These approaches are a type of partial equilibrium analysis that has received formal and mathematical treatment but remains similar to a "teeter-totter" whereby holding one set of factors constant for balance, the inevitable result is that if one variable goes up the other must come down. This alas is not the way of the real world. A more realistic model typically involves at least three variables and three possible reactions to change. As a result, we cannot be sure when one variable is increased just how the other two variables are going to react. They may both decrease in a partial manner equal to the increase, or one may remain constant while the other decreases in proportion to the increase, and finally one may even add to the initial increase so that the third variable will have to decrease an amount equivalent to the sum of the two increases.

Faced with these more complex possibilities, the "either-or" farm examples given earlier must be recast to allow at least for the farm producer, the non-farm producer, and the consumer. In addition, each producer is tied to his quantity of goods and its price while the consumer is tied to his income and propensities to consume. The potential trade-offs between the three sectors and multiple price-quantity factors will give the policy maker a number of possible answers depending largely on the consumer's reaction to the market changes. Four possible reactions can be imagined. (1) If the consumer does not wish to change the pattern of his consumption expenditures and his income remains the same, then both producers (farm and non-farm) must lower the price of their goods in order to sell a larger quantity. (2) If the consumer is willing to change his pattern of expenditures for a bargain, then at least one price must be lowered. (3) If, on the other hand, the non-farm producer introduces a new, attractive article that appeals to the consumer so that he cuts back on his normal purchases in order to acquire the new item, then the original quantities of goods cannot be sold except at lower prices, the consumer s income still remaining the same. (4) If the farmer reduces production, then the consumer income must be higher to maintain his consumption of farm commodities and so farm prices can rise. As they rise, the consumer has less money left over to spend on non-farm products. The price of non-farm products must then decline to balance the money available or the quantity of goods produced and sold will have to be less.

Such results are often unexpected and not readily accepted so the tendency is for policy makers to revert to partial equilibrium analysis as giving more acceptable, even if less valid, answers. The need, therefore, is to consider in more detail the methods offered by the more complex but real world approaches to agri-business development.

1.2. Economic Relationships

The complex influences introduced in the previous section are shown to react on agriculture in unpredictable ways so that the final outcome of a change may be quite different than expected. In order to forecast more accurately the outcome of projects and policy changes, we should recognize that the state of knowledge has changed considerably over the past several decades and that rather effective new tools of analysis, combining overall theory, empirical laws and measurement, have come into use. It seems highly preferable that we adopt these new techniques however difficult they are rather than continue being guided by the indeterminate methods of partial analysis.

Three particularly useful economic tools or models are applicable to the question of converting agricultural production into increased rural income and employment. They involve in order of consideration three important economic ratios: (a) the average propensity to consume, (b) money and prices, and (c) the proportion in input-output relationships. Projects based upon exceptions to the analysis based on these ratios should be undertaken either with reluctance or only after the most careful analysis establishing the probability of the benefits expected. The three ratios are described in some detail below, along with a number of other useful tools.

1.2.1. <u>The Propensity to Consume</u>

Increased agricultural production cannot very well escape the fact that it performs but a part of the task of improving rural incomes and employment. The other part is in all cases the matching over time of consumption to what is produced. The income and preferences of the consumers concerning what is offered in the market also have a bearing on what crops and quantities agricultural producers will find it profitable to grow.

At any given level of income, the propensity to consume is the ratio of consumption to income and the average propensity to save is the ratio of savings to income (and, ultimately, for the economy as a whole the average propensity to invest). More important here is the marginal propensity to consume, that is, the ratio of change in consumption to a given change in income and similarly the marginal propensity to save is the ratio of the change in savings to the change in income. The key point is that the average propensity to consume is less than one, and the marginal propensity to consume is typically even less than the average propensity to consume. Thus, when income increases, consumption increases but at a lower rate. The average and marginal propensities to consume are stable for each country within a range of incomes and appear to be long-term phenomena.[2]

It is also a general phenomena that the marginal propensity to consume food products is lower than that of most other products. Thus, as incomes increase, the consumption of food products increases but at an increasingly lower rate. The result is that, under normal circumstances, an increase in production means an increase in income which in turn means a lesser increase in consumption of agricultural products which results in lower prices to clear the market.

Savings and investment are also important. Investment is what produces growth in an economy. If the part of income that is not consumed (that is, saved) is invested in income-producing projects, the resulting increase in aggregate income may be enough to offset the relatively low marginal propensity to consume agricultural products and allow agricultural production increases to be cleared without price reductions. This all means that (1) agricultural supply increases do not, alone, create their own demand, and that (2) in order to have per capita agricultural production increases without price reductions, the economy as a whole must be growing, and such growth in turn requires a high level of investment. These concepts are looked at from other approaches in the following sections.

Present world prosperity is largely the result of policy decisions formulated through the use of the income-consumption-investment relationship. The fact that agriculture in much of the world still follows the idea that production does create its own demand may well account for the persistence of low incomes in rural areas. It is hard to use successfully an inappropriate approach for rural and agricultural development while competing with a better economic concept in urban areas.

1.2.2 Money and Prices

Money must also be taken into account in considering the reaction of prices to changes in production. Agricultural production, of course, is in real commodities and to exchange them for other real goods requires money except in pure barter arrangements. The relationship of money, prices and transactions is commonly expressed in the form $MV = PT$, where M is the stock of money, V is average velocity of money in circulation, P is average prices, and T is the transactions of production, goods and services.[3]

An increase in agricultural production will change the equilibrium of the equation unless at least one of the other factors changes in proportion. It is sometimes proposed that these changes can take place with stable prices, that is, a change in agricultural production can be balanced by a proportionate change in the velocity of money in circulation. If this proposition is likely, then the concept of production creating its own demand might be made valid through velocity increases contrary to the opposite conclusion expressed in the previous section. The velocity of money, however, is considered one of the "great ratios of economics"[4] because of its statistical stability.

A recent financial study of conditions in Afghanistan by M. J. Fry[5] is of interest in regard to the relationships in the above equation. He shows that the velocity of money in circulation has indeed been stable in Afghanistan. Over a period of 39 years (1313-1352), the mean velocity (the ratio of gross national product in the money economy to the stock of money, i.e. currency in circulation plus private demand and time deposits excluding inter-bank deposits, usually denoted as M_2) is 5.24 and the standard deviation is 0.215 or about 4%. The beginning velocity ratio in the period was 5.09 and the ending ratio was 5.06. This data confirms, for Afghanistan, the law of stability of the velocity of money in circulation. See Exhibit 1.2.2.1.

Under these circumstances, and if the stock of money is held constant, then increases in transactions (production) will result in the price factor decreasing in order to maintain equilibrium. In the actual Afghanistan case, the stock of money has increased rapidly and inflation of prices has averaged 8.65% annually. Such an increase tends to disguise the real production-price relationships, particularly with regard to agriculture and rural income. Inflationary price increases, or price stability for agricultural crops in the face of general price inflation,

EXHIBIT 1.2.2.1

MONEY ESTIMATES FOR AFGHANISTAN
1314–1352: 1935–1973
(Millions of Afghanis)

Date	Money Economy GNP	Money Stock M_2	Velocity
1314	997	196	5.09
1315	1,070	209	5.12
1316	1,153	224	5.15
1317	1,224	240	5.10
1318	1,314	257	5.11
1319	1,412	275	5.17
1320	1,522	292	5.21
1321	1,817	338	5.38
1322	2,332	420	5.55
1323	2,858	502	5.69
1324	3,355	582	5.76
1325	3,951	684	5.78
1326	4,492	797	5.64
1327	4,610	850	5.42
1328	4,571	855	5.35
1329	4.797	907	5.29
1330	5,444	1,040	5.23
1331	6,014	1,168	5.15
1332	6,423	1,274	5.04
1333	6,824	1,339	5.10
1334	8,221	1,593	5.16
1335	11,122	2.097	5.30
1336	13,140	2,473	5.31
1337	12,987	2,481	5.23
1338	12,161	2,417	5.03
1339	12,519	2,587	4.84
1340	13,230	2,728	4.85
1341	15,050	2,981	5.05
1342	18,330	3,565	5.16
1343	23,379	4,405	5.31

Date	Money Economy GNP	Money Stock M_2	Velocity
1344	29,059	5,393	5.39
1345	33,050	6,160	5.37
1346	33,516	6,355	5.27
1347	32,132	6,289	5.11
1348	33,019	6,538	5.05
1349	37,776	7,341	5.15
1350	42,440	8,181	5.19
1351	45,070	8,759	5.15
1352	50,396	9,954	5.06
Mean			5.24
Standard Deviation			.215

Source: M. J. Fry[5]

obviously do not help the rural sector. We must, therefore, move to the "real" analysis, and do so through discussing demand elasticities for agricultural products.

1.2.3. Income and Price Elasticities of Demand

The income elasticity of demand for goods and services including agricultural commodities expresses the change in quantity demanded that will result from a given change in income. Such expressions are commonly shown as numerical coefficients. For example, if the income elasticity of demand for food in low-income countries is shown to be 0.8, this means that a 1% increase in income will increase the demand for food by 0.8%. Carrying this notion a step further and assuming that 60% of the average income is spent on food, then in a case where an average income of $100 is increased $1, the $60 normally spent on food will be increased only 48 cents (0.8 x 0.6 = 0.48). In terms of income levels, the income elasticity for all food is shown in international comparisons to be about 0.8 when per capita incomes are around $100, to drop to about 0.5 at incomes in the $500 range, and to drop further toward zero as incomes rise above $2,000. Urban and rural demand responses for food-grains are also interesting. For example, it has been shown in FAO studies that where the income demand coefficient may average 0.5, the average for the large rural sector will approach 0.6 and urban average will approach 1.3. This is another example illustrating the web of relationships that restrict the open-ended expansion of agricultural production.

The price elasticities of demand express the change in the quantity of a commodity that will be demanded in relation to a change in its price. In the previous case of income elasticities, an increase in income gives rise to an increase in quantity demanded; in the case of price elasticities, however, an increase in prices results in a decrease in quantity demanded. For this reason coefficients of price elasticity have the opposite sign of those for income elasticity, that is, a negative or minus sign. Thus, a price elasticity of demand for food, typical of low-income countries, of -0.9 means that a 1% increase in price will cause the quantity of food taken to decrease by 0.9%, and a 1% decrease in price will cause the quantity purchased to increase by 0.9%.

The relationships of increasing population, changing rates of agricultural production and incomes when combined with income and price elasticities are complex but they still respond in predictable fashion to the familiar laws of supply and demand in their reaction to changes in price. Of particular interest in the present case is how population and income demand (that is, demand affected by change in population and income) affect prices in response to changes in supply. In order to follow through on these interactions, we must divide the income demand between the population in agriculture and that in non-agricultural pursuits. We also want to know the combined reaction on prices when the non-agricultural income per capita is held constant, as well as the necessary reaction of non-agricultural incomes under conditions in which agricultural prices are constant. In addition, two changes in the overall system are of interest. We want to know the reactions when (1) the proportion of the population in agriculture decreases, say from 70% to 50%, and (2) when the general per capita income increases, say from \$100 to \$500, with corresponding changes in the income and price elasticities of demand for agricultural products, i.e. from 0.8 to 0.5 and -0.9 to -0.6 respectively.

The assumptions and estimated results of such conditions, changes and general reactions are set out in Exhibit 1.2.3.1. The secondary iterative factors have been ignored for the sake of simplicity and because we are more interested in trends at this point than the absolute values which require more elaborate treatment. In each example in the Exhibit, the accelerated increase in agricultural production is the same, 2%, 3%, 4% and 5%, while population increases uniformly at two percent so that the net per capita increase in agricultural production is 0%, 1%, 2% and 3%, respectively.

The results clearly show that when non-agricultural per capita income is stable and when agricultural production is increasing faster than population, then average agricultural prices will fall. Further, as the proportion of population in agriculture is smaller and/or when the overall level of per capita income is larger, then the average agricultural prices will fall even more rapidly in response to agricultural production increases outdistancing population increases.

The most serious constraint on increasing agricultural production per capita is found in the marginal rate of change in agricultural prices. This is defined as the rate of price change considering only the production representing the increase over the previous year, i.e. the last x percent where x = the rate of production increase. To put it into real life terms, it is in the nature of agriculture that prices

EXHIBIT 1.2.3.1. THE EFFECT OF DIFFERENT RATES OF INCREASE IN AGRICULTURAL PRODUCTION UPON THE DEMAND FOR AGRICULTURAL COMMODITIES AND AGRICULTURAL PRICES, WITH VARIOUS ASSUMPTIONS.

ASSUMPTIONS							ESTIMATED RESULTS				
										Prices	
				Supply				Demand: Average rate of growth in demand due to changes in:			
Annual growth in population	Proportion of population in agriculture	Income elasticity of demand for agri. products	Price elasticity of demand for agri. products	Rate of growth in agri. production	Annual growth in agri. production per capita	Annual growth in per capita non-agri. income	Overall growth of income per capita $\frac{dg_a + (100-d)g_n}{100}$	Population	Income	Average rate of change in agri. prices $\frac{Q-P-ng}{e} = r$	Marginal rate of change in agri. prices $\frac{100(r + rQ)}{Q} = m$
P	d	n	e	Q	$g_a = Q-P$	g_n	g	P	ng	e	Q
1. Nominal changes in agricultural prices when non-agricultural per capita incomes are stable: low-income countries ($100)											
2%	70%	0.8	-0.9	2%	0%	0%	0.0%	2%	0.0 %	0.0 %	0 %
2%	70%	0.8	-0.9	3%	1%	0%	0.7%	2%	0.56%	-0.49%	-16.8%
2%	70%	0.8	-0.9	4%	2%	0%	1.4%	2%	1.12%	-0.98%	-25.5%
2%	70%	0.8	-0.9	5%	3%	0%	2.1%	2%	1.68%	-1.47%	-30.9%
2. Nominal changes in non-agricultural per capita income to stabilize agricultural prices: low-income countries ($100)											
2%	70%	0.8	-0.9	2%	0%	0.0 %	0.0 %	2%	0.0 %	0.0 %	0 %
2%	70%	0.8	-0.9	3%	1%	1.83%	1.25%	2%	1.0 %	0.0 %	0 %
2%	70%	0.8	-0.9	4%	2%	3.67%	2.50%	2%	2.0 %	0.0 %	0 %
2%	70%	0.8	-0.9	5%	3%	5.50%	3.75%	2%	3.0 %	0.0 %	0 %
3. Similar to Case 1. above when proportion of population in agriculture has decreased from 70% to 50%: low income countries ($100)											
2%	50%	0.8	-0.9	2%	0%	0%	0.0 %	2%	0.0 %	0.0 %	0 %
2%	50%	0.8	-0.9	3%	1%	0%	0.5 %	2%	0.4 %	-0.67%	-23.0%
2%	50%	0.8	-0.9	4%	2%	0%	1.0 %	2%	0.8 %	-1.33%	-34.6%
2%	50%	0.8	-0.9	5%	3%	0%	1.5 %	2%	1.2 %	-2.00%	-42.0%
4. Similar to Case 2. above when proportion of population in agriculture has decreased from 70% to 50%: low income countries ($100)											
2%	50%	0.8	-0.9	2%	0%	0.0 %	0.0 %	2%	0.0 %	0.0 %	0 %
2%	50%	0.8	-0.9	3%	1%	1.50%	1.25%	2%	1.0 %	0.0 %	0 %
2%	50%	0.8	-0.9	4%	2%	3.00%	2.50%	2%	2.0 %	0.0 %	0 %
2%	50%	0.8	-0.9	5%	3%	4.50%	3.75%	2%	3.0 %	0.0 %	0 %
5. Similar to Case 3. above when the overall per capita income has increased from a low-level to a relatively high-level ($500)											
2%	50%	0.5	-0.6	2%	0%	0%	0.0 %	2%	0.0 %	0.0 %	0 %
2%	50%	0.5	-0.6	3%	1%	0%	0.5 %	2%	0.25%	-1.25%	-42.9%
2%	50%	0.5	-0.6	4%	2%	0%	1.0 %	2%	0.50%	-2.50%	-65.0%
2%	50%	0.5	-0.6	5%	3%	0%	1.5 %	2%	0.75%	-3.75%	-79.5%
6. Similar to Case 4. above when the overall per capita income has increased from a low-level to a relatively high-level ($500)											
2%	50%	0.5	-0.3	2%	0%	0.0 %	0.0 %	2%	0.0 %	0.0 %	0 %
2%	50%	0.5	-0.6	3%	1%	3.0 %	2.0 %	2%	1.0 %	0.0 %	0 %
2%	50%	0.5	-0.6	4%	2%	6.0 %	4.0 %	2%	2.0 %	0.0 %	0 %
2%	50%	0.5	-0.6	5%	3%	9.0 %	6.0 %	2%	3.0 %	0.0 %	0 %

Note: Interaction factors are suppressed in the calculations by rounding-off and have, therefore, been ignored so the results show mainly trends.

are highest just before the harvest begins and that they fall progressively until at the end of the harvest period prices are the lowest, particularly when it is evident that production has increased significantly. Thus, it is at the point in time when increases in production are realized that they are being sold at the lowest prices. In other words, the agricultural inputs that caused the increases are then seen to be yielding the lowest return. According to the calculations in the Exhibit, the marginal prices and returns can range from zero change to -79.5%, based on the various assumptions used.

The motivation psychology to increase agricultural production in the face of such marginal price effects is unlikely to be very urgent, especially if producers know through experience or hearsay that such are the effects. There is, in addition, the plain-everyday work and income psychology that further diminishes motivation. It has been summarized effectively by R. Lekachman[6] as follows:

" — Work is painful and is never undertaken for its own sake."

" — Additional work becomes more painful hour by hour."

" — Wages are pleasant because those who receive them can use them to command pleasurable objects and services."

" — Nevertheless, additional wages yield less pleasure, pay by pay, than their predecessors, because they gratify tastes of diminishing urgency, for individuals buy items of greater pleasure with their initial units of income."

" — Therefore, work is performed in anticipation of pleasure that exceeds the pain of the additional labor. Hence, additional work for additional production tends to cease just before the point where additional pleasures match additional pains."

Lekachman's conclusion can be paraphrased with respect to prices as follows: Additional agricultural production tends to cease just before the point where additional pleasures match the pain of decreasing marginal prices of agricultural commodities.

1.2.4. Non-Agricultural Per Capita Incomes

Exhibit 1.2.3.1. shows that the tendency toward decreasing agricultural prices can be offset by rising non-agricultural per capita incomes. It is found, however, that non-agricultural incomes must rise much faster than agricultural production in order to stabilize agricultural prices. This inescapable income differential between fast-rising urban incomes and stable rural incomes is an important cause of the observed migrations of population from the agricultural sector to the non-agricultural sector even when non-agricultural jobs are scarce. The chances of income benefits are generally judged better in those sectors where higher per capita incomes are known to exist. This movement of rural workers to higher income areas, where they are slow to find high-paying jobs, reduces the per capita income level in these areas. At the same time, this movement reduces the population in the rural areas without reducing the volume of income so rural per capita incomes increase. The net effect is to reduce the difference between rural and urban per capita incomes. Increases in total per capita income levels, say from \$100 to \$500 per year, also reduce the difference between rural and urban per capita income. In Exhibit 1.2.3.1., the annual differences between per capita income of agricultural and non-agricultural sectors varies from zero to 6%, i.e. the differences between column (g_a) and (g_n) as shown in the bottom section, case 6, of the Exhibit. On the basis of agricultural population decreasing from 70% to 50% with agricultural prices being stabilized by rising non-agricultural per capita incomes, cases 2 and 4 of the Exhibit, then non-agricultural

per capita incomes do not need to rise as much to stabilize agricultural prices, i.e. in case 2 non-agricultural per capita incomes increased 5.5% to obtain a 3% increase in agricultural per capita income; in case 4 the required change is only 4.5%, which is about 18% less than before the shift in population.

The overall effect of increasing agricultural production faster than the population is increasing is either a lowering of agricultural prices or an increase in the per capita income in the non-agricultural sector faster than in the agricultural sector. There is no "trickle-down effect." If anything, economic growth tends to cause a "trickle-up effect." Relatively then, the non-agricultural sector gets rich faster while the agricultural sector tends to fall behind.

1.2.5. An Empirical Example of Crop Production - Price Relationships

The agri-business price-relationship in Exhibit 1.2.3.1. is a general and theoretical one. It indicates that concentration on the inputs and production side of agriculture, though of great importance, is not sufficient by itself when improvements in rural income and employment are the goal. Before settling on this implied conclusion, it is worth considering a production-price case based on empirical evidence. The American case of agricultural production and prices has been selected. This choice was made for two reasons. First, the necessary statistical data is available and in good order. Second, the data reflects a prosperous agricultural sector and a well-developed agri-business one. Together, they provide a fair test of the production-price relationship under favorable conditions and thus give an indication of the directions the agri-business study will need to consider in greater detail.

The U. S production price data[9] for 67 crops during the period 1954-1969 were analyzed at five-year intervals, Exhibits 1.2.5.1 and 1.2.5.2. A summary of the results in terms of per capita demand or production with current prices deflated to constant dollar agricultural prices is shown below using index numbers. Constant dollar prices per metric ton for agricultural commodities are arrived at by dividing the farm value in current dollars by the constant dollar price deflator and then dividing this quotient by production in metric tons.

Three food grains

Year	1954	1959	1964	1969
Production Index (per capita)	100	101	109	117
Price Index	100	87	72	52

The numbers show clearly that as production per capita increased 17 points in 15 years, prices in constant units decreased 48 points.

Four feed grains

Year	1954	1959	1964	1969
Production Index (per capita)	100	120	99	122
Price Index	100	78	87	46

Here the results show shorter term swings whereas food grains showed a steady progression. Feed grain production per capita increased 20 points between 1954-59 and prices declined 22 points. In the next five-year period, 1959-64, the farmers cut back production about 21 points and prices increased about 9 points.

In the following period 1964-69, per capita production was again increased and constant dollar prices fell sharply.

Twenty-five vegetable crops

Year	1954	1959	1964	1969
Production Index (per capita)	100	98	100	101
Price Index	100	108	120	124

In the case of vegetables, production per capita was held almost constant over the fifteen-year total period. Prices even in constant dollars are seen to have increased, possibly because effective demand had increased with rising per capita incomes, but production did not keep pace.

Twenty-five fruit and tree nut crops

Year	1954	1959	1964	1969
Production Index (per capita)	100	89	78	104
Price Index	100	112	145	113

The same general pattern is again revealed. The first two five-year periods show production falling and prices rising, while at the end of the third period, production has risen rapidly and constant dollar prices sharply declined.

Ten other crops

Year	1954	1959	1964	1969
Production Index (per capita)	100	104	124	137
Price Index	100	92	92	62

The progressive decline in constant dollar prices as per capita production increased is also true for the ten crops in general. There is, however, an exception in the price pause of 1964 which seems not to have persisted for by 1969 a 37-point rise in production has been matched by a 38-point fall in constant dollar prices.

On the basis of the above evidence, a change in per capita crop supply does not appear to be capable of creating its own demand except by an inverse movement in constant dollar prices.

The detailed backup data for these index number illustrations are given in Exhibits 1.2.5.1. and 1.2.5.2. which follow.

EXHIBIT 1.2.5.1. U. S. CROP DATA, 1954 - 1969 — AN EMPIRICAL EXAMPLE

Crop	1954 Metric tons ('000)	1954 Farm value ($ '000)	1959 Metric tons ('000)	1959 Farm value ($ '000)	1964 Metric tons ('000)	1964 Farm value ($ '000)	1969 Metric tons ('000)	1969 Farm value ($ '000)	Price $ per M T 1954	Price $ per M T 1959	Price $ per M T 1964	Price $ per M T 1969
Food grains												
Wheat	26,778	2,082,485	30,420	1,969,546	34,928	1,756,969	39,704	1,786,156	77.77	64.75	50.30	44.99
Rye	659	31,241	586	23,354	624	34,041	798	31,298	47.41	39.85	41.31	39.22
Rice	2,912	293,030	2,433	246,317	3,319	358,634	4,141	449,162	100.63	101.24	108.05	108.46
Sub-total	30,349	2,406,756	33,439	2,239,217	39,071	2,149,644	44,643	2,266,616	79.30	66.96	55.02	50.77
Feed grains												
Corn	68,785	3,872,433	97,150	4,013,126	88,505	4,065,208	116,284	5,178,781	56.30	41.31	45.92	44.54
Oats	20,461	1,002,206	15,242	667,186	12,371	540,875	13,788	552,923	48.98	43.77	43.72	40.10
Barley	8,257	408,828	9,149	357,584	8,406	362,098	9,083	370,429	49.51	39.08	43.08	40.78
Sorghum	5,984	296,063	14,109	472,078	12,442	511,988	18,877	795,626	49.48	33.46	41.15	42.15
Sub-total	103,487	5,579,530	135,650	5,509,974	121,724	5,480,169	158,032	6,897,759	53.92	40.62	45.02	43.65
Vegetables												
Artichokes	16.3	2,736	17.1	3,419	25.7	5,704	29.8	6,933	167.85	199.94	221.95	232.65
Asparagus	139.1	36,872	164.5	40,682	159.8	44,801	132.3	57,451	265.08	247.31	280.36	434.25
Lima beans	95.6	15,584	75.0	11,018	71.5	14,310	88.6	17,533	167.9	199.9	221.9	232.7
Snap beans	314.3	41,396	331.9	38,982	426.2	47,80[illegible]	513.0	56,082	131.7	117.5	112.2	109.3
Beets	135.8	3,078	133.1	2,707	161.3	3,385	195.7	4,728	22.7	20.3	21.0	24.2
Broccoli	80.0	13,783	93.7	16,252	105.4	18,522	104.5	24,162	172.3	175.4	175.7	231.2
Brussel sprouts	28.7	4,693	31.1	5,696	33.1	7,752	28.4	7,180	163.5	183.2	234.2	252.8
Cabbage	1,178.6	36,442	949.6	48,709	994.3	53,905	1,[illegible]9.3	63,743	30.9	51.3	54.2	62.5
Cantaloups	598.6	52,784	583.8	56,361	551.7	61,009	622.6	77,021	88.2	96.5	110.6	123.7
Carrots	685.5	57,918	702.2	55,014	785.5	56,175	828.9	84,097	84.5	78.3	76.4	101.5
Cauliflower	94.0	13,396	102.5	14,245	113.7	19,291	115.6	24,694	142.5	139.0	169.7	213.6
Celery	686.1	48,777	704.6	48,[illegible]55	638.2	63,474	693.6	82,934	71.1	68.5	99.5	119.6
Sweet corn	554.0	44,300	590.4	47,987	560.1	54,929	564.1	61,562	80.0	81.3	98.1	109.1
Cucumbers	191.0	18,743	184.0	22,463	228.7	28,495	212.2	33,900	98.1	122.1	124.6	159.8
Eggplant	21.1	2,242	22.5	3,128	24.4	3,245	24.0	4,570	106.3	139.0	133.0	190.4
Escarole	32.5	2,486	45.8	4,466	48.0	6,676	49.8	8,180	76.5	97.5	139.1	164.3
Garlic	6.6	1,672	12.3	2,576	22.9	4,746	38.1	7,160	253.3	209.4	207.2	187.9
Honeydews	79.6	8,385	56.7	6,982	59.5	7,206	85.0	10,992	105.3	123.1	121.1	129.3
Lettuce	1,417.7	125,245	1,595.8	134,482	1,775.6	172,069	2,016.5	241,041	88.3	84.3	96.9	119.5
Onions	1,005.8	49,909	1,010.6	54,756	1,069.8	65,540	1,158.6	95,986	49.6	54.2	61.3	82.8
Green peas	362.2	36,941	429.3	41,591	437.9	46,767	476.0	55,746	101.7	96.9	106.8	117.1
Green peppers	131.6	21,193	150.0	29,973	176.5	37,715	212.2	51,441	161.0	199.8	213.7	242.4
Spinach	90.6	3,958	134.1	5,531	133.2	5,630	122.2	5,717	43.7	41.2	42.3	46.8
Tomatoes	2,441.0	65,656	3,210.6	86,574	4,158.0	140,810	4,471.5	171,103	26.9	27.0	33.9	38.3
Watermelon	1,431.9	35,087	1,224.5	46,798	1,252.6	46,880	1,193.3	54,084	24.5	38.2	37.4	45.3
Sub-total	11,819.3	743,276	12,555.7	828,647	13,963.6	1,016,836	14,995.8	1,308,040	62.9	66.0	72.8	87.2
Fruit												
Apples	2,429.5	200,000	2,571.5	214,690	2,830.6	249,626	3,049.0	274,717	82.3	83.5	88.2	90.1
Peaches	1,336.3	111,000	1,611.4	137,432	1,555.2	151,153	1,662.6	184,451	83.1	85.3	97.2	110.9
Pears	648.6	52,000	654.4	52,081	651.9	66,383	645.6	73,122	80.2	79.6	101.8	113.3
		133,326	2,917.6	174,529	3,155.2	218,657	3,540.8	273,110	57.3	59.8	69.3	77.1

Crop	1954 Metric tons ('000)	1954 Farm value ($ '000)	1959 Metric tons ('000)	1959 Farm value ($ '000)	1964 Metric tons ('000)	1964 Farm value ($ '000)	1969 Metric tons ('000)	1969 Farm value ($ '000)	Price $ per MT 1954	Price $ per MT 1959	Price $ per MT 1964	Price $ per MT 1969
Fruit (cont.)												
Cherries	185.8	51,037	197.7	53,854	312.1	57,339	252.6	66,881	274.7	272.4	183.7	264.8
Apricots	145.1	20,096	208.0	26,379	197.8	26,978	209.2	33,543	138.5	126.8	136.4	160.3
Plums	526.2	70,000	482.8	72,195	572.2	63,812	436.8	69,760	133.0	149.5	111.5	159.7
Figs	79.7	5,449	58.0	5,241	60.8	6,313	49.6	4,864	68.4	90.4	103.8	98.1
Nectarines	17.1	2,406	35.4	4,485	68.0	7,088	59.9	9,240	140.7	126.7	104.2	154.3
Olives	45.4	8,300	24.5	6,183	49.0	7,452	63.5	23,030	182.8	252.4	152.1	362.7
Dates	14.0	1,448	23.6	3,328	22.0	3,596	15.5	2,770	103.4	141.0	163.4	178.7
Avocados	51.3	10,735	68.9	8,279	33.3	14,773	41.7	23,232	209.3	120.2	443.6	557.1
Cranberries	46.2	10,926	56.8	11,167	61.0	19,137	82.7	29,693	236.5	196.6	313.7	359.0
Strawberries	186.6	79,026	217.6	85,924	252.5	110,933	220.3	109,673	423.5	394.9	439.3	497.8
Oranges	4,834.5	280,000	3,413.2	210,353	2,139.1	274,866	7,164.7	479,418	64.9	61.6	128.5	66.9
Grapefruit	1,767.2	60,000	1,537.5	57,419	1,264.6	90,046	2,002.6	83,136	34.0	37.3	71.2	41.5
Lemons	577.9	38,000	628.4	34,977	656.4	50,749	545.0	67,655	65.8	55.7	77.3	124.1
Limes	13.4	1,200	11.6	1,267	16.3	1,976	25.4	3,150	89.6	109.2	121.2	124.0
Tangerines	194.1	17,000	111.4	9,180	148.6	15,444	173.8	16,752	87.6	82.4	103.9	96.4
Tangelos	-	-	22.5	2,640	36.7	4,896	73.5	5,994	-	117.3	133.4	81.5
Temples	89.8	6,000	159.2	11,115	138.8	17,034	183.7	13,770	66.8	69.8	122.7	75.0
Sub-total	15,513.9	1,157,949	15,012.0	1,182,718	14,222.1	1,458,251	20,142.9	1,847,961	74.6	78.8	102.5	91.7
Tree nuts												
Pecans	42.9	27,057	66.0	47,307	81.0	40,390	106.9	70,694	630.7	716.8	498.6	661.3
Walnuts	68.1	26,226	56.9	30,146	81.8	41,197	93.0	48,385	585.1	529.8	503.6	520.3
Almonds	39.2	21,514	75.1	38,585	68.4	47,502	110.7	72,834	548.8	513.8	694.5	657.9
Filberts	7.7	2,712	9.2	3,799	7.3	3,560	6.6	4,089	352.2	412.9	487.7	619.5
Sub-total	157.9	77,509	207.2	119,837	238.5	132,649	317.2	196,002	490.9	578.4	556.2	617.9
Other crops												
Cotton lint	2,982	2,301,358	2,205	2,304,265	3,305	2,258,491	2,181	1,038,964	771.7	1045.0	683.3	476.4
Cotton seed	5,179	344,175	5,435	232,115	5,379	293,838	3,798	172,030	66.4	42.7	54.6	45.3
Flaxseed	1,048	125,937	539	63,795	620	68,901	926	95,999	120.2	118.3	111.1	103.7
Peanuts	457	122,792	691	145,842	952	235,006	1,145	308,934	268.7	211.0	246.8	269.8
Soybeans	9,283	840,767	14,503	1,046,468	19,076	1,836,441	30,397	2,580,029	90.6	72.1	96.3	84.9
Dry beans	750	123,000	839	128,268	788	130,691	852	143,675	164.0	152.9	165.8	168.6
Potatoes	9,958	474,705	11,125	555,889	10,935	846,016	13,936	616,320	47.7	50.0	77.4	44.2
Sugarcane	15,215	50,935	15,300	52,138	22,728	98,015	20,495	112.598	3.35	3.41	4.31	5.49
Sugar beets	12,775	152,151	15,436	191,186	21,218	275,660	25,871	367,882	11.9	12.4	13.0	14.3
Tobacco	1,018	1,146,830	815	1,048,043	1,011	1,317,943	819	1,296,781	1126.5	1285.9	1303.6	1583.4
Sub-total	58,665	5,682,650	66,888	5,768,009	86,012	7,361,002	100,420	6,733,212	96.87	86.23	85.58	67.05
Totals	219,992	15,647,670	263,752	15,648,402	275,232	17,598,551	338,551	19,249,590	71.13	59.33	63.94	56.86

Source: USDA Agricultural Statistics, 1970.

EXHIBIT 1.2.5.2. U. S. CROP PRODUCTION — PRICE RELATIONSHIPS — AN EMPIRICAL EXAMPLE (amounts in thousands)

Year / Item	1954 Metric tons	1954 Farm value (U.S. dollars)	1959 Metric tons	1959 Farm value (U.S. dollars)	1964 Metric tons	1964 Farm value (U.S. dollars)	1969 Metric tons	1969 Farm value (U.S. dollars)	Index numbers 1954	1959	1964	1969	
Population	161,761		176,551		191,462		202,696		100	109	118	125	
Constant agricultural dollar deflator	1.02		.99		.98		1.14						
Food grains (3)	30,349	2,406,756	33,439	2,239,217	39,071	2,149,644	44,643	2,266,616	Food grain index				
Per capita	.1876	14.5867	.1894	12.8112	.2040	11.4565	.2202	9.8090	100	101	109	117	Prod.
Price / ton	77.75		67.64		56.16		44.55		100	87	72	57	Price
Feed grains (4)	103,487	5,579,530	135,650	5,509,974	121,724	5,480,169	158,032	6,897,759	Feed grain index				
Per capita	.6397	33.8161	.7683	31.5242	.6357	29.2068	.7796	29.8509	100	120	99	122	Prod.
Price / ton	52.86		41.03		45.94		38.29		100	78	87	46	Price
Vegetables (25)	11,819	743,276	12,556	828,647	13,964	1,016,836	14,996	1,308,040	Vegetable index				
Per capita	.0730	4.5048	.0711	4.7409	.0729	5.4192	.0739	5.6607	100	98	100	101	Prod.
Price / ton	61.71		66.68		74.34		76.60		100	108	120	124	Price
Fruits & tree nuts (25)	15,672	1,235,458	15,012	1,302,555	14,461	1,590,900	20,460	2,043,963	Fruit & nut index				
Per capita	.0969	7.4878	0862	7.4523	.0775	8.4788	.1099	8.8455	100	89	78	104	Prod.
Price / ton	77.29		86.45		112.27		87.64		100	112	145	113	Price
Other crops (10)	58,665	5,682,650	66,888	5,768,009	86,012	7,3[illegible]1,002	100,420	6,733,212	Other crop index				
Per capita	.3627	34.4411	.3789	33.0005	.4492	39.2309	.4954	29.1388	100	104	124	137	Prod.
Price / ton	94.96		87.10		87.33		58.82		100	92	92	62	Price
67 crops (67)	219,992	15,647,670	263,752	15,648,402	275,232	17,598,551	338,551	19,349,590	67 crop index				
Per capita	1.3600	94.8365	1.4939	89.5292	1.4375	93.7925	1.6702	83.3051	100	110	106	123	Prod.
Price / ton	69.73		59.93		65.25		49.88		100	86	94	72	Price

Note: Per capita and price per ton are adjusted for constant dollar value.

Source: Agricultural Statistics, 1970, U. S. Department of Agriculture.

1.2.6. Livestock Production and Price Relationships

In order to complete the agricultural picture on production and prices, livestock has been treated in the same manner as crops, and not unexpectedly the results have been the same. Rising per capita production in livestock results in lower real prices while decreasing per capita production results in higher real prices. Again there is an exception, this time in wool, where both production and prices declined. The detailed analytical results are given in Exhibit 1.2.6.1. and are summarized below.

Livestock and Commodities	Index of Price Changes		
	1960	1964	1969
Cattle & calves			
Production Index (per capita)	100	114	114
Price Index	100	88	114
Hogs			
Production Index (per capita)	100	99	94
Price Index	100	99	125
Sheep and lambs			
Production Index (per capita)	100	77	56
Price Index	100	127	86
Wool			
Production Index (per capita)	100	76	56
Price Index	100	127	86
Chickens & broilers			
Production Index (per capita)	100	114	140
Price Index	100	85	79
Turkeys			
Production Index (per capita)	100	116	121
Price Index	100	84	77

EXHIBIT 1.2.6.1. U. S. LIVESTOCK PRODUCTION — PRICE RELATIONSHIPS — AN EMPIRICAL EXAMPLE (amounts in thousands)

Year / Item	1960 Metric tons	1960 Farm value (U.S. dollars)	1964 Metric tons	1964 Farm value (U.S. dollars)	1969 Metric tons	1969 Farm value (U.S. dollars)	1960 Index numbers	1964 Index numbers	1969 Index numbers	
Population	180,007		191,462		202,696					
Constant agricultural dollar deflator	.99		.98		1.14					
Cattle &calves	13,062	7,526,207	15,802	7,938,883	16,777	12,730,268	Cattle & calves index			
Per capita	.0725	42.2330	.0825	42.3108	.0828	55.0919	100	114	114	Production
Price / ton	582.52		512.86		665.36		100	88	114	Price
Hogs	8,711	3,047,688	9,170	3,149,607	9,235	4,661,551	Hogs index			
Per capita	.0484	17.1020	.0479	16.7860	.0456	20.1735	100	99	94	Production
Price / ton	353.35		350.44		442.40		100	99	125	Price
Sheep & lambs	738	328,650	604	321,583	468	337,615	Sheep & lamb index			
Per capita	.00409	1.8442	.00315	1.7139	.00230	1.4611	100	77	56	Production
Price / ton	450.90		544.10		635.22		100	121	141	Price
Wool	120	111,142	96.3	112,877	75.2	69,580	Wool index			
Per capita	.00066	.6237	.00050	.6016	.00037	.3011	100	76	56	Production
Price / ton	945.00		1,203.20		813.78		100	127	86*	Price
Chickens and	518	138,812	530	107,984	547	117,503				
Broilers	2,729	1,014,084	3,412	1,070,124	4,557	1,530,942	Chicken & broiler index			
Per capita	.01803	6.4694	.02059	6.2788	.02518	7.1338	100	114	140	Production
Price / ton	358.81		304.94		283.31		100	85	79	Price
Turkeys	675	377,353	828	383,909	918	453,494	Turkey index			
Per capita	.00374	2.1175	.00432	2.0461	.00452	1.9626	100	116	121	Production
Price / ton	566.18		473.63		434.20		100	84	77	Price
Eggs	3,649	1,848,389	3,863	1,836,384	4,083	2,293,980	Egg index			
Per capita	.0203	10.3721	.0202	9.7871	.0201	9.9275	100	100	99	Production
Price / ton	510.94		484.51		493.91		100	95	97	Price
Milk & cream	54,686	5,158,116	56.616	5,218,886	51,851	6,414,394	Dairy index			
Per capita	.3038	28.9445	.2957	27.8144	.2558	27.7591	100	97	84	Production
Price / ton	95.27		94.06		108.52		100	99	114	Price
							Livestock index			
Total livestock	84,888	19,550,441	90,921	20,140,237	88,511	28,609,332	100	101	93	Production
Per capita	.4716	109.7064	.4749	107.3386	.4367	123.8106	100	97	122	Price
Price / ton	232.63		226.02		283.51		*unexplained			

Note: Per capita and price per ton are adjusted for constant dollar value.

Source: Agricultural Statistics, 1970, U. S. Department of Agriculture.

Livestock and commodities

		1960	1964	1969
Eggs				
	Production Index (per capita)	100	100	99
	Price Index	100	95	97
Milk and cream				
	Production Index (per capita)	100	97	84
	Price Index	100	99	114

1.2.7. Subsidies

The agricultural production price effect on agricultural per capita incomes can be offset when non-agricultural incomes rise more rapidly than agricultural incomes as shown in Section 1.2.4. The income differentials thus generated tend to raise problems of inequality in a society and other means must be employed to reduce such disparities. In the U.S., the Government has found it desirable to make subsidy payments to the agricultural sector, which have accounted for 15 percent of the agricultural gross incomes[10] over the fifteen-year period analyzed. In addition, the population in agriculture has decreased from about 12 percent to about 5 percent over the same period. Thus, farm incomes in the U. S. have tended to keep pace with non-agricultural incomes. The EEC follows similar policies of subsidy and protection to keep farm incomes from falling too far behind.

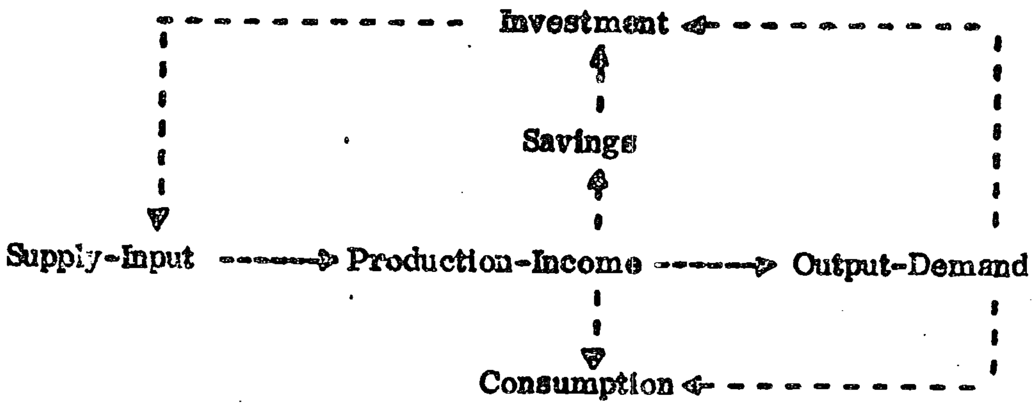
In developing countries such as Afghanistan, where the proportion of the population in agriculture is as high as 70 percent, the available resources do not permit subsidy programs of such magnitudes. We must, therefore, look to the development of agri-business and non-agricultural payrolls in rural areas if improvement is to be made in rural incomes and employment.

1.2.8. Input-Output Relationships

In the preceding sections concerning the propensity to consume, elasticities of demand, and money and prices, the emphasis was on the total or aggregate relationships in the economy. These general relationships are essential to insure soundly-oriented policies for agri-business. They are not sufficient by themselves, however, as a guide in the development of equally sound policy at the much more detailed level of industry where promotion of investment in individual projects is required.

The Leontief input-output techniques[7] fortunately provide us with the means of disaggregating the economic totals of income, consumption and investment as expressed in Section 1.2.1. At the same time, in a cross-section or matrix format, it identifies the industrial outputs contributing to these totals. In the process the inputs to each industry from other industries are identified and summed with the factors of value added such as employment, taxes, interest, and surpluses including net profit. The rigor of this approach is tested for each industry by the requirement that the total measurement of outputs and inputs must always equal one another. In addition, this input-output system adapts itself to the inclusion of exports and imports, thus expanding the previous models of consumption and money, which were shown for closed economies without foreign trade, for the sake of simplicity.

The real value of this input-output approach for the agri-business study comes from its bracketing of a given project with 'demand' for its production through all various transactions to the final product on one side, while on the other side all sources of supply-inputs must be accounted for. In the cross-section, production and income are bracketed by savings-investment and consumption. These relationships can be put into a simple, illustrative diagram.



The diagram includes both the investment step prior to the start-up of production as well as the production step itself. The investment step is shown by the broken line from Demand (the demand for investment goods) through Investment to Inputs (for plant development) and the broken line from Income through Savings to Investment. The production step of Input to Consumption (final expenditures) is shown by the rest of the diagram.

A description of these relationships is expositionally complex and the most satisfactory way to present them is in the form of a symbolic equation or model.

Inputs to Production		Total Sales Turnover		Outputs to Users
X + M + W + T + R	=	Ø	=	X + C + I + G + E

where,

X =	Inter-industry trade or purchases of finished output from one industry to another industry. The "X" terms on either side of the equal signs may be subtracted without changing the equality.
M =	Imports
W =	Employee compensation
T =	Taxes less subsidies
R =	Residual of depreciation, profits, etc.
Ø =	Sum of all transactions or turn-over during given period
C =	Personal consumption expenditures
I =	Gross private domestic investment including inventory change
G =	Government purchase of goods and services
E =	Exports

The above equation can be readily reduced in the following manner to show how it includes the earlier equation or model for the "propensity to consume" in a closed economic system by assuming no foreign trade or government sector and by subtracting the Xs from either side of the equation, thus

$$W + R = C + I$$

Recognizing that $W + R$ equals income for which we can substitute the symbol Y, we have the earlier equation for the propensity to consume $Y = C + I$.

We can also expand the input-output equation to show the inter-industry relationships including money-prices. It is worth the time to develop this expanded form of the input-output equation because of its usefulness in measuring and understanding how agri-business relates to supply and demand. It also provides a sound means for evaluating agri-business projects as well as many other kinds of projects. The matrix format in which the expanded model is set forth may appear new and complex, but like any other evaluation technique, it requires some repeated use after which it becomes quite natural and nowhere near as complicated as it first appears. In its fully developed form, of course, where it is used for analyzing and forecasting national economic changes, the inter-industry matrix algebra can become quite formidable, but that is not our purpose. Our purpose will remain at the project evaluation level. The basic accounting format for evaluating the agri-business and some other projects in this study is presented in Exhibit 1.2.8.1.

Exhibit 1.2.8.1

THE BASIC ACCOUNTING FORMAT

	Agri-culture	Agri-business	Other industry	Personal consump-tion	Private domestic invest-ment	Govern-ment consump-tion	Exports	Row Sum
Agriculture	$p_{11}q_{11}$	$p_{12}q_{12}$	$p_{13}q_{13}$	c_1	i_1	g_1	e_1	ϕ_1
Agri-business	$p_{21}q_{21}$	$p_{22}q_{22}$	$p_{23}q_{23}$	c_2	i_2	g_2	e_2	ϕ_2
Other industry	$p_{31}q_{31}$	$p_{32}q_{32}$	$p_{33}q_{33}$	c_3	i_3	g_3	e_3	ϕ_3
Imports	m_1	m_2	m_3	m_4	m_5	m_6	$-\sum m$	
Payrolls	w_1	w_2	w_3					
Taxes	t_1	t_2	t_3					
Residuals	r_1	r_2	r_3					
Column sum	ϕ_1	ϕ_2	ϕ_2					$\sum\sum\phi$

p = price c = personal consumption e = exports i = investment

q = quantity g = government consumption m = imports w = payrolls

t = taxes r = residuals $\sum$ = sum $\sum\sum$ = double sum

1.3. Chapter Summary

In Chapter I we attempt to demonstrate, in a variety of ways, that increases in agricultural production do not create their own demand and that, unless other developments occur or other steps are taken, the normal result of a simple increase in per capita agricultural production is a drop in price. Further, such a drop may be so large that the agricultural sector is worse off than it was before the per capita increase in production was achieved.

Using the propensity to consume as a tool, we show that consumers will not tend to increase their consumption of food as rapidly as their income increases or in response to increased availability. We demonstrate that the increases in the money supply may tend to increase current afghani prices; but, because the velocity of money is remarkably stable, the monetary effects do not raise real prices of agricultural output. Using income and price elasticities of demand, we show again that, unless there is a very large increase in non-agricultural incomes, increases in agricultural output per capita result in lower prices, especially lower marginal prices and a relatively slower rate of income growth in the agricultural sector. The rural-urban income growth rate differentials can and do become quite large, a subject which we explore in much more detail in Chapter II on the Rural-Urban Duality.

Getting away from the theoretical analysis for a moment, Chapter I makes use of some of the great mass of data available on the U. S. economy to give an empirical example of the point under discussion. In the past 15 years, up to 1969, most U. S. agriculture exhibited the phenomenon of real prices varying inversely with per capita production. The chapter points out that the United States uses subsidies to the agricultural sector to offset these unfavorable price and income effects, but this is difficult in Afghanistan where such a large portion of the population is in agriculture.

Chapter I also introduces the input-output analysis pioneered by Wassily Leontief. In a relatively simplified form, this will be used in Chapter III for evaluating various types of projects in the Afghan setting.

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/1/ President Mohammed Daoud of Afghanistan, Address to the Nation, radio speech on August 23, 1973 and reported in the English language daily, Kabul Times, August 26, 1974, pp. 1-4.

/2/ J. M. Keynes, "The General Theory of Employment, Interest and Money " Macmillan, 1936, London, p. 115.

> "Changes in consumption and changes in income have the same sign, but changes in income are greater than changes in consumption . . . . Let us define the ratio of changes in consumption to changes in income as the marginal propensity to consume. This quantity . . . tells us how the next increment of output (income) will have to be divided between consumption and investment. $dY = dC + dI$ "

/3/ J. M. Keynes, "The Pure Theory of Money," Macmillan, 1971 Edition, pp. [illegible]8-210.

> "Since the publication of Professor Irving Fisher's 'The Purchasing Power of Money' in 1911, the famous formula MV=PT therein propounded has held the field in the world at large as against any other propounded."

/4/ L. R. Klien and R. F. Kosobud, "Some Economics of Growth: Great Ratios of Economics," Quarterly Journal of Economics, May 1961.

The great ratios are (1) constancy of the labor share, (2) the average propensity to save (or consume), (3) the capital output ratio, (4) the velocity of circulation of money (or more precisely, its reciprocal), and (5) the proportions between factors in production.

/5/ M. J. Fry, "Money, Finance and the Critical Constraints to Economic Development," USAID, Kabul, July 1973, Table 2.14.

/6/ R. Lekachman, "The Age of Keynes," Pelican Books, 1919, p. 74.

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"The less developed countries argued at the conference that to break out of their poverty they must industrialize fast enough to increase their gross national product by a minimum rate of 5 percent a year. This they regarded as a minimum to provide employment and slowly raise the level of their peoples."

— Encyclopaedia Britannica, 1970, Book 22, p. 140c.

/9/ United States Department of Agriculture, "Agricultural Statistics, 1970."

/10/ United States Department of Agriculture, "Agricultural Statistics, 1970," Table 673.

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CHAPTER II

THE RURAL-URBAN DUALITY

CONTENTS

CHAPTER II

THE RURAL-URBAN DUALITY

2.1 The Duality

Urban and rural areas are so distinctly different in character that the economy as a whole can be seen to be divided into two parts. The most recognizable feature to most of us is the difference in density of population in the urban centers as compared with the open spaces and distances between people in the rural or agricultural areas. Another easily identified difference is the much greater activity and traffic to be observed in urban centers. Less visible but no less real are the differences whereby nature produces rural products and personal activity is required to produce urban products and services.

Urban areas are predominantly centers of non-agricultural activities and employment while rural areas account for most of the agricultural employment. The boundaries between these classifications, however, are not sharply marked and we must recognize village-town activities in rural areas as well as fresh fruit and vegetable farming in or quite near to urban centers. It is also true that specialization of farm and urban activities are not entirely separated even at the family level, particularly in urban areas and commercial villages. Many such families engage in both agriculture and non-agricultural pursuits in order to insure their basic food supply such as wheat and so augment their non-agricultural incomes. The overall objective of increasing rural incomes and employment can, nevertheless, be well served by observing the rural-urban duality, or agricultural and non-agricultural sectors of employment, as separate entities. An important distinction can thus be drawn between the manner in which urban and rural incomes are generated.

Urban incomes depend largely on the day-by-day activities and transactions. Rural incomes on the other hand depend more on seasonal activities at the time of planting and harvesting. In between these periods, except for irrigation as in Afghanistan, there is little the farmer can do to influence the part that the biosphere and agronomics play in successfully maturing the crops. The urban sector follows a different pattern and is basically dependent on activities which are largely within the control of its participants in contrast with the farmers who must play a waiting role while forces beyond their control are determining the outcome of their income potential.

Another factor in this dual system is a matter of logistics in which time, distance and volume are of quite different orders.

The urban center is compact and the density of population is relatively great so that the time required for one person to contact another is relatively short with the result that many transactions and deliveries can be achieved in a single day. The distances between transactors are similarly short and the volumes to be exchanged each time are small so that transportation requirements are minimized. For the rural areas these factors are just the opposite. Transportation is typically long and difficult so that much time is required for one person to reach another. Also the principal transactions of exchanging crops occur only at relatively long time intervals. Crop movements are also in relatively large volumes and so require greater organization and facilities as compared with the small volumes that can often be carried by hand from shop to home.

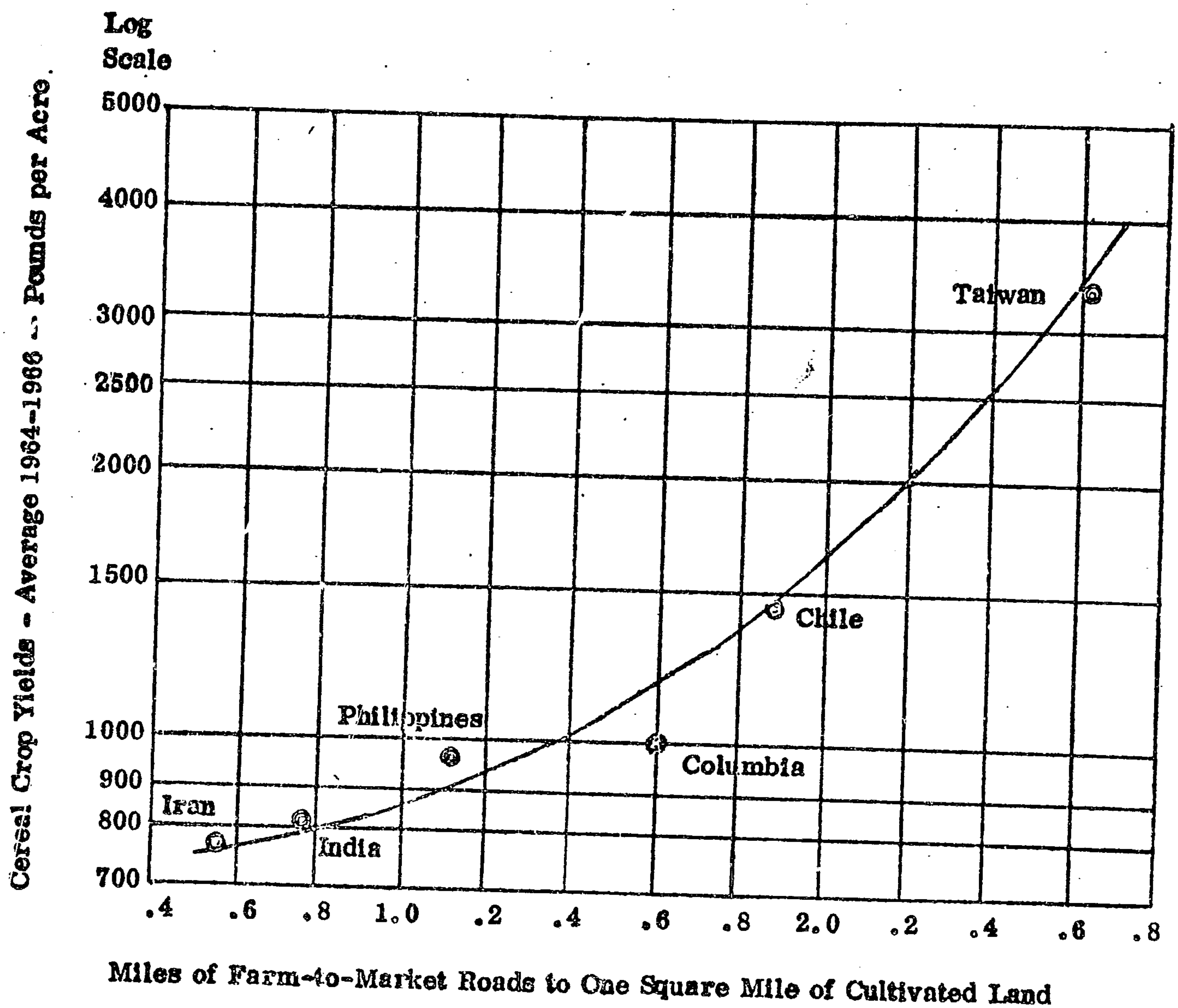
The patterns of growth that result from these differences in rural and urban areas are also in contrast by their very nature. Urban development spreads out in roughly concentric circles with greater densities along major routes of transportation. Depending on the approach adopted in town or urban planning, the expanding boundary of built-up areas can be sharply marked or it can tend to trickle out into open suburbs and small commercial farming for the urban market. Nevertheless, such growth patterns are the result of street extensions and other infrastructure programs to satisfy the needs of people for homes and living space. The investment required to carry out such programs is basically governed by the availability of funds and the numbers of people that can be served by a given expenditure. Hence, a rather high minimum density of population is fundamental to such growth and tends to maintain the efficiency of urban development in terms of activities and transactions. These physical amenities and efficiency in turn attract institutions both national and foreign as well as industry and commerce. Thus the stage is set for the next expanding wave of street extensions and concentric outward growth.

These many factors together act to pump up purchasing power in the urban system and through the income-multiplier of consumption and investment and so promote in many ways the attractiveness of urban living that is in high contrast to most rural and village life. The typical result is a steady migration of population from rural to urban areas with little or no benefit to rural incomes and employment. At the same time, population growth is not all benefit to the urban areas because many new arrivals in the cities lack skills and resources and so add to the problems of congestion, urban sprawl, pollution and slum enclaves. This duality or action and reaction in the system supports the belief that projects designed to increase rural income and employment will ameliorate these negative trends. It is, therefore, one of the purposes of this agri-business research study to show how agri-business can be an effective means of counteracting the migrations by making rural areas better places in which to find jobs and earn incomes.

As the urban center grows and expands in its compact efficient pattern of concentricity, the rural areas prove to be much more resistant to change for a number of reasons. The migration from the rural areas to urban centers is unavoidably reflected in much slower rates of growth in rural towns and villages as compared with that in urban centers. Consequently, the development of the needed infrastructure of services and amenities suffers from higher per capita cost due to the greater distance between users as well as the lower level of demand placed upon them. Even farm-to-market roads fail under such circumstances to show returns sufficient to justify their investment under the common criteria of user cost/benefits. This is unfortunate because there is a quite definite correlation between the ratio of farm-to-market roads and cultivated land to crop yields. Thus, it is not until the farm-to-market roads reach a

EXHIBIT 2.1.0.1.

TREND IN CEREAL CROP YIELDS CORRELATED WITH MILES OF ROAD TO SQUARE MILES OF CULTIVATED LAND



Source: Evaluation Handbook, A.I.D., 1972[1]

Imagine a corridor with people and few roads add a major road and you move up on the curve.

density of 1.5 miles per square mile of cultivated land that yields start to increase rapidly enough for road user benefits to exceed the cost of the roads. A typical curve demonstrating these relationships is shown in Exhibit 2.1.0.1. This investment-land-yield relationship is one of the essential differences between rural and urban growth patterns. Urban street-land-income relationships can also be plotted as a curve but it is not necessary because, as already pointed out, the user demand tends to precede investment in street extensions.

2.2. The Urban Complex

The urban complex is typically the seat of government administration and the legislative function of creating laws and regulations. This decision-making machinery is given weight and force by the power to issue money, borrow, tax and make expenditures. As a result, such centers are most attractive to those groups seeking to influence, and benefit from, these governmental activities. Such interest groups include industry, domestic commerce, foreign trade, commercial agriculturalists, social and educational services, public administration, financial institutions and so forth. Their incomes, payrolls and profits create a growing effective demand, consumption and new investment. This set of dynamic activities tends to be self-contained and looks to the rural sector for little more than a few basic agricultural commodities for which resource endowments are particularly favorable. As per capita incomes increase in these urban enclaves, a progressively smaller portion is spent on food as has already been pointed out in Chapter I. At the same time, rising incomes cause a change in tastes favoring imported food items and so further lowers the portion of urban incomes circulating to the domestic rural areas.

In developing countries such as Afghanistan, the rising non-food portion of income expenditures is also influenced by taste preferences favoring imported goods, particularly those not produced within the country. Foreign travel also increases and together with other imports generates a strong demand for foreign exchange which requires a more than proportionate increase in the in-flow of foreign exchange from exports, tourism, and capital transfers in the form of loans and grants. In addition, these in-flows of foreign exchange must be large enough to provide for the imported needs of development projects and new industries and construction. It is one of the anomalies of development that agriculture is often expected to generate ever greater export volumes to earn foreign exchange for urban purposes and from which agriculture receives only a declining portion of the benefits.

The effect of these many factors opens a distribution gap between the participants in the urban economic system and those in the rural system almost as though they were separate countries engaged in an approximate international trade relationship. This point will be further developed in later chapters of this study. Such gaps or differences are of low visibility but nevertheless real in that they are clearly recognized by many in the rural population who at least feel that moving across the boundary into the urban complex will give them a better living than they can find in the rural areas.

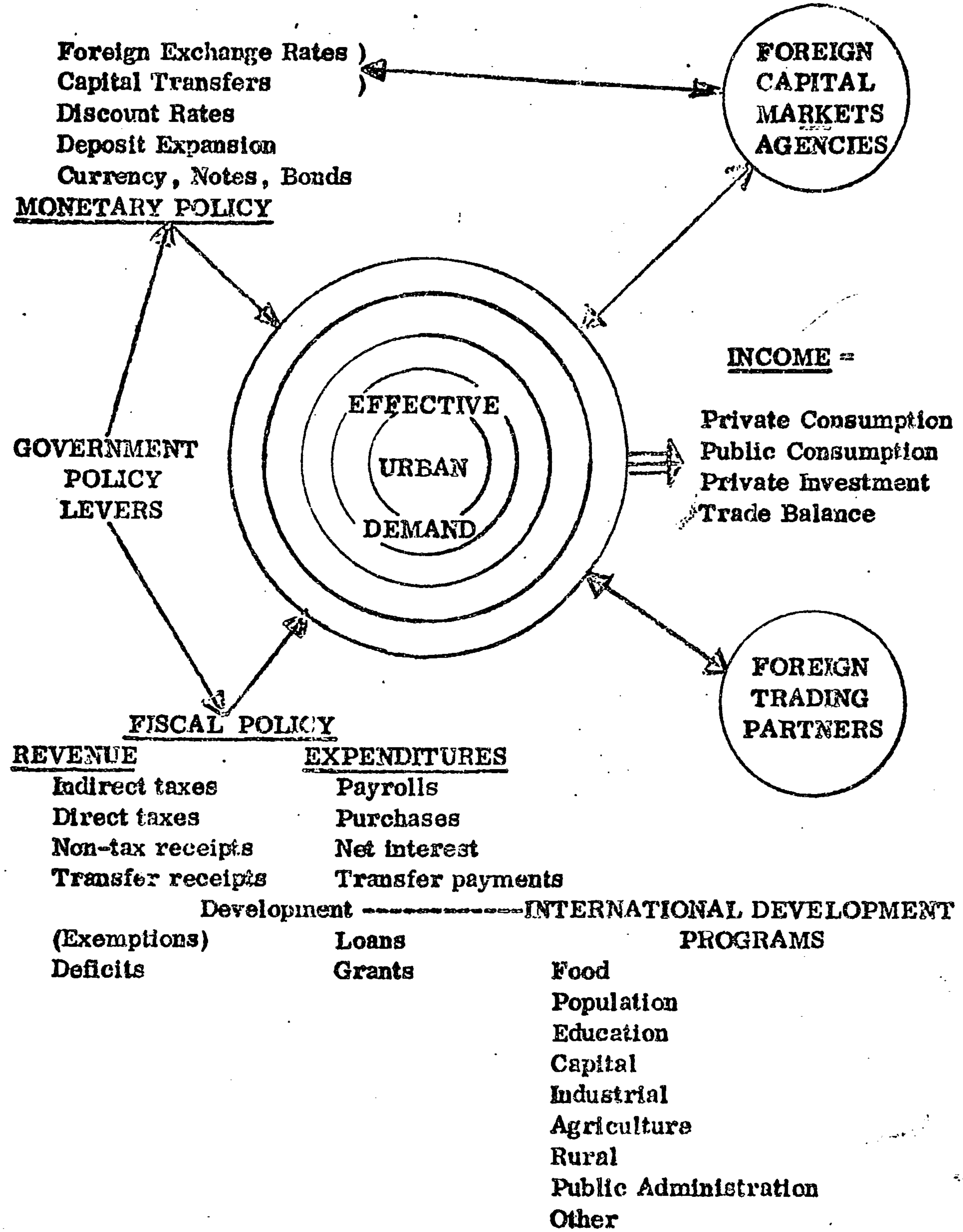
A strict definition of an urban area or center has not been agreed upon by the international community of planners. However, the U. S. Bureau of the Census defines an urban place as an incorporated municipality which has reached a population of 2,500 and, in addition, the physical, political, social and economic features of the limited area must be so developed and interrelated as to be recognized as a functioning unit. Various other agencies use larger populations and 5,000 seems to be a popular figure while retaining the other features of the above definition. An alternate population used in many analytical studies is a population density of 2,500 per square mile or 1,000 per square kilometer.

A schematic illustration of the dynamic set of urban activities outlined in this section is shown in Exhibit 2.2.0.1. It will later be shown as part of a composite illustration of the combined urban-rural system.

2.3. The Rural Area

The open and independent character of rural areas stands in strong contrast to the compact and interdependent one of the urban sector. The relative difference varies greatly from country to country but it can be roughly measured by constructing an index based on the ratio of rural area to urban area. Actual urban area data by country is not generally available but can be estimated from population data and the use of an average urban density ratio as indicated in the previous section. The following short index list of rural area/urban area ratios based on a density of 2,500 gives a not surprising indication of the differences between industrial and non-industrial countries.

EXHIBIT 2.2.0.1. URBAN SECTOR DEVELOPMENT CONCENTRIC GROWTH PATTERN



Country and Census Date	Ratio of rural area to urban area*
Iraq (1965)	218 - 1
Venezuela (1961)	178 - 1
Iran (1966)	148 - 1
Afghanistan (est. 1970)	146 - 1
U. S. A. (1960)	71 - 1
France (1962)	16 - 1
England (1961)	3 - 1

*The urban area is estimated by dividing the urban population by the density factor of 2,500 persons per square mile. This factor tends in most cases to increase the urban area somewhat and thus reduces slightly the magnitude of the ratio. The inaccuracies induced by this approach are judged not to impair seriously the validity of the results as a good relative indicator of the transaction-distance differences between rural and urban areas.

The importance of these numbers for rural income, employment and agri-business lies in the average distance separating transactors in urban and rural areas. In Afghanistan, for instance, where an urban transaction might be located in a one-square mile area, a rural transaction will be in a 146-square mile area. The square root of these areas will represent the probable differences in average distances separating transactors, that is, a rural transaction on the average will have to move twelve times the distance of an urban one.

Another feature of the rural area involves the subsistence nature of production and consumption and its lack of alternate choices. If a cash urban market value is placed on this production so that it can be equated to income, then consumption by the producers is their expenditures and what is held in reserve and storage is their savings. In cash terms, these amounts can be fairly impressive, but in terms of efficiency and satisfaction of final goods, the return is low in comparison with the choices available to the urban producer and employee both in consumption and social relationships.

Each farm family living in this subsistence style endeavors to produce some surplus that can be traded for essentials such as tea, salt, sugar and some textiles and trimming that cannot be produced on the farm or be gathered from the uncultivated areas and open range feeding of livestock. Typically, the surplus is the same commodity that the neighboring farm is producing and gathering and the surplus cannot be increased materially without causing marginal prices to decline as shown in Chapter I. Each farm or farm village is constrained in this manner from progressively increasing personal rural incomes. Long experience in these matters by the rural population sets a traditional pattern that can be changed only at considerable risk to rural family living requirements. Few attempts at change are made without considerable evidence or guarantees that the farmers or villagers believe can be explicitly relied upon or controlled by themselves. After all, the agricultural community cannot be expected to change the already-described overall system of constraints and distances in which it operates simply by increasing production through changing the pattern of inputs from the traditional to the modern.

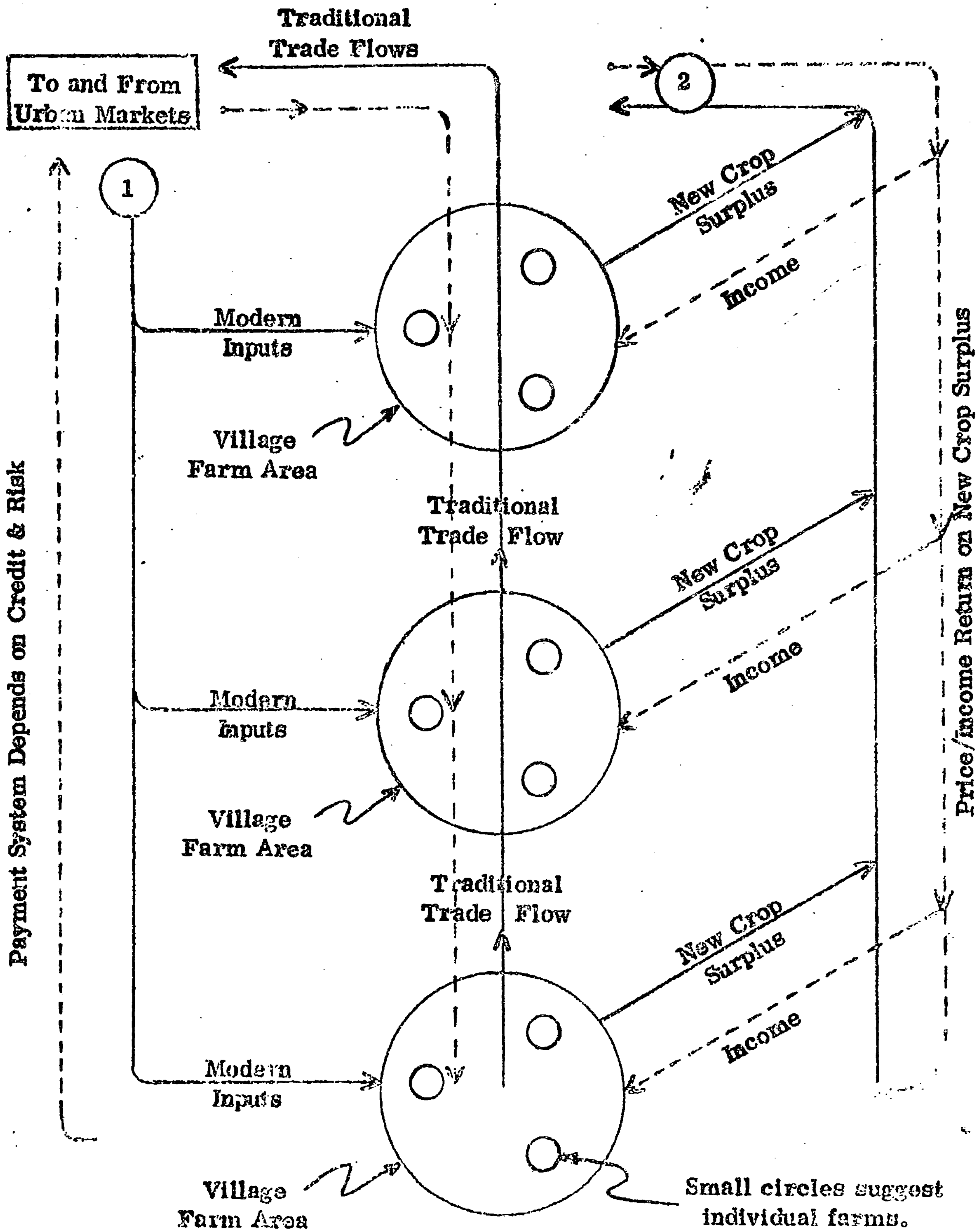
The arid climate of Afghanistan and its dependence on irrigation accentuates the separation of productive areas in the form of small oases with stretches of unarable land on all sides. Aerial photographs in Afghanistan often give the impression of small green ships on a brown dun-colored sea. This appearance gives rise to the schematic representation of rural areas as shown in Exhibit 2.3.0.1.

2.4. The Traditional Trade Pattern

The need for trade between small centers of agricultural and rural production is extremely limited due to the lack of specialization. In the traditional form, each center is a small sub-system of as near self-sufficiency as can possibly be maintained. The small surpluses produced must find their way to a market town and so pass on through the hands of traditional agri-business and middlemen to urban centers of deficit where demand exceeds production.

This gathering or concentration of commodities into the system of distribution to the final consumers of agricultural production passes through a hierarchy that further constrains any change in traditional methods. The Afghan hierarchy, when visualized as a pyramid of constraints, can be said to start with the rural population of about 10.37 million.[2] The next level is composed of some 1,275,000 landowners followed by approximately 16,338 villages which are grouped under 325 administrative centers.[3] These centers are governed through 26 provinces topped by the Central Government of 14 ministries gathered around that of the Prime Ministry and Head of State.

EXHIBIT 2.3.0.1. SCHEMATIC OF TRADITIONAL TRADE FLOW AND PAYMENT/INCOME CIRCULATION



(1) Payment, credit and risk are contingent on (2).

(2) Price and income are contingent on rising incomes in urban markets. Low incomes cause lower prices and so inhibit modern inputs and higher farm income.

Each level in the hierarchy provides a demand for part of the agricultural surplus moving through the gathering and distribution channels. Part of this flow is, of course, disbursed in the form of taxes including controlled food prices. A large portion of these taxes is expended in the urban areas and so reduces the net flow of income to rural and agricultural areas. The volume of trade exchange in money terms between urban markets and the representation of farm villages in Exhibit 2.3.0.1. is thus necessarily a rather thin line of flow.

The schematic combination of the urban center, Exhibit 2.2.0.1., and farm village, Exhibit 2.3.0.1., is shown in Exhibit 2.4.0.1. It is worth noting that the export trade in agricultural commodities passes through the urban center and only indirectly reaches the farm-village system.

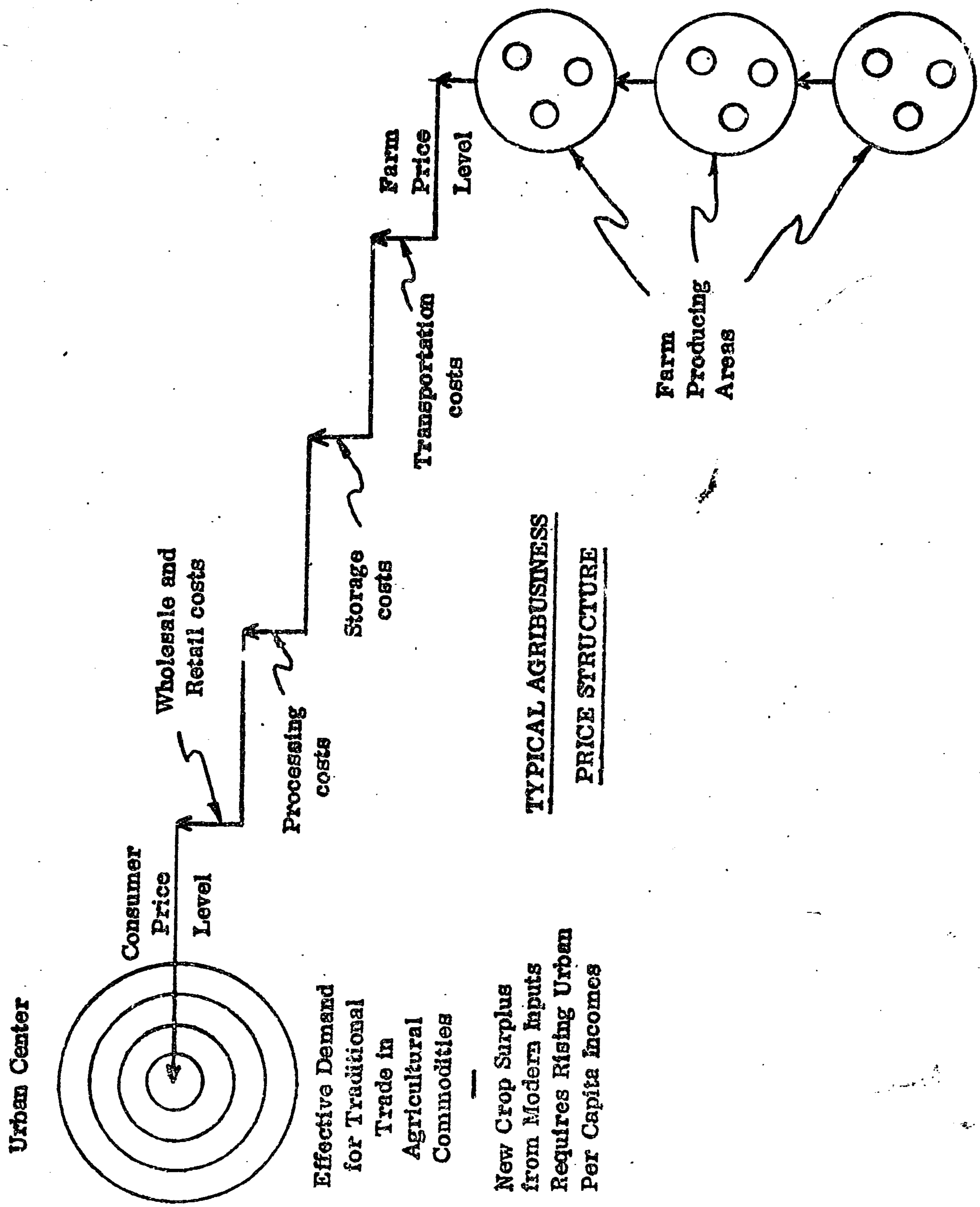
2.5. Traditional Agri-business

Agri-business is an intermediary between supply and demand or producers and final consumers. It is an outgrowth of the "farmers market" brought about by rudimentary forms of specialization better to satisfy urban demand as it develops. In this process a chain of marketing functions such as transporation, processing, wholesaling and retailing has come into being. Traditionally, both farmer and consumer have been suspicious of these so-called middlemen. They have looked upon them as unproductive, parasitical and often dishonest. They still do in some cases.

> "Some farmers in the past deliberately raised only as much wheat as they required themselves. This was because transportation was

EXHIBIT 2.4.0.1.

SCHEMATIC OF URBAN/RURAL, TRADE/PRICE SYSTEM



prohibitively costly and any surplus wheat was purchased at dumping prices by dealers, usurers and profiteers." — The Kabul Times, Editorial page, July 8, 1974.

The only adjustment that might be made to the above paragraph is to use the present tense instead of the past tense. Middlemen will continue to do business because they perform useful services and are necessary in order to obtain the lower cost and price benefits of specialization.

One of the problems being faced by this research study is how to help overcome the above sociological burden by developing and distinguishing between modern and traditional agri-business. It requires recognition that such marketing services can be truly productive. This can be done by showing that modern agri-businesses have economic utility: by transporting farm products, they produce space utility; by processing them, they produce form utility; by storing them, they produce time utility; and by buying and selling, they produce possession utility.

Each of these functions or steps between the farmer and the consumer represents a cost or a build-up on the farmers' price that must be paid by the final consumer. If the cost or price increments are high, then the geographical market area available to any farmer will be small in the traditional form. There is thus a relatively inelastic price margin between the farmer and the consumer within which the agri-businessman must operate. If the agri-businessman exceeds this price margin, he loses business. He is caught between two opposing forces, the producer and the consumer.

On one side is the farmer working for higher prices using his power to determine production through crop substitution and land use including restriction of land planted to crops. On the other side is the consumer working for lower prices using his power to determine demand through substitution of what he consumes. In between is government policy trying to satisfy both the farmer and consumer as best it can. When, as in Afghanistan, an agency of government, the Food Procurement Department, takes over part of the agri-business function in an effort to satisfy these conflicting price interests, it is also caught in the same price squeeze. The difficulty of any government agency to control costs (most public sector enterprises in Afghanistan operate at a financial loss) adds to the problem. Such agencies have, however, an escape route not available to private agri-business. Their losses are made up by taxes or government deficit financing. Thus, agri-business enterprise is typically caught in a three-way squeeze by forces over which it has little control. In any case, the normal price margin is exceeded but is paid for indirectly by society as a whole with the result that this payment acts as a constraint on economic growth.

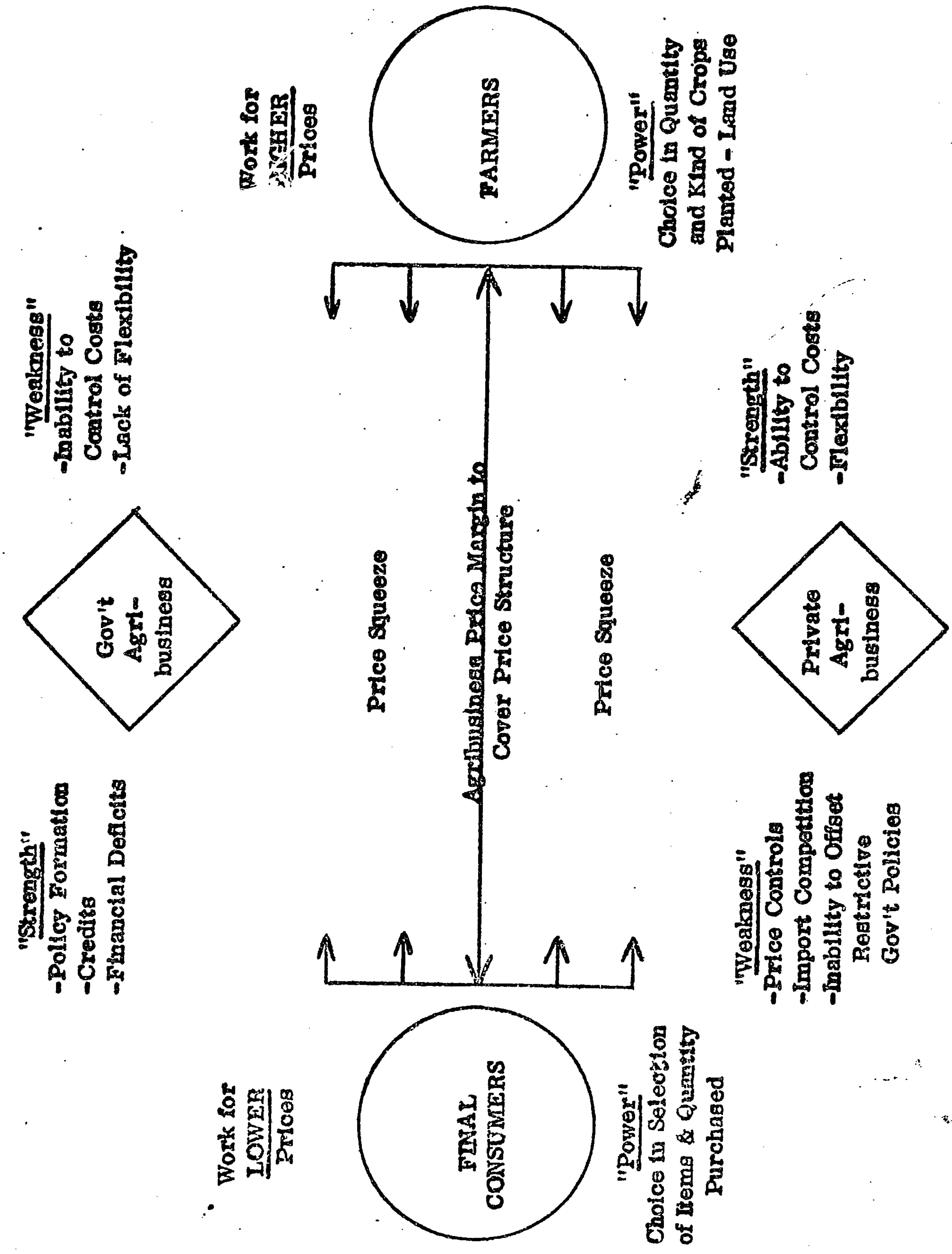
A schematic illustration of the forces involved in the agri-business price squeeze is shown in Exhibit 2.5.0.1.

2.6. Agri-business Location

This traditional agri-business system encourages the agri-businessman to locate his enterprise in urban centers where the effective demand for agricultural products is most easily reached and where prices and incomes can be most

EXHIBIT 2.5.0.1.

SCHEMATIC OF AGRI-BUSINESS "PRICE SQUEEZE"



effectively managed. Non-agricultural enterprises are located in urban centers for similar reasons as well as to avoid the extra cost of transportation of materials and finished goods to and from a rural location.

The question of location has been recognized in the revised (May 1974) Foreign and Domestic Private Investment Law (FDPIL), which has added an incentive to locate new enterprises outside of the Kabul area by exempting the enterprise from income taxes for an additional two years. The erosion of net income due to the extra cost of transportation, which is not reduced after the extra two years, is enough in itself to give this incentive a minor value in the absence of other favorable factors.

It is well to note in this regard the major differences in market size and distance between Kabul and the other important urban centers in Afghanistan. Except for the Kabul-Charikar corridor, so-called in this study, in which seven sizeable towns and administrative centers are located, the other urban centers constitute quite separate urban areas. Not all of the population in these places listed below are urban (the exact data are unavailable) but the numbers do express reasonably well the relative importance of these locations from an urban business point of view.

Place names	Kilometers from Kabul	Estimated Population
Kabul	0	500,000
Shakardara		73,000
Quarabagh		67,000
Mirbachakot		53,000
Kalakan		69,000
Bagram		107,000
Charikar	64	96,000
K - C corridor		965,000

Place names	Kilometers from Kabul	Estimated Population
Jalalabad	150	106,000
Pule-Khumri	230	94,000
Kunduz	337	166,000
Mazar-i-Sharif	432	231,000
Kandahar	488	310,000
Herat	1,053	232,000

As we go beyond these centers into the more rural area where the need for income and employment is greater, there is an increasing requirement for government incentives and policy to encourage the necessary private and public investment on which job creation depends. Part of any such solution is likely to depend on technological innovation regarding agricultural commodity processing. Instead of accepting industrial technology that integrates as many processing steps as possible in a single establishment in order to gain the maximum efficiency and scale of operations, it is better to separate the initial processing steps and locate them closer to the points of agricultural production. Some efficiency is lost in this approach but the trade-off is between further concentration of agri-business enterprises in urban centers or positively moving some portion of the processing facilities into rural areas for the benefits to be achieved in rural income and employment.

The principal incentives, and incentives are going to be needed, relate to financing of facilities and production, some transport subsidies, and guaranteed contractual arrangements with financing between wholesalers (in some cases, the government), final processors, initial processors (including cooperatives), and the farmers who agree to grow the required crops of specified quality. Once such a complete commodity system is fully introduced by a concerted effort, including donor country technicians who understand this approach, subsequent projects following this direction will become more natural and more easily undertaken.

Chapter IV below discusses more fully the range of incentives which are used to encourage industry to locate in rural and generally poorer areas.

The raisin cleaning and packaging projects under FDPIL auspices are a successful example of agri-business accomplishment under favorable conditions of existing surplus and marginal supply and effective demand. Once ready-made situations of this type are developed, new opportunities prove to be more difficult of accomplishment. Often times suitable technology of the necessary small-scale is not available and must be designed to meet the local conditions. Treating individual commodities in a systematic way from farm to final consumer and optimum location is not always easy but without application of a thorough method or scientific approach, successful results are difficult to achieve. An aim of this study is to discover opportunities where such an approach can be proved beneficial.

2.7. Chapter Summary

The first chapter introduces the adverse price-income relationship with respect to increasing per capita production of agricultural commodities. It points out, among other things, that urban per capita incomes must increase more rapidly than rural incomes, if increases in per capita agricultural production are not to result in sharply declining marginal farm prices.

In this second chapter the distinction between urban complexes and rural areas are described. The important feature of these differences is the ability of the urban center to grow quite independently of the rural areas, particularly when typical foreign assistance is injected into the economy. The ability of the urban complex to absorb this assistance is most pronounced and in the process it draws heavily on imports including food products. Efforts to develop demand and supply of suitable local farm products which would help to adjust this imbalance have tended to fall behind. As a result, the gap between urban development and rural growth increases sharply and gives rise to very visible inequalities in the distribution of incomes and employment.

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CHAPTER III

MEASURES OF INVESTMENT AND AN INFORMATION SYSTEM FOR POLICY RECOMMENDATIONS

CONTENTS

CONTENTS Cont.

CHAPTER III

MEASURES OF INVESTMENT AND AN INFORMATION SYSTEM FOR POLICY RECOMMENDATIONS

3.1. Introduction

The aim of investment measures is not to create a new way to measure investment projects as much as it is to select one from the innumerable methods already available. Such measures fall into two groups — financial and economic. Financial measures relate primarily to firms or organizations which include government and institutions. Economic measures typically relate to national aggregates and sub-aggregates of production and income.

In the field of economic development, the development banks are highly interested in the financial measures in order to improve the security and repayment of loans. Development institutions designed to assist prospective investors in planning their investment enterprises for government approval and licensing also tend to rely on financial measures in preparing feasibility studies. Financial measures are labeled the "micro" approach to development.

Economic planning agencies such as planning ministries devote themselves almost exclusively to aggregate economic measures for the allocation of resources as in "Five Year Plans," and for the approval of categories of investment industry, infrastructure, and social development. In some cases such planning departments also prepare national accounts and projections of the economy. In other cases economic measures are used by other government agencies and ministries to prepare the national accounts. Economic measures are labeled the "macro" approach to development.

This division of investment measures for exclusive use by two separate branches of, or approaches to, development has an unfortunate effect on both aggregate and enterprise growth. It results in poor coordination of effort so that national plans often fail to achieve their goals. And enterprises, even when financially viable, often fail to make the anticipated contribution to economic growth through loss of the multiplier effect. As a result, both planners and entrepreneurs lose the support and respect they need in their work.

In this chapter we undertake a review of various available measures for the purpose of working out a composite system in terms of both financial and economic measures. Such an approach depends on the inherent fact that macro measures must depend on the aggregation of information first obtained at the micro level.

3.2 Nature of Enterprise Investment

Investing is an act of expenditure. It must, therefore, be preceded by the identification and availability of funds or other resources necessary to the investment expenditure. For a private investor, the sources of funds are savings, borrowings, profits, or the transfer of other resources to the new investment. For a government, the sources of funds are taxes, borrowings, new money, or the transfer of other resources.

Once the prospective investor has identified a potentially interesting project and has reason to believe that funds in their various forms are, or will be, made available, the next step is to evaluate the feasibility of the selected project in order to increase the probability of financial success and the security of the investment expenditures on plant, materials and working capital. The process of converting these plans into reality is a physical process as is the process of production once the project is in operation. Both are beyond the scope of this chapter.

Production gives a return first in the form of sales receipts, a part of which is then expended as inter-industry payments, and factor incomes for the inputs of production. Another part of the receipts is paid out in taxes to support government activities of administration, investment, and social welfare redistribution of income. What remains, if there is not a loss, is profit or return on the investment which then becomes available for dividend income to investors and/or for starting a new cycle of savings, borrowings, investment, production, incomes and employment.

All these activities and processes go into making up the nature of investment and the economic system. They need to be kept in mind as the various means of measurement are considered in the following sections.

3.3. Investment Purposes

An obvious question is what prompts investors to convert savings and their purchasing power that can be used in so many different ways into an investment involving so much "brick, mortar and hardware" with the attending risks and time lag.

For a family investing in a house, the answer can be necessity and the desire for future living comfort, status and security. For an entrepreneur, the basic urge may be to provide the means of earning an income. In view of the risks involved, his reasons are likely to be more complex. He is perhaps more ambitious and is looking for greater returns both financially and socially as well as the personal satisfaction in achieving them. There is also the element of more influence and power that tends to go with such success.

Government investment in productive enterprise, in contrast to Government's other expenditure purposes, is motivated by an expressed desire to increase the national product and employment while avoiding the supposed exhorbitant profits of private industry and its investors. The suppression of the profit motive reduces the efficiency of the enterprise operations because profits are the control and measure of management effectiveness. This loss of efficiency is often offset by giving such enterprises monopoly power.

> "Furthermore some [government] enterprises acted like monopolies, and were able to report profits only through overcharging the customers, who in many instances were government organizations."[1]

By implication, the purpose of investment is profits whether the enterprise is public or private. In the process of generating profits and new cycles of investment for profits, the social benefits of production and employment are very much in the nature of by-products. In other words, a compositive method of measuring investment is needed to insure that neither purpose is overlooked as so often happens when financial and economic measures are used separately by different agencies or institutions of development.

3.4. Accounting Measures

Accounting measures or systems of accounting fall under two headings already mentioned — financial and economic — and are considered in some detail in the next two sub-sections. Following these is a composite measure which is developed and applied, as an example, to some of the private enterprise projects under the Foreign and Domestic Private Investment Law.

An equally important measure is the one of location where an investment should be made in order to achieve a distribution of benefits and avoid enclave development. This subject is considered separately in Chapter V, Regional Resources and Income in Afghanistan.

3.4.1. Financial and Operating Measures

Business accounting is a double entry system for control and accuracy. It produces its periodic reports in two main forms, the balance sheet and the operating ("profit and loss") statement.

The balance sheet presents the financial condition of the firm or organization at a specific point in time. It separates the assets and liabilities into separate columns following established rules and procedures. The liabilities are separated vertically into liabilities due to others and liabilities due the owners and investors. This last group of liability accounts are commonly headed "net worth of the enterprise."

The operating statement presents an accumulation of transactions over a given period of time. These transactions in detail measure the performance of the enterprise during the period covered by the statement. In this sense, the operating statement also measures the utilization of the investment in plant, material and working capital as well as the effectiveness of the management and the productivity of the labor force.

Condensed examples of the balance sheet and operating statements are shown in Exhibit 3.4.1.1. Though considerable information concerning the firm's activities is to be obtained directly from two statements, scientific management is necessarily interested in obtaining a more thorough understand of what is actually happening so that improvements can be constantly made. Conversely, if things are going wrong, it is important for management to be able to determine the precise corrective steps or policy changes necessary for better results. Intuition is a poor substitute for knowledge in such cases because choosing the wrong steps that make matters worse is as likely as taking the proper corrective action. Ratio analysis as set forth in the following section is the recommended approach for the problems indicated above.

3.4.2. Ratio Analysis

Ratio analysis involves relating items in the balance sheet and operating statement to one another at frequent and regular intervals. Though the ratios themselves have importance, it is the change or variances in the ratios from period to period, say month to month, relative to a pre-determined standard that

EXHIBIT 3.4.1.1.

EXAMPLE OF THE BALANCE SHEET AND THE OPERATING STATEMENT IN A CONDENSED FORM

BALANCE SHEET

Assets	Liabilities
Current assets	Current liabilities
Cash & receivables	Payables
Inventories[1]	Accrued liabilities
Fixed assets	Borrowed debt
Less allowance for	**Net worth**
depreciation[2]	Paid-in capital
Other assets	Earned surplus[3]

Total Assets equal Total Liabilities & Net Worth.

OPERATING STATEMENT

Purchases	Net sales
Inventory change[1]	Other net income
Wages and salaries	
Other expenses	
Depreciation[2]	
Taxes	
Profits[3]	Losses[3]

Note: The superscripts 1, 2, 3 represent the net financial effects of operations transferred to the balance sheet.

gives management the best information or guide to future policy and action. Such variances indicate whether performance is good or bad compared with the standard. The standards themselves must of course be designed for a satisfactory overall level of performance.

The ratios can be conveniently divided into financial and operational. The number of such ratios that can be devised is large. A study by Roy Foulke[2] lists 14 important financial ratios, while the American Society of Association Executives found 34 separate types of financial ratios being compiled by 26 trade associations. We list below only the 10 financial ratios recommended by the U. S. Small Business Administration.[3]

1.	Current assets	to current liabilities
2.	Net worth	to current liabilities
3.	Net worth	to net sales
4.	Net worth	to net profit
5.	Net worth	to fixed assets
6.	Net worth	to borrowed debt
7.	Net sales	to current assets minus current liabilities
8.	Net sales	to goods inventory
9.	Net sales	to net profit
10.	Credit sales	to credit collections

Operating ratios, listed below, depend for their number on the accounting detail employed in dividing costs and expenses that represent the operations of the enterprise or organization. We list only 11 of the more important operating ratios below.

1. Net sales to cost of goods sold
2. Net sales to gross profit
3. Net sales to operating expenses
4. Net sales to operating profit
5. Net sales to selling expense

6. Net sales to administrative expense
7. Net sales to general expense
8. Net sales to financial expense less financial income
9. Net sales to profit before taxes
10. Net sales to taxes
11. Net sales to net profit

Pro forma balance sheets, operating statements and ratio analysis are all used in preparing project feasibility studies. The value of ratio analysis in such studies is that it acts as a check on the validity of the assumptions that must be made in preparing feasibility studies.

It is vital to note, and it cannot be overstressed, that none of the above work or assumptions has any validity unless the assumptions concerning the market for the final products of the enterprise are themselves sufficiently researched so that they are as attainable and reasonable as it is possible to make them. Everything about the project investment hinges on the reality of this one point.

3.5. The Financial Investment Decision

The accounting measures above are preliminary to preparing the analysis on which investors make their technical decisions. The subjective and intangible factors on which investment decisions are based must be assumed favorable or the above accounting work becomes a waste of time and resources. Factors such as the general investment climate, legal and economic, are most important. The attitude of the Government's Investment Committee concerning the character of the investors and the specific project must also be taken into account along with all the problems of where to locate the establishment. If these subjective and intangible factors can be formally determined before the actual feasibility study is undertaken, the situation will be better for all concerned. In other words, the project approval process is best divided into a pre-feasibility application, that is, the general aspects of the investors and the project without the technical and financial analysis, and the feasibility application which is only to be undertaken after the pre-feasibility application has been approved.

The technical investment decision is based on the second step or feasibility application but the accounting procedures indicated above are not yet in a form that lends itself to the broad thinking in which most investors are primarily interested. Of course, they want to be assured that the details are properly handled but in addition they want to know more about the return of their capital as well as when net profits can be expected to change from repayment profits to income profits.

This distinction in the nature of profits is all too often overlooked or under-emphasized, particularly by government enterprises and planners.

Repayment profits are those allocated by management to retiring bor rowed debt and return on paid-in-capital whether debt or capital is obtained fr public or private sources. If these funds are not recovered from profits, the become "sunk costs" and cease to be a factor in economic growth that most economic analysts project for them. Paying out the maximum of sales-inco labor so that profits are minimized or nonexistent is often the underlying ju tion for government enterprises. It is the surest way possible of making i a "sunk cost" and so restricting the growth of income and employment.

In regards to the methods of analyzing returns on investment, there are four generally accepted approaches.

1. Cash-flow analysis
2. The rate of return on the average life of the investment
3. The pay-back period
4. The simple rate of return on investment

All four approaches could be applied to each project but such redundancy is not to be recommended.

(1) Cash-flow analysis is the most elaborate and sophisticated of the four methods. The assumptions concerning the future, on which it is based, become progressively unreliable as the future is extended. As a result, cash-flow analysis suffers from what is commonly called "pseudo-accuracy." An example of cash-flow methods is shown in Exhibit 3.5.0.1. The principal value of the cash-flow approach is to show that the analyst has done his "homework" so to speak and as an indicator of when additional working capital is most likely to become necessary.

(2) The rate of return on the average life of the investment is particularly useful when an existing plant or establishment is to be expanded or an important machine or piece of equipment is to be added. In such a case, the expected life of the machine, etc., and the investment required when installed and ready to produce is first determined. Second, the new output value and its cost is estimated to give the net income to be expected over the average life. Third, the net income on the old production or portion of production, if any, is computed and deducted from the net income first determined for the new investment. Fourth,

EXHIBIT 3.5.0.1.

CASH-FLOW METHODS FOR EVALUATING PROSPECTIVE INVESTMENTS

CASH-FLOW SCHEDULE

Timing-years	Cash-out*	Cash-in**	Cash-flow
-2	$1000		$-1000
-1	2000		-2000
start-up	1000		-1000
+1		$1000	+1000
+2		1500	+1500
+3		2000	+2000
+4		3000	+3000
5. life of project		2000	+2000
	$4000	$9500	$ 5500

* = capitalized disbursements ** = profits (after taxes) + depreciation

METHOD		A. PRESENT VALUE at 10%* Discount		B. FUTURE VALUE at 10%* Discount	
Timing-yrs.	Cash-flow	Factors	Amount	Factors	Amount
-2	$-1000	1.210	$-1210	1.949	$-1949
-1	-2000	1.100	-2200	1.772	-3544
start-up	-1000	1.000	-1000	1.610	-1610
+1	+1000	.909	+ 909	1.464	+1464
+2	+1500	.826	+1239	1.331	+1997
+3	+2000	.751	+1502	1.210	+2420
+4	+3000	.683	+2049	1.100	+3300
+5	+2000	.621	+1863	1.000	+2000
	$ 5500		$ 3152		$ 4078

*Interest rate cost of credit for investment borrowings.

METHOD		C. INTERNAL RATE OF RETURN = Trial 22%		Trial 23%	
Timing-yrs.	Cash-flow	Factors	Amount	Factors	Amount
-2	$-1000	1.488	$-1488	1.513	$-1513
-1	-2000	1.220	-2440	1.230	-2460
start-up	-1000	1.000	-1000	1.000	-1000
+1	+1000	.820	+ 820	.813	+ 813
+2	+1500	.672	+1008	.661	+ 991
+3	+2000	.551	+1102	.537	+1074
+4	+3000	.451	+1353	.437	+1311
+5	+2000	.370	+ 740	.355	+ 710
	$ 5500		$ 25		$- 74

Source of factors: Financial Compound, Interest and Annuity Tables, 4th Edition; Financial Publishing Co., Boston, 1966.[4]

the benefits or costs to the other operations and price structure are estimated and either added to or deducted from the above results to give the net return on the new investment over its average life. This net return is then divided by the new investment to give the percentage rate of return on the average life of the investment. The strengths and weaknesses of this method are similar to those of the cash-flow method.

(3) The pay-back period method is similar to (1) and (2) above except that the estimated stream of net profits or net returns is summed until it is equal to the investment or net assets (total assets less current liabilities). The time required to achieve this equality is the pay-back period. In some cases the allowance for depreciation is added to net returns or net profits to give a cash-pay-back period, which of course is considerably shorter than in the first case.

(4) The preferred method is the "Simple Return on Investment" (ROI). It gives the investors the information they are looking for, it is simple enough so that alternative investment schedules can be readily prepared for comparative purposes, and it has a high degree of reliability because it is based on the minimum of assumptions, and those being the ones in which most confidence can be placed.

The Harvard Business School recently conducted a study[5] of 189 multinational companies in which, almost without exception, the financial officers of these corporations used a simple form of return on investment (ROI) as the basic measure for making investment decisions in their international subsidiaries. A common target is 8 percent (projected average annual net profit divided by projected net assets, i.e. total assets less current liabilities). A sample form for calculating ROI is shown in Exhibit 3.11.01. This rate of return is seldom realized and when it is, it is usually for only a few years before some change occurs that pulls it down again. We should note that the 8 percent target from the survey results corresponds to the period before the recent spectacular increases in world-wide interest rates.

Thus, multi-national enterprises, in spite of their resources and capabilities to develop sound assumptions, prefer the more simple ROI investment indicators. In developing countries where assumptions are much less reliable and cannot compare in quality with assumptions based on the scientific information systems of multi-national corporations, there is even less justification for cash-flow methods. At the same time, we ought not to ignore Maynard's statement that traditional methods of ROI are both inadequate and unreliable.[6] With these caveats in mind, we move on to methods of national income accounting, input-output analysis and multiplier effects in order to develop a composite method of evaluating prospective investments in both financial and economic terms.

3.6. National Income Accounting

National accounting is an empirical summation of national economic activities during stated periods of time. It is very much in the nature of operating statement accounting for business that appeared in Section 3.4.1. The principal difference is in the handling of business purchases which do not appear as such in national accounting. Otherwise the purpose is to provide factual information on the basis of which government officials are assisted in the formation of policy and its implementation, just as comparable information is needed and used by businessmen. National accounting methods, however, do not include the equivalent of a balance sheet though there are many economists who believe that they should.

The easiest way to describe what happens to purchases in the aggregation of national accounting is by considering how the bread we eat comes to be made in the following simple example. Starting with wheat and an assumed farmer's price of 5 cents a pound sold to a miller and further assuming no losses along the way, the miller may sell the wheat in the form of flour to a baker for 10 cents a pound. Next the baker may sell the bread to a housewife for 15 cents a pound. All other purchases have been ignored. The price differences are entirely due to the value added (further described in Section 3.8.) during each processing step. Now, if we add together each of the sales prices, including purchases, we arrive at a sum of 30 cents but the final price is only 15 cents. Clearly we have been double adding by including the value added of wheat three times instead of once and the miller's value added twice instead of but once. That is, the farmer added 5 cents of value, the miller purchased 5 cents of wheat and added 5 cents of value, and the baker purchased 10 cents of flour and added 5 cents of value. If we ignore purchases and sum only the values added, we have 15 cents or the final price to the housewife.

industry enterprise must include purchases from other industries in its accounting procedures. National accounting excludes those purchases so as to avoid double counting, as pointed out in Section 3.11.

3.6.1. National Accounts

The national account headings start with gross national product (GNP) and gross national income which, by their definitions, must equal one another. This arrangement sets up a double accounting method for accuracy just as the familiar double accounting method used in finance and business. The GNP is equivalent to the sales or income side of the business operating statement; gross national income, on the other hand, is equivalent to the cost, expense and profit side of the business operating statement. The switch in terminology between national income and business expenditures is due to the fact that business expenditures represent income to those who receive the expenditures. The income point of view is more interesting to government policy makers because they want to know who is receiving such income. They already know from the GNP figures the enterprises that are receiving sales income and for the different kinds of goods and services as well as the general purposes for which they are purchased.

The various sub-headings used in national accounting are summarized below.[7]

GROSS NATIONAL PRODUCT	equals	GROSS NATIONAL INCOME
1. Personal consumption expenditures		6. Inventory change
2. Gross private domestic investment formation		7. Wages and salaries
3. Exports of goods and services		8. Transfer payments
4. Less imports of goods and services		9. Rental income of persons
5. Government purchases of goods and services		10. Net interest
		11. Dividends
		12. Corporate surplus
		13. Proprietors' income
		14. Capital consumption allowance
		15. Indirect business taxes
		16. Less subsidies

3.7. Matching Business Accounts and National Accounts

Business operating accounts and national income accounts can be matched up in the following fashion. The expenditure side of the business operating statement is used in a slightly expanded form that in no way changes the results previously shown in Exhibit 3.4.1.1. The gross national income side of the national accounts is in a slightly reordered sequence to facilitate the matching process.

BUSINESS ACCOUNTS	NATIONAL ACCOUNTS
Operating Statement	Gross National Income
A.	A.
Purchases	(excluded)

B.	**B.**
Inventory change (incl. cash and receivables)	6. Inventory change
Wages and salaries	7. Wages and salaries
Social insurance, etc.	8. Transfer payments
Rent	9. Rent income of persons
Net interest	10. Net interest to persons
Depreciation	14. Capital consumption allowance
Indirect business taxes	15. Indirect business taxes
Less: subsidies	16. Less: subsidies
Dividends	11. Dividends to persons
C.	**C.**
Profits	12. Corporate surplus
Income taxes	13. Proprietors' income
Net profits	- Income taxes deducted from 12 and 13

Note: The numbering in the right hand column follows that of the national income account headings given in the text above.

Group A, purchases, is not included on the national income side for the reasons set forth in Section 3.6., the wheat to bread example. Group B accounts are directly comparable as one would expect. The profit or surplus, group C, has been extended to show income taxes on profits, corporate surplus and proprietors' income. Personal income taxes are not shown because (1) they are not part of business accounting, and (2) on the national income side, they are part of wages, salaries and other personal income that are typically shown in more detailed schedules of national income.

Both income and direct taxes flow to government purchases, which then move through the business accounts, and to government wages and salaries. Taxes are thus a redistribution mechanism used in societies to shift incomes from one group to another, or from productive to less productive purposes, so as to provide security, social services and amenities that cannot be directly derived from production. The subsidy item seldom appears in project feasibility studies, though it is as real as any of the other items and often causes future misunderstandings and problems by its absence.

The reason for not including subsidies in feasibility studies is that they are usually in the form of exemptions used as incentives to encourage new investment. Later, when the project has been in operation for some time, the exemptions expire with the result that expenditures increase to reduce or wipe out profits unless market conditions and competition from other new and exempt projects are such that prices can be increased. In theory, these older projects should have so improved in efficiency as to absorb the added expense but all too often other changes have made such improvements impossible. The FDPIL program in Afghanistan experienced this problem in a rather acute form when the period of incentives of custom duties and income tax exemption for the first group of projects expired. A number of investors reported that they would have to shut down their enterprises.

If the feasibility studies for these investments had projected results with and without subsidies, a more equitable means of transition might have been provided.

3.8 Value Added Relationships

Value added quite simply is the value added by an enterprise to its purchases of raw materials and goods and services. Clearly, the differences between total outputs and inputs of raw materials, energy, shipping materials, etc., is the payment of wages and salaries, and the residuals. So value added can be derived either by subtracting inputs from outputs or adding wages-salaries and residuals. Capital as depreciation and changes in stock or inventories complicates the definition as do other items in most accounting systems. It is, therefore, a matter of adjusting the accounts used in the feasibility study so that they can be most appropriately divided into inputs and residues. A recommendable division of accounts is shown in Exhibit 3.11.0.1.

Value added varies from enterprise to enterprise and from year to year. Combining enterprises into industry groups reduces these variations and gives a benchmark or indicator of the value added that may be expected in preparing feasibility studies. In addition, the labor share in value added has been found to be an important constant (Section 1.2.2.) so that by comparing the value added by industry groups, we can obtain an indicator of relative employment potential. An example of such an analysis using available U. S. A. data[8] is shown in Exhibit 3.8.0.1.

EXHIBIT 3.8.0.1.

ANALYSIS OF VALUE ADDED (VA) BY BROAD INDUSTRY GROUPS IN ORDER OF VALUE ADDED TO SALES RECEIPTS: U. S. DATA

Industry Group	VA as % of sales	VA as % of GNP	Units of Invested assets to earn one unit of: VA	Payroll
Transport & utilities	59.4	9.5	3.70	6.61
Services	58.5	11.5	.70	1.16
Mining	53.7	2.1	2.66	4.44
Construction	43.4	7.0	1.09	1.57
Agriculture	39.9	4.3	3.32	4.36
Manufacturing	35.5	32.4	2.09	3.07
Wholesale & retail	20.4	16.7	1.70	2.60
Finance, etc.	68.1*	15.2	13.18	51.90

* Receipts do not include loan capital repaid.

Sources: "Statistics of Business Income," U. S. Department of Treasury, 1969.
"Statistical Abstract of the U. S.," U. S. Department of Commerce, 1970.

The low ranking of manufacturing as a potential employer of labor may come as a surprise to some readers. If they will recognize, however, how important manufacturing is to the demand and income of the other industry groups, it will be easier to understand why manufacturing must act as the principal employment multiplier in the overall economic system. The smaller the manufacturing sector, the smaller the other sectors will be in proportion to the demand created for them by manufacturing.

The right hand column of Exhibit 3.8.0.1. shows the relative dollars of assets required to pay on the average one dollar in payrolls. The order of labor intensiveness shown in this column is quite different than the order of value added to sales receipts in the first column. The industry groups are reordered below, starting with the most labor intensive.

Industry Group	Dollars of assets required for one dollar of payroll
Services	1.16
Construction	1.57
Wholesale and retail trade	2.60
Manufacturing	3.07
Agriculture	4.36
Mining	4.44
Transport and utilities	6.61
Finance, etc.	51.90

The assets to value added ratio in column three follows the same order as above but with lower values representing the inclusion of the necessary return on investment.

3.9. Multiplier Effect in Value Added

There are two ways of looking at the multiplier effect for purposes of this study. One is to consider an increase in demand brought about by the government increasing its expenditures or the supply of money. The other is to consider increasing investment either by government investment or by government incentives inducing an increase in private investment.

In the first case, the government can use fiscal measures or monetary measures. In the fiscal area, government expenditure increases must be financed by increasing the money supply or through tax increases. Increasing taxes, however, may reduce demand (consumption) which cancels the very effect it is trying to achieve, or they may tap idle savings or hoards, if they exist, which will have the desired effect of increasing demand. Alternatively, the government may employ monetary measures by borrowing and/or increasing the stock of money so that expenditure can be increased, but in so doing there is a greater risk of causing inflation.

In the second case, the incentives represent government revenues foregone or actual subsidies made. The expenditure or demand effect is thus achieved through the recipients of these incentives. Both cases rest on the assumption that the multiplier effects will increase production and incomes sufficiently to cause economic growth, increased personal income and employment.

The multiplier effects can be described in terms of income, consumption and investment ($Y = C + I$) for the simplest case of a closed system. The more complex case of an open system, including government and foreign trade, is more representative of the real world but more difficult of description ($Y = C + I + G + E - M$).

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feature previously discussed. In order to follow the effects of the expenditures being put into private investment, we need to reorder the above equation so that ($I = U - C - G - E + M$). In the first instance, an increase in private investment will increase imports(M) and income (Y) while decreasing personal consumption (C), other government expenditure and investment (G) and exports (E). The increase in income (Y) will then act as in the equation ($Y = C + I + G + E - M$). The problem in first increasing investment (I) is the time lag effect on creating the new demand to absorb the new production from the new investment. It should be remembered that the new production must be sold at a price including raw materials, goods and services, so that it is only the value added that increases incomes while the required demand and expenditure must cover the total price of new production. Thus, both approaches are in disequilibrium and must be combined in a balanced fashion to achieve the desired economic growth. They need to be combined in a common policy based on workable proportions that recognize the economic realities in each development situation. This is no simple task because of varying time lags and differing coefficients that are involved. The elaboration of such combined equations properly lies in the province of econometrics and is beyond the scope of this study.

The effects of increasing investment to increase income are conventionally referred to as the investment multiplier effect following the basic notion expressed by dividing the numeral 1 by the percentage of new income saved or invested. This basic idea has been developed into many specialized multipliers[10].

but the many variables at work in the economy require many complex equations for their expression. As a result, a sizeable computer is often needed to solve them in the time available. Econometric testing of these equations has verified their fundamental soundness so that in simplified forms they make useful indicators in measuring the financial feasibility studies used in project evaluation.

3.10. Partial Multipliers

The general multiplier effect considered above is obtained when expenditures or investment are aggregates for the total economy. When the effect is concentrated in a specific industry, it may be called a partial multiplier effect. It is in this partial sense that use of the multiplier calculations can be applied in evaluating the individual projects or a group of projects of the FDPIL program.

Using a partial multiplier in this way introduces several important questions that need to be resolved before the multiplier can be used in project evaluation. The general multiplier takes no account of purchases as explained in the wheat to bread example. It is, therefore, only concerned with the value added as income. For an individual project, its purchases may also act to increase the partial multiplier effect. In order to include purchases, however, we must distinguish between purchases of locally-produced materials and imported ones. The local material purchases increase the multiplier effect while imports act as leakages that reduce the effect. On the other hand, however, export sales reduce this leakage and so add to the positive effect.

Another question involves under-utilization of the project capacity. In preparing feasibility studies, a high utilization factor is generally arrived at in some form of time-phased schedule. Failure to reach the high level projected is quite prevalent in developing countries and this low utilization acts as a further leakage in the multiplier effect.

3.11. A Mixed Leontief-Keynes Format or Model

The means of achieving a workable measure for evaluating individual investment projects while remaining simple enough for use under conditions of limited resources in which small-scale feasibility studies must be prepared and approved rests on a combination between national income accounting that provides for the partial multiplier effect with import leakages plus export gains and the basic input-output accounting system that provides for the business accounts, including purchases. This necessary format was briefly introduced in the last part of Chapter I.

The Keynesian point of view of the multiplier ignores the inter-industry transactions and treats consumption as a generator of the income-investment process. The economic repercussions as developed by W. Leontief recognizes the role of the production process but treats the final demand for the outputs of production as given quantities as determined empirically by national income accounting methods.

> "But both views should be synthesized because, on the one hand, the Leontief process only gives partial streams of outputs, obtained by damming up the back flows through the channels of consumption and,

on the other, Keynes' theory of the multiplier can be valid only if it is supplemented by accurate information about the structure of industrial outputs."[11]

Without going into a detailed line by line description, the synthesis of a mixed Keynes-Leontief format is illustrated as a recommended "Investment Projects Evaluation Form" for handling the general accounts of a financial feasibility analysis as shown in Exhibit 3.11.0.1. The necessary account schedules for preparing a financial feasibility analysis which are standard procedures are not made part of this presentation as they would add nothing for the purposes of this study.

There is also a progressive partial multiplier to be considered. It is in the nature of development that a potential demand for a product must exist before entrepreneurs will make an investment. For example, it is irrational to start a yarn spinning mill if there are no existing weaving mills to use the yarn. Once weaving mills are in operation, it is logical to start up a spinning mill. The question this progressive process raises is how best to account for this improvement in the partial multiplier equation (see Exhibit 3.11.0.1. for explanation of the terms in this equation) $\frac{1}{S/(E - M+X+C+G+S)}$. Obviously, the improvement is most easily measured by the difference (D') in price between the cost of fiber and the cost of yarn to be imported, which can then be added to the above equation, thus $\frac{1}{S/(E-M+D'+X+C+G+S)}$. A special account schedule for determing the value amount of (D') is prepared when a progressive partial multiplier effect is to be determined.

EXHIBIT 3.11.0.1.

INVESTMENT PROJECTS EVALUATION FORM

A Mixed Leontif-Keynes Format

(Project Year__________)

	Accounts	Feasibility Amounts	ROI factors	Partial Multiplier factors
1.	Total assets less current liabilities		A	A
2.	Net sales		O	O
3.	Export sales		E	E
4.	Import purchases, CIF		M_1	
5.	Foreign interest payments		M_2	−M
6.	Foreign technical payments		M_3	
7.	Domestic purchases (only locally-produced raw materials, goods and services)			
8.	Domestic interest payments		X	X
9.	Domestic payrolls and commissions		W_1	
10.	Payroll benefits		W_2	C
11.	Taxes (property, income, customs duties, sales, and other)		T	
12.	Less: subsidies in whatever form granted		U	G
13.	Depreciation		D	S
14.	Net profit		R	

Return on investment (ROI) equation: R/A

Partial multiplier equation: $$\frac{1}{S/(E-M+X+C+G+S)}$$

Progressive partial multiplier equation: $$\frac{1}{S/(E-M+D'+X+C+G+S)}$$

where D' = difference in raw material cost between Project A and new Project B (see explanation in the text).

Note: The letter symbols are arbitrarily chosen but follow general economic usage.

3.12. Mixed Format Model Applied to FDPIL Projects

Three hundred and ten FDPIL project applications were reviewed and one hundred and ninety-seven were selected for examination on the basis of their completeness with regard to financial feasibility information. The date of the first application was in March 1967 and the last in April 1974. Eighty-four of the examined applications had failed to be approved or to start their implementation process. The remaining 113 applications approved and licensed by the Investment Committee were analyzed and the financial feasibility data was tabulated accordint to the account headings in Exhibit 3.11.0.1. Eighty-eight of the analyzed applications have become operating enterprises and twenty-three are in advanced stages of implementation or construction.

The 113 applications were divided into seven industry categories: (1) agri-business, (2) health associated industries, (3) chemically based industries, (4) inorganic materials based industries, (5) mixed chemical and inorganic based industries (6) service type industries, and (7) financial enterprises. These seven categories were further subdivided under thirty-four headings so as to more explicity show the nature of the products to be manufactured. This classification scheme is listed in Exhibit 3.12.0.1.

EXHIBIT 3.12.0.1.

CLASSIFICATION LIST FOR FDPIL PROJECT INDUSTRIES WITH NUMBER OF PROJECTS ANALYZED

I. Agri-business Industries	No.
1. Edible oil	2
2. Nut processing	2
3. Raisin packing	7
4. Beverages	2
5. Natural honey	3
6. Ice plants	4
7. Animal casings	3
8. Sausages	1
9. Other food stuffs	1
10. Hides, skins & leather	12
	37

II. Health Industries	
11. Pharmaceuticals	2

III. Other Chemically-Based Industries	
12. Man-made fiber spinning	1
13. Thread spinning	1
14. Knitting mills	4
15. Rayon weaving	21
16. Blending of lubricants	1
17. Detergents & soap	1
18. Chemicals	3
19. Perfumeries	1
20. Plastic products	6
	39

IV. Inorganic Materials-Based Industries	
21. Metal working	11
22. Construction materials	1
23. Stone working	1
	13

V. Mixed Chemical and Inorganic-Based Industries	No.
24. Furniture	1
25. Truck bodies	1
26. Auto & truck batteries	2
27. Printing	3
28. Paper cartons	3
29. Buttons	1
	11

VI. Service Type Industries	
30. Dry cleaning	5
31. Carpet washing	1
32. Tire recapping	1
33. Public accounting and data processing	3
	10

VII. Financial Enterprises	
34. Development banks	1

Total projects analyzed	113

The financial feasibility data for the 113 applications are summarized in Exhibit 3.12.0.2. according to the seven principal industry categories and total program under the account headings of Exhibit 3.11.0.1. The summary results are then used to calculate the return on investment (ROI) and the partial multiplier (P) for the categories and total.

The returns on investment (ROI) appear to be fairly high except for Pharmaceutical Industrial and Financial Industries which appear to be low. Lower profits and savings act in the equations to increase the partial multiplier effect where these effects are positive and decrease them where they are negative. The agri-business partial multiplier effect is high and positive as would be expected because high percentages of domestic raw materials are used, planned imports are low, and planned exports of nuts, raisins, and animal hides and skins are high. On the other hand, the Chemical and Mixed Industry categories result in negative partial multiplier effect on the economy because the planned imports are larger.

No program can expect to eliminate all the negative effects because of the need to develop inter-industry supply and trade effects. The fiber and yarn example previously cited illustrates how negative multiplier effects can be

EXHIBIT 3.12.0.2.

ANALYSIS OF FDPIL PROJECTS, 1967-1973, (Planning Financial Data in Licensed Applications), PRODUCING AND PRE-START-UP
(Amounts in thousands of Afghanis)

Partial investment multiplier = P = $\frac{1}{S/(E-M+C+G+S)}$

	Industry categories	No. of proj.	Net assets	Net sales	Inter-industry transactions			Value added = V				Return on investment ROI	Partial investment multiplier
					Foreign trade = B			Consumption = C		Savings = S			
					Export sales	Foreign purchases, payments	Domestic purchases	Payrolls & commissions	Taxes, less subsidies*	Depre'tion, stock change	Net profits		
			A	O	E	M	X	W	G	D	R	%R/A	P
I.	Agri-business Industry	37	1,722,711	2,260,712	1,728,774	248,456	1,351,354	320,703	-	26,235	313,964	18.2	+10.3
II.	Health Industry	2	174,556	110,980	-	58,995	14,064	14,989	-	10,709	12,223	7.0	- .3
III.	Other Chemically-Based Industry	39	1,609,871	2,912,434	184,367	2,057,457	143,022	210,632	-	73,873	427,450	26.6	- 2.0
IV.	Inorganic Materials-Based Industry	13	79,030	174,556	-	104,279	16,974	18,519	-	3,929	30,855	39.0	- 1.0
V.	Mixed (C,D) Industry	11	161,144	299,155	6,040	210,218	10,851	33,205	-	4,215	40,666	25.2	- 2.6
VI.	Service Industry	10	82,896	79,621	-	21,220	8,681	23,923	-	6,791	19,006	22.9	+ 1.4
VII.	Financial Industry	1	1,010,690	70,175	-	15,500	11,312	6,000	-	300	37,063	3.7	+ 1.1
	Totals	113	4,840,898	5,907,633	1,919,181	2,716,125	1,556,258	627,971	-	126,052	881,227	18.2	+ 2.4

Source: Investment Advisory Center, Project Application Files

* Applications based on the FDPIL of 1967; benefits assumed no taxes for five years and did not include calculations of "subsidy."

modified by subsequent inter-industry activity of new supplier projects. This process, when well-planned to reach raw material potential existing in a country, can give spectacular economic results when the early negative effect is turned into a positive one.

In order to accomplish these beneficial results, a sound long term policy-making structure based on a scientific management information system is needed. Such a system is discussed in later sections of this chapter. Until such a system is firmly established and in operation, it is difficult to know to what extent the desired program is being implemented. For example, we do not know whether the 113 projects are performing as planned or to what degree they are falling behind, or why. It is frequently stated by observers that the FDPIL projects are operating at only half of their capacity. We do not know if the projects were badly planned according to the above data, or whether the planned investments were only partially made, or whether other factors are at work that could be corrected by policy changes based on sound evidence rather than on complaints and hearsay. Serious efforts to correct this situation have been and are being made, but the necessary "feed back" of financial data from the management of the FDPIL projects is not effective.

The partial investment multiplier fills an obvious gap in project evaluation that relies heavily on financial analysis for decision-making. Both are needed. The financial analysis is essential to the investors, bankers and other lenders. The multiplier is required by economic planners and those departments of government involved in formulating and applying incentives designed to encourage both private and public investment. The partial multiplier principle, when effectively modified, can and should be applied to all kinds of programs including infrastructure, food and nutrition, health and welfare, education, rural development and so forth.

The partial-multiplier is a ratio or percentage and, though an excellent indicator, it does not tell us the magnitude of benefits to be expected from the planned total investment or net assets involved. The magnitudes of the expected annual contribution to gross national product (GNP) by industry categories can, however, be calculated as shown below:

	Industry categories	Savings* ('000,000 Afs.)	x	Partial multiplier =	Contribution to GNP ('000,000 Afs.)
I	Agri-business	340.2		+ 10.3	+ 3,504.1
II	Health	22.9		- 0.3	- 6.9
III	Chemically-based	501.3		- 2.0	- 1,002.5
IV	Inorganic-based	34.8		- 1.0	- 34.8
V	Mixed base	44.9		- 2.6	- 116.7
VI	Services	25.8		+ 1.4	+ 36.1
VII	Financial	37.4		+ 1.1	+ 41.1
	Total	1,007.3		+ 2.4	+ 2,420.0

* Savings from Exhibit 3.12.0.2. = depreciation plus change in stock plus net profits.

The annual contribution to GNP divided by the net assets indicates the effectiveness of the planned investment by industry categories and is shown below.

	Industry categories	Contribution to GNP ('000,000 Afs.)	÷	Net Assets ('000,000 Afs.)	=	Investment effectiveness ratio
I	Agri-business	+ 3,504.1		1,722.7		+ 2.034
II	Health	- 6.9		174.6		- 0.040
III	Chemically-based	- 1,002.5		1,609.0		- 0.623
IV	Inorganic-based	- 34.8		79.0		- 0.441
V	Mixed base	- 116.7		161.1		- 0.724
VI	Services	+ 36.1		82.9		+ 0.435
VII	Financial	+ 41.1		1,010.7		+ 0.041
	Total	+ 2,420.0		4,840.9		+ 0.500

A positive investment effectiveness ratio is desirable even if it is near zero because it indicates a current contribution to GNP. Negative ratios, when they are small, can often be justified if they make a real social contribution as do the health industries. Larger negative ratios indicate a need for a change in investment promotion policy, unless it can be shown that in a reasonable time period the larger negative ratio will be reduced to small figures or preferably become a positive one. The negative ratios in the above table are due to an excess of imported materials.

3.13. A Receiving System Concept

Development projects and progress are frequently considered and planned as "delivery systems" but without mentioning the complimentary system on which it will depend for success. In the following discussion, we choose to call this missing process a "receiving system." The oversight seems to be the result of an unfounded assumption that a neatly organized receiving system already exists in the underdeveloped economy and is complimentary to the newly conceived delivery system. The economic framework already considered should surely raise serious doubts that the economic system is so simple. In other words, it is almost as though the "delivery system" were planned to deliver "charmed bullets" which would reach only those targets for whose benefit they had been produced. If we are to avoid this costly and wasteful method of delivery, we must give more attention to treating the problems of development as a system. A simple diagram from systems analysis can illustrate this point.

$$\underrightarrow{\text{Inputs}}\ \boxed{\text{Process}}\ \underset{\text{Inputs}}{\underrightarrow{\text{Outputs}}}\ \boxed{\text{Process}}\ \underset{\text{Inputs}}{\underrightarrow{\text{Outputs}}}\ \boxed{\text{Process}}\ \underrightarrow{\text{Outputs}}$$

If the second and third processes are missing or differently aligned, the outputs of the first process will not be able to reach the succeeding ones. Similarly, if the outputs are not the correct ones, the following processes cannot receive them as inputs. That is, the system will not work as planned or hoped for.

A delivery system for creating irrigated land and distributing it to poor people may be diagrammed as follows:

Experience shows that such projects tend to give returns less beneficial then originally proposed. Kalbrunner[11] points out that in cases where land is redistributed by land reforms, it is more than likely that in ten years' time, the distribution will return to a pattern not unlike that before redistribution took place, though the actual owners may be different persons or agencies. In 1935, the U. S. settled some two hundred families on new land in the Matanuska Valley of southern Alaska. Ten years later, these two hundred small farms had been consolidated into some twenty larger farms with some of the original land being entirely abandoned.

Part of the problem for such delivery system projects lies in the definition of the aim, goal or target, which in the above example stopped with "distributing land to poor people." If the definition had been carried to its logical conclusion instead of stopping short, it would have been clear that these people would also need incomes or they would end up in the well-known agricultural "subsistence trap" which makes them little or no better off than being in the landless situation from which they were transferred. The poor on "mini" farms or marginal farm land can experience as much poverty as the poor in urban centers and with perhaps less opportunity to escape their condition.

A natural question then is, how should we define a receiving system? Clearly, the above delivery system requires a market but the idea of market assumes the existence of a demand for the surplus commodities that the new-land people hope to produce. This demand is reasonably assured because we know that there are many poor people in urban areas that would like to have more to eat.

It is, therefore, necessary that this potential demand be converted to effective demand, which means new incomes for the poor people in the urban area and this requirement translates into the need for new jobs and the investment necessary to create them. If the investment comes from savings, all well and good. If investment comes from government issue of money or expenditures, then prices are raised by inflation and no benefit in real terms is available.

The difficulties of arriving at a complete solution or a complete receiving system within a domestic economy are commonly recognized and it has now become popular to add exports as a final step in the process. Before considering exports, let us summarize the above domestic problems arising from delivery systems and implied markets. Delivery system = new dam + irrigation works + distribution of land to the poor + a surplus agricultural commodity + a market. A market = a receiving system = investment = new jobs = new income = effective domestic demand. To this process, we must now add the potential possibilities of exports to increase effective demand.

Export-import trade occurs if, and only if, relative prices before trade are different between countries, that is, if the price ratio in the home country, $\frac{p_1}{p_2} = \frac{\text{price of home exportables}}{\text{price of home importables}}$, is different from the price ratio in the foreign country, $\frac{q_1}{q_2} = \frac{\text{price of foreign country exportables}}{\text{price of foreign country importables}}$. If the price ratios are equal, $p_1/p_2 = q_1/q_2$, then no trade will occur. However, the above prices are an average for a number of commodities. Thus, at least some commodities' price ratios will tend to be different and competitive forces will generate an exchange rate such that it is cheaper for each country to buy at least one product from another. All that is necessary in the most general case is to stipulate that trade will occur if the difference in relative prices is sufficiently great to outweigh the cost of transportation and foreign import duties.[12]

Knowing that price ratios must be different does not explain why they are different, since the same commodities are often being produced in both countries. It should, therefore, be evident that we need to consider the functions of cost that lead to differences in prices. Production of a commodity requires various quantities of inputs, each with its own price. Hence, the price (p_i) of a single commodity unit to be exported will equal the sum of the necessary input quantities (a_i) times their prices which can be written as:

$$p_i = p_1 a_{i1} + p_2 a_{i2} \ldots p_n a_{in}$$

where (n) equals the number of inputs required, and (i) indicates the commodity being considered. The reader is perhaps accustomed to distinguishing between "cost" and "profit" so that one of the inputs (a_i) above will represent "capital" and one of the prices (p_i) above will represent the rate of profit on capital.

If the commodity (i), grapes, for example, of a similar variety and quality, has the same price in both exporting and importing countries so that $p_i = q_i$ then these grapes will not be traded. In order to export commodity (i), the difference in price must at least equal the added cost of exporting (special packaging and handling, transportation, import and export duties, etc.). Thus, the question turns on which inputs can be lowered in price to absorb the price differential between p_i and q_i.

The inputs to agricultural production for export, that we must consider, are: (1) production labor, (2) land, (3) water for irrigation in Afghanistan, (4) purchased agricultural supplies, particularly imported fertilizer, and (5) export grading, packing and handling. Starting in the reverse order: factor (5) is an urban activity and has already been included in the price differential to be absorbed; factor (4) is urban-supplied and costs are relatively fixed; factor (3) is scarce and has alternate crop uses so will be applied where it will give the highest return; factors (2) and (1) are rural activities and, in face of the cost inelasticities in factors (3-5) will undoubtedly have to absorb the export price differential between p_i and q_i. Thus, production labor, the people we most wish to help, will have to absorb possibly half of the price differential depending on their arrangements with the landowner. If they are also small landowners, they will perhaps have to absorb the whole difference.

Only in the case where domestic market prices for commodity (i) are already low enough to absorb the whole price difference will rural labor receive its full income share from exports. Opportunities for finding such price differentials are, however, limited by other countries in the world trying to export the same or competing commodities. An additional limiting factor is that in foreign markets where commodity (i) production costs are high and thus favorable to imports, the commodity is usually protected by high duty rates or non-tariff barriers. As a result, only countries that do not produce commodity (i) will be ready to absorb the necessary price difference and even then they will seek the lowest world price.

The outcome of this review of exports in terms of a receiving system is that only specialty products with limited foreign competition or limited production offer long-term prospects for agricultural exports and equitable prices. World scarcity in the face of high effective demand is a relatively short-term exception. A complete receiving system concept must, therefore, add technological innovation if it is to be successful, because agricultural exports, except for specialty crops, tend to add only marginal benefits which must be shared with the urban sector while the agricultural sector absorbs the price differential. The subject of technical innovation is considered more fully in later chapters of this agri-business research study.

3.14. Trade and Import Substitution

Import substitution industries have gained a bad reputation among development theorists because they have, in their work, come across too many examples of negative effectiveness ratios in investment programs. We believe, however, that they would have been better advised to distinguish between various kinds of import substitution. Sweeping generalizations such as "import substitution projects are bad" have the common fault of inaccuracy. We recommend that at least two import substitution categories be recognized and used: (1) resource import substitution, and (2) non-resource import substitution. The first category of industries can lead to highly favorable development results while the second category of industries has little long-term potential for development benefits.

An example of a resource-import substitution project will help to clarify our recommendation. Afghanistan has the agricultural resources to produce sugar beets and cotton. Nevertheless, both sugar and cotton cloth are imported and thus demonstrate an existing and effective domestic demand for these goods. By virtue of this existing demand, it follows that a portion of average family income is already allocated to their purchase. This means that a portion of national income can be shifted from imports to the domestic sector without the necessity of first raising the national income level by increasing government expenditures. The shift to the domestic sector will increase national income through new investment and its multiplier following the inherent time lag involved in this process. Continuing the implied import policy will in contrast hold back Afghan development because the import expenditures act as a drain to reduce national income as has already been demonstrated.

An example:

	1350		
Commodity	Production Producer Value *	Exports*	Imports *
Cotton textiles and yarn	1,006	nil	257
Raw cotton	713	1,049	-
Synthetic textiles	41	-	113
Synthetic fiber and yarn	-	-	677
Sugar, commercial	138	-	771
Sugar, loans and grants	-	-	154

* In millions of Afghanis.

Source: Production data -- Survey of Progress, 1350;[13] Exports of Merchandise, 1350;[14] and Imports of Merchandise, 1350.[15]

It is also reported that raw cotton could be converted to grey cloth for export and thus increase the value added in Afghanistan. The problems of producing grey cloth to market specifications and quantity may hinder such conversion. The cotton-synthetic import-export data is included to illustrate the complexity of resource substitution when a non-resource import phase is included. The potential domestic benefits can be real enough, however, if planning policy and management is sound, strong and effectively implemented.

In the case of sugar, the potential benefits from resource import substitution are impressively real. The traditionally low cost of sugar on world markets and the higher costs in Afghanistan have been repeatedly used as arguments to block greater domestic sugar production. However, the economic cost of imports and the corresponding lowering of national income has not been included in the financial feasibility studies. Therefore, a true picture on which to base policy decisions has been missing. This subject will be taken up in greater detail in Chapter VI of this study.

3.15. Need for a Management Information System

The quantity of information that government and planning officials must face daily is often overwhelming. It indicates a comparable growth in problems and decisions to the point where many questions cannot receive the time and attention that they deserve. The very complexity of the issues involved in modern dynamic social and economic relationships defy easy or speedy solution. Often the information and advice received by the officials is contradictory and so decisions become even more difficult to make and the long-term effects can escape consideration altogether.

The response to these growing problems has resulted in modern management systems, spurred on by computer technology, designed to handle information scientifically and so convert it into more highly usable forms. The adoption of such information systems leads to easier and sounder decision-making for those willing and able to make use of them.

The positions so far presented in this study is based on the availability of information in highly usable form. The information system outlined in this section is designed to obtain, organize and analyze information for the use of planners and decision-makers according to framework and economic measures applicable to agri-business development. Without some such management information system desired progress will be delayed and possibly prove to be misdirected.

Decisions in the real world are necessarily made in the time available on the basis of imperfect information. The goal of a management information system is aimed, therefore, at providing the maximum of organized and analyzed facts in the minimum of time. In this process, there are three information functions that must be constantly kept in mind: (1) what is going on externally to the planning and development organization and process as specified, (2) what is going on internally to the organization and process as specified, and (3) the orderly and indexed accumulation of the record of past activities and information.

Policy management in turn makes use of the organized facts above in three principle ways: (1) the day-to-day policy that solves problems for the many clients that never cease to demand favors of government and management, (2) policy that aims to avoid future problems, and (3) policy that aims to make improvements in the organization itself as well as to increase economic development in the nation.

The choice of a coordinated and consistent economic framework and set of measures is fundamental to a useful management information system and sound policy formation. An economic framework and set of measures have been presented in the earlier portions of this study, but it seems worthwhile in the present context to consider in brief some of the conflicting beliefs and advice that a management information system can be asked to deal with when preparing information for the policy-makers. Two points of view are listed below. The first set of five beliefs represents the conventional wisdom often advanced in various forms and projects by some aid experts. The second set of five beliefs represents a more modern point of view tested by experience in handling development projects.

"Conventional Wisdom"

1. Supply creates its own demand.
2. Financial feasibility measures are all important.
3. Investment and money multipliers are naturally positive.
4. Measurement of final aid-effects is a disservice to the concept of aid.
5. Aid should focus on simple, fast-responding projects.

"Modern Point of View"

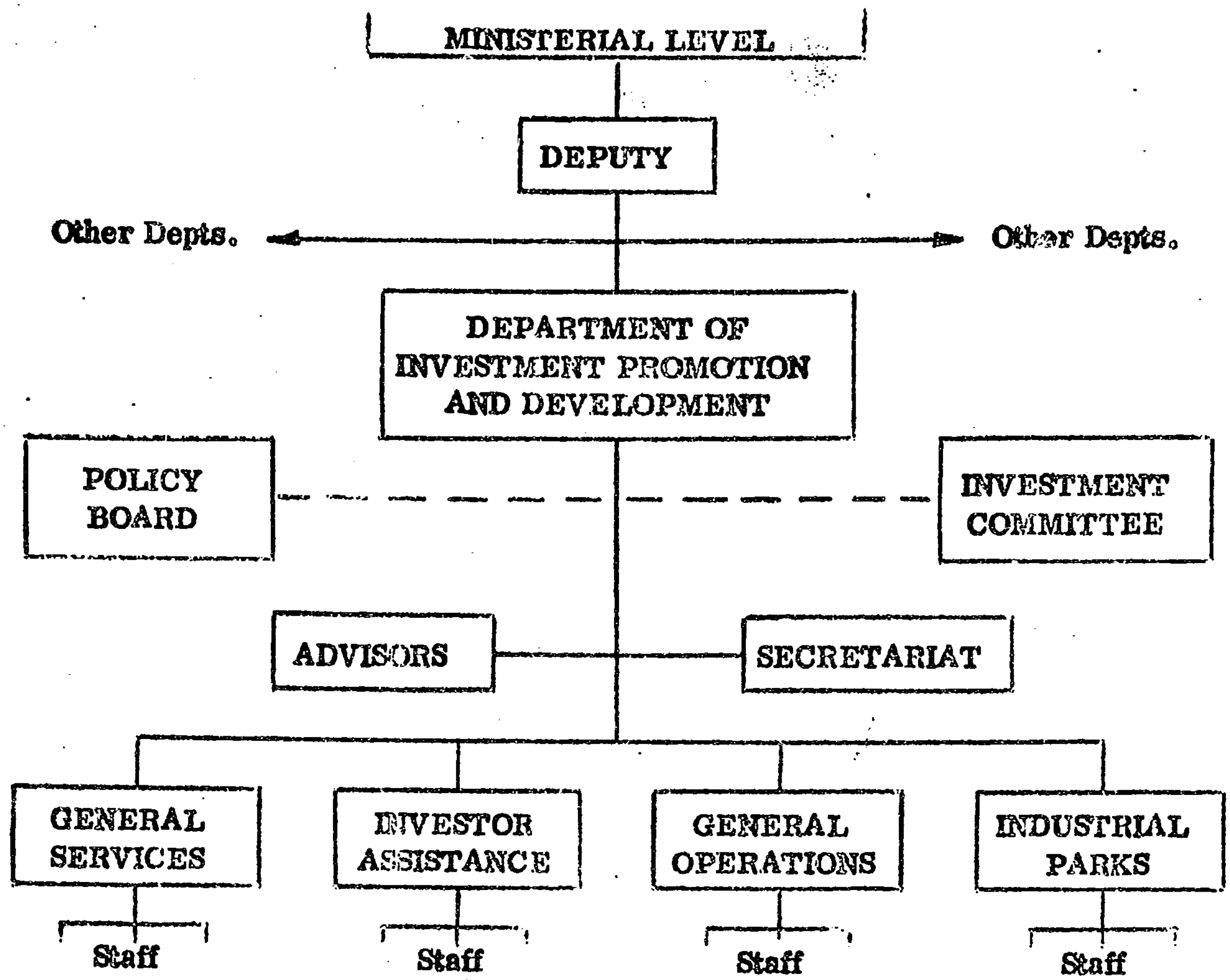
1. Increased supply must be matched by a new and independently effective demand.
2. Economic viability is equally as important as financial feasibility.
3. Investment and money multipliers can be negative as well as positive at the project level.
4. Lack of base level and final level measurement is a major cause of rising opposition to aid in donor countries.
5. There are no simple, fast-responding projects waiting around for development in economically poor countries.

The differences between the two points of view are quite clear. The difficulties in forming and applying framework, measures, and receiving system concepts undoubtedly account for much of the delay in adopting the modern, though more complex, concepts to the development process. This general problem has been solved in science, technology, and big business by including scientific information systems as part of their organizational structure. Development agencies are now moving rapidly in this same direction.

3.16. Organizational Outline

The inclusion of a management information system as a separate entity or office in an already existing organization can itself present problems: (1) how should it be tied into the "organization chart," (2) how should it be internally organized, and (3) what are the essential lines of communications and functional relationships with other offices, boards and committees of the organization?

A traditional organization chart in the form of a pyramid is shown below.



The lines of authority and response together form the direct, internal control system of managing the organization. The line of authority transmits instructions, requests, explanations of policy, etc., from the top levels to the lower levels. The line of response transmits upward information concerning the activities or outputs generated by the inputs from the line of authority. There is a third information network, not shown in such organization charts, by which external information is received at various levels with a corresponding outward response. In addition, we should recognize that an indirect information input is also operating from the historical record maintained in the files of the organization.

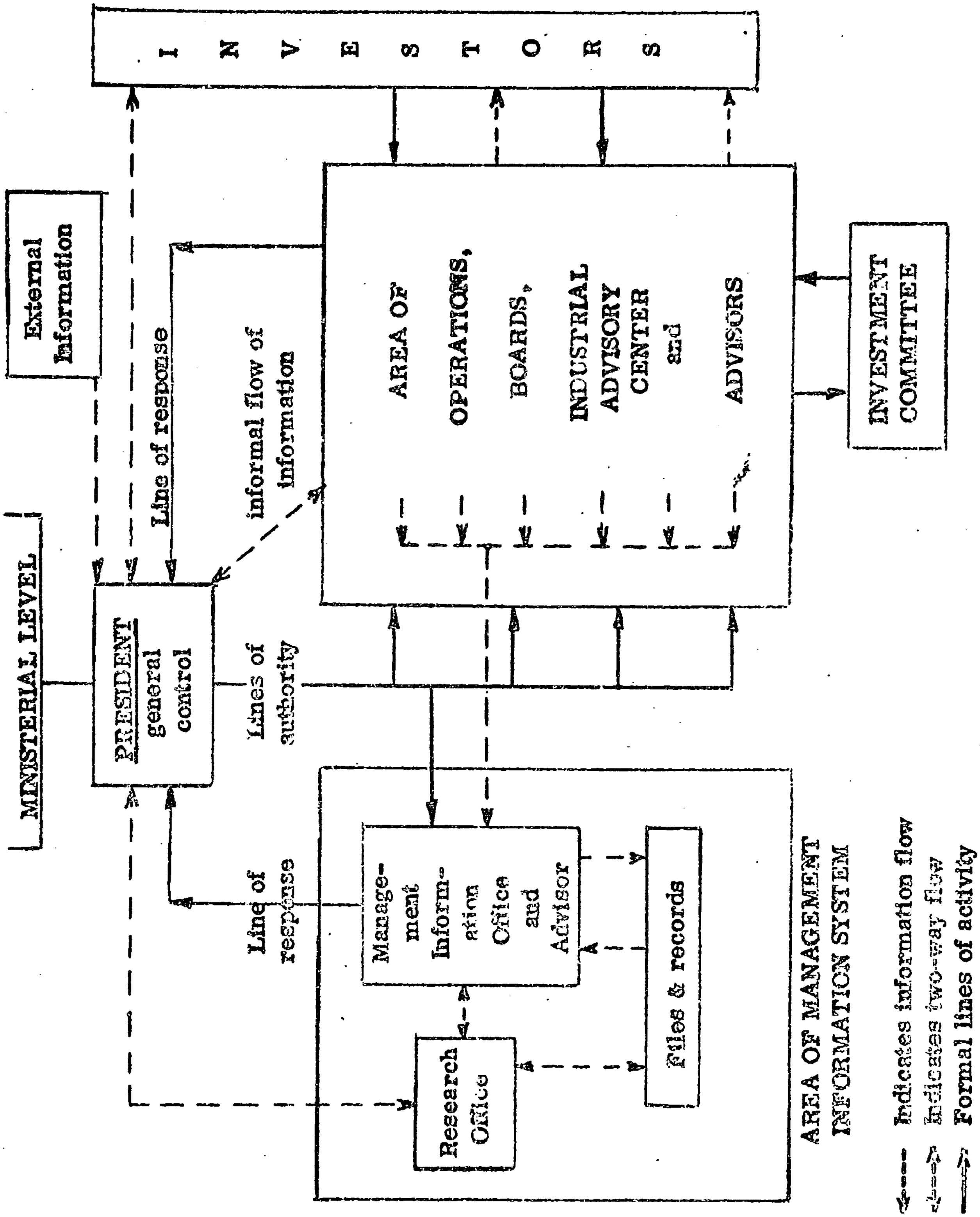
This system of control is traditional but nevertheless has a weakness in that the line of response conveys only that information that the lower levels want the top control level to receive. It is usually unbalanced to show the operations and activities in a favorable manner with little indication of the failures and inefficiencies involved. As a result, policy-makers often do not hear about the deficiencies until they are brought to their attention by external sources. Modern management information systems have come into use in order to overcome this inherent weakness in as neutral a manner as possible.

The above pyramidal diagram is rearranged in a vertical form to include the lines of information flow and the management information system as shown in Exhibit 3.16.0.1. This vertical organization diagram indicates how a management information system can be added to a department along with the internal organization of its offices.

The above organization concepts can be considered in terms of a real case, as follows. This agri-business research study was carried out in a manner not unlike that shown in the Exhibit, except that the management information office as shown in the Exhibit was part of the Checchi team attached to the Investment Promotion and Development Department, now in the Ministry of Planning. The Research Office was set up separately as indicated, but the Files and Records were divided between the offices and the team. The flow of information came from the Area of Operations, etc., and Investors as indicated. The inclusion of the Investors in the Exhibit represents a major change from the pyramid of the Organization Chart first shown. The addition of some 100 operating

EXHIBIT 3.16.0.1.

SCHEMATIC ORGANIZATION CHART FOR INVESTMENT PROMOTION AND DEVELOPMENT DEPARTMENT



Source: Adapted from "Systems Analysis Frameworks," 17 private industries is an excellent example of the added complexities of modern development that tend to overburden and break down the traditional lines of authority and response, which were never designed to deal with the autonomous nature of external industries and enterprises. The Industrial Advisory Center (now Operations Department) of the Private Enterprise Program helped cope with the investors' needs, but the feedback and analysis of these activities were handicapped by the lack of a formally organized management information system within the department, and this function has been handled directly by the Checchi team in parallel with the traditional information system which, due to budgetary constraints, was unable to attract personnel with the necessary analytical training. Nevertheless, a real effort should be continued to include a formally organized management information section within the Investment Promotion and Development Department.

3.17. Chapter Summary

This chapter provides many of the basic concepts and much of the analysis which is used in later chapters to describe agri-business projects and proposed programs for their encouragement.

Projects can be measured, or evaluated, using financial or economic measures. Both are important. Financial measures, the "micro" measures, use well-known tools such as balance sheets, operations statements and ratio analysis. Feasibility studies are based on the same tools, plus the all-important market study. The chapter describes four approaches to using these tools and concludes that the simple "return on investment" is the most useful and most used financial measure.

On the other side are the economic measures, using national accounts. These measure the value of the project to the economy, not to the investors, and thus are "macro" measures. The chapter goes on to describe value added analysis and the use of multipliers and, especially, partial multipliers to analyze the economic value of the project.

The best approach to measurement, of course, is the composite one making use of parts of both financial and economic measures. A model system is described and 113 projects approved under the FDPIL are analyzed using the model. Not surprisingly, there are large differences between various types of projects, with agribulture-based, and agri-business type projects scoring very well.

The chapter then introduces the concept of a receiving system, which is needed to complement the delivery system in economic development projects, but often is not considered. This reverts to earlier discussion in Chapter I about the importance of demand as well as supply. The effect of foreign trade, especially exports, is introduced with a further warning that technological innovation is often necessary for the development of an effective receiving system.

Finally, there is the discussion of the need for an information system in any organization designed to foster economic development, and for the organizational structure to be so designed as to make the information system effective.

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CHAPTER IV

AREA DEVELOPMENT TO ENCOURAGE AGRI-BUSINESS

CONTENTS

CHAPTER IV

AREA DEVELOPMENT TO ENCOURAGE AGRI-BUSINESS

4.1. Introduction

The previous chapters have been presented largely in economic and sometimes abstract language. Basically they were the groundwork for what follows. Sufficient recognition has not yet been given to the importance of project location and to area or regional disparities of incomes and employment opportunities. This chapter, therefore, introduces in more general language the area or regional concepts of development which are sometimes referred to as rural development. Following this subjective description of the typically proposed requirements for area development, we examine in the succeeding chapter a regional division for Afghanistan including data on population, agricultural land and production, and other resources. The relative differences between the divisions can then be identified and project locations can be proposed most advantageously for the reduction of regional disparities in rural and agricultural areas.

Industrialization does not affect all parts of a country in an even manner. Vast areas are characterized by low economic activity and suffer from unemployment and low per capita incomes. A few areas, however, attract concentrations of industry and, as a consequence, employment and per capita income in these enclaves are relatively high. This problem of imbalanced income-location is not self-correcting. Deliberate measures must be designed and effectively applied if income and employment are to be spread more widely throughout a country.

Almost all countries have aimed at rapid employment generation through industrial development which has characteristically led to imbalanced concentrations of factories and an inability of public authorities to expand proportionately civil amenities, transportation and housing. As a result, both rural and urban areas are suffering from imbalances. In the first case, there is a low level of income-employment but a relatively high level of unpolluted amenities. In the second case, there is a higher level of income-employment but a relatively high level of urban slums and pollution. The unsolved problem is how to achieve a more satisfactory balance in the location of income, employment, amenities and the development of policies needed to achieve these goals.

In order to be able to deal with this problem, a logical framework concerned with spatial distribution of economic activities is necessary. It is more complicated than the previous aggregate approaches to development because space and location have to be explicitly determined. If the disparities of aggregate development are to be kept within tolerable limits, the approach has to be such that it incorporates a strategy for constantly monitoring the induced location changes as they take place.

A traditional society depending on agriculture for two-thirds of its economic activity generally has a very limited volume of goods and services for consumption. The typical progress of development through industrialization leads to tremendous changes in the spatial concentration of business activity and the concomitant redistribution of population. Any program, such as agri-business located in rural areas, that tends to reduce the migration of workers to urban areas may be considered a change for the better. A major constraint, of course, is the unwillingness of the people to refrain from the typical rural to urban-industrial migrations.

4.2. Characteristics of Low Income-Employment Areas

Some of the broad characteristics of low income-employment locations are unemployment, low levels of living, a low rate of absolute growth due to migration to urban areas, inadequate infrastructure and lack of community facilities. Many other characteristics are also involved such as lack of enterprise, skilled labor, purposeful social attitudes and in many cases a lack of natural resources. Indeed, many such areas show a tendency to slip backward as other locations are seen to be forging ahead.

It is clear that low income employment locations reflect a number of characteristics which are interrelated. It is difficult to separate cause and effect in assessing these relationships or to pick one characteristic out of many for the purpose of defining such locations. Consequently, several criteria out of the many recognizable ones are generally required to satisfy the definition of a poor location.

Examples of such criteria in widespread use are:

- population density
- industrial employment
- per capita tax base
- per capita gross area product
- labor supply greater than demand
- high unemployment
- rate of business closures
- area migration
- seasonal movement of labor
- heavy dependence on traditional agriculture
- inadequate all-weather roads
- insufficient hospital beds
- insufficient schools
- low per capita income

Except for the last two items, the unit of measure is a selected percent of the national average. It is clear that the official point of view is a relative one. It is a matter of how one area stands relative to its neighbor. It is also typical of relative measures that the closer the point of view is to the problem, the less distinguishable are the relative differences. In a poor neighborhood, how are the poorest one-third to be identified and how does a project avoid also helping the well-to-do in the neighborhood, unless the project is strictly "welfare" in nature? There is no simple or available answer to this question, but every effort will be made as we progress to keep this problem in mind as recommendations are made.

4.3. Classification of Low-Income Areas

In many countries only one category of poor location is recognized although various areas show quite different combinations of criteria and degree of variation below the norm. It is quite unlikely that a single program could deal effectively with a wider range of criteria and degree. Many area project failures suggest that ineffective classification of the specific location problems is a principal cause of unforeseen difficulties.

The factors that have resulted in low income areas are many and intricate as they relate to the interplay of economic, social and political forces throughout the history of the area. A comprehensive account of these factors when reduced to a scheme of classification applicable to each location gives a subjective tone to programs that will be important in selecting policy and ultimate success or failure.

In combination with these underlying factors is the obvious condition that projects need to be located in a specific place. Typically, location theory attributes this selection process to comparative advantage. For instance, better transportation facilities can often be a determining factor. Similarly, the proximity of the seat of political and fiscal authority has always played an important part in where development takes place. Availability of natural resources and infrastructure along with social amenities also plays an important role in comparative advantages. In some cases, selection of location may even revolve on personal preference or convenience.

Once sited, a project draws people to provide services to the employed. The level of income tends to rise because of the increase in economic activity. As men seek a better future, the rural poor are also attracted to a developing center, however small, where expectations are more attractive, even though less real, than in the location from which they come.

4.4. Contrasts in Area Development

Many large centers of activity start with a single enterprise, for example, a quiescent village may suddenly acquire a large oil refinery or manufacturing establishment. As the projects and enterprises grow, they draw people from the surrounding region. They first draw skilled labor from other areas which then are made poorer because the high productivity of skill is removed. Next, the people left behind find life more difficult because skills are less and in time many of them will also move to the more active areas, and thus they help to intensify the problems of the urban poor because they bring few or poor skills with them.

When such a location starts to develop, it creates a comparative advantage that attracts more enterprises and, in turn, more people. As the population grows, a ready market emerges and then consumer goods industries take root along with an expanding service sector. As infrastructure facilities are strengthened and expanded, they stimulate further development. It should be obvious that enterprise will find it much more profitable to be in a place where these facilities are already available rather than in a location where the lack of such facilities makes it more difficult to attract skilled labor and so reduces profitability.

Schools, hospitals and other social services may be called the social infrastructure, and when combined with the economic infrastructure, they tend to increase the total viability of the area. It is a matter of natural response to a growing concentration of people. As a consequence, skilled and trained labor becomes even more available. Thus, the place which received an initial impetus becomes a growing center of activity. It attracts people and industry which naturally prefer such areas to low income-employment locations because the infrastructure, labor, subsidiary services and markets are all together in compact centers, making distribution and communications highly efficient. Such areas attract people to employment opportunities as well as to schools, colleges, hospitals and other secondary facilities which are to be found in greater abundance. The highly industrialized urban center typically emerges from this process.

Such a development need not pose serious problems but most of them do. If the growth of a city is systematic and all its functions are fully developed and maintained in proportion to need and not just relative to the per capita tax base all might be well. Unfortunately, such articulated development generally does not occur. Growth of enterprise is generally much faster than the growth in the availability of infrastructure facilities. The growth of population is also, generally, much faster than the growth of available social amenities. As a consequence, the city becomes a highly congested area with many socially undesirable effects such as pollution, crime, delapidated structures, ineffective sanitary services and pot-holed or unsurfaced streets.

Given the congestion and the break-down of amenities, why do enterprises and people continue to migrate into such centers and not start to move away from them? They come and remain mainly because initially they do not have to bear the cost of the infrastructure and existing amenities and if they try to go back where they came from, the opportunities that exist there are usually no longer available to them so that staying in the city is the lesser problem.

In the early stages of development, some areas do not receive the impetus needed. As growth proceeds elsewhere, these areas keep losing their chances. The country's resources of entrepreneurship and capital become absorbed by the opportunities available in the relatively few urban centers. For the same reason, infrastructure facilities are not provided in the poor areas.

Attracted by better employment opportunities in industrial areas, people come to them from low employment areas. Such immigration is usually of skilled and young people and so reduces the scope for development in poor locations. However, even urban and industrial areas are known to lose their impetus and go into decline. In some cases, a depletion of a natural resource causes a loss of output and employment. In other cases, the demand for manufactured products may shift and due to an inability of the industry to develop new products, the area stagnates and emigration may take place in particularly unfavorable situations.

There are several generalizations to be derived from the above description. An area may grow and improve, or it may stagnate, or it may decline. The trend that is actually followed is relative to what is happening in other areas. It is also typical of cities, however they are defined, that they draw more from their hinterlands than they return to them. Perhaps the most critical element in overcoming low income-employment and lack of opportunities in poor areas is the lack of effective decentralization of public authority and fiscal decision-makers to such areas.

4.5. General Requirements

Government agencies in many countries around the world are engaged in the task of planning development so as to reverse the trend towards growing regional disparities. Efforts to change direction are considered essential because of political activities arising from regional disparities that can disrupt the economy and undermine national integrity. Area development and who pays for it form one of the frequently discussed issues among European nations. Even the energy crisis of 1973-4 has become enmeshed in these fundamental regional issues. The U. S. Congress is also changing the manner in which USAID funds are divided, in reaction to the visible disparities that have resulted from past development efforts. It is now concentrating on food, population and education programs to meet the need for better regional income distribution.

The goal of many government agencies is to attract enterprise and labor into the depressed regional areas by providing both suitable infrastructure facilities as incentives for investment in enterprises and subsidies to help hold the necessary labor skills in rural areas.

Infrastructure facilities include such things as roads, railways, waterways, airways, and defense systems which help to link and secure regions and areas so that resources available in the various locations can be better distributed and utilized by all. In low income-employment locations, it is important to insure that the land is developed by providing drainage, roads, water supplies, electric power and telephones. In some cases, industrial service facilities and structures must precede investment so that the efficient movement of goods is guaranteed.

Incentives by government are frequently offered to attract industries. Initially the choice of location is not generally a condition for incentives being granted, but in time it grows increasingly important. Government incentives can take many forms as the partial list below indicates.

- subsidized land acquisition
- buildings with low rent
- buildings on lease-purchase arrangements
- subsidy on plant and machinery
- subsidy on transport costs
- tax and duty concessions
- loans at low rates of interest
- loanson easy repayment terms
- participation in equity capital
- concessions on electricity rates
- concessions on rates and the obtaining of water
- modernization loans with easy terms

Some of these measures may have to be adapted to local conditions. It is not likely that a single location would be so poorly endowed as to require all of these measures. Nevertheless, ruling any of them out arbitrarily is not a conducive beginning to solving development problems.

Assistance is required in training labor for employment in the new industries. Subsidies toward the cost of training or retraining labor are a great help to individuals but often fail to benefit the poor locations as, once trained, the individuals tend to move away to more developed centers where the newly-acquired skills command a higher income. Therefore, in addition to a subsidy toward the cost of training local labor and bringing trained persons into a poor location, adequate assistance must be provided for all these persons to obtain housing under favorable conditions. It will probably also be necessary for subsidies to be made for the construction of houses which can then be sold directly or on lease-purchase to the new labor force.

The above measures tend to influence development directly and give both encouraging and discouraging results. Too few cases seem, however, to achieve the level of development expected. On the other hand, there are examples of development where direct assistance is avoided in favor of indirect approaches that have achieved rather spectacular successes due to fine natural endowments. Cities such as London, Birmingham, Tokyo, Osaka, Moscow, Leningrad, Paris, Lyon, Delhi, Bombay, New York and Pittsburg are examples where planned and unplanned development have created concentrated, congested and polluted industrial centers. Measures to discourage further industrialization in such places and to encourage dispersal of industries have been adopted by planners, but these measures have not been entirely effective and there is even doubt regarding the ability of the authorities to guide development growth in such fecund locations. Satellite towns and centers are being planned and built, but they also seem unable to keep up with the problem. The search for solutions thus falls back into the field where changes tied to other conditions such as agri-business development in rural areas tend to become more attractive.

It thus becomes clear that prospects for a successful regional incomes development policy depend on the interaction of many factors with the problems of counter productive moves always present. Perhaps the most important group of factors are those relating to the ability of public authorities to envisage and work out the details necessary for persuading investors to establish themselves in low income areas while at the same time working to achieve the essential cooperation required between officials and investors.

4.6. Location Requirements

It is widely recognized that extensive efforts are necessary to develop backward areas and such efforts must be aimed at creating the conditions that will attract investment and enterprise into those areas. It must be realized that areas of low income generally are caused by deficiencies that need to be made up in order to attract new investors that have the option of location in other, already developed, areas.

The first step in this task of improvement is to identify the degree to which the infrastructure is deficient and to schedule those infrastructure facilities that must be rapidly achieved. The next step is to determine the group of incentives, from the many that are available, that are most appropriate to conditions within the areas selected for development, as well as for the type of industry and investor that needs to be attracted. The different type of measures needed to accomplish these two steps are described in some detail in the following sections.

4.6.1. General

The facilities generally looked for when an investor is seeking a new site for an enterprise are those community facilities that are commonly used by many different industries and most of the people. They include transport, communications, power, water, and social overheads such as schools, hospitals, welfare, training facilities, etc. A close look at the better developed areas reveals that they usually have adequate infrastructure facilities with a slow grading off to the poorer regions. Even in many less developed countries, these facilities are fairly adequate in a few of the principal centers. It is the rapidity with which these facilities decline in number and quality as one moves out of the centers and into the countryside that is in marked contrast to industrialized countries.

4.6.2. Roads and Communications

The lack of infrastructure facilities, particularly all-weather roads, increases unit costs of supply. These costs narrow the market radius in which products can be sold in competition with other producers in more central locations. This condition is typical of the agricultural trap in which improved farming methods raise productivity on the farm in a relatively uniform fashion while leaving transport costs to rise rapidly as more distant markets must be reached in order to sell the increased production. Improved farm technology is of little help in such a situation. Only when real food shortages occur do prices rise to the point where they are able to overcome this cost hurdle and even then the time lost in moving over poor roads often results in the food supplies arriving too late to help those who need them. An efficient communications network and transport system are the proven means of overcoming this problem.

4.6.3. <u>Land</u>

In countries where the population density is high or where arid climate severely limits utilization of large sections of the land surface, the price of suitable land may be extremely high relative to the potential market prices for whatever is produced on that land. In some cases, suitable blocks of land for industrial purposes may simply not be available without government assistance. This assistance can take the form of low-cost loans and credit. Payments may even be scheduled so as to reduce the burden to the enterprise during its difficult initial period of a few years. Financial assistance can be made available on a priority basis for help in purchasing land. These types of assistance related to land are often contingent upon the area occupied as well as the amount of employment created. Care is also required to ensure that the temporary quarters provided during the construction phase are not turned into squatter-type housing. Such occupancy can be very difficult to correct at a later date.

4.6.4. <u>Buildings</u>

The bazaar system of building and shop construction with management and supervision can often be adopted to encourage small-scale enterprise of a craft and manufacturing nature. The buildings can be municipally owned and leased as in the grain bazaars of Afghanistan, or private landowners can be encouraged by various government ministries to build such bazaars and to sell individual stalls on the installment or loan purchase plan. Or they may be rented or leased so as to encourage investors to start new enterprises.

Such facilities combine to solve two of the major problems facing regional development at the level of local markets, i.e. the cost and financing of land and building in suitable locations.

4.6.5. Electric Power

Electric power is the modern prime mover and one of the major forces on which a rising per capita income depends. With the help of electric energy, the individual worker is able to increase his output and so his income. Without the addition of external energy, the laboring man can only earn what his own muscles are able to produce. Once his physical skill and techniques are fully developed, his maximum real income level will have been reached.

The dependence of productive modern enterprise on electricity is enormous. More crucial than concessions and incentives is the continuous supply of electricity of the correct voltage at a reasonable cost. A failure or interruption in the electric power supply affects enterprises directly as production is hampered and even stopped. In some development programs, the importance of a steady supply of electric power has been recognized to the point where consideration is given to compensating new enterprises during their first few years for loss of production on this count.

New enterprises that are willing to locate outside centers where a steady supply of electric power is available must face the capital intensive cost of generating their own electricity. A liberal granting of financial assistance for the purchase and installation of generators is an essential incentive where governments wish to encourage regional development in low-income locations.

4.6.6. Water

Water is an essential requirement in many industries. Where it is not available from public sources, or when the charges levied by public sources are high, some concessionary assistance to new industry is needed. In arid countries where water rights are jealously guarded and allocated, even greater government assistance to new industry may be required in order to obtain the necessary water supply.

Water effluent from industrial processes is often polluted and must not be allowed to drain into fresh water channels. Again, in arid countries, this problem can be most serious and further assistance may be needed in providing water treatment to remove the undesirable wastes.

In those cases where deep or shallow wells prove to be the only water sources available, or where treatment of waste water must be provided by the new industry, it is important to include the cost of these facilities in the project investment plans and feasibility studies.

4.6.7. <u>Industrial Estates</u>

Provision of land, structures, roads, electricity and water is the least that must be done to attract industry. It is the nature of such facilities that it is more economical to provide them for a large number of enterprises in a single location than it is when the establishments are scattered. The economy of compactly arranged services when passed on to a new enterprise connecting to them can be an important factor in attracting new investment to an area.

An industrial estate is initiated when a convenient and compact area is acquired by the public authorities and is then made suitable for industrial occupation by providing the needed facilities from public funds. Water and electricity are installed. An approach road and internal roads are graded and finished along with drainage for the area. The land is plotted into conveniently-sized parcels and demarcated to assist investors in making their selections. Carefully worded agreements between the estate managers and the users are required. Structures of standard or specialized form can be made part of the agreement. A general storage or warehouse depot is generally required as an estate-operated facility. A number of other common facilities such as post office, branch bank, canteen, etc. must also be made available. In other words, all the basic requirements of enterprise must be provided if the estate is to prove successful in attracting investors.

If a part of the estate development effort falls on the industries, a suitable subsidy needs to be given.

4.7. Specific Incentives

In addition to the already-mentioned general infrastructure facilities required to encourage investment in rural areas, there are a number of specific incentives that may be used. They are made available on an individual project basis. Some of the incentives mentioned below are available to new Afghan enterprises under the Foreign and Domestic Private Investment Law (FDPIL) wherever they may be located. To encourage location outside the Kabul area, some of the present incentives are extended for a period of two years. Location in under-developed rural areas will undoubtedly require a review and consideration of additional incentives to help overcome the greater operating and financial problems that will be encountered.

The various specific incentives to encourage rural investment fall under four general headings: (1) subsidies, (2) financial assistance, (3) fiscal help, and (4) other assistance.

4.7.1. Subsidies

Subsidies in various forms have already been mentioned and some are included a second time in the following discussion but should cause no confusion.

Subsidies on fixed capital are often given to help defray the added expense of erecting structures and installing machinery in difficult locations. This added expense is caused in part by the extra cost of delivering the materials and maintaining the necessary skilled labor involved in such work. Without a subsidy such plants are not competitive because their average costs will greatly exceed those in urban centers.

Subsidies on feasibility reports are provided by the Operations Section of the Investment Promotion and Development Department (IPDD) which has a responsibility for assisting in their preparation through the application system and so covers a considerable portion of these costs. In order to prepare such reports for agri-business or rural investments, more care and expense will be needed to assure that the physical infrastructure already described is available or included in the plans and estimates.

Subsidies on freight or transportation is an important factor that influences a decision in favor of locating an industry in hard-to-reach rural areas. In addition to considerations such as indicated above for plant construction and installation, there is the continuing problem of transport cost to the major market centers to which it is often cheaper to deliver imports than it is to haul goods from rural areas over poor roads and long distances. This competitive difference needs to be adjusted if rural development is to prosper.

Subsidies on labor have already been mentioned and need not be repeated.

4.7.2. Financial Assistance

Loans to enterprises willing to locate in rural areas are an important incentive to potential investors. The recently established Industrial Development Bank of Afghanistan (IDBA) has been created to make such loans. It faces, however, the triple problem involved in all banking enterprises. The cost of administering large loans is about the same as that for small ones. Urban industries tend to be larger than those in rural areas and their borrowing needs tend to be greater so they are more attractive to the bank. Second, a sound loan needs to be granted against some security such as the facilities of the new industry. Urban facilities are generally a better risk than rural ones where alternative uses are less and additional investment is harder to obtain. Third, supervising loans is a function which involves distance and ease of transportation. Thus, again, urban loans are favored because they reduce the risk of inadequate supervision by the loan officers. Together these three problems form a natural bias against making loans in rural areas and greater security or guarantee is required if the bank is to manage its risks effectively and keep its funds turning over so that it can make new loans.

Credit guarantee is an accepted method of encouraging development banks in making small rural loans while assuring them of adequate liquidity to carry on their purpose of making new loans. Typically, the credit guarantor is the government that will, for some premium payment from the bank (often charged to the borrower), agree to absorb a major portion of loan losses actually incurred. It may also agree to discount loans that it deems to be collectable and so help the bank maintain a favorable liquidity position.

Capital participation is another form of assistance to encourage industry to locate in rural areas. It can reduce the problem of raising risk capital, induces smaller loan requirements and so encourages development banks by increasing the soundness of such loans, and where farmer cooperatives are being encouraged, it will help induce their formation and participation in an industry that will increase directly rural income and employment in the selected locations.

4.7.3. Fiscal Help

Fiscal assistance as used here consists of the various forms of tax concessions that can be made to encourage investment. They reduce available revenues before new ones can be generated, whereas subsidies are a use of revenues or funds that have been generated already. Tax concessions relate to partial or total exemption from income (profit) tax, excise tax, sales tax, import and export duties, property tax, and fees such as registration, court, mortgage and stamp duties.

The FDPIL program grants exemption from income taxes and some related taxes for five years with an additional two years granted if the enterprise is located outside the Kabul area. Exemption from import duties was similarly granted but in July 1974 exemption was rescinded and a special tariff with lower import duty rates for FDPIL projects was inaugurated.

4.7.4. Other Assistance

Provision of infrastructure facilities, subsidies, financial assistance and fiscal concessions create a favorable industrial climate and stimulate enterprise investment. H wever, in the relatively uncertain situation prevailing in rural or backward areas, some more stimulants are generally necessary. Of major importance are those relating to assured markets, price preferences, market information, and supply on input materials which for agri-business development will depend on the cooperation with farmers in growing the specified crops.

The assurance of markets is of utmost importance in encouraging investors to locate their enterprises in selected rural areas. The government as a purchaser can play an active role in assuring markets by directing its purchasing departments to contract with such enterprises for a portion of their requirements. Such contracting should also include a price preference or differential that will ease the competition from large industries or importers who can and often do underprice or offer concessions on their goods so as to eliminate small competitors. The government should also discourage new enterprises that integrate all of the agri-business processing steps in urban areas.

Information on various economic and market conditions is not easily available in backward or rural areas and there is a need for active government support in collecting and disseminating such information on a regular basis either by mailing of special bulletins or by radio, which is now done only on an irregular basis.

4.8. Chapter Summary

Development in rural or backward areas that are lacking in so many ways the basic infrastructure facilities, ease of communications and transactions, and social amenities that attract business are not easily accomplished in short periods of time. This throws the burden of encouraging agri-business investment to locate in such areas on a well-coordinated system of incentives which is presently unavailable in Afghanistan. This agri-business research study proceeds in the following chapters on the assumption that these area development requirements and incentives will be forthcoming or can be incorporated in the recommended project programs, as they are planned for implementation. What we are saying is that development for economic growth is a process that is continuously forcing resource reallocation and methods upon planners and the economy. Conversely, if we are either unwilling or unable to change our methods, policies and resource allocations, progress will be slow indeed.

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CHAPTER V

REGIONAL RESOURCES AND INCOME IN AFGHANISTAN

CONTENTS

CONTENTS (cont.)

CHAPTER V

REGIONAL RESOURCES AND INCOME IN AFGHANISTAN

5.1. Introduction

In many ways regions are particular human creations and as old as man's feeling for territorial rights. Such concepts started as natural hunting areas with boundaries that shifted as food game moved from place to place. Later nodal centers or agricultural villages developed in fixed locations with rough boundaries determined by the extent of cultivated fields. Areas between such centers remained undetermined but still subject to the territorial concern of the hunter or the life pattern of the nomad.

The modern world has extended boundary concepts to fill up the unclaimed space so that nations have been formed contiguous to one another. Such political boundaries seldom coincide with natural features of the land topography or the economic endowment of resources or trade and income among people. As a result, maldistribution of well-being has become progressively more evident and has created a need for better planning as a means of achieving more equitable distribution of income and employment.

Significant contributions to planning processes have been made by specialists in various areas of knowledge. The major fields of study that provide important inputs to this planning approach are listed as follows:

(1) **Geography** -- the nature of man's occupancy of the earth and of its regional similarities and differences.

(2) **Economics** -- the flow of goods, money and credit to, from and within regions; also location theories, related to economic activity.

(3) **Political science** -- the institutional means by which plans are made effective.

(4) **Psychology** and **philosophy** -- the motivation and identification of social goals.

(5) **Sociology** -- the organization of society and social action.

(6) **Management science** -- the improvement of organizations in structure and relationships, both internally and externally.

(7) **Engineering** -- the physical structure and the manner of utilizing resources.

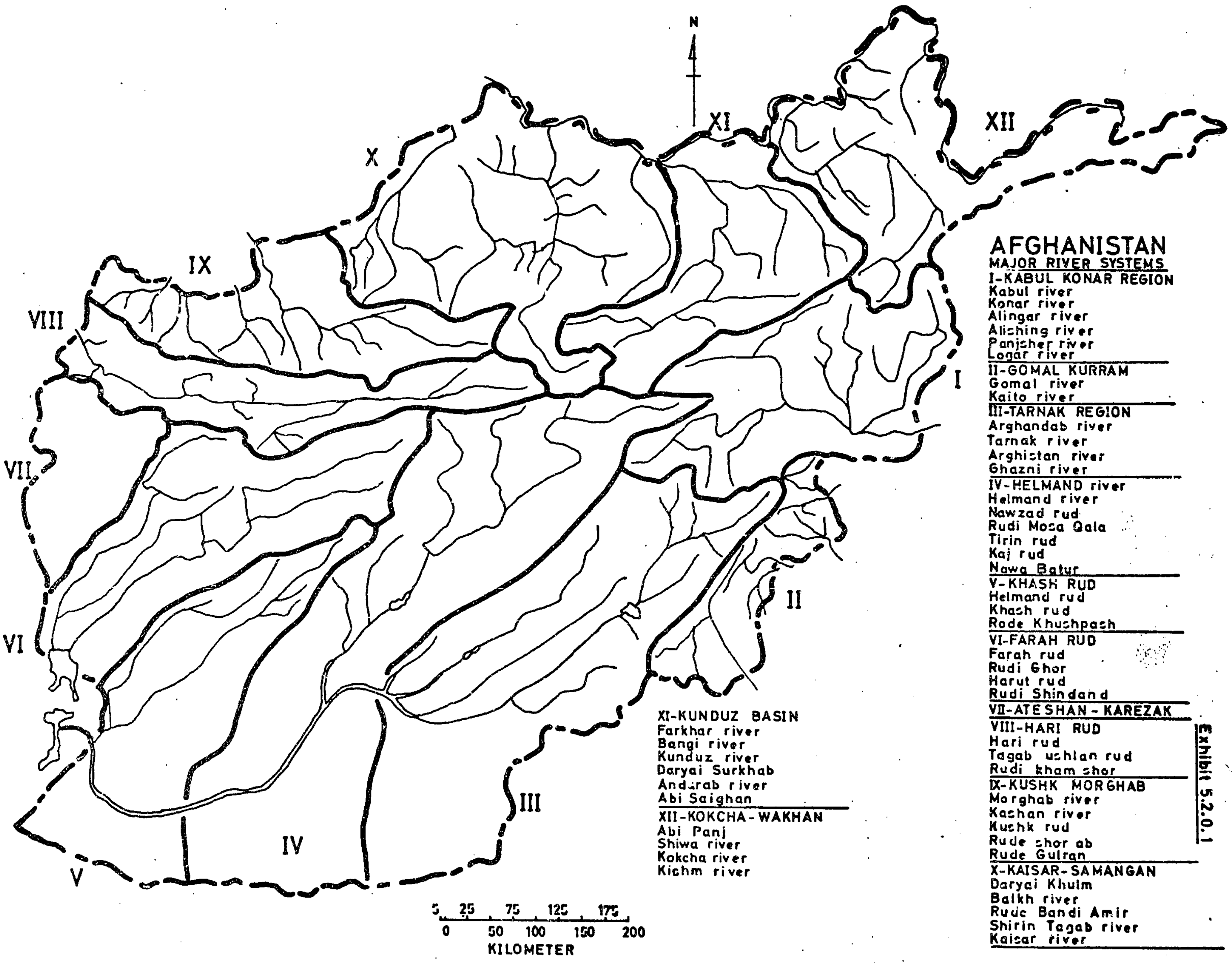
5.2. <u>Boundary Identification</u>

Afghanistan is a landlocked mountainous country in the south central part of the Asian mainland with a surface area of a quarter million square miles. In the north, Afghanistan borders on the Soviet Central Asian Republics between 35° - 39° N. latitude; in the northeast at the end of the narrow Wakhan Corridor, it borders over a short stretch on the Chinese Peoples Republic and the disputed territory Jammu and Kashmir in the area of 74° E. longitude; in the east and south as far as 30° N. latitude, the border is with Pakistan; and in the west, the border is with Iran in the area of 61° E. longitude. The lowest and highest elevations are along the Amu Darya (Oxus River) near the border with the U.S.S.R. The lowest elevation, 860 feet above sea level, is near the town of Qarkin on the banks of the Amu Darya about 66° E. longitude and the highest elevation, 22,700 feet above sea level, is near the town of

Kashkandyo in the Wakhan Corridor. There are eight mountain peaks rising to over twenty thousand feet in this general area. The topography of the landscape is dominated by the Hindu Kush range, containing these peaks. North of Kabul, the main range fans out into three sub-ranges. The northern branch runs westward and north of the Hari Rud Valley and is known as the Paropamisus Mountains, which are finally interrupted by the Hari Rud west of Herat, where it turns north and runs into the U.S.S.R. The central branch runs south of the Bamiyan Valley where it is known as the Koh-i-Baba range, and south of the Hari Rud Valley where it is known as the Siah Koh Mountains which terminate north of Farah. The southern branch starts at the Safed Koh east of Kabul and runs into the Sulaiman range of Pakistan. This mountainous system has caused Afghanistan to be called the land of "ten thousand" passes. Of the twelve principal watersheds created by these mountains only one, the Kabul-Konar river system, reaches an ocean via the Indus River. The others disappear into desert irrigation or into inland depressions such as the Aral Sea in the U.S.S.R. and the marshy lakes in the Sistan Basin on the southwest border of Afghanistan and Iran. These twelve drainage and river systems are shown on the map in Exhibit 5.2.0.1. The heavy lines on the map indicate the mountain ridge lines that define the boundary of the twelve principal catchment basins and river systems in Afghanistan.

The geography is also an ecological-energy system of considerable interest. The high mountain ridges act as water and snow collectors that give a hydraulic head (energy) to the run-off, so that it can irrigate the land along the many streams and rivers in the country. Perhaps even more important, the mountains act as a

Exhibit 5.2.0.1

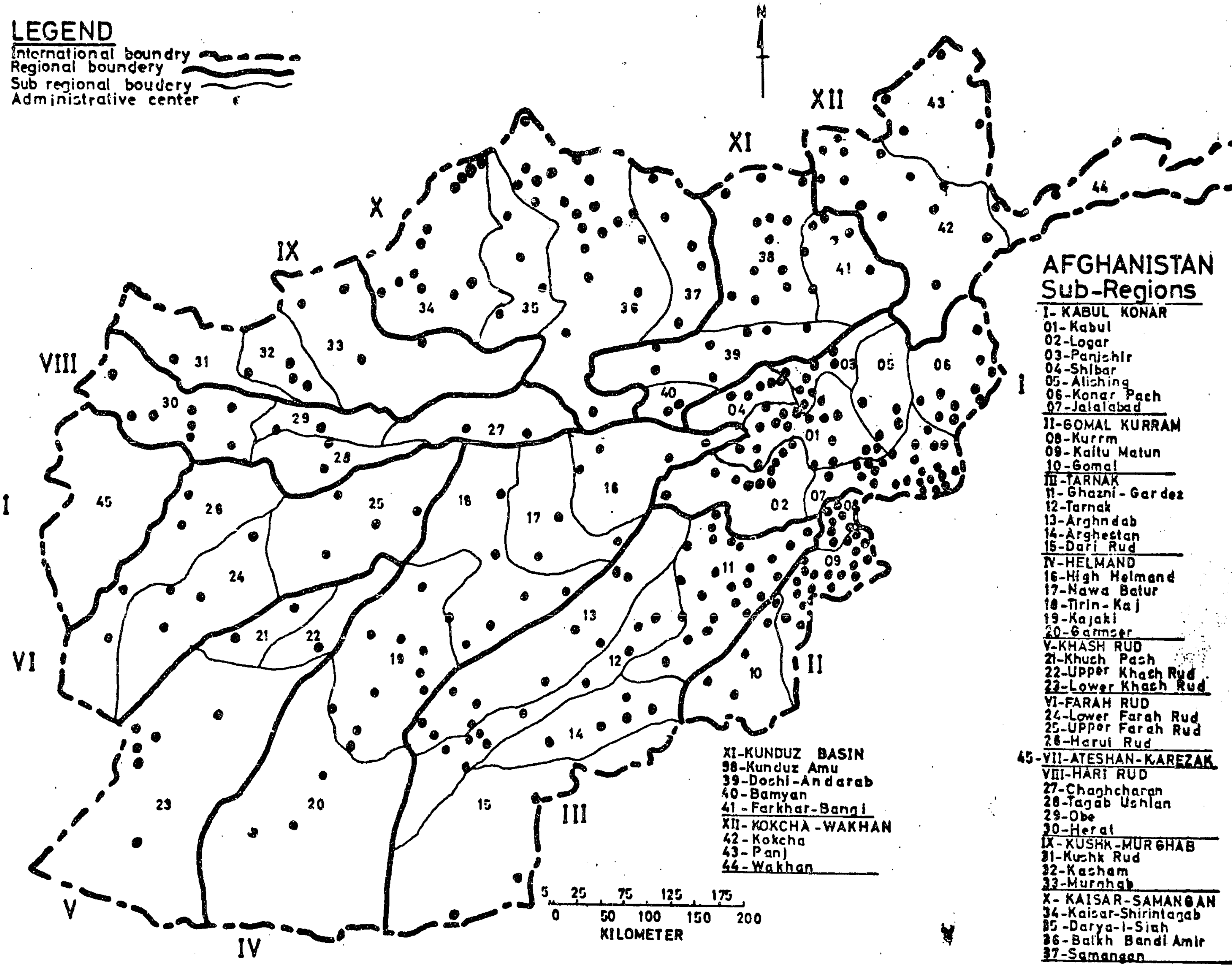


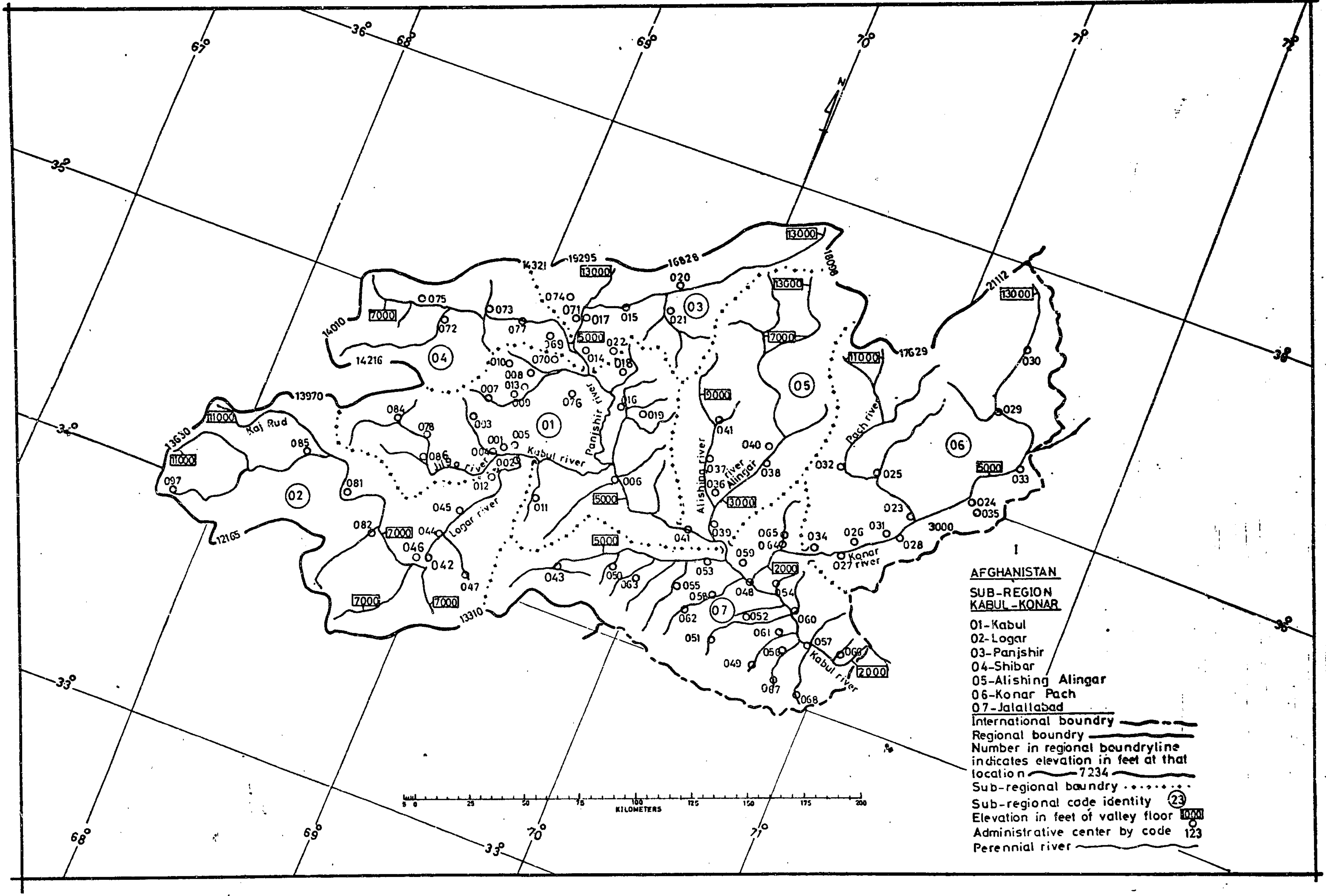
timing system. Afghanistan is an arid country with an average precipitation of less than twelve inches per year.[4] Even this small amount of water and snow is received in the winter time when it can be of little benefit to agriculture and agri-business. However, the mountains hold much of this precipitation and release it when needed for irrigation and ground water in the spring and summer. Thus, Afghanistan is like a gigantic girdle of oases around the flanks of its mountain system. This remarkable natural technological system has considerable potential for agriculture and agri-business, but it poses, at the same time, some serious problems for man-made technologies that have been developed under quite different circumstances of more adequate and seasonal precipitation in broad, fertile valleys that encourage low cost land and transportation terminating in seaports. The advantageous scale and integration of such technologies have trouble transferring directly to Afghan conditions. Major modifications are often necessary before they can be successfully adopted. More on this subject is discussed in later chapters of this study.

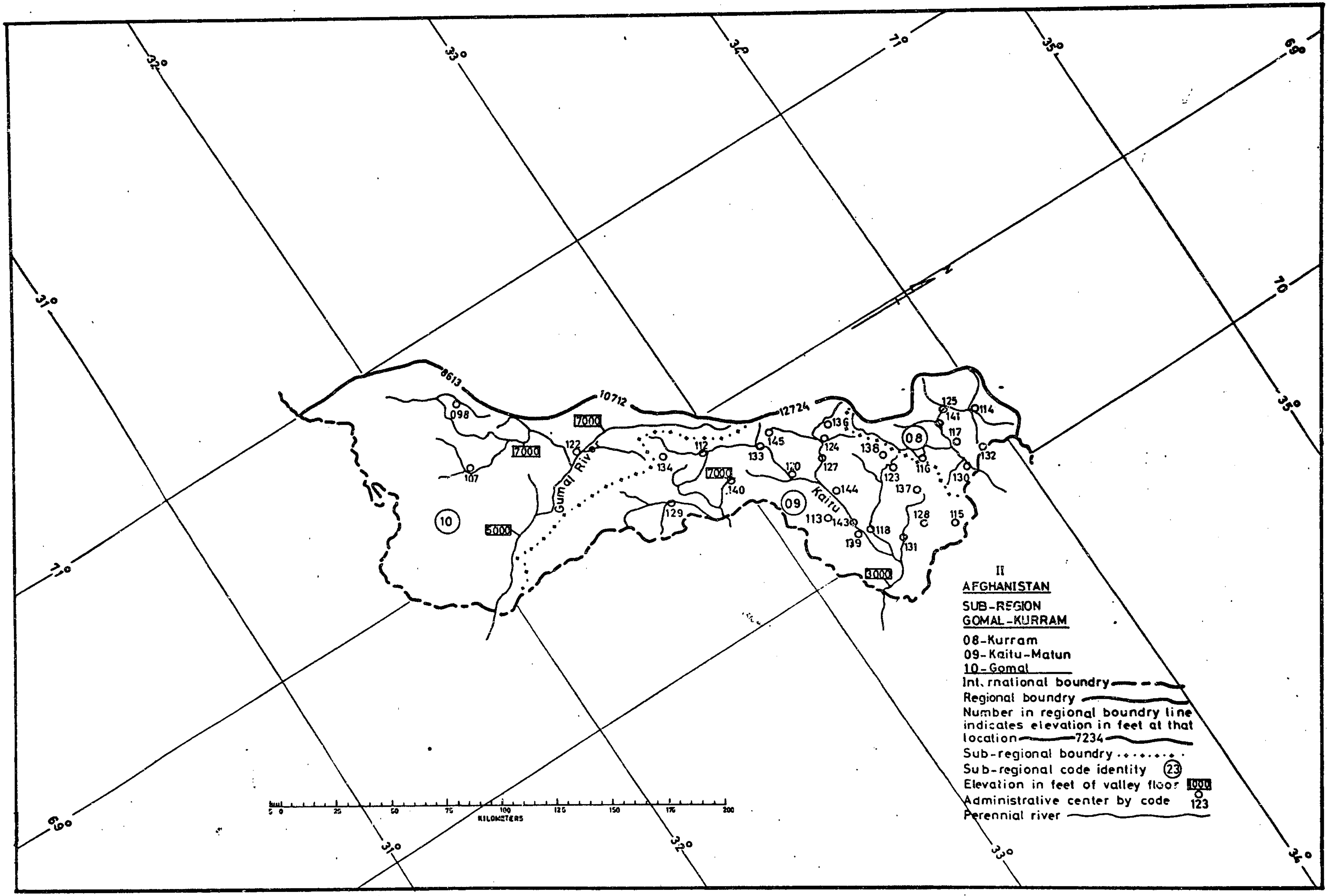
Within the twelve major regions above, there are forty-five sub-regions that have been identified, again by using mountain or watershed ridge lines. In this second case, the problem of boundary definition is more complicated. In the first case, the regional boundaries all run to the national boundary lines, while in the second case the sub-regional boundaries terminate in many instances within the twelve regions themselves. Following such a method of sub-boundary determination often means a choice has to be made between very small, more numerous sub-regions, and larger and fewer sub-regions. The height of ridges compared with that of their valleys has a bearing on such judgment, as does the location of administrative centers, of which ... re are 325 in Afghanistan. Of particular interest for agri-business development is the cost of transportation which involves multiple factors of distance, grades over mountain ridges, location of agricultural land in the valleys, potential road alignments, and so forth. In addition, it is important to observe that the semi-nomadic and semi-sedentary population moves vertically up the mountains from their winter homes[6] and not horizontally as real nomads. This vertical search for green grassland and pasturage for their livestock in the spring and summer means that people tend to occupy valleys up to the ridge lines as indicated by the 45 sub-regions and in Afghanistan do not tend to spread out along general contour lines as has sometimes been suggested. These factors, to the extent they could be observed on the base map or determined from general information, were all considered. The sub-regional boundaries determined in the above manner are indicated on the map, Exhibit 5.2.0.2. and on the twelve regional maps that follow. Included in this Exhibit are the 325 administrative centers, shown as heavy dots on the map. The names assigned to the regions and sub-regions are river, valley or place names, depending on which appear most appropriate or descriptive. See Exhibit 5.3.0.1. for list of codes and names.

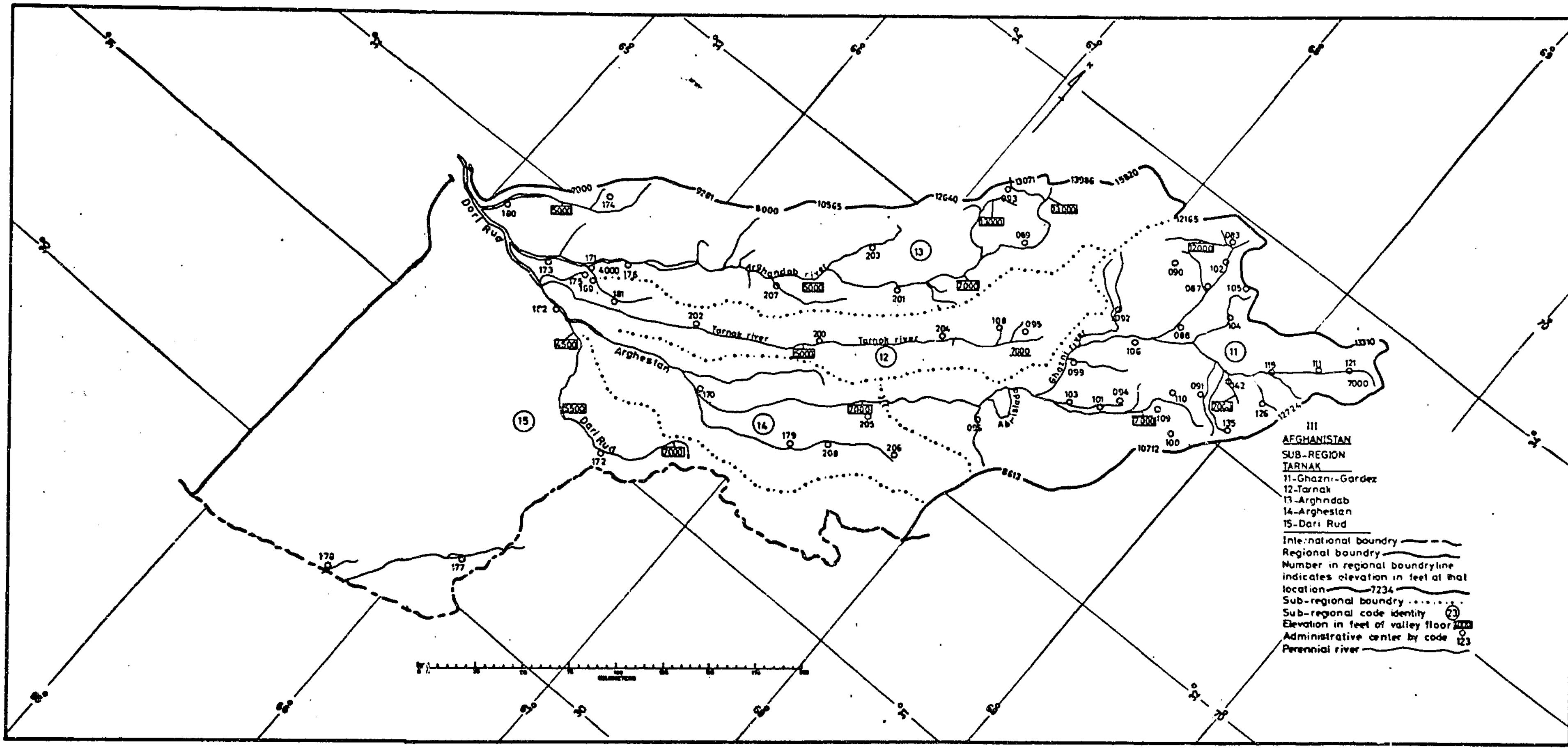
There are twenty-six provinces within Afghanistan. Prior to 1974 there were twenty-eight. Clearly, the sub-region boundaries, of which there are forty-five, do not coincide with the province boundaries. As a matter of observation, the boundaries of the twelve regions do not follow the indicated province boundaries. The Afghan Demographic Studies Staff has indicated to us that administrative center

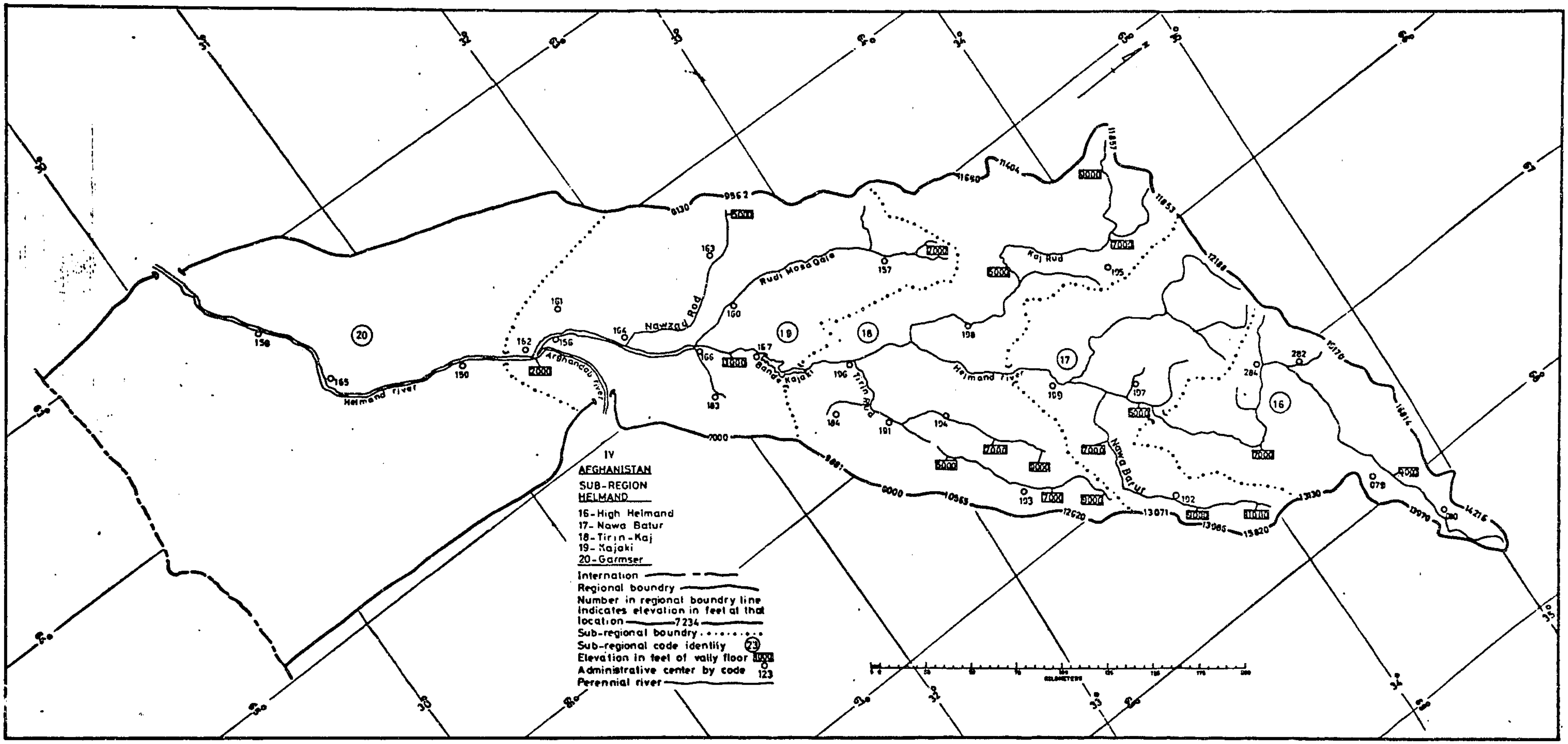
Exhibit 5.2.0.2

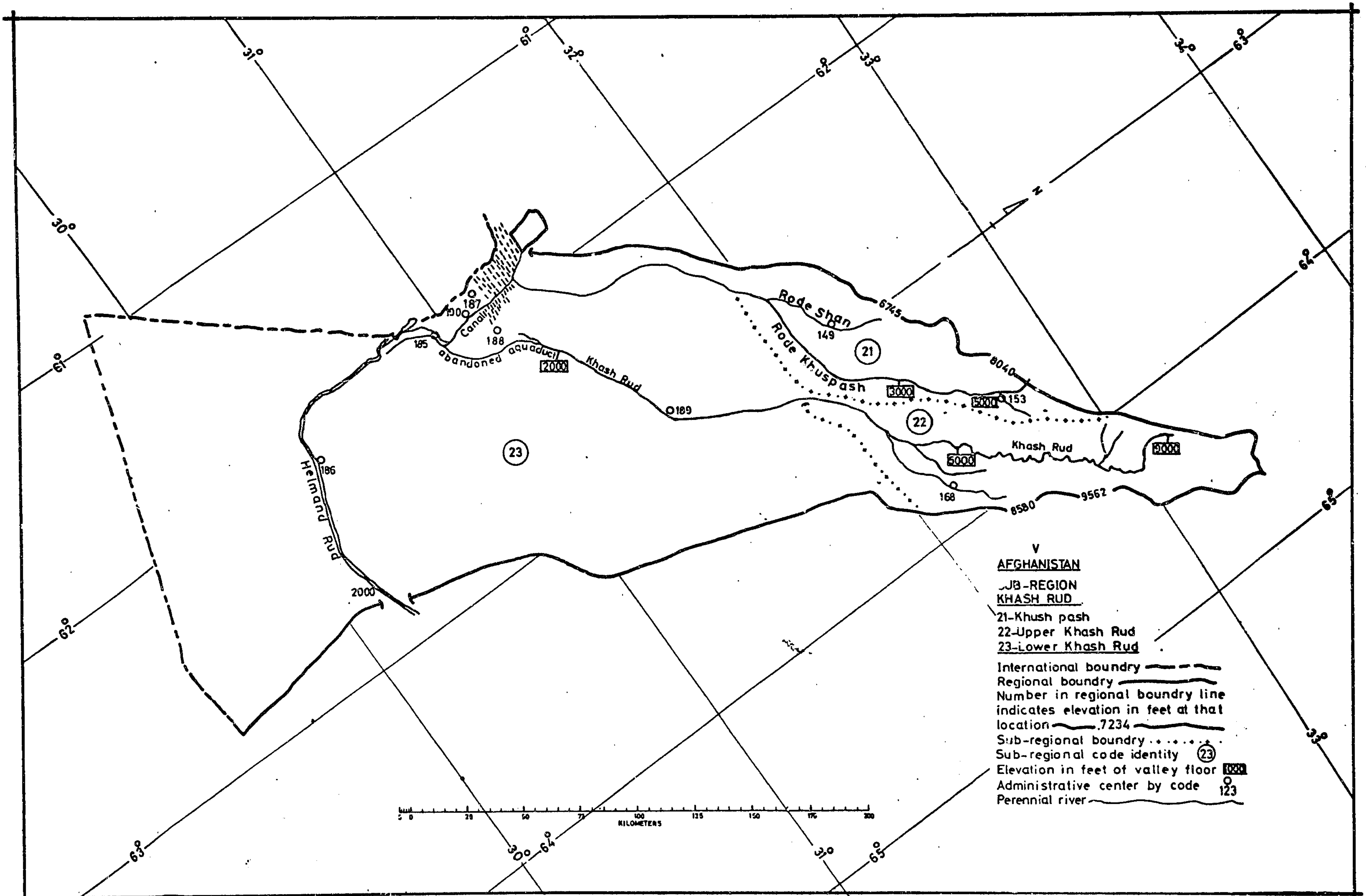


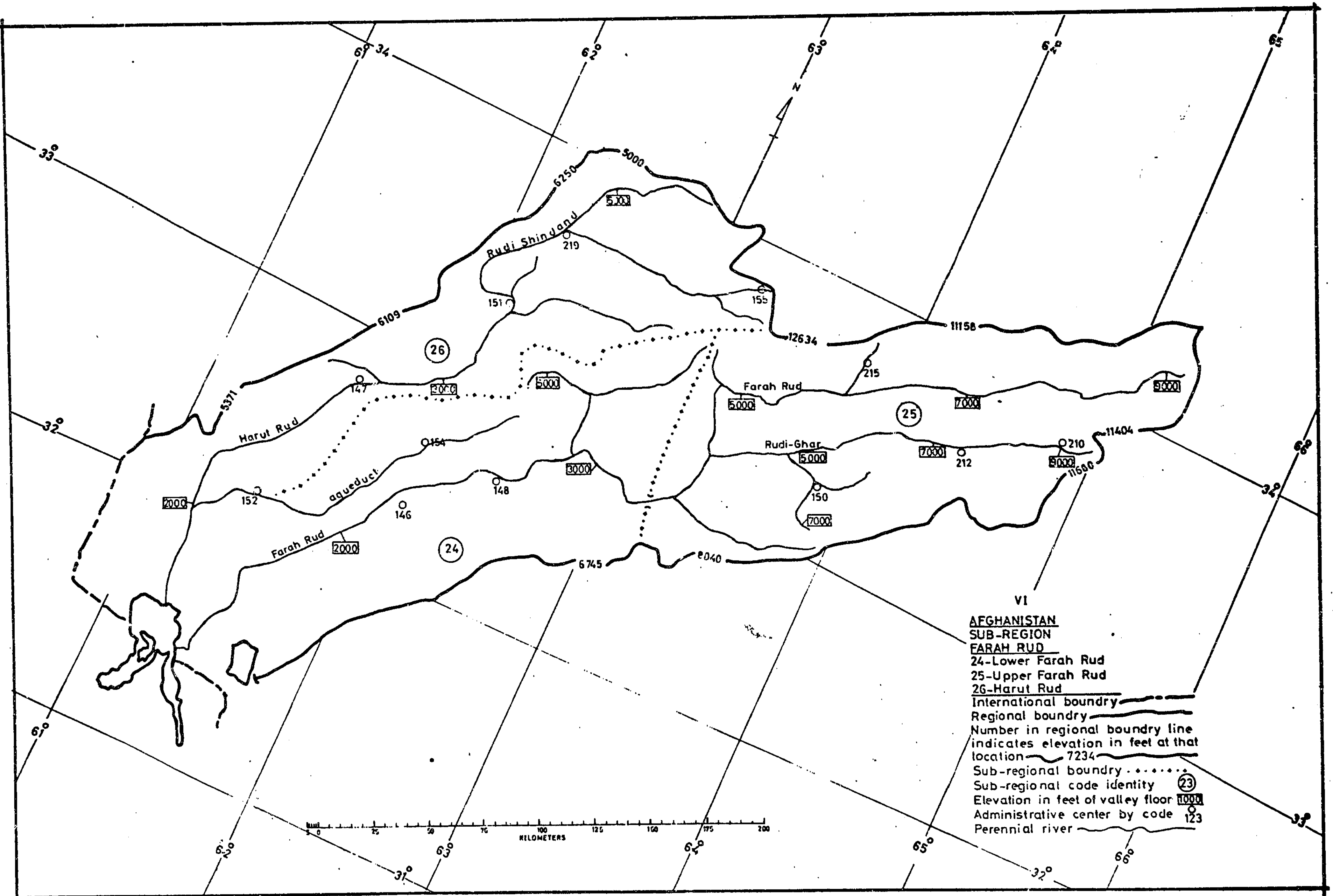

I
AFGHANISTAN
SUB-REGION
KABUL-KONAR
01-Kabul
02-Logar
03-Panjshir
04-Shibar
05-Alishing Alingar
06-Konar Pach
07-Jalallabad
International boundry
Regional boundry
Number in regional boundryline indicates elevation in feet at that location 7234
Sub-regional boundry
Sub-regional code identity 23
Elevation in feet of valley floor 1000
Administrative center by code 123
Perennial river
KILOMETERS
Kabul river
Panjshir river
Logar river
Alishing river
Alingar river
Pach river
Konar river
Raj Rud


II
AFGHANISTAN
SUB-REGION
GOMAL-KURRAM
08-Kurram
09-Kaitu-Matun
10-Gomal
Int. rnational boundry
Regional boundry
Number in regional boundry line indicates elevation in feet at that location
7234
Sub-regional boundry
Sub-regional code identity
23
Elevation in feet of valley floor
1000
Administrative center by code
123
Perennial river
Gumal Riv
Kaitu
8613
10712
12724
KILOMETERS

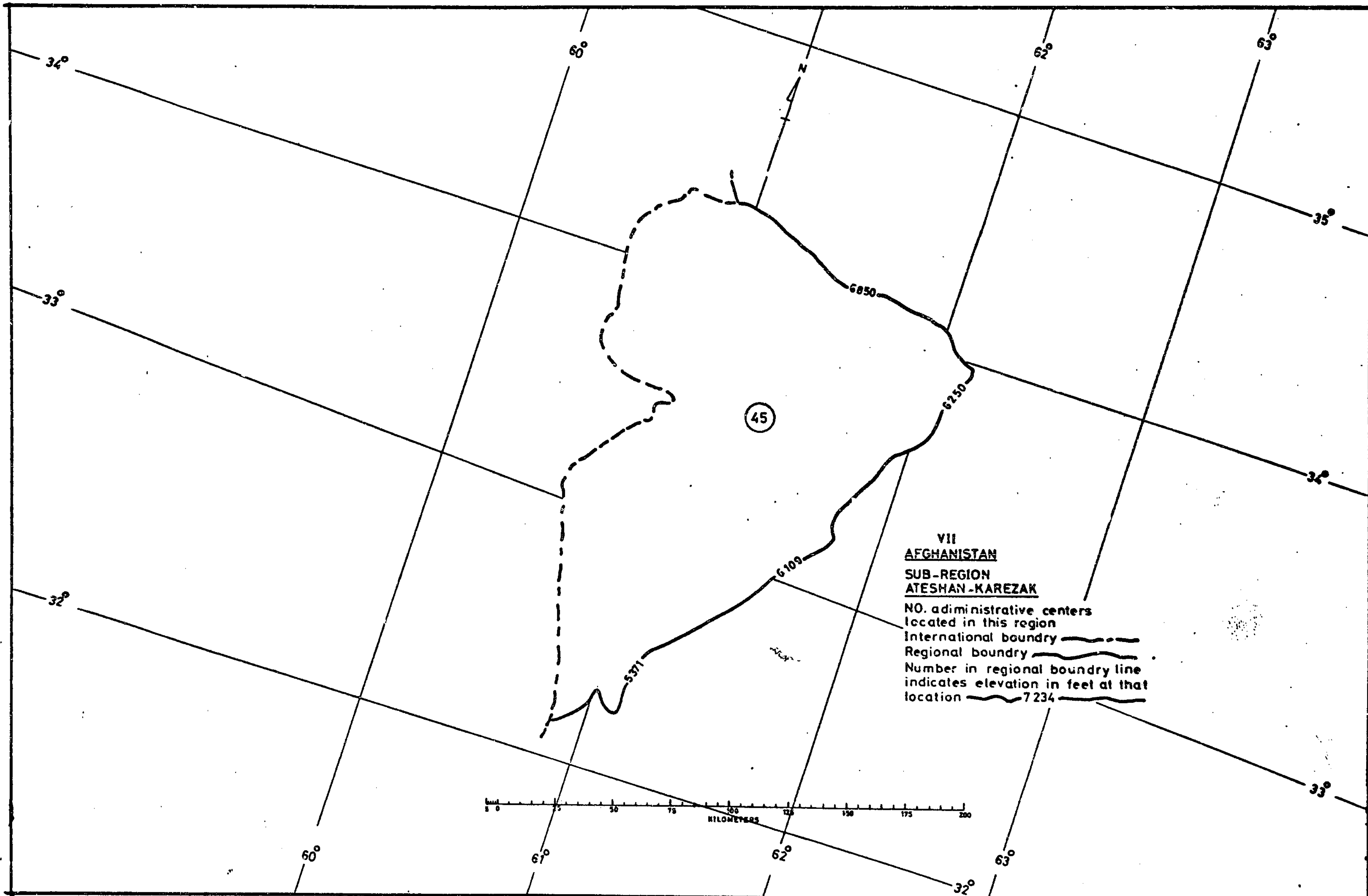

III
AFGHANISTAN
SUB-REGION
TARNAK
11-Ghazni-Gardez
12-Tarnak
13-Arghndab
14-Arghestan
15-Dari Rud
International boundry
Regional boundry
Number in regional boundryline indicates elevation in feet at that location 7234
Sub-regional boundry
Sub-regional code identity
Elevation in feet of valley floor
Administrative center by code 123
Perennial river
Dari Rud
Arghandab river
Tarnak river
Arghestan
Ghazni river

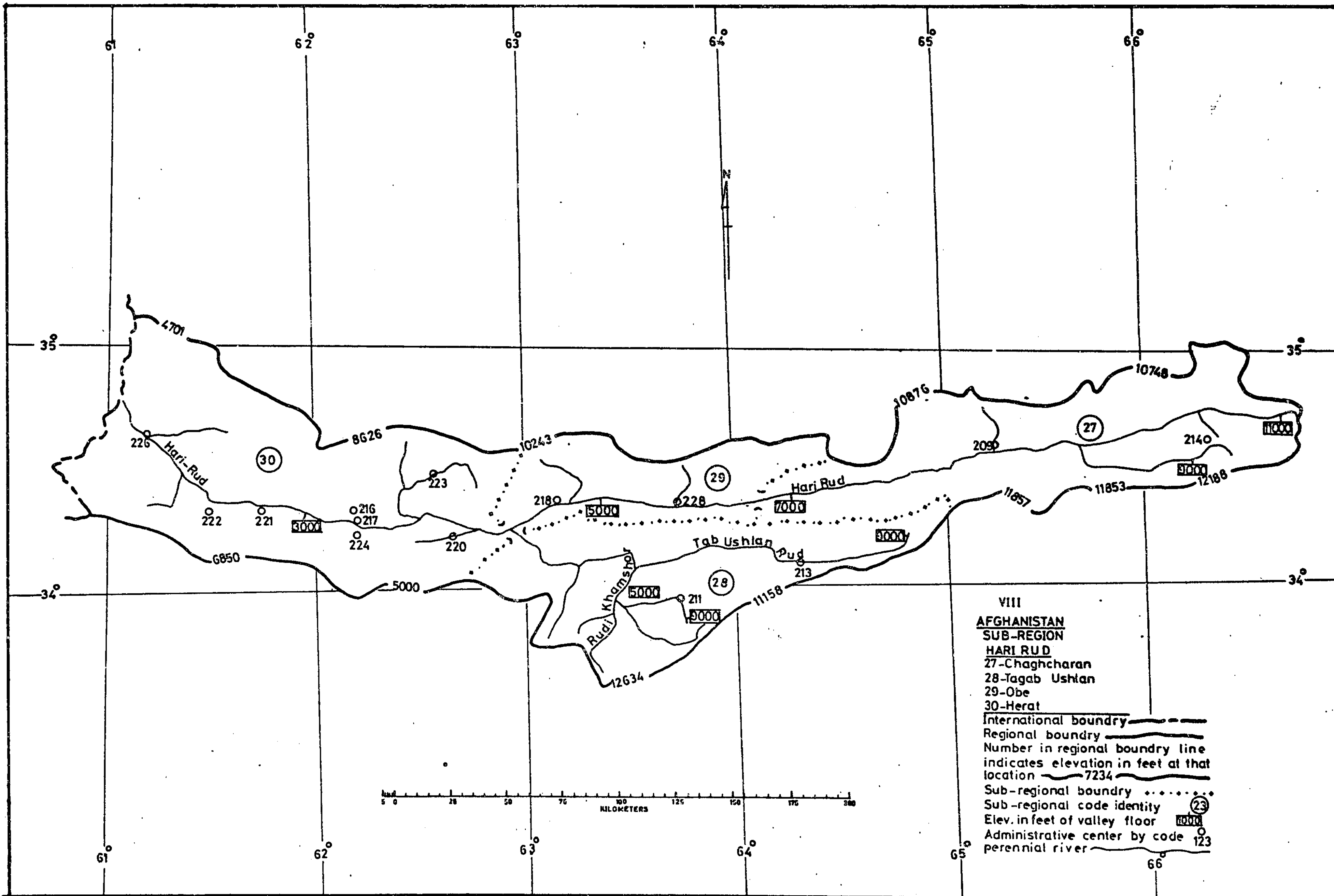

IV
AFGHANISTAN
SUB-REGION
HELMAND
16-High Helmand
17-Nawa Batur
18-Tirin-Kaj
19-Kajaki
20-Garmser
Internation
Regional boundry
Number in regional boundry line indicates elevation in feet at that location
7234
Sub-regional boundry
Sub-regional code identity
Elevation in feet of vally floor
Administrative center by code
123
Perennial river
Helmand river
Arghandab river
Nawzad Rod
Rudi Mosa Qale
Kaj Rud
Bande Kajaki
Tirin Rud
Nawa Batur
KILOMETERS

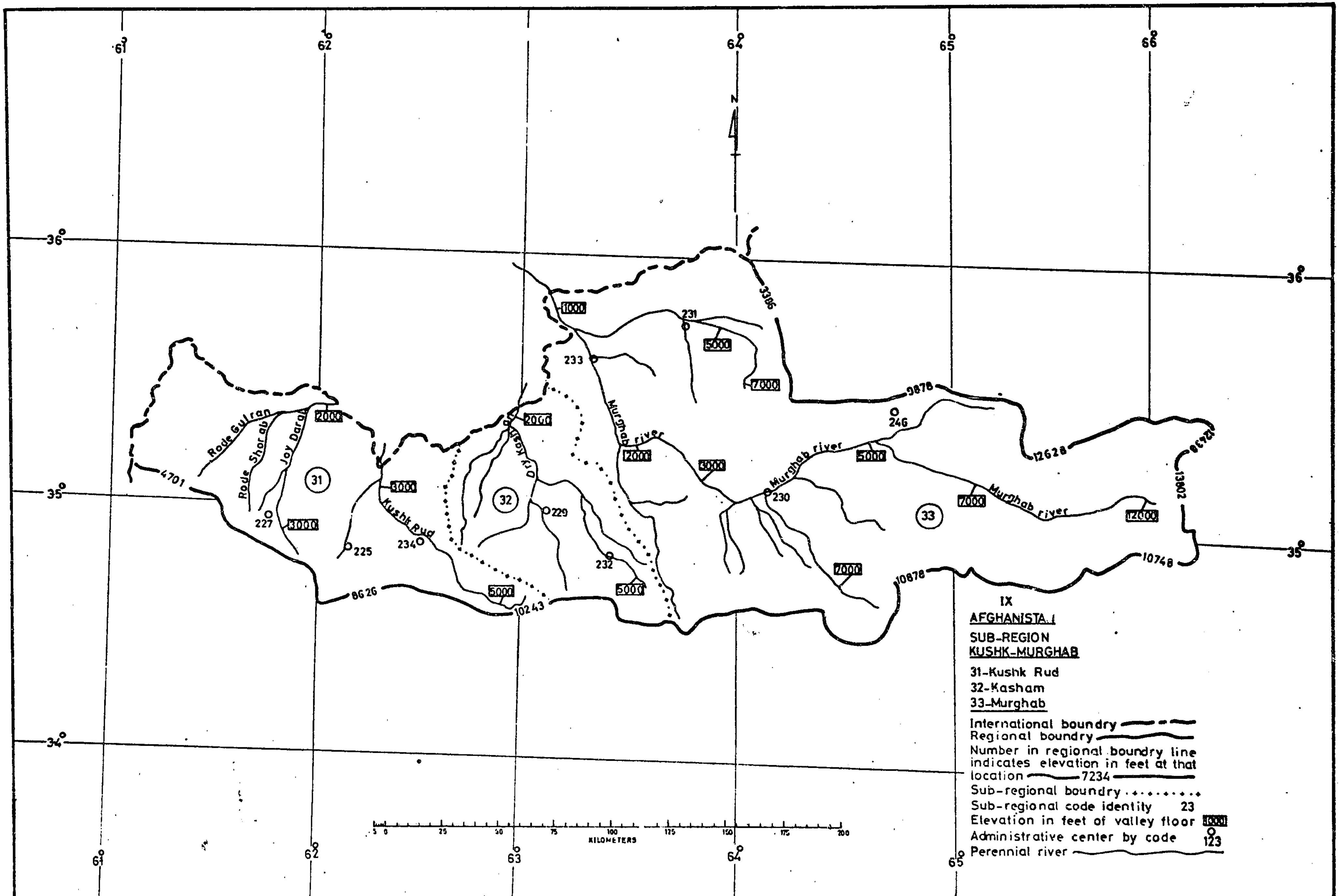

V
AFGHANISTAN
SUB-REGION
KHASH RUD
21-Khush pash
22-Upper Khash Rud
23-Lower Khash Rud
International boundry
Regional boundry
Number in regional boundry line indicates elevation in feet at that location 7234
Sub-regional boundry
Sub-regional code identity 23
Elevation in feet of valley floor 1000
Administrative center by code 123
Perennial river
Rode Shan
Rode Khuspash
Khash Rud
Helmand Rud
Canal
abandoned aquaduct
6745
8040
8580
9562
2000
3000
5000
21
22
23
149
153
168
185
186
187
188
189
190
KILOMETERS
0
25
50
75
100
125
150
175
200



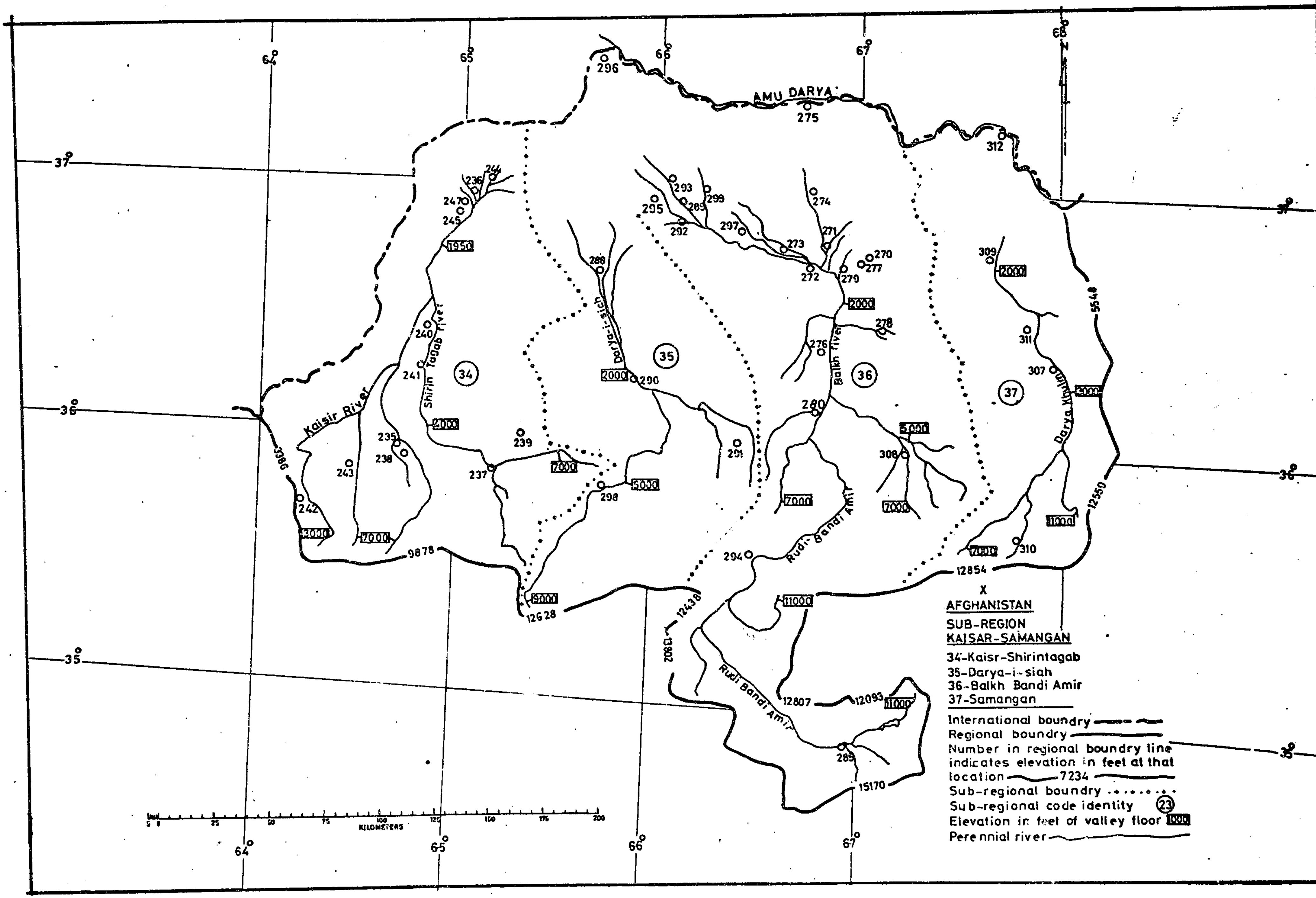
VI
AFGHANISTAN
SUB-REGION
FARAH RUD
24-Lower Farah Rud
25-Upper Farah Rud
26-Harut Rud
International boundry
Regional boundry
Number in regional boundry line indicates elevation in feet at that location 7234
Sub-regional boundry
Sub-regional code identity 23
Elevation in feet of valley floor 1000
Administrative center by code 123
Perennial river
KILOMETERS
0
25
50
75
100
125
150
175
200
N
Rudi Shindand
Harut Rud
aqueduct
Farah Rud
Rudi-Ghar
24
25
26
5000
6250
6109
5371
12634
11158
11404
11680
6745
8040
2000
3000
5000
7000
9000
147
151
152
146
148
154
155
219
215
150
212
210
61°
62°
63°
64°
65°
66°
31°
32°
33°
34

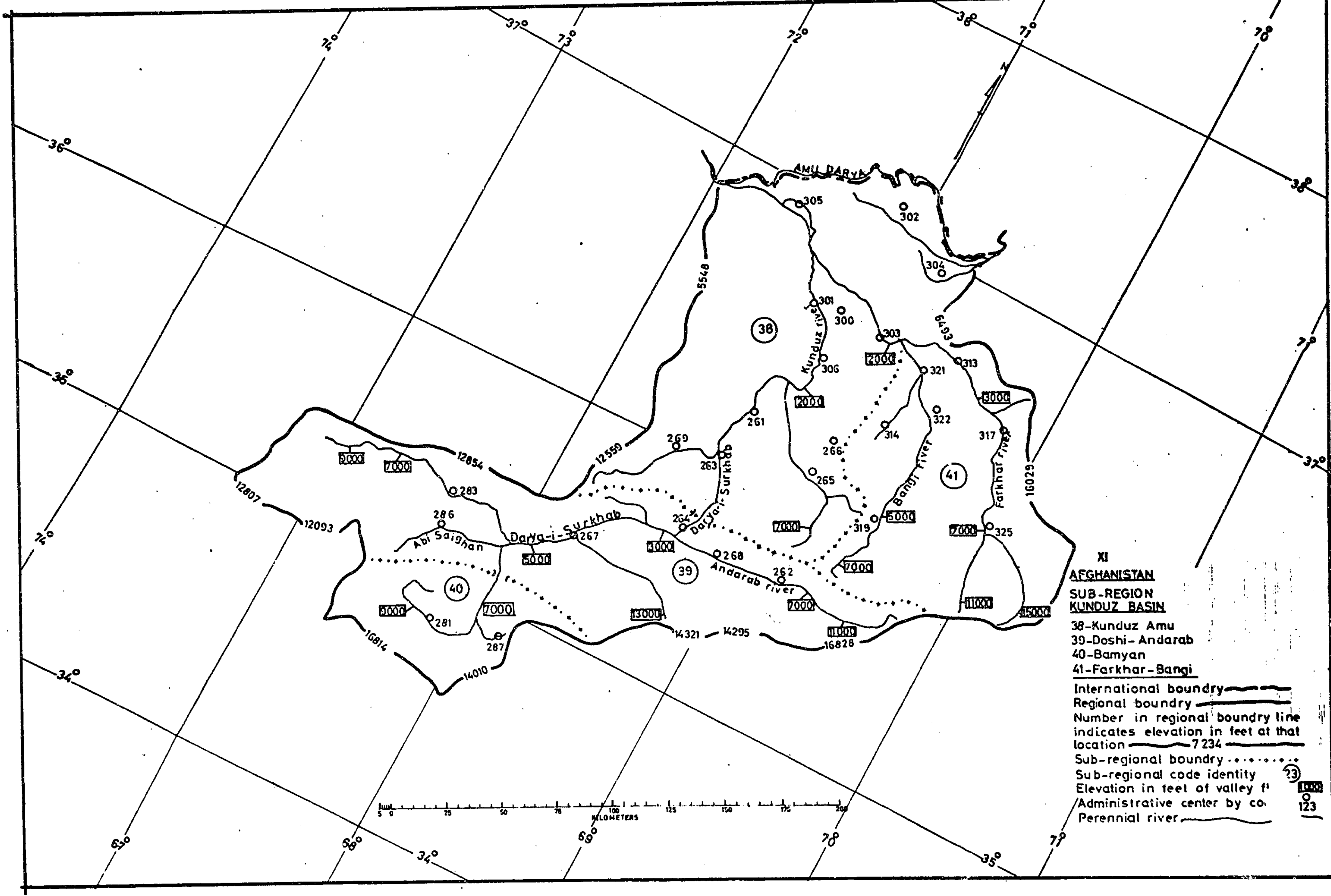

VII
AFGHANISTAN
SUB-REGION
ATESHAN-KAREZAK
NO. adiministrative centers located in this region
International boundry
Regional boundry
Number in regional boundry line indicates elevation in feet at that location 7234
45
6850
6250
6109
5371
N
KILOMETERS
0
25
50
75
100
125
150
175
200
34°
33°
32°
35°
60°
61°
62°
63°

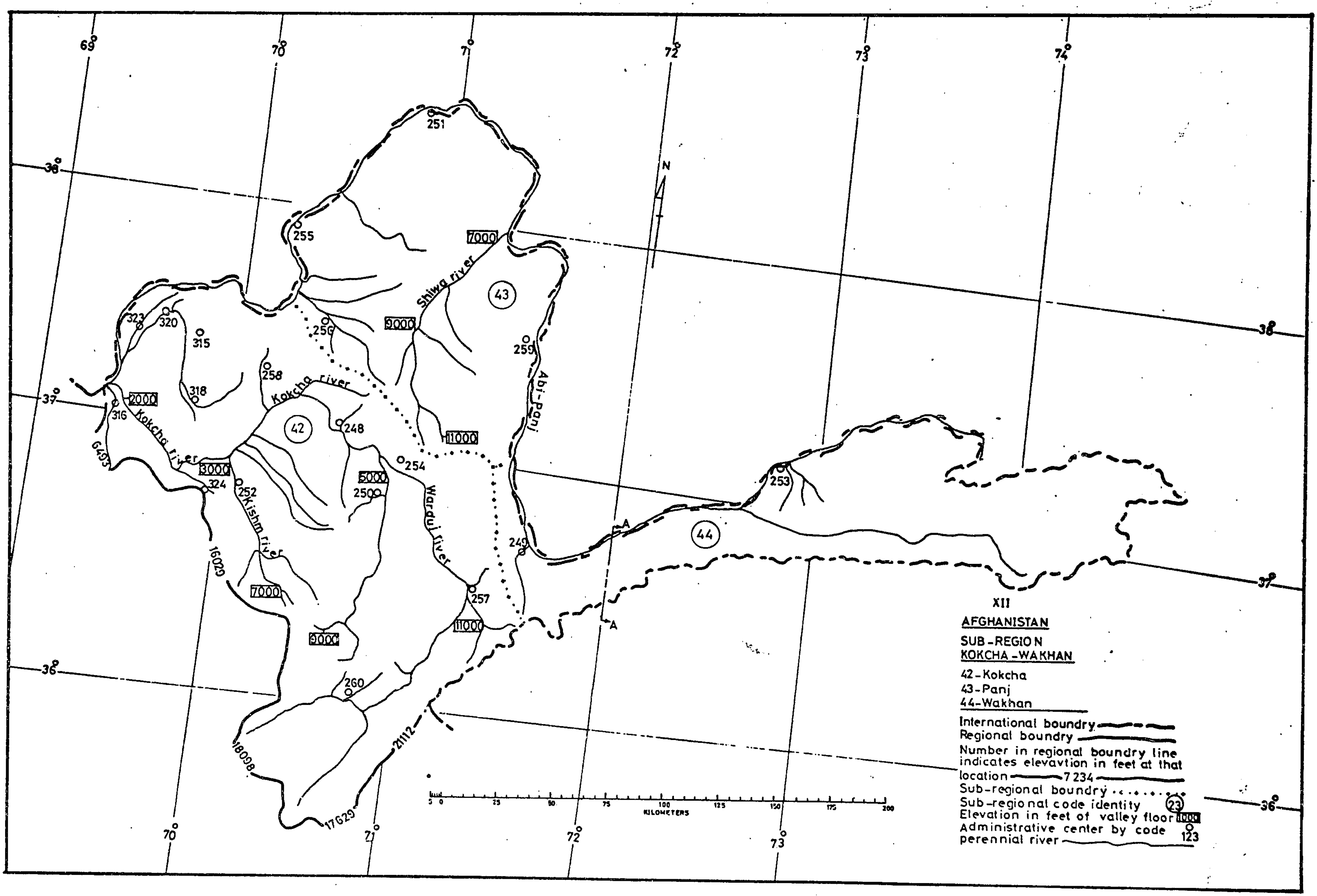

VIII
AFGHANISTAN
SUB-REGION
HARI RUD
27-Chaghcharan
28-Tagab Ushlan
29-Obe
30-Herat
International boundry
Regional boundry
Number in regional boundry line indicates elevation in feet at that location 7234
Sub-regional boundry
Sub-regional code identity 23
Elev. in feet of valley floor 1000
Administrative center by code 123
perennial river
KILOMETERS
Hari-Rud
Hari Rud
Tab Ushlan Rud
Rudi Khamshor
4701
8626
10243
10876
10748
12188
11853
11857
11158
12634
5000
6850
226
222
221
216
217
224
223
220
218
228
209
2140
211
213
3000
5000
7000
9000
11000
61°
62°
63°
64°
65°
66°
35°
34°



IX
AFGHANISTA.I
SUB-REGION
KUSHK-MURGHAB
31-Kushk Rud
32-Kasham
33-Murghab
International boundry
Regional boundry
Number in regional boundry line indicates elevation in feet at that location 7234
Sub-regional boundry
Sub-regional code identity 23
Elevation in feet of valley floor
Administrative center by code 123
Perennial river
Rode Gulran
Rode Shor ab
Joy Darah
Kushk Rud
Dry Kasham
Murghab river
KILOMETERS
4701
8626
10243
3386
9878
12628
12438
13802
10748
10878


AMU DARYA
Kaisir River
Shirin Tagab river
Darya-i-siah
Balkh river
Rudi-Bandi Amir
Rudi Bandi Amir
Darya Khulm
X
AFGHANISTAN
SUB-REGION
KAISAR-SAMANGAN
34-Kaisr-Shirintagab
35-Darya-i-siah
36-Balkh Bandi Amir
37-Samangan
International boundry
Regional boundry
Number in regional boundry line indicates elevation in feet at that location 7234
Sub-regional boundry
Sub-regional code identity 23
Elevation in feet of valley floor 1000
Perennial river
KILOMETERS


XI
AFGHANISTAN
SUB-REGION
KUNDUZ BASIN
38-Kunduz Amu
39-Doshi-Andarab
40-Bamyan
41-Farkhar-Bangi
International boundry
Regional boundry
Number in regional boundry line indicates elevation in feet at that location 7234
Sub-regional boundry
Sub-regional code identity
Elevation in feet of valley f'
Administrative center by co.
Perennial river
KILOMETERS
AMU DARYA
Kunduz river
Bangi river
Farkhar river
Darya-i-Surkhab
Andarab river
Abi Saighan



XII
AFGHANISTAN
SUB-REGION
KOKCHA-WAKHAN
42-Kokcha
43-Panj
44-Wakhan
International boundry
Regional boundry
Number in regional boundry line indicates elevavtion in feet at that location 7234
Sub-regional boundry
Sub-regional code identity 23
Elevation in feet of valley floor 1000
Administrative center by code 123
perennial river
KILOMETERS
N
Shiwa river
Abi-Panj
Kokcha river
Warduj river
Kishm river
42
43
44
7000
9000
11000
5000
2000
3000
251
255
256
258
259
248
254
249
257
253
252
250
260
315
318
320
323
316
324
6403
16029
18098
17629
21112
69°
70°
71°
72°
73°
74°
36°
37°
38°

Exhibit 5.2.0.3

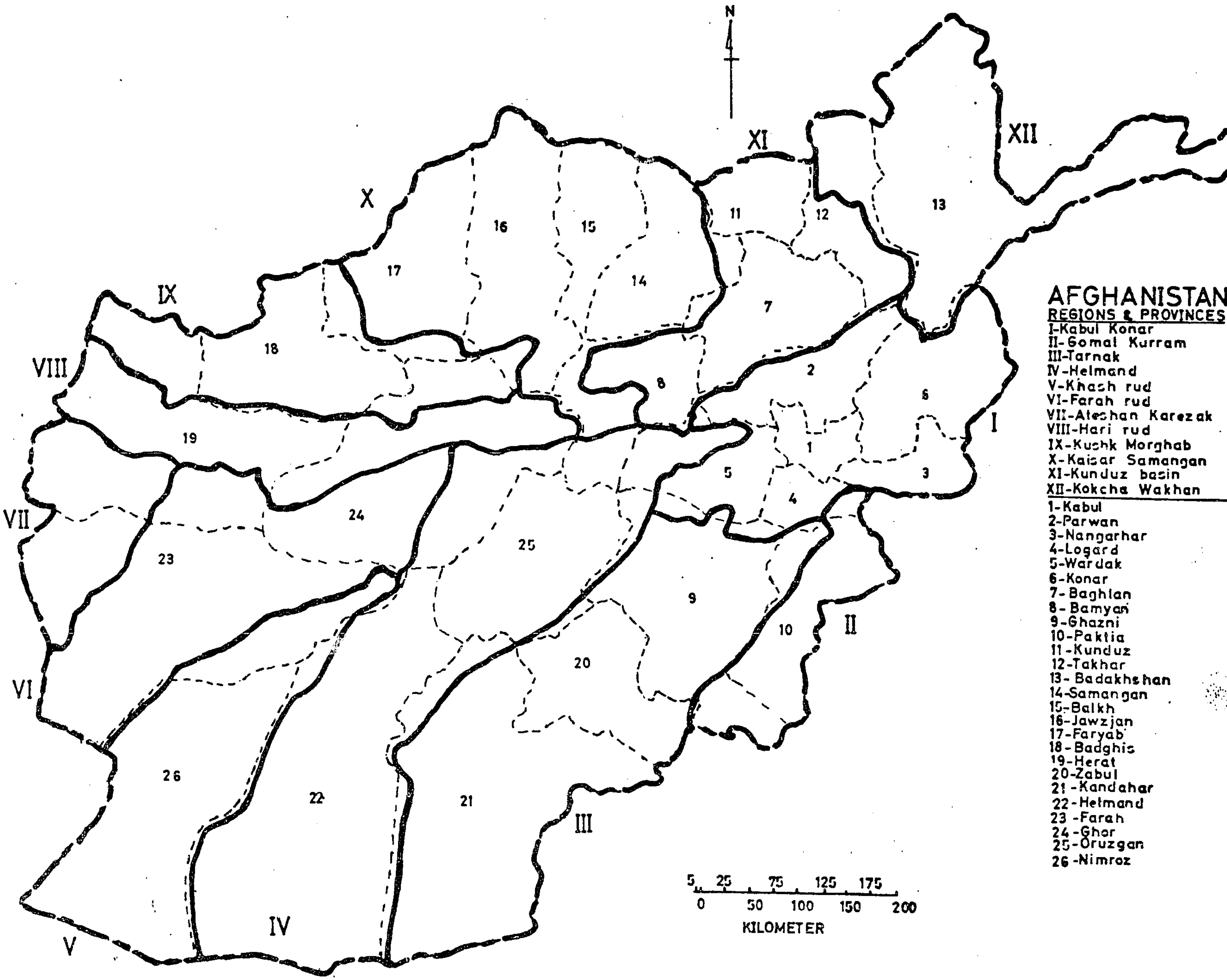
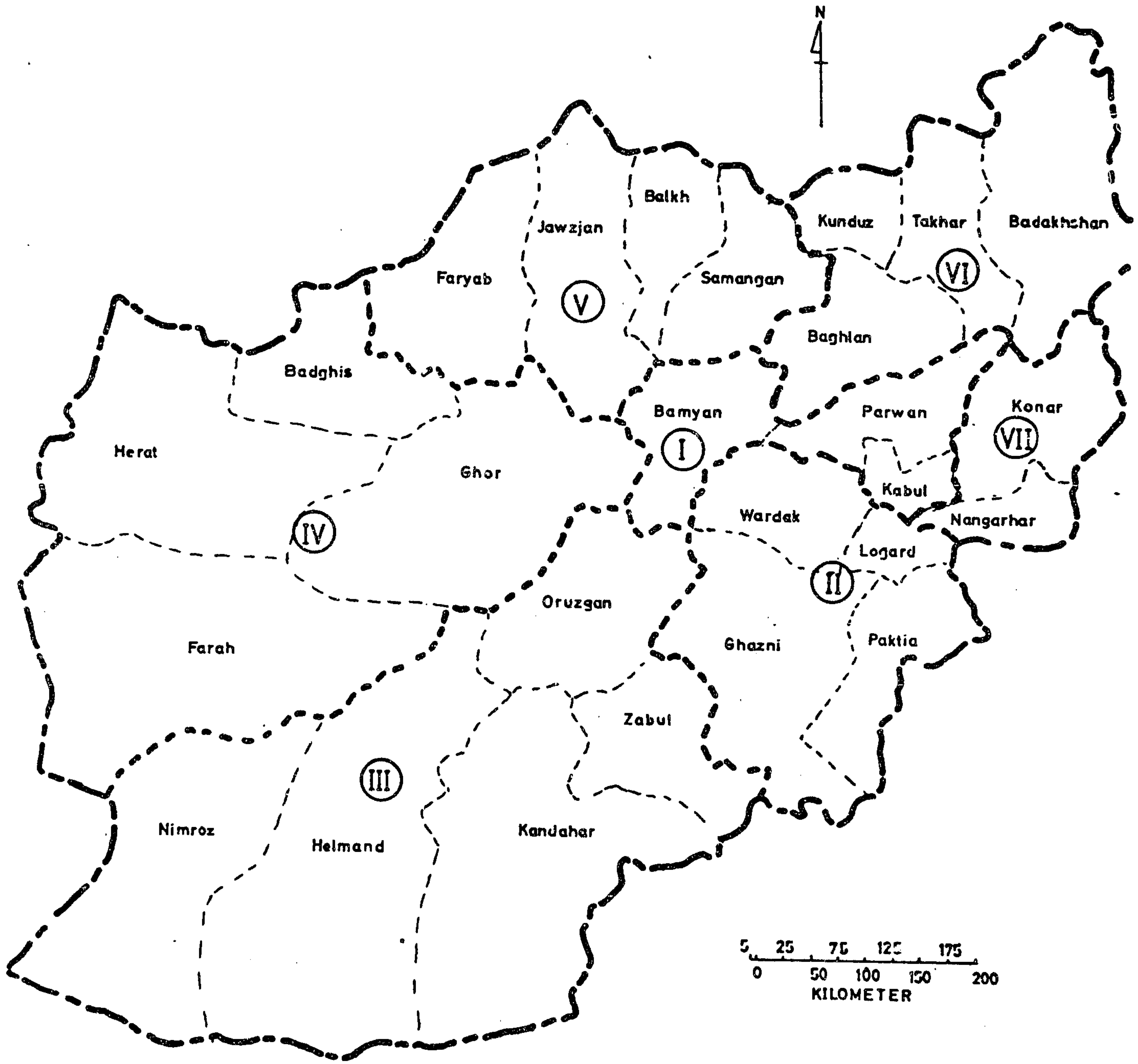


Exhibit 5.2.0.4



AFGHANISTAN
BY ADMINISTRAIVE REGIONS AND PROVINCES

I-NORTH KABUL
Kabul
Parwan
Bamyan

II-SOUTH KABUL
Ghazni
Paktia
Wardak
Logard

III-KANDAHAR
Kandahar
Oruzgan
Zabul
Helmand
Nimroz

IV-HERAT
Herat
Ghor
Badghis
Farah

V-MAZAR
Faryab
Jawzjan
Balkh
Samangan

VI-KUNDUZ
Kunduz
Baghlan
Takhar
Badakhshan

VII-JALALABAD
Nangarhar
Konar

boundaries tend to follow ridge lines and presumably the province boundaries as a collection of administrative centers should do the same. There may, therefore, be a discrepancy in the province boundary maps that are available or the base map used in producing the province boundary maps may be different from the base map used in this study, i.e. the Operational Navigation Charts.[1] The indicated boundary differences between the twelve regions and the twenty-six provinces are shown on the map, Exhibit 5.2.0.3.

A map, Exhibit 5.2.0.4., showing the seven Administration Regions and twenty-six provinces of Afghanistan, is also included.

5.3. Boundary Content

In order to utilize the boundary system of the 45 sub-regions, they need to be quantified in terms of their production of crops, livestock and other resources. The data for this purpose has been obtained from published and unpublished reports relating to the 325 administrative centers or selected major centers in the sub-divisions. The grouping of the administrative centers within the sub-regions is given in the following table, Exhibit 5.3.0.1., according to place name and the identification code numbering system developed by the Afghan Demographic Studies Staff.[2] Some changes in their code numbers are being made due to the change from 28 to 26 provinces, but they are not yet available in published form.

The 371 line headings in the following tables are reduced for data presentation to the 45 sub-regional headings and a total for the country. The work sheets for the 325 administrative centers are not included in this study report, but may be made available at a later date in duplicated form.

EXHIBIT 5.3.0.1.

AFGHAN WATERSHED BOUNDARIES BY REGIONS, SUB-REGIONS AND BY LISTING OF ADMINISTRATIVE CENTER PLACE NAMES

Code	Descriptive Names
0100.	**KABUL-KONAR REGION**
0101.	Upper Kabul Sub-region
001.0101*	Kabul City
002.0102	Bagrami
003.0108	Paghman
004.0104	Chardehi
005.0106	Dehsabz
006.0107	Sorobay
007.0109	Shakardara
008.0112	Quarabagh
009.0110	Mirbachakot
010.0113	Istalef
011.0103	Kakejabar
013.0111	Kalakan
016.0202	Tagab
018.0206	Negrab
019.0203	Alasai
070.0304	Bagram
076.0305	Kohesafi
078.0401	Maydan
084.0402	Jalrez
086.0403	Nerkh
0102.	Logar Sub-region
012.0105	Charasyab
042.0501	Baraki
044.0506	Kolanghar
045.0504	Mohammadaqha
046.0503	Charkh
047.0502	Khoshi
081.0404	Chak Wardak
082.0408	Saydabad
085.0405	Day Mirdad
097.0605	Nawar
0103.	Panjisher Sub-region
014.0201	Mohmudi Ragi
015.0207	Panjsher
017.0204	Kohestan
020.0208	Chargria
021.0209	Dara Hazara
022.0205	Koband
071.0306	Jabullussaraj
074.0307	Salang
0104.	Shibar Sub-region
069.0301	Charikar
072.0308	Surkhe Parsa
073.0302	Ghorband
075.0309	Shekhali
077.0303	Shenwar
0105.	Alishing-Alingar Sub-region
036.0901	Laghman
037.0905	Ali Sheng
038.0904	Alingar
039.0902	Qarghai
040.0906	Nurestan
041.0903	Kache Aziz
0106.	Konar Pach Sub-region
023.1001	Chaghasaray
024.1007	Bar Konar
025.1013	Pech
026.1011	Chowki
027.1006	Khas Konar
028.1008	Sarkani
029.1009	Kamdesh
030.1010	Bargematal
031.1003	Badeel

* The last four digits refer to the Afghan Demographic Studies code system. Other digits refer to location code system on maps developed and used by Checchi and Company in this Agri-business Research Study.

Code	Descriptive Names
032.1002	Chapa Dara
033.1004	Naray
034.1012	Nur Gal
035.1005	Dangam

0107. Jalalabad Sub-region

Code	Descriptive Names
043.0505	Azra
048.0801	Jalalabad
049.0811	Achen
050.0816	Hesarak
051.0810	Deh Bala
052.0805	Rodat
053.0814	Surkhrod
054.0812	Kama
055.0819	Khugakhel
056.0802	Shenwar
057.0807	Mohmand Dara
058.0806	Chaprahar
059.0815	Behsud
060.0813	Goshta
061.0804	Patikot
062.0820	Pacher
063.0821	Sharzad
064.0817	Kuzkonar
065.0818	Dara Nur
066.0808	Lalpur
067.0809	Nazyan
068.0803	Dur Baba

0200. GOMAL-KURRAM REGION

0208. Kurram Sub-region

Code	Descriptive Names
114.0719	Jaji
116.0721	Janikhel
117.0728	Chamkani
125.0720	Ahmad Khel
130.0729	Patan
132.0713	Daradarang
141.0730	Lacha

0209. Kaitu-Matun Sub-region

Code	Descriptive Names
112.0702	Urgun
113.0714	Tani
115.0734	Jaji Maydan
118.0709	Khost
120.0707	Sapra
123.0717	Mosakhel
124.0724	Wazijadran
127.0726	Bargi
128.0735	Bak
129.0706	Barmal
131.0712	Terezay
133.0708	Zirok
134.0723	Sarobi
136.0725	Swak
137.0711	Sabari
138.0718	Khalandar Khail
139.0715	Guriz
140.0705	Gayan
143.0710	Mandozai
144.0716	Nadarshkot
145.0703	Naka

0210. Gomal Sub-region

Code	Descriptive Names
098.0623	Wazakhwa
107.0733	Warmal
122.0722	Gomal

0300. TARNAK REGION

0311. Ghazni-Gardez Sub-region

Code	Descriptive Names
083.0409	Jaghate
087.0601	Ghazni
088.0613	Andar
090.0606	Jaghatu
091.0621	Sharan
092.0609	Qarabagh
094.0616	Katawaz
096.0615	Nawa
099.0612	Awband
100.0620	Omna
101.0618	Janikhel
102.0604	Khwaga Umri
103.0619	Khoshmand
104.0603	Dehak
105.0602	Zena Khan

Code	Descriptive Names
106.0614	Giru
109.0617	Yahyakhel
110.0622	Yosufkhel
111.0701	Gardez
119.0731	Zurmat
121.0727	Sayd Karam
126.0733	Arma
135.0711	Saroti
142.0732	Matakhan

0312. Tarnak Sub-region

095.0610	Moqor
108.0611	Gilan
169.2401	Kandahar
175.2404	Dand
181.2405	Daman
200.2501	Kalat
202.2502	Jaldak
204.2504	Shahjoy

0313. Arghandab Sub-region

089.0607	Jaghori
093.0608	Malestan
171.2412	Arghandab
173.2413	Panjwai
174.2407	Khakrez
176.2415	Dahla
180.2414	Maywand
201.2505	Arghandab
203.2506	Daychupon
207.2503	Mizan

0314. Arghestan Sub-region

170.2406	Arghestan
179.2416	Maruf
205.2507	Shemkay
206.2509	Shamalzai
208.2508	Atgar

0315. Dari Rud Sub-region

172.2402	Spinboldak
177.2410	Shorabak
178.2411	Karez
182.2403	Shegay

Code	Descriptive Names

0400. HELMAND REGION

0416. High Helmand Sub-region

079.0406	Behsud I
080.0407	Behsud II
282.2806	Panjaw
284.2807	Waras

0417. Nawa Batur Sub-region

192.2607	Ajrestan
197.2605	Sharestan
199.2608	Gezab

0418. Tirin-kaj Sub-region

184.2409	Nesh
191.2601	Tarinkot
193.2602	Oruzgan
194.2606	Chora
195.2604	Daykundi
196.2603	Darawad
198.2609	Kajran

0419. Kajaky Sub-region

156.2301	Lashkargah
157.2312	Baghran
160.2305	Musakala
161.2310	Nadi Ali
162.2311	Nawah Bara
163.2307	Nawzad
164.2303	Nahre Saraj
166.2304	Sangin
167.2306	Kajaky
183.2408	Ghorak

0420. Garmser Sub-region

158.2313	Dishu
159.2309	Garmser
165.2302	Registan

0500. KHASH RUD REGION

0521. Khuspash Sub-region

149.2106	Bakwa
153.2109	Gulestan

Code	Descriptive Names
0522.	Upper Khash Rud Sub-region
168.2308	Washere
0523.	Lower Khash Rud Sub-region
185.2201	Zarang
186.2205	Charbarjak
187.2206	Juween
188.2203	Chakhansur
189.2204	Kashrod
190.2202	Kurki
0600.	FARAH RUD REGION
0624.	Lower Farah Rud Sub-region
146.2101	Farah
148.2107	Balabolak
154.2102	Khake Safed
0625.	Upper Farah Rud Sub-region
150.2110	Purchaman
210.2707	Pasaband
212.2705	Tewarah
215.2703	Saghar
0626.	Harut Rud Sub-region
147.2105	Anardara
151.2103	Shindand
152.2108	Qalikhan
155.2104	Faras
219.2013	Adraskan
0700.	ATESHAN-KAREZAK REGION
0745.	No sub-regions or administrative centers
0800.	HARI RUD REGION
0827.	Chaghcharan Sub-region
209.2701	Chaghcharan
214.2706	Sarjangal

Code	Descriptive Names
0828.	Tagab Ushlan Sub-region
211.2704	Tulak
213.2702	Shahrak
0829.	Obe Sub-region
218.2008	Obe
228.2009	Cheshte Sharif
0830.	Herat Sub-region
216.2001	Herat
217.2002	Enjil
220.2004	Pashtoon Zarghoon
221.2011	Zendajan
222.2007	Ghoryan
223.2010	Karokh
224.2003	Gozara
226.2012	Kohsan
0900.	KUSHK-MURGHAB REGION
0931.	Kushk Rud Sub-region
225.2006	Kushk
227.2005	Gulran
234.1902	Kushke Kohna
0932.	Kashan Sub-region
229.1901	Qala Naw
232.1905	Qades
0933.	Murghab Sub-region
230.1906	Jawand
231.1904	Ghormach
233.1903	Murghab
246.1807	Kohestan
1000.	KAISAR-SAMANGAN REGION
1034.	Kaisar-Shirintagab Sub-region
235.1801	Maymana
236.1802	Andkhoy
237.1809	Belcheragh

Code	Descriptive Names
238.1806	Pashtoon Kot
239.1812	Darzab
240.1813	Dawlatabad
241.1810	Shirintagab
242.1811	Qaysawr
243.1808	Almar
244.1803	Khane Charbagh
245.1805	Qaramqul
247.1804	Qurghan

1035. Darye-i-Siah Sub-region

288.1701	Sheberghan
290.1704	Sarepul
291.1702	Sang Charak
298.1705	Kohestanat

1036. Balkh Band-i-Amir Sub-region

270.1601	Mazar-i-Sharif
271.1602	Balkh
272.1611	Chemtal
273.1610	Charbolake
274.1606	Dawlatabad
275.1609	Shortepa
276.1607	Sholgara
277.1603	Nahre Shahi
278.1605	Charkent
279.1604	Dehdadi
280.1608	Khesende
285.2805	Yekawlang
289.1706	Aqcha
292.1710	Qarqin
293.1712	Mengajek
294.1703	Balkab
295.1709	Khanaqah
296.1711	Khamab
297.1708	Faizabad
299.1707	Mardyan
308.1502	Darae Souf

1037. Samangan Sub-region

307.1501	Samangan
309.1503	Khulm

Code	Descriptive Names
310.1506	Roey Doab
311.1505	Hazarate Sultan
312.1504	Kaldar

1100. KUNDUZ BASIN REGION

1138. Kunduz Amu Sub-region

261.1301	Baghlan
263.1302	Pule-Khumri
265.1307	Nahrin
266.1308	Burka
269.1303	Dahani Ghori
300.1401	Kunduz
301.1407	Chardara
302.1403	Emam Saheb
303.1404	Khanabad
304.1405	Archi
305.1406	Qalizal
306.1402	Aliabad

1139. Doshi-Andarab Sub-region

262.1309	Andarab
264.1304	Doshi
267.1305	Tala-wa-Barfak
268.1306	Khenjan
283.2803	Kahmard
286.2804	Sayghan

1140. Bamiyan Sub-region

281.2801	Bamiyan
287.2802	Shibar

1141. Farkhar-Bangi Sub-region

313.1201	Taloqan
314.1204	Eshkamesh
317.1310	Khost wa Freng
319.1210	Farkhar
321.1205	Bangi
322.1206	Chal
325.1211	Warsaj

Code	Descriptive Names
1200.	**KOKCHA-WAKHAN REGION**
1242.	**Kokcha Sub-region**
248.1101	Fayzabad
250.1106	Jurm
252.1112	Keshem
254.1107	Baharak
257.1110	Zebak
258.1103	Shahre Bozurg
260.1108	Koranomunjan
315.1207	Chahab
316.1203	Khwajaghar
318.1202	Rustaq
320.1208	Yangi Qala
323.1209	Darqad
324.1212	Kalafgan
1243.	**Panj Sub-region**
251.1104	Darwaz
255.1105	Khawhan
256.1102	Ragh
259.1111	Shaghnan
1244.	**Wakhan Sub-region**
249.1109	Eshkashem
253.1113	Wakhan

5.4. Resources Inventory and Analysis

The principal resources of interest in this study involve people, land, agricultural production, roads and water. Data on these subjects by sub-regions are included in the following Exhibit tables. Data on other resources such as schools, health services, minerals, electric power, etc. have been gathered as available on work sheets but are not included in this report. In addition, however, agricultural production in the form of crops and livestock has been evaluated in terms of prices to give relative farm value income by sub-regions. Market prices were obtained by interviews with traders operating between the sub-regions and Kabul or other major urban centers. These market prices were then reduced to estimated farm-gate prices on the basis of information obtained from the same interviews and interviews with other persons informed on the subject. The aggregate farm value built up in this detailed manner was checked and proved compatible with the national income accounts for the agricultural sector.

The above inventory data and information were analyzed to show per capita results in each category of information, which are then used to give a relative ranking to each sub-region. Each category is ranked separately from 1-45 so that the lower the number, the more of the particular resource is available per person in the sub-region. The sum factor of the individual rankings as a partially weighted line total is an indicator of the potential well-being of the people in the sub-region.

Programs and projects to help the poorest areas should thus be started first in those sub-regions with the highest number indicator. The second step in this approach is to survey the selected sub-region(s) in greater detail with emphasis on the data and information needed by specific projects. This method is in contrast to similar efforts to survey and maintain current detailed information on all sub-regions simultaneously. Such broad approaches tend to break down for two reasons. One, the sheer volume of work is costly and, two, the general inability to carry on projects in so many areas is discouraging to the local people who answer survey questions and then find no project implementation can be carried out. The selected sub-region approach as recommended needs up-dating only at long intervals and so releases personnel and funds for a more concentrated effort at those points where projects are most to be encouraged.

Five important measures have been selected as representative in evaluating resource location for agri-business purposes and in identifying areas most in need of attention if rural per capita income and employment are to be improved. The first is people and population distribution as the central theme of interest. Immediately coupled with this is the second, the land occupied and utilized for agricultural purposes. The land and, therefore, the people depend on the supply of the water which, in arid Afghanistan, is a tyrannical master and is the third measure. The fourth measure is roads or the effective access and egress to and from the land by the people and their products. The effectiveness of these combined factors is measured by the fifth factor, production of crops and livestock related to the rest of society in terms of the farm value of production.

The estimated population of Afghanistan used in this study is 14.7 million not including some 2.0 million "kuchio" nomads, Exhibit 5.4.0.1. A Preliminary

EXHIBIT 5.4.0.1.

AGRICULTURAL RESOURCES & INCOME
(1) POPULATION BY SUB-REGION

Code	Sub-region	Population Total (in thousands)	Non-agri. (in thousands)	Agriculture (in thousands)	Villages (number)	Administrative centers (number)
0101	Upper Kabul	1,835	900	935	724	20
0102	Logar	520	75	445	644	10
0103	Panjsher	522	118	404	330	8
0104	Shibar	412	141	271	142	5
0105	Alishing-Alingar	233	93	140	236	6
0106	Konar-Pach	371	109	262	292	13
0107	Jalalabad	935	369	566	616	22
0208	Kurram	134	39	95	152	7
0209	Kaitu-Matun	532	80	452	463	21
0210	Gomal	65	23	42	194	3
0311	Ghazni-Gardez	915	267	648	1,596	24
0312	Tarnak	452	175	277	610	8
0313	Arghandab	452	22	430	505	10
0314	Arghestan	226	47	179	628	5
0315	Dari Rud	160	68	92	58	4
0416	High Helmand	367	108	259	130	4
0417	Nawa Batur	140	21	119	173	3
0418	Tirin-kaj	413	154	259	389	7
0419	Kajaki	264	57	207	630	10
0420	Garmser	61	33	28	39	3
0521	Khushpasa	30	2	28	104	2
0522	Upper Khash Rud	22	8	14	41	1
0523	Lower Khash Rud	128	9	119	602	6
0624	Lower Farah Rud	117	8	109	123	3
0625	Upper Farah Rud	204	36	168	235	4
0626	Harut Rud	146	6	140	311	5
0745	Ateshan Karezak	na	na	na	na	na
0827	Chaghcharan	116	29	87	640	2
0828	Tagab Ushlan	94	37	57	167	2
0829	Obe	91	63	28	99	2

EXHIBIT 5.4.0.1. (cont.)

Code	Sub-region	Total	Non-agri. (in thousands)	Agriculture	Villages (number)	Administrative centers
0830	Herat	466	121	345	690	8
0931	Kushk Rud	156	11	145	327	3
0932	Kashan	142	29	113	166	2
0933	Murghab	188	51	137	204	4
1034	Kaisar-Shirintagab	438	131	307	351	12
1035	Darya-i-Siah	175	25	150	336	4
1036	Balkh Bandi Amir	795	261	534	850	21
1037	Samangan	176	78	98	287	5
1138	Kunduz Amu	879	219	660	537	12
1139	Doshi Andarab	360	154	206	136	6
1140	Bamiyan	85	14	71	95	2
1141	Farkhar Bangi	281	62	219	505	7
1242	Kokcha	457	64	393	808	13
1243	Panj	92	6	86	110	4
1244	Wakhan	53	7	46	43	2
Total	Afghanistan	14,700	4,330	10,370	16,335	325

Note: Kuchie nomads estimated at 2.0 million are not included above.

Source: Total population: Ministry of Planning; other data: Ministry of Agriculture and Irrigation.[3]

Agricultural Census of Afghanistan[3] shows an agricultural population of 10.37 million for the period of 1967-68. Thus, by difference, the non-agricultural population is approximately 30 percent of the settled population. The settled population is divided among some 16,338 villages and 325 administrative centers.

The land utilized by the agricultural population in various productive ways including forestry and pasturage amounts to 67.3 million jeribs, which is equivalent to 32.6 million acres or 50,720 square miles out of an approximate 250,000 square mile total, Exhibit 5.4.0.2. On the basis of such data, the low population density of 290 per square mile of productive land is used to suggest considerable room for population expansion before serious over-population as in neighboring countries takes place. If, however, the real limiting factor of water is fully taken into account, then this optimistic point of view requires serious reconsideration because irrigated land amounts to only 9,515 square miles. To this figure we can add the land used for dry farming, if we adjust the yield which is about one-fifth of that for irrigated land. Thus, the real land-water resource for food and industrial crops is about 11,400 square miles and the working population density now rises to 1,285 per square mile. The pasture and forest land of some 31 thousand square miles provides some opportunity for expansion but at a cost in pressure on livestock and future forest products. In any case, settling farmers on such land does not increase the water supply or increase beneficial crop yields for farm income.

The irrigation water system of Afghanistan following the multiplicity of topographical features and small islands of arable land is similarly diverse and complex. To irrigate the 9,515 square miles of crop land requires at present

EXHIBIT 5.4.0.2.

AGRICULTURAL RESOURCES & INCOME
(2) AGRICULTURAL LAND BY SUB-REGION

Code	Sub-region	Total productive land	Cultivated Land: Total	Cultivated Land: Irrigated land	Cultivated Land: Dry land	Pasture & forest
		(in thousands of jeribs)				
0101	Upper Kabul	734	595	416	179	139
0102	Logar	648	353	211	142	295
0103	Panjsher	258	209	168	41	49
0104	Shibar	240	163	131	32	77
0105	Alishing-Alingar	495	179	162	17	316
0106	Konar-Pach	1,886	159	126	33	1,727
0107	Jalalabad	1,522	680	406	274	842
0208	Kurram	1,825	36	27	9	1,789
0209	Kaitu-Matun	1,316	343	183	160	973
0210	Gomal	134	36	10	26	98
0311	Ghazni-Gardez	2,500	728	372	356	1,772
0312	Tarnak	953	551	347	204	402
0313	Arghandab	1,189	753	475	278	436
0314	Arghestan	706	299	225	74	407
0315	Dari Rud	681	158	59	99	523
0416	High Helmand	485	195	139	56	290
0417	Nawa Batur	883	249	198	51	634
0418	Tirin-Kaj	1,932	524	425	99	1,408
0419	Kajaki	1,045	544	440	104	501
0420	Garmser	515	319	264	55	196
0521	Khushpash	276	55	40	15	221
0522	Upper Khash Rud	46	25	19	6	21
0523	Lower Khash Rud	1,488	1,311	323	988	177
0624	Lower Farah Rud	1,800	365	291	74	1,435
0625	Upper Farah Rud	467	263	120	143	204
0626	Harut Rud	1,094	376	244	132	718
0745	Ateshan Karezak	na	na	na	na	na
0827	Chaghcharan	1,484	373	62	311	1,111
0828	Tagab Ushlan	670	192	68	124	478
0829	Obe	1,076	847	809	38	229

EXHIBIT 5.4.0.2. (cont.)

Code	Sub-region	Total productive land	Cultivated Land: Total	Cultivated Land: Irrigated land	Cultivated Land: Dry land	Pasture & forest
		(in thousands of jeribs)				
0830	Herat	1,819	1,078	633	445	741
0931	Kushk Rud	1,267	924	75	849	343
0932	Kashan	1,328	308	55	253	1,020
0933	Murghab	2,788	451	93	358	2,337
1034	Kaisar-Shirintagab	5,043	1,572	573	999	3,471
1035	Darya-i-Siah	2,497	934	384	550	1,563
1036	Balkh Bandi Amir	7,600	2,649	1,625	1,024	4,951
1037	Samangan	2,903	724	231	493	2,179
1138	Kunduz Amu	5,277	2,852	1,439	1,413	2,425
1139	Doshi Andarab	1,376	134	75	59	1,242
1140	Bamiyan	342	34	25	9	308
1141	Farkhar Bangi	2,322	1,027	216	811	1,295
1242	Kokcha	3,139	1,413	306	1,107	1,726
1243	Panj	989	333	68	265	656
1244	Wakhan	261	107	67	40	154
Total	Afghanistan	67,299	25,420	12,625	12,795	41,879
	In square miles	50,719	19,157	9,515	9,643	31,564

Source: Ministry of Agriculture and Irrigation.[3]

some 28,500 man-made or constructed jules, canals, karezes and wells, Exhibit 5.4.0.3. That is, every third of a square mile or 213 acres of land must on the average support the construction and maintenance of its own separate irrigation works. In the same context, these water systems drive many small grain mills. More and more of these mills are being driven by small internal combustion engines but these, together with the water-driven mills, add up to some 18,400 in Afghanistan and give an indication of the small, widely dispersed agri-business technology required for success under Afghan conditions.

The paved or surfaced road system is extremely limited with only some 2,400 kilometers of such highways in a country of over 640 thousand square kilometers in area. Even when 4,280 kilometers of dirt and gravel roads suitable for regular motor transportation are added, the ratio of roads (in miles) is an unimpressive 0.217 miles of road to square miles of cultivated land, and places Afghanistan near the bottom of the list of countries of the world in this respect.

The production of agricultural crops is estimated at 6.36 million metric tons average in the years 1347-48. The livestock production is not reduced to a weight basis but is estimated at 16.[illegible] million head including poultry. See Exhibit 5.4.0.4. The average crop yield based on the equivalent 11,400 square miles of cultivated land (one-fifth of cultivated dryland added to irrigated land) or 7.3 million acres gives about 1,920 pounds of crops per acre. This figure indicates a good degree of productivity and skill considering the low level of fertilizer and insecticides in use in Afghanistan during the data period.

EXHIBIT 5.4.0.3.

AGRICULTURAL RESOURCES & INCOME
(3) (4) WATER AND ROADS BY SUB-REGION

Code	Sub-region	Irrigation Water sources: Juies & canals	Irrigation Water sources: Karezes & wells	Small grain mills	Market roads[1]: Paved Hwy.	Market roads[1]: Motor transport	Miles of roads per sq. mi. of cultivated land
		(number)			(kilometers)		
0101	Upper Kabul	659	859	1,009	225	95	.485
0102	Logar	1,057	422	743	149	10	.371
0103	Panjsher	213	87	583	36	--	.142
0104	Shibar	142	4	502	--	98	.496
0105	Alishing-Alingar	48	--	560	25	30	.254
0106	Konar-Pach	290	13	681	--	75	.389
0107	Jalalabad	533	492	1,027	80	35	.139
0208	Kurram	130	204	208	--	12	.277
0209	Kaitu-Matun	450	479	542	--	110	.265
0210	Gomal	80	277	30	--	15	.343
0311	Ghazni-Gardez	1,285	2,399	1,118	100	333	.490
0312	Tarnak	359	774	231	255	--	.382
0313	Arghandab	890	555	617	100	95	.214
0314	Arghestan	412	496	171	25	--	.069
0315	Dari Rud	--	69	14	70	--	.365
0416	High Helmand	391	10	780	--	125	.529
0417	Nawa Batur	291	9	392	--	80	.265
0418	Tirin-kaj	513	330	874	--	128	.201
0419	Kajaki	316	338	460	90	197	.435
0420	Garmser	47	--	33	--	145	.375
0521	Khushpash	80	251	41	52	50	1.531
0522	Upper Khash Rud	--	35	23	50	25	2.479
0523	Lower Khash Rud	195	159	133	--	330	.208
0624	Lower Farah Rud	116	1,324	74	125	110	.531
0625	Upper Farah Rud	361	7	229	--	65	.204
0626	Harut Rud	176	1,149	188	90	187	.607
0745	Ateshan Karezak	na	na	na	na	na	na
0827	Chaghcharan	802	260	200	--	65	.144
0828	Tagab Ushlan	282	1	90	--	60	.258
0829	Obe	98	104	205	--	75	.073

Code	Sub-region	Irrigation Water sources: Juies & canals	Irrigation Water sources: Karezes & wells	Small grain mills	Market roads: Paved Hwy.	Market roads: Motor transport[1]	Miles of roads per sq. mi. of cultivated land
		(number)			(kilometers)		
0830	Herat	276	383	934	202	92	.225
0931	Kushk Rud	90	149	151	63	--	.056
0932	Kashan	31	23	206	--	90	.241
0933	Murghab	119	29	356	--	160	.292
1034	Kaisar-Shirintagab	214	1,798	916	--	160	.084
1035	Darya-i-Siah	313	185	345	52	200	.222
1036	Balkh Bandi Amir	651	497	1,099	182	230	.128
1037	Samangan	65	206	125	107	60	.190
1138	Kunduz Amu	205	55	656	238	243	.139
1139	Doshi Andarab	148	7	345	67	125	1.181
1140	Bamiyan	98	103	169	--	90	2.184
1141	Farkhar Bangi	388	160	369	--	25	.020
1242	Kokcha	402	391	741	--	257	.150
1243	Panj	82	8	205	--	--	--
1244	Wakhan	26	--	68	--	--	--
Total	Afghanistan	13,324	15,161	18,443	2,413	4,282	.217

[1]Unpaved but capable of supporting motor transport as regular traffic.

Sources: Irrigation water sources, Ministry of Agriculture[3] and market roads by measurement on maps[1], and calculation miles of roads per square mile of cultivated land by Checchi and Company.

EXHIBIT 5.4.0.4.

AGRICULTURAL RESOURCES & INCOME
(5) (6) AGRICULTURAL PRODUCTION AND FARM VALUE BY SUB-REGIONS

Code	Sub-region	Agricultural production		Estimated value of production		
		Crops (thousand) (metric tons)	Livestock* (thousand) (head)	Crops	Livestock (million Afs.)	Total
0101	Upper Kabul	257	369	880	417	1,297
0102	Logar	125	394	556	355	911
0103	Panjsher	91	219	378	206	584
0104	Shibar	112	145	403	136	538
0105	Alishing-Alingar	128	214	534	178	712
0106	Konar-Pach	70	94	302	131	433
0107	Jalalabad	338	332	1,274	477	1,751
0208	Kurram	13	55	67	61	128
0209	Kaitu-Matun	90	443	454	432	886
0210	Gomal	10	81	53	121	174
0311	Ghazni-Gardez	236	590	1,245	830	2,075
0312	Tarnak	171	282	781	274	1,055
0313	Arghandab	221	389	831	524	1,355
0314	Arghestan	82	204	320	241	561
0315	Dari Rud	30	118	91	172	263
0416	High Helmand	136	226	433	338	771
0417	Nawa Bahur	7	343	331	350	681
0418	Tirin-kaj	162	381	700	474	1,174
0419	Kajaki	205	392	854	364	1,218
0420	Garmser	106	49	522	58	580
0521	Khushpash	13	43	36	39	75
0522	Upper Khash Rud	10	25	56	20	76
0523	Lower Khash Rud	196	333	1,012	295	1,307
0624	Lower Farah Rud	89	132	272	109	381
0625	Upper Farah Rud	55	179	206	274	480
0626	Harut Rud	102	257	566	289	855
0745	Ateshan Karezak	na	na	na	na	na
0827	Chaghcharan	74	232	290	370	660
0828	Tagab Ushlan	33	169	200	139	339
0829	Obe	51	149	186	148	334

EXHIBIT 5.4.0.4. (cont.)

Code	Sub-region	Agricultural production: Crops (thousand) (metric tons)	Agricultural production: Livestock* (thousand) (head)	Estimated value of production: Crops	Estimated value of production: Livestock (million Afs.)	Estimated value of production: Total
0830	Herat	289	672	1,373	751	2,124
0931	Kushk Rud	123	266	342	357	699
0932	Kashan	41	489	178	650	828
0933	Murghab	67	694	236	1,016	1,252
1034	Kaisar-Shirintagab	266	722	791	1,350	2,141
1035	Darya-i-Siah	209	943	836	1,707	2,543
1036	Balkh Bandi Amir	723	2,454	3,099	4,405	7,504
1037	Samangan	138	577	542	842	1,384
1138	Kunduz Amu	743	970	3,845	1,463	5,308
1139	Doshi Andarab	41	344	201	396	597
1140	Bamiyan	11	130	58	164	222
1141	Farkhar Bangi	146	201	774	297	1,071
1242	Kokcha	203	599	801	761	1,562
1243	Panj	45	166	187	200	387
1244	Wakhan	28	42	89	56	145
Total	Afghanistan	6,356	16,108	27,185	22,236	49,421

*Includes poultry.

Sources: Crop production and livestock inventory, Ministry of Agriculture and Irrigation.[3] New livestock production and value of production obtained by surveys and calculations, Checchi and Company.

EXHIBIT 5.4.0.5. AGRICULTURAL RESOURCES & INCOME
RANKING OF SUB-REGIONS BY PER CAPITA RESOURCES

		Per capita of Agricultural Population								
		Productive land		Irrigated land		Farm value of production		Roads to cult. land		
Code	Sub-region	Jerib	Rank	Jerib	Rank	Afs.	Rank	ratio	Rank	Rank Sum
0101	Upper Kabul	.79	43	.45	38	1,387	43	.485	10	134
0102	Logar	1.46	41	.47	37	2,047	38	.371	15	131
0103	Panjsher	.64	44	.42	39	1,446	42	.142	34	159
0104	Shibar	.89	42	.48	35	1,985	39	.496	8	124
0105	Alishing-Alingar	3.54	32	1.16	21	5,086	18	.254	23	94
0106	Konar-Pach	7.20	24	.48	36	1,653	41	.389	12	113
0107	Jalalabad	2.69	39	.72	26	3,094	32	.139	35	132
0208	Kurram	19.21	4	.28	43	1,347	44	.277	19	110
0209	Kaitu-Matun	2.91	36	.41	40	1,960	40	.265	20	136
0210	Gomal	3.19	35	.24	44	4,143	23	.343	17	119
0311	Ghazni-Gardez	3.86	31	.57	31	3,202	27	.490	9	98
0312	Tarnak	3.44	33	1.25	19	3,809	25	.382	13	90
0313	Arghandab	2.77	38	1.11	22	3,151	29	.214	27	116
0314	Arghestan	3.94	30	1.26	18	3,134	30	.069	40	118
0315	Dari Rud	7.40	23	.64	30	2,859	35	.365	16	104
0416	High Helmand	1.87	40	.54	32	2,977	33	.529	7	112
0417	Nawa Batur	7.42	22	1.66	13	5,723	16	.265	21	72
0418	Tirin-kaj	7.46	21	1.64	14	4,533	21	.201	30	86
0419	Kajaki	5.05	28	2.13	9	5,884	15	.435	11	63
0420	Garmser	18.39	5	9.43	2	20,714	1	.375	14	22
0521	Khushpash	9.86	16	1.43	16	2,679	37	1.531	3	72
0522	Upper Khash Rud	3.29	34	1.36	17	5,429	17	2.479	1	69
0523	Lower Khash Rud	12.50	11	2.71	4	10,983	6	.208	28	49
0624	Lower Farah Rud	16.51	8	2.67	5	3,495	26	.531	6	45
0625	Upper Farah Rud	2.78	37	.71	27	2,857	36	.204	29	129
0626	Harut Rud	7.81	20	1.74	12	6,107	13	.607	5	50
0745	Ateshan Karezak	na	45	na	45	na	45	na	45	180
0827	Chaghcharan	17.06	6	.71	28	7,586	9	.144	33	76
0828	Tagab Ushlan	11.75	12	1.19	20	5,947	14	.258	22	68
0829	Obe	38.43	1	28.89	1	12,071	5	.073	39	46

EXHIBIT 5.4.0.5. (cont.)

		Per capita of Agricultural Population								
		Productive land		Irrigated land		Farm value of production		Roads to cult. land		Rank
Code	Sub-region	Jerib	Rank	Jerib	Rank	Afs.	Rank	ratio	Rank	Sum
0830	Herat	5.27	27	1.84	11	6,157	12	.225	25	75
0931	Kushk Rud	8.74	17	.52	33	4,821	20	.056	41	111
0932	Kashan	11.75	13	.49	34	7,327	10	.241	24	81
0933	Murghab	20.35	3	.68	29	9,139	7	.292	18	57
1034	Kaisar-Shirintagab	16.43	9	1.87	10	6,974	11	.084	38	68
1035	Darya-i-Siah	16.65	7	2.56	6	16,953	2	.222	26	41
1036	Balkh Bandi Amir	14.23	10	3.04	3	14,052	4	.128	37	54
1037	Samangan	29.62	2	2.36	7	14,112	3	.190	31	43
1138	Kunduz Amu	8.00	18	2.18	8	8,042	8	.139	36	70
1139	Doshi Andarab	6.68	25	.36	41	2,898	34	1.181	4	104
1140	Bamiyan	4.82	29	.35	42	3,127	31	2.184	2	104
1141	Farkhar Bangi	10.60	15	.99	23	4,890	19	.020	42	99
1242	Kokcha	7.99	19	.78	25	3,975	24	.150	32	100
1243	Panj	11.50	14	.79	24	4,500	22	--	43	103
1244	Wakhan	5.67	26	1.46	15	3,152	28	--	44	113
Avg.	Afghanistan	6.49		2.45		4,766		.217		

Source: Calculations using Exhibits 5.4.0.1. - 5.4.0.4., Checchi and Company.

The farm value of the above production is estimated at 27.2 million Afs. for crops and 22.2 million Afs. for livestock for a total of 49.4 million Afs. On the basis of seventy-five percent value added in Afghan agriculture, the total estimate is remarkably consistent with the gross national product estimates for the agricultural sector as they appear in the Afghan national accounts.[7]

The distribution of land, irrigation, production farm value, and roads varies between sub-regions. Each sub-region has, therefore, been ranked according to the above resources and income headings on a per capita basis as shown in Exhibit 5.4.0.5.

5.5. Distribution of Agricultural Resources and Income

One of the principal purposes in area development is to identify the more depressed regions or sub-regions in their aggregate form, which is somewhat difficult to do because individual and specific observation can be rather misleading. After all, most areas contain both rich people and poor people and what we are seeking most is the difference in proportion of each. That is, in which sub-regions will the average agricultural per capita resources and income be low and which high?

The work of this chapter as given in its various exhibits is summarized in Exhibit 5.5.0.1. according to the previously discussed factors of population, land, farm value and roads. Of special interest is the use of the sub-region rankings by factors to place these sub-regions in three groups. Thus, the high third of the agricultural population according to its per capita resources and income is placed by sub-regions in the first group, the middle third of the agricultural population in the second group, and the low third of the agricultural population in per capita resources and income by sub-regions appears in the third group. The results of this analytical arrangement are as follows.

Resource & Income	Sub-region Groupings		
	High Third	Middle Third	Low Third
Agricultural population by sub-regions	34.1%	32.5%	33.4%
Number of sub-regions	20	15	10
Productive land, per capita	11.7j	5.8j	1.7j
Irrigated land, per capita	2.32j	0.75j	0.54j
(j = jeribs, 0.482 acres)			
Farm value, per capita in Afs.	8,693	3,406	2,075
Motorable roads, per capita. in centimeters	102	55	28
Non-agricultural population by sub-regions	31.0%	27.7%	41.3%

Clearly there is a poor one-third in the agricultural community of Afghanistan and it is a question of where these sub-regions are and how they are to be reached in face of the recognized lack of roads suitable for regular motor transportation. As a matter of fact, how many people realize the dependence of agriculture on farm-to-market roads and then are prepared to acknowledge that the Afghan agricultural community is asked to prosper and grow on only 65 centimeters of such roads per person? This situation, for agri-business development, borders on the absurd and it is fair to ask how it has come about. The answer is in part traceable to the criteria of donor agencies that require roads to be justified on

EXHIBIT 5.5.0.1. **AGRICULTURAL RESOURCES AND INCOME - SUMMARY OF RESOURCES BY THIRDS OF AGRICULTURAL POPULATION AND BY SUB-REGIONS**

Rank-ing	Code	Sub-region	Rank sum	Agricultural population ('000)	Productive land ('000 jeribs)	Irrigated land ('000 jeribs)	Farm value of production (million Afs.)	Market roads motor transp. (kilometers)	Non-agri. population ('000)
		High Third of Agricultural Population in Per Capita Resources & Income							
1.	0420	Garmser	22	28	515	264	580	145	33
2.	1035	Darya-i-Siah	42	150	2,497	384	2,843	252	25
3.	1037	Samangan	43	98	2,903	231	1,384	167	78
4.	0624	Lower Farah Rud	45	109	1,800	291	381	235	8
5.	0829	Obe	46	28	1,076	869	334	75	63
6.	0523	Lower Khash Rud	49	119	1,488	323	1,307	330	9
7.	0626	Harut Rud	50	140	1,094	244	855	277	6
8.	1036	Balkh Bandi Amir	54	534	7,600	1,625	7,504	412	261
9.	0933	Murghab	57	137	2,788	93	1,252	160	51
10.	0419	Kajaki	63	207	1,045	440	1,218	287	57
11.	1034	Kaisar-Shirintagab	68	307	5,043	573	2,141	160	131
12.	0828	Tagab Ushlan	68	57	670	68	339	60	37
13.	0522	Upper Khash Rud	69	14	46	19	76	75	8
14.	1138	Kunduz Amu	70	660	5,277	1,439	5,308	481	219
15.	0521	Khushpash	72	28	276	40	75	102	2
16.	0417	Nawa Batus	72	119	883	198	681	80	21
17.	0830	Herat	75	345	1,819	633	2,124	294	121
18.	0827	Chaghcharan	76	87	1,484	62	660	65	29
19.	0932	Kachan	81	113	1,328	55	828	90	29
20.	0418	Tirin-kaj	86	259	1,932	425	1,174	128	154
		Sub-total		3,539	41,564	8,[illegible]16	30,764	3,875	1,342
		Percentage		34.1%	61.7%	65.1%	62.3%	57.9%	31.0%
		Per capita		1	11.7j	2.32j	8,693 Afs.	109 cm.	-

EXHIBIT 5.5.0.1. (cont.)

Rank-ing	Code	Sub-region	Rank sum	Agricultural population ('000)	Productive land ('000 jeribs)	Irrigated land ('000 jeribs)	Farm value of production (million Afs.)	Market roads motor transp. (kilometers)	Non-agri. population ('000)
		Middle Third of Agricultural Population in Per Capita Resources & Income							
21.	0312	Tarnak	90	277	953	347	1,055	255	175
22.	0105	Alishing-Alingar	94	140	495	162	712	55	93
23.	0311	Ghazni-Gardez	98	648	2,560	372	2,075	433	267
24.	1141	Farkhar Bangi	99	219	2,322	216	1,071	25	62
25.	1242	Kokcha	100	393	3,139	306	1,562	257	64
26.	1243	Panj	103	86	989	68	387	--	6
27.	1140	Bamiyan	104	71	342	25	222	90	14
28.	1139	Doshi Andarab	104	206	1,378	76	597	192	154
29.	0315	Dari Rud	104	92	681	59	263	70	68
30.	0208	Kurram	110	95	1,825	27	128	12	39
31.	0931	Kushk Rud	111	145	1,267	75	699	63	11
32.	0416	High Helmand	112	259	485	139	771	125	108
33.	0106	Konar Pach	113	262	1,866	126	433	75	109
34.	1244	Wakhan	113	46	261	67	145	--	7
35.	0313	Arghandab	116	430	1,189	475	1,355	195	22
		Sub-total		3,369	19,710	2,539	11,475	1,847	1,199
		Percentage		32.5%	29.3%	20.1%	23.2%	27.6%	27.7%
		Per capita		[illegible]	5.8j	.75j	3,466 Afs.	55 cm.	-

EXHIBIT 5.5.0.1. (cont.)

Rank-ing	Code	Sub-region	Rank sum	Agricultural population ('000)	Productive land ('000 jeribs)	Irrigated land ('000 jeribs)	Farm value of production (million Afs.)	Market roads motor transp. (kilometers)	Non-agri. population ('000)
	Low Third of Agricultural Population in Per Capita Resources & Income								
36.	0314	Arghestan	118	179	706	225	561	25	47
37.	0210	Gomal	119	42	134	10	174	15	23
38.	0104	Shibar	124	271	240	131	538	98	141
39.	0625	Upper Farah Rud	129	168	467	120	480	65	36
40.	0102	Logar	131	445	648	211	911	159	75
41.	0107	Jalalabad	132	566	1,522	408	1,751	115	369
42.	0101	Upper Kabul	134	935	734	416	1,297	350	900
43.	0209	Kaitu-Matun	136	452	1,316	183	886	110	80
44.	0103	Panjsher	159	404	258	168	584	36	118
45.	0745	Ateshan Karezak	[illegible]	na	na	na	na	na	na
		Sub-total		3,462	6,025	1,870	7,182	973	1,789
		Percentage		33.4%	9.0%	14.8%	14.5%	14.5%	41.3%
		Per capita		1	1.7j	.54j	2,075 Afs.	28 cm.	-
		Grand total		10,370	67,299	12,625	49,421	6,695	4,330
		Percentage		100%	100%	100%	100%	100%	100%
		Per capita		1	6.5j	1.22j	4,776 Afs.	65 cm.	-

Note: Percentages will not multiply evenly due to rounding.

the basis of "user cost savings." The purpose of farm-to-market roads is <u>not</u> to save users a fraction of a cent or Afghani per ton kilometer on their hauling bills. The purpose of farm-to-market roads is to increase the motivation to higher yields and income by providing timely access to and from markets. Until transportation experts acknowledge modern economic theory and partial multipliers in their techniques of road evaluation, we shall be forced to hold back on road projects as unjustified even when the poorest third of Afghan agriculture has only 28 centimeters of farm-to-market roads for its per capita use.

As a general result, the value of production of Afghan agriculture was on the average less than 4,800 Afs. per person in the agricultural population during the 1968-69 period analyzed. At 80 Afs. per U.S. dollar, this average is about 60 U.S. dollars a year; at the present exchange rate of 56 Afs. per U.S. dollar (August 1974), the average agricultural per capita income is only a little higher at about 86 U.S. dollars per year. This average is not necessarily equivalent to monetary income as the above figures include the estimated value of agricultural products consumed on the farm by farm families.

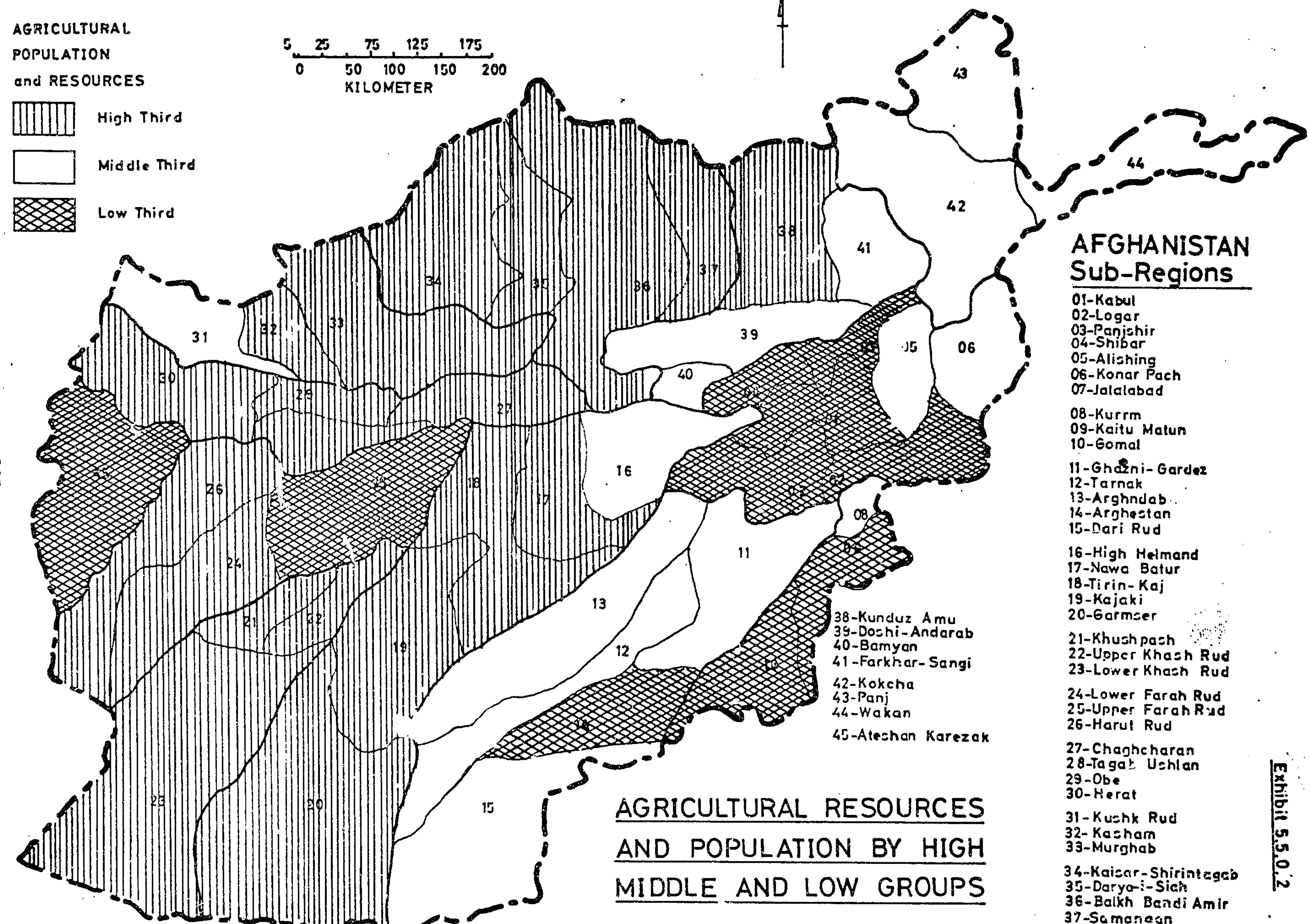
The disparity in farm value from the high third to the low third is in the order of four times with the high third having, on an average per capita basis, some 8,562 Afs. per year while an average person in the low third has only 2,075 Afs. per year. Some care must be taken in interpreting this difference because the non-agricultural population is not proportional in the sub-regional groups, as is shown in the tabulation below.

Sub-Regions	Total	Agri-culture (in thousands)	Non-Agri-culture	Non-Agriculture population by group
High Group	4,881	3,539	1,342	27.5%
Middle Group	4,568	3,369	1,199	26.3%
Low Group	5,251	3,462	1,789	34.1%
TOTAL	14,700	10,370	4,330	29.5%

The high proportion of non-agricultural population in the lowest group is partially due to the inclusion there of the Upper Kabul Sub-region in which there is a large urban and governmental population. It is characteristic of the family system under such conditions to combine small per capita land distribution for the basic food supply it provides with low urban cash salaries and incomes as a supplement to cover other necessities and amenities.

In absolute terms, however, the differences in non-agricultural population, as can be seen above, are insufficient to account for anything but a small portion of the per capita farm value differences as first indicated. The low third of the agricultural population must indeed be poorer than either the top or middle groups. In other words, the agricultural population pressure in group three on its equivalent irrigated land is 1,455 persons per square mile as compared with 274 persons per square mile in the top group. There is no way physically to redistribute the land from the top third to the low third as can be seen on the map, Exhibit 5.5.0.2. In addition to the land being fixed in place, these two groups are quite effectively separated by the middle group of sub-regions with two exceptions: one,

Exhibit 5.5.0.2



AGRICULTURAL RESOURCES AND POPULATION BY HIGH MIDDLE AND LOW GROUPS where productive land is particularly scarce and the other where water is so scarce that no administrative centers are located in the sub-region. The problem of the bottom third is how to make inadequate agricultural resources more productive than they already are.

5.6. Chapter Summary

Research and examination into the topographical features of Afghanistan reveal that the country is divided into twelve major watersheds and river systems surrounding the central mountain massive of the extended Hindu Kush. These major river or drainage basins can be further divided into 45 sub-regions of basins due to the mountain folds and terrain that produce valleys within valleys.

In the broad sense of agriculture that includes livestock and forests, only 20 percent of the area of Afghanistan is productive. It is an arid country where the average precipitation is 12 inches or less per year.[4] The irrigated land on which crop production mainly depends is about one-fifth of the productive area or 4 percent of the total. As a consequence, the total settled population of some 14.7 million persons, of which 70 percent are classified as in agriculture, have a per capita income of less than 100 U.S. dollars a year. Even at this low level of income, the top one-third of the agricultural population is estimated to have an annual farm value income equivalent to about 150 U.S. dollars per capita while the lowest one-third has the equivalent of about 40 U.S. dollars. The scarcity of farm-to-market roads suitable for economical motor transportation is particularly noticeable and is a contributing cause to the low incomes.

The concentration of the poorest third of the agricultural population in the southeast section of Afghanistan as shown in Exhibit 5.5.0.2. is suggestive of the need for particular and early attention.

EXHIBIT 5.7.0.1. CONVERSION FACTORS[5]

LENGTH	Gaz of jerib	Feet	Meters	Miles
	1.	2.415	.7361	.0004574
	.4141	1.	.3048	.0001894
	1.3585	3.281	1.	.0006214
	2185.8	5280.	1609.	1.

AREA	Jeribs	Acres	Hectares	Square Miles
	1.0	.4823	.1952	.000754
	2.073	1.	.4047	.001562
	5.123	2.471	1.	.003861
	1326.9	640.	259.0	1.

WEIGHT	Seers	Pounds	Metric Tons	Short Tons
	1.	15.58	.007066	.00779
	.0642	1.	.0004536	.0005
	141.53	2205.	1.	1.102
	128.37	2000.	.9072	1.

AVERAGE FOREIGN EXCHANGE RATE

1341	(March 21, 1962 - March 20, 1963)	Afs. 50.39 = U.S. $1.00
1342	(" 1963 " 1964)	Afs. 50.14 = "
1343	(" 1964 " 1965)	Afs. 58.74 = "
1344	(" 1965 " 1966)	Afs. 74.76 = "
1345	(" 1966 " 1967)	Afs. 75.00 = "
1346	(" 1967 " 1968)	Afs. 75.56 = "
1347	(" 1968 " 1969)	Afs. 74.47 = "
1348	(" 1969 " 1970)	Afs. 75.44 = "
1349	(" 1970 " 1971)	Afs. 83.68 = "
1350	(" 1971 " 1972)	Afs. 84.57 = "
1351	(" 1972 " 1973)	Afs. 80.64 = "
1352	(" 1973 " 1974)	Afs. 61.05 = "

Source: Ministry of Commerce and Da Afghanistan Bank.

CHAPTER V

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/5/ See Conversion Factor Tables on previous page.
Source: Ministry of Commerce and Da Afghanistan Bank.

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CHAPTER VI

AGRI-BUSINESS PROJECT ANALYSIS

CONTENTS

CONTENTS (cont.)

CONTENTS (cont.)

CHAPTER VI

AGRI-BUSINESS PROJECT ANALYSIS

6.1. Introduction

Agri-business commodity systems* or projects may conveniently be divided into three categories: export, import and domestic. Export commodity systems are those which are primarily oriented toward the export market, but are based on domestic supplies. Import commodity systems are the opposite — foreign supplies distributed to the domestic market. Domestic commodity systems are based on domestic raw materials, generating products for distribution primarily to the domestic market.

Export-oriented projects are highly popular in financial circles where foreign exchange earnings are most desired. In contrast, import projects are frowned upon because of their drain on foreign exchange unless they are supported by long-term foreign loans or grants. Domestic type agri-business projects tend to be unpopular because of their general complexity and continuous price squeeze situation described in Chapter II.

Economic benefits can be derived from all three kinds of agri-business projects, but the risks involved are far from equal. In order to evaluate these

*An agri-business commodity system is defined as that set of relationships holding together all of the participants in agricultural supply, production, processing, marketing and consumption as influenced by imports, exports and government.

risks and benefits, we must deal with the complexities involved; but in doing so, we must also face those who nurse a prejudice in favor of simple projects and economics. In this regard, we can do no better than to quote Alfred Marshall:

> "In this world every plain and simple doctrine as to relations between cost of production, demand and value is necessarily false; and the greater the appearance of lucidity which is given to it by skillful exposition the more mischievous it is."[1]

In this rather lengthy chapter, all three categories of agri-business project are discussed and compared. Export projects are covered in a general way. Import projects are dealt with mostly by describing and analyzing the existing Afghan sugar system. For domestic projects, sugar is also used. Two approaches for growing and processing the bulk of Afghanistan's domestically consumed sugar are described and analyzed in detail as an example of a domestic project. The chapter also introduces a second domestic project, corn, but does not include the detailed analysis provided for sugar.

6.2. Export Projects -- General Discussion

Afghanistan is in the typical position of wanting to increase export earnings and so improve its balance of payments or simply to be able to increase its imports. It is, therefore, most natural in such an agricultural country that farm commodities should be promoted for export.

We can assume that there is an unsatisfied demand in the world for agricultural products because of the many current reports on hunger and under-nourishment in many countries. This situation gives a positive attraction to export promotion. Unfortunately perhaps, exports must be paid for and this fact we cannot assume. Rather, we must critically face the problems of effective demand based on incomes and prices.

Foreign trade occurs when and only when exporters have much to sell, when there is demand abroad unsatisfied by local production and when foreign prices net of transport cost and duties are higher than home market prices so that good export profits are to be earned. None of these conditions tend toward stability. The foreign conditions can be varied either at will by the trading partner through changes in tariff and non-tariff barriers or by changes in the foreign exchange rates.

In addition, competing nations are free to change policies toward a common trading partner so as to change the proportions of the trade flows. For example, many exporting countries expend much ingenuity and large sums in the form of subsidies to create the necessary price difference that will permit trade. On the other hand, many importing countries (often the same ones) do as much as they can to reduce the needed price differential on imports with either tariff duties or non-tariff barriers such as quotas and inspection restrictions. Even when satisfactory price differentials are found to exist, they can be quickly equalized by the devices mentioned above.

Exceptions to these general conditions do exist when a particular commodity is not produced in a possible importing country and other world suppliers are not competing strongly for this special market, or when the home country produces an exportable and marketable commodity that is not produced elsewhere or in few other countries. Once such opportunities are being exploited, the markets may be expanded by improving the quality of the export or by increasings its variety or again by lowering its price. But once these additional steps have been taken, further export promotion of agricultural commodities must revert to finding existing price differentials of a durable nature on a commodity-by-commodity basis. If such efforts are to be more than quick market surveys resulting in trial and error projects, there is a need for a workable understanding of international trade and the principles upon which it functions.

In order to plan an agri-business export project we must, of course, know the probable price differential. But equally important, we must also be able to determine quantity and specifications on which to plan the required investment. The Kandahar Fruit Company project is an example of a serious failure in this respect. Quite simply, the export quantity cannot be determined on the demand side by investigation only within the exporting country. Thus, determination of quantity (demand) is divided into two problems just as are prices, i.e. the foreign and the domestic.

The minimum required of a foreign market survey once a commodity is selected is:

1. foreign price net of transport costs and duties
2. probable stability of the price, costs and duties
3. propensity to consume the selected commodity in the foreign country
4. the gross national product of the foreign country
5. present imports of the commodity or its substitutes

The minimum required of the domestic side of the market survey is:

1. domestic price at the export gateway
2. probable stability of the price and supply
3. propensity to consume the selected commodity at home
4. the gross national product
5. present exports of the commodity

Using this information to determine probable quantity, plant capacity and investment often requires matrix algebra and the use of a computer. Such first-order quantity and capacity must then be tested for probable reaction on domestic prices, etc.

Faced with such survey problems, it is not surprising that heuristic methods are adopted and initial investments are small and on a trial and error basis. Given the many imponderables in exporting, it is natural that government entities trade with other government entities and private traders with other private traders. The exceptions are large multinational business companies that are able to control large market shares, but such considerations are beyond the scope of this study.

The domestic price level raises questions other than the quantities and value that can be exported of a given commodity. Of particular interest are agri-business and rural income and employment. Assuming for the moment that favorable export opportunities are discovered, how and where are the benefits distributed?

The domestic price level depends on factor costs, i.e. labor, land, capital and water. If they are high cost, then prices are high and exportables are reduced. If they are low, then prices are low and exports can increase. The cost of factors, in turn, depends on their endowment, i.e. if the land is fertile, plentiful and well-watered with skilled labor to work it, and ample capital at low interest for improvement, then factor costs per unit produced will tend to be low. That is to say, exportable agricultural commodities can be most effectively produced in those sub-regions where per capita resources are high.

The Afghan export statistics for 1340 through 1345 (1961-67) give data from fourteen customs houses throughout Afghanistan.[2] After 1345, the export data was consolidated into seven customs locations. On the basis of the fourteen locations and the map in Exhibit 5.5.0.2., the exports from the three areas of agricultural resources per capita have been analyzed and demonstrate the tendency of exports to follow resources as expected.

Year	Export Value (million Afs.)	Agricultural Population: Low Third	Agricultural Population: Middle Third	Agricultural Population: High Third
		(percent of exports)		
1340	1,354	29.4	4.6	66.0
1341	2,968	18.6	11.9	69.5
1342	3,459	21.7	11.5	66.8
1343	4,152	22.0	11.5	65.5
1344	5,025	26.5	10.9	62.6
1345	4,835	27.6	10.2	62.2
Total	21,793	24.2	10.7	65.0

The reason for the low percentage of exports from the middle third as compared with the low third is due to the principal customs house at Kabul City serving the adjacent areas of the middle third while the high third is sufficiently distant to make this sort of concentration less practical. Nevertheless, as the national highway around the country was built and put into use, the customs administration was able to reduce its locations from fourteen to seven.

The Kohdaman area near Charikar is famous for its grapes and raisins which are exported in large quantities, but it is located in a sub-region of the low third. This apparent exception to the findings of resources per capita is due to a relatively small area of excellent land and conditions for viticulture being submerged numerically in its larger sub-region with a dense population. This type of local endowed resources strongly fortifies the conclusion that agri-business export projects benefit the more prosperous agricultural areas and not the poorer ones and so increase the duality of the economy.[3]

6.3. Import Projects (The Afghan Sugar Industry as an Example)

Import projects, as one of the three kinds of development activity, are frequently encountered but seldom evaluated in economic terms related to agri-business or rural incomes and employment. Just as export projects tend to work against the poor areas, we find that import projects tend to have a similar effect. The main difference between them is in the timing of the investment risk. Export risks derive from fluctuating demand and selling price differentials which, because of their immediacy, cause trouble for the export promoters early in the life of the project. Imports, on the other hand, rely on supply and purchase terms that affect price differentials but slowly and push troubles into the future for someone else to cope with.

Wheat, fertilizer and sugar are examples of import projects that are playing an important role in Afghan agri-business economics. The first has been most successful but the second two, in spite of their past successes, are clear examples of the high risks involved. The world prices for these two commodities have increased in a manner to put serious stress on domestic policy and development. Sugar as an import project and commodity system is of special interest to this study because it has a long and well-documented history, world prices have caused changes in attitudes towards the project, and it is subject to conversion from an import project to a domestic project. In studying the feasibility of the conversion, there are a number of important factors to be considered for future policy.

The existing Afghan sugar industry as an import project is first reviewed in three steps: (1) sugar beet farming in Baghlan Province, North Afghanistan, (2) sugar juice extraction from the beets and refining into white sugar in the Baghlan Sugar Factory, and (3) the purchase of Baghlan and imported sugar by the Sugar Monopoly (absorbed in 1974 into the Petroleum Monopoly for greater efficiency) for distribution throughout Afghanistan. The amounts shown are the averages for the years 1348 and 1349 as obtained from the Urwick, Lugg & Gould report.[4] All tons shown are metric tons.

6.3.1. Sugar Beet Farming (Baghlan Province)

Average purchase of sugar beets by the Baghlan Sugar Factory, ex farm	61,404 tons
Average yield of beets per jerib of land	2.8 tons
Average number of jeribs harvested for sale	21,930 jeribs

(1 hectare = 5.123 jeribs; 1 acre = 2.073 jeribs)

(average exchange rate U.S. $1 = 80 Afs.)

Sugar Beet Farming in Baghlan Province

Combined Operating Statement

Cost Accounts	Units/jerib	Afs. per jerib	Total Amount 21,930 jeribs (thousand Afs.)
Seed	6-7 kilos	free	-
Fertilizer			
Chemical	15.6 kilos @ 7.3 Afs.	114	2,500
Organic	113 loads	198	4,342
Hired Labor			
Weeding	4.4 days @ 70 Afs.	308	6,754
Harvest	4.3 days @ 60 Afs.	258	5,658
Other	6.2 days @ 43 Afs.	267	5,855
Hauling		63	1,382
Canal repairs		42	921
Taxes		57	1,250
Interest		14	307
Depreciation		35	768
Total cost and expense:		1,356	29,737
Income Accounts			
Beet value 690 Afs. per ton, official price		1,932	42,369
Less, deductions by sugar factory for dirt, tops and low sugar content		132	2,369
Income from sugar beets		1,800	39,500
Plus, sale of beet tops		20	437
Less, total cost and expense above		1,356	29,737
Return to family for labor, capital and management		464	10,200

The value added in the above accounts in thousands of Afghanis is:

Wages	18,267
Taxes	1,250
Depreciation	768
Return to family — labor, etc.	10,200
Value added by agriculture	30,485

The actual net price to the farm is not the posted 690 Afs. per ton but only 643 Afs. per ton of beets (39,500/61,404) or a reduction of 47 Afs. due to the deductions made at the sugar factory. This reduction may be interpreted in three ways: (1) the real price for beets is only 643 Afs. per ton and not the official price of 690 Afs. per ton, or (2) the real yield is only 2.61 tons per jerib (2.8 tons x ratio of 643/690) because the farmer includes too much dirt and tops with the beets, or (3) the sugar factory over-deducts for these factors and thereby increases the factory sugar yield and lowers its cost per ton of sugar accordingly. In any case, the farmer is likely to be dissatisfied with the results whether justified or not.

The poor return to the farmer per jerib cultivated in sugar beets is due to the low yield obtained. Either he is using marginally productive land or following poor agricultural practices. The use of marginal land and water supply are believed to be the major cause of low yields rather than poor methods because the better land is put into more immediately desirable and profitable crops as influenced by government pricing policies that have generally given sugar beets a low priority.

6.3.2. Baghlan Sugar Factory (Baghlan City)

The data for this operation, based on the average for 1348 and 1349 are as follows.

Basic Data

Sugar beets purchased ex farm	61,404 tons
White sugar produced	7,369 tons

Operating Statement

Cost Accounts	Amount (thousand Afs.)
Sugar beets purchased, ex farm	39,500
Fuel and materials	9,800
Taxes	1,500
Contract transport	5,600
Salaries and labor	11,300
Repairs	1,800
Depreciation	4,500
Sundries	2,100
Interest payments	6,900
Total operating cost and expense	83,000
Income Accounts	
Less sales of by-products and sundries	1,200
Net costs and expenses	81,800
15% margin allowed on net costs*	12,300
Value of white sugar to Sugar Monopoly	94,100
Value of total sales income	95,300

*The owners of the Baghlan Sugar Factory and GOA have agreed in principle on the costs eligible in calculating a 15% profit or margin as indicated in the above accounts.[5]

The value added in the above account is:

Salaries	11,300
Taxes	1,500
Depreciation	4,500
Net surplus	12,300
Value added by sugar factory	29,600

The Baghlan Sugar Factory works about 100 days per year including and following the harvest period. The beets can be stored during the cold weather following the harvest, but the storage period is limited by rising temperatures in the early spring with clear skies and hot sunlight. The high daytime temperatures cause the beets to spoil. The beet pulp is sold for animal feed with some of the molasses from the refining process. Those products not sold go to waste.

Clearly, the sugar factory is under-utilized at 100 days per year. This is particularly true for the refining portion of the plant. Expansion of the first stage juice-producing portion of the plant and storage of concentrated juice or syrup could extend the number of days for operating the refinery and thus increase the production of white sugar. This approach to increased sugar production appears not to have been recommended in the past because of low yields and the limited land areas available for sugar beet production. Increases in beet yields and production have not been forthcoming for reasons of marginal land use mentioned above. In spite of large inputs of foreign technical assistance in the agronomics of sugar beet production over the past twenty years, this situation has not improved. A more radical change in the technological concepts of the sugar industry is needed to meet the conditions in Afghanistan. This subject will be discussed in more detail in later sections of this chapter.

6.3.3. Sugar Monopoly (Afghanistan)

The Sugar Monopoly (SM) administration has been absorbed recently into the Petroleum Monopoly for greater efficiency in the face of rising world prices for sugar. Nevertheless, the functions remain the same as before and the following analysis remains valid. Two operating cases are presented. In Case One, the average sugar import prices for 1348 and 1349 (March 21, 1969 to March 20, 1971) are used as summarized in the Import Statistics prepared by the Ministry of Commerce.[6] In Case Two, the sugar import prices for 1350 are applied, while holding all the other factors in Case One constant. The sugar prices increased from an average of 7.49 Afs. per kilo in Case One to an average of 18.09 Afs. per kilo in Case Two.

The average demand for imported and Baghlan sugar has been estimated at 65,000 metric tons.[7] The average supply to meet this demand is derived as follows for 1348 and 1349.

Baghlan Sugar Factory	7,369 tons
Commercially imported sugar	48,064 tons
Imported sugar by loan or grant or from inventory	9,567 tons
Total demand and supply	65,000 tons

Sugar Monopoly (S.M.) Operating Statement, Case One
(Imported sugar at 7.49 Afs./kg.)

Cost Accounts	Amount (thousand Afs.)
Baghlan sugar at warehouse	94,100
Imported sugar, combined, 7.49 Afs./kg.	431,400
Customs duties, 30 Afs./ton	1,700
Port fees & charges, 200 Afs./ton	11,500
Transport from port to S.M. warehouse 540 Afs./ton (imported sugar only)	31,100
Cost of sugar at warehouse	569,800
Expenses of Sugar Monopoly	
Salaries, wages and benefits	8,200
Administrative charges	4,900
Depreciation	800
Total Monopoly expenses	13,900
Average transport and distribution charges in Afghanistan, 550 Afs./ton	35,800
Retailers' commission, 200 Afs./ton	13,000
Total cost of sugar at retail	632,500
Income Accounts	
Retail (controlled) selling price 16 Afs./kg.	1,040,000
Margin accruing to GOA through Sugar Monopoly	407,500

The value added in the above account is:

Salaries, wages and benefits	8,200
Taxes, ordinary	13,200
Taxes (margin as effective tax)	407,500
Depreciation	800
Total value added by SM	429,700

Sugar Monopoly (S.M.) Operating Statement Case Two

(Imported sugar at 18.09 Afs./kg.)

Cost Accounts	Amount) (thousand Afs.)
Baghlan sugar at warehouse	94,100
Imported sugar, combined, 18.09 Afs./kg.	1,042,545
Customs duties, 30 Afs./ton	1,700
Port fees & charges, 200 Afs./ton	11,500
Transport from port to warehouse 540 Afs./ton (imported sugar only)	31,100
Cost of sugar at warehouse	1,180,945
Expense of Sugar Monopoly	13,900
Average transport & distribution cost	35,800
Retail commission	13,000
Total cost of sugar at retail	1,243,645
Income Accounts	
Retail (controlled) selling price	1,040,000
Deficit to be subsidized by GOA	(203,645)

The value added in the above account is:

Salaries, wages and benefits	8,200
Taxes, ordinary	13,200
Subsidy, minus	(203,645)
Depreciation	800
Negative value added by Sugar Monopoly	(181,445)

The subsidy indicated for the deficit follows the present practice of the GOA to stabilize the sugar price level for the consumer.

The change from a value added contribution to the gross national product (GNP) of 429.7 million Afs. to a negative effect of 181.4 million Afs. means that the GNP for the Afghan sugar industry has been reduced by 611.1 million Afs. due to the increase in imported sugar prices.

The question to be determined is whether or not more conventional technology adapted to Afghan conditions can convert such a negative "import project" into a positive and satisfactory "domestic project."

6.4. <u>Sugar as a Domestic Project with Conventional Technology</u>

Project proposals have been made to the Ministry of Agriculture and Irrigation for new sugar factories in either Herat or Kandahar or in both places so as to reduce the dependence on imported sugar, and thus create a domestic sugar industry. These factory projects have become particularly attractive at this time because of the increases in world sugar prices. However, we also want to know if these projects will solve the problem of domestic sugar supply, regardless of whether sugar prices remain at their present high levels or decrease in the near future due to increases in world sugar production.

In a sense these proposed projects include a transfer of conventional technology in the plant machinery and equipment. The Baghlan Sugar Factory was inaugurated in 1941 and improvements have been made in the machinery and equipment technology during the past thirty-three years. On the other hand, this is a narrow view of modern technology which today includes the conceptual approaches of systems analysis. This raises a typical question of whether developing countries should opt for modern or more conventional technology. It is the writer's opinion that modern technology is better, when it can be used, for the simple reason that developing countries fall further behind when they choose conventional methods while other countries apply more modern techniques.

The proposed projects are conceptually the same as the Baghlan Sugar Factory and its agricultural supply of sugar beets except that the new projects cost so much more to build and install that one hundred day campaigns are even less efficient and give higher costs per ton of sugar than the older Baghlan plant.

Using the same agricultural, Baghlan plant, and monopoly accounting data above but adding new sugar factories and their accounts, we can measure the cost effectiveness of such projects. Later in this chapter, we will propose and measure a conceptual change to modern technology and measure its cost effectiveness for comparative purposes.

6.4.1. <u>New Sugar Factories</u>

The accounts data for this project are also obtained from the Urwick, Lugg & Gould report.[4] The factory proposed in the report has a capacity of 120,000 tons of sugar beets for a hundred day campaign. Production at 90 percent of capacity (108,000 tons) will yield an average of 13,000 tons of sugar per year. The total fixed asset investment is estimated at 649.1 million Afghanis.

As previously indicated, the annual sugar demand in Afghanistan is 65,000 tons of which about 57,000 tons is presently being imported. This means that three new sugar factories of the above capacity, requiring an investment of 1,947.3 million Afs., will be needed to reduce seriously the sugar import requirements, without considering the growing domestic demand which, it is estimated, will probably double in the next ten years.

6.4.2. Three New Sugar Factories

The analytical accounts for the addition of three sugar factories to the Afghan sugar industry follow. These account data are based on 1348-49 estimated conditions so as to maintain comparability throughout the analysis. That is, we want to know how the Afghan sugar industry would have behaved financially and economically if there had been more sugar factories and less importation of sugar.

Basic Data

Sugar beets, purchased, ex farm	325,000 tons
Land required, 2.8 tons of beets/jerib	116,070 jeribs
White sugar produced	39,000 tons
Investment in fixed assets for three sugar factories (million Afs.)	1,947.4
Imported portion of fixed assets	1,186.0
Working capital (million Afs.)	117.8

Combined Operating Statement

Cost Accounts	Amount (thousands Afs.)
Sugar beets purchased, 643.3 Afs./ton	208,932
Seeds (estimate)	18,000
Fuel and materials	24,117
Taxes	7,960
Transport costs	30,456
Employment costs	39,860
Spares (50% imported)	21,600
Interest on working capital (at old rate of 8%)	9,420
Depreciation	145,020
Total operating cost and expense	505,365
Income Accounts	
Less sales of by-products	6,357
Net operating cost and expenses	499,008
15% margin allowed on net costs	74,851
Value of white sugar delivered to Sugar Monopoly	573,859
Value of total sales income	580,216

The value added in the above account is:

Wages, salaries and benefits	39,860
Taxes	7,960
Depreciation	145,020
Net surplus	74,851
Value added by new sugar factories	267,691

The value added by agriculture to supply sugar beets for the above sugar factories is in proportion to the increased demand for sugar beets on the basis of the assumption that the Baghlan farm accounts can be applied wherever the sugar factories are located in Afghanistan. The agricultural value added is, therefore:

> 324,000 tons of beets/61,402 tons of beets times 30,486,000 Afs. of value added by agriculture as determined above. The new value added is thus 160,865,000 Afghanis.

6.4.3. Sugar Monopoly Accounts

The Sugar Monopoly (SM) Accounts will change due to the addition of the three new sugar factories as follows:

White sugar supply	
Baghlan Sugar Factory	7,369 tons
New sugar factories	39,000 tons
Imported sugar	18,631 tons
Total demand and supply	65,000 tons

S. M. Operating Statement Case One
(Imported sugar at 7.49 Afs./kg.)

Cost Accounts	Amount (thousands Afs.)
Baghlan sugar at warehouse	94,100
New factory sugar at their warehouses	573,859
Imported sugar, 7.49 Afs./kg.	139,546
Customs duties, 30 Afs./ton	559
Port fees & charges, 200 Afs./ton	3,726
Transport from port to warehouse, 540 Afs./ton (imported sugar only)	10,061
	821,851
Sugar Monopoly expenses	13,900
Transport and distribution charges	35,800
Retailers' commission	13,000
Total cost of sugar at retail	884,551
Income Accounts	
Retail (controlled) selling price	1,040,000
Margin accruing to GOA	155,449

The value added in the above accounts is:

Salaries, wages and benefits	8,200
Taxes, ordinary	4,285
Taxes (margin as effective tax)	155,449
Depreciation	800
Total value added by S. M.	168,734

Clearly the addition of three new sugar factories changes the value added by the Sugar Monopoly operations. This effect is but part of the economic changes due to adding three new sugar factories. It is better, however, to complete case two of the Sugar Monopoly before analyzing the overall effect.

S. M. Operating Statement Case Two
(Imported sugar at 18.09 Afs./kg.)

Cost Accounts	Amount (thousands Afs.)
Baghlan sugar at warehouse	94,100
New factory sugar at their warehouses	573,859
Imported sugar, 18.09 Afs./kg.	337,035
All other expenses as above	77,046
Total cost of sugar at retail	1,082,040
Income Accounts	
Retail (controlled selling price)	1,040,000
Deficit to be subsidized by GOA	(42,040)

The value added in the above accounts is:

Salaries, wages and benefits	8,200
Taxes, ordinary	4,285
Subsidy, minus	(42,040)
Depreciation	800
Negative value added, subsidy	(28,755)

6.4.4. Accounts Summary

All of the above account information can be summarized in a more convenient form according to industry classification and income distribution. We should note that the new beet farming and new sugar factory accounts will need to be added to the corresponding accounts of the Baghlan operations. The Sugar Monopoly accounts are already in a combined form.

Summary Case One (imported sugar, 7.49 Afs./kg.)

GNP VALUE ADDED

Industry	Example I Present System	Example II with new factories
	(in thousands of Afs.)	
Agriculture (sugar beets)	30,486	191,351
Agri-business (sugar factories)	29,600	297,291
Government (Sugar Monopoly)	429,700	168,734
GNP Value Added	489,786	657,376

INCOME DISTRIBUTION

Salaries, wages, etc.	37,767	174,016
Taxes	423,450	177,040
Depreciation	6,038	155,140
Surplus or profit	22,501	151,180
GNP Value added	489,786	657,376

The three new sugar factories increase the value added to the gross national product (GNP) overall, and particularly benefit the agriculture and agri-business industries but largely at the expense of the government sector. Under such circumstances it is not likely that, based on this analysis, the GOA policy would favor the development of the new sugar factories when world sugar prices are low even though new employment opportunities are considerably enlarged in the private sector.

Summary Case Two (imported sugar, 18.09 Afs./kg.)

GNP VALUE ADDED

Accounts	Example I Present System	Example II with new factories
	(In thousands of Afs.)	
Agriculture (sugar beets)	30,486	191,351
Agri-business (sugar factories)	29,600	297,291
Government (Sugar Monopoly)	(181,445)	(28,755)
GNP value added or (deficit)	(121,359)	459,887

INCOME DISTRIBUTION

Salaries, wages, etc.	37,767	174,016
Taxes	15,950	21,591
Less Subsidies to cover deficits	(203,645)	(42,040)
Depreciation	6,058	155,140
Surplus or profit	22,501	151,180
GNP value added or (deficit)	(121,359)	459,887

The above analysis of the Afghan sugar industry is rather long and involved but the results are quite clear. The sugar industry was heavily taxed when import prices of sugar were low. Of GNP value added, the tax rate was a burdensome 86 percent (423,450,000 Afs. of tax/489,386,000 Afs. of value added) and the industry was unable to develop; in consequence, the GOA placed itself in a vulnerable economic position as a result of this tax policy. In the period under consideration, 1348-1349, the Afghan GNP averaged 75,300 million Afghanis and the sugar industry thus contributed 0.23 percent of this total. Just how vulnerable the economic position was is demonstrated by the rise in imported sugar prices which turn a surplus tax of 423.4 million Afs. into a net subsidy position of some 187.7 million Afs. In the meantime, the price of sugar was allowed to increase, but imported sugar prices also continued their upward spiral so the conditions actually grew worse by 1352.

If the sugar industry had been encouraged to develop new factories as indicated, the tax vulnerability would have been reduced but almost total self-sufficiency would have been required in order to avoid falling into a subsidy situation. At the same time, the 86 percent tax would have been foregone and the resulting revenue would have been reduced to a low level of around 10 percent. As many monetary advisors to Afghanistan recommended raising taxes, and not lowering them, as would have been necessary, the problem facing the tax authorities was ambiguous to say the least.

On the other hand, employment income and profits would have been increased over 500 percent in the private sector if the domestic development of the sugar industry had been carried through. The effect on employment would have tended to shift jobs from government service to the private sector but the GNP value added in Summary Case One, Example I, of 489.8 million Afs. has turned into a deficit of 121.4 million Afs. in Summary Case Two, Example I. This loss would have been prevented by having developed the sugar industry as shown in Summary Case Two, Example II, when the GNP value added at 459.9 million Afs. is only slightly below that originally given above. If the private enterprise multiplier effect is taken into consideration, then the economy would show a real benefit from developing the domestic sugar industry. Employment redistribution to rural areas is not benefitted directly by the proposed sugar factories as they most likely will be located in urban areas and thus encourage urban concentration of employment in the same way as taxes and government services encourage it. Agricultural and rural income and employment are, of course, benefitted by the expansion in sugar beet production but as this growth is effectively confined to a 30-kilometer radius from the sugar factory, the rural benefits are not widely spread.

6.4.5. Investment Schedule

In order to ensure that a planned industry expansion can take place, it must be financed and for this purpose we need to consider the analytical approach outlined in Section 3.11, "A Mixed Leontief-Keynes Format or Model." Before doing so, it is necessary to estimate the investments required in agriculture, the Baghlan Sugar Factory and the Sugar Monopoly. We can arrive at a serviceable investment value for the Baghlan Factory and monopoly by extrapolation from the annual depreciation accounts and from associated information. For agriculture, we can use recent information on the cost of acquiring and preparing new, unimproved farm land for cultivation.[8] As these estimates are used consistently in the analysis, Exhibit 6.4.6.1., the average results obtained are not seriously distorted and provide for a sound comparative evaluation. The estimated investment schedule is as follows (see Exhibit 6.4.5.1. for details):

EXHIBIT 6.4.5.1.

SCHEDULE OF ESTIMATED TOTAL ASSETS

	Factors	Amount (thousand Afs.)
Agriculture (sugar beets)		
Present system	21,930 j. x 2,500[8]	54,830
New factories requirements	116,070 j. x 2,500	290,175
Agri-business (white sugar)		
Baghlan Sugar Factory		
Fixed assets	Depreciation of 4.5 M Afs. equals 7.5% of assets	60,000
Working capital (avg.)	1/3 calculated direct costs	21,900
New sugar factories		
Fixed assets	3 times Urwick's estimate[4]	1,947,400
Working capital (avg.)	1/3 calculated direct costs	116,000
Government Sugar Monopoly		
Fixed assets	Depreciation of 890 M Afs. equals 7.5% of assets	11,900
Working capital (avg.)		
Low import prices		
Present system	1/6 calculated direct costs	101,120
With new factories	1/6 calculated direct costs	143,745
High import prices		
Present system	1/6 calculated direct costs	292,970
With new factories	1/6 calculated direct costs	176,655
Total Asset Summary		
Low import prices		
Present system		249,750
New sugar factories		2,645,950
High import prices		
Present system		351,600
New sugar factories		2,678,860

Four Investment Conditions	Investment Amounts (thousand Afs.)
1. Present system and low import prices	249,750
2. With three new factories added to system	2,645,950
3. Present system and high import prices	351,600
4. With three new factories added to system	2,678,860

The total assets invested in examples (3) and (4) are higher than in (1) and (2) due to added working capital requirements.

6.4.6. Analytical Notes

The development of agri-business for the purpose of improving rural income and employment is intermediate between agricultural supply and urban demand. It is important to include the effect of an agri-business project on both the supply and demand sectors and not just evaluate the project by itself. This broad approach becomes even more important when the purpose includes planning and locating the agri-business enterprise so as to optimize beneficial rural effects. In preparing an alternative approach to the present and proposed agri-business sugar factories, the summary, Exhibit 6.4.6.1., will serve as the baseline for comparison.

It should be carefully noted that the information displayed in the Exhibit is representative of the whole Afghan sugar industry from the farm to the consumer. The separate activities of farming, sugar production and distribution have already been examined in the earlier sections of this chapter. Thus, the Exhibit reflects the interactions of the industry's parts as well as its relations to the GNP of the total Afghan economy. It also shows the combined financial return on the total assets required by the various parts of the total industry.

EXHIBIT 6.4.6.1.

AFGHANISTAN SUGAR INDUSTRY FINANCIAL AND ECONOMIC EVALUATION BY SUGAR IMPORT PRICES AND BY ADDITION OF NEW SUGAR FACTORIES

Accounts	Case One (imported sugar, 7.49 Afs./kg.)				Case Two (imported sugar, 18.09 Afs./kg.)			
	Present system		With new factories		Present system		With new factories	
	Financial accounts	Economic accounts	Financial accounts	Economic accounts	Financial accounts	Economic accounts	Financial accounts	Economic accounts
			(in thousands of Afghanis)					
Total assets	249,750		2,645,950		351,600		2,678,860	
Net sales	1,041,638		1,050,403		1,041,638		1,050,403	
Export sales	-		-		-		-	
Import purchases, CIF including sugar	435,106	(435,106)	168,655	(168,655)	1,046,251	(1,046,251)	366,144	(366,144)
Domestic purchases except sugar & beets	109,559	109,539	206,125	206,125	109,539	109,539	206,125	206,125
Interest payments	7,207	7,207	18,247	18,247	7,207	7,207	18,247	18,247
Employee costs	37,767	37,767	174,016	174,016	37,767	37,767	174,016	174,016
Taxes	423,450	423,450	177,040	177,040	15,950	15,950	21,591	21,951
Less: subsidies	-		-		(203,645)	(203,645)	(42,040)	(42,040)
Depreciation	6,068	6,068	155,140	155,140	6,068	6,068	155,140	155,140
Net profit (to whole system)	22,501	22,501	151,180	151,180	22,501	22,501	151,180	151,180
Return on investment, ROI	9.0%		5.7%		6.4%		5.6%	
Partial multiplier effect		6.00		2.33		-36.60		1.34
Economic return as % of GNP, avg. for 1348-49 = 75.3 billion Afghanis		0.23%		0.95%		-1.40%		0.42%

Note: See Section 3.11 for method employed in arranging the data above and the calculations.

The financial returns on investment (ROI) discussed in Section 3.11 and applied in Exhibit 6.4.6.1. are presented under four headings: (1) the present system based on the Baghlan Sugar Factory production and imported sugar at 7.49 Afs./kg.; (2) the present system plus three new sugar factories to produce 29 thousand tons of domestic sugar and so reduce imports by an equal amount; (3) the present system as first above, but with higher imported sugar prices at 18.09 Afs./kg.; and (4) the present system plus three new sugar factories and the higher imported sugar prices. The retail price of sugar in Afghanistan is held constant throughout so that comparability is maintained in all four examples.

(1)	Present system and low import prices, ROI	9.0%
(2)	3 new factories added to system, ROI	5.7%
(3)	Present system and high import prices, ROI	6.4%
(4)	3 new factories added to system, ROI	5.6%

The return on investment is lower in example (2) because of the higher plant and equipment cost per ton of sugar produced by the new sugar factories as compared with the older low-cost Baghlan Sugar Factory commissioned in 1941. The ROI in examples (3) and (4) are lower because working capital in total assets was increased to meet high imported sugar prices.

The variations in the return are not so great, in view of the 8 percent target and usually lower results for multinational corporations referred to in Section 3.5., Para. (4), as to rule out investment in the new sugar factories. Economic measures such as the partial multiplier and the economic return as a portion of the GNP give a quite different view of the situation. Following the same four examples as above, the results are as follows:

	Alternate Examples	Partial Multiplier	Effect as % of GNP
(1)	Present system and low import prices	6.00	0.23%
(2)	3 new factories added to system	2.33	0.95%
(3)	Present system and high import prices	-36.80	-1.40%
(4)	3 new factories added to system	1.04	0.42%

The present system at low imported sugar prices shows a highly favorable partial multiplier in example (1), but the domestic portion of the sugar industry is too small to realize the real potential for the national economy. The three new sugar factories, example (2), even with a much smaller partial multiplier, still increase the national benefit some 400 percent. Even in the case of higher imported sugar prices, the potential economic benefits of the new factories are nearly 200 percent greater even though the partial multiplier is smaller.

The real problem lies in continuing the present system with high imported sugar prices. The difference between examples (1) and (3) shows the vulnerability of the present system in which a positive economic contribution of 0.23% drops to a minus 1.4% of GNP. In connection with this price effect on GNP, it is well to point out that in 1348-1349 the low price of sugar was about U.S. $100 per ton while the high price of 18.09 Afs./kg. represents about U.S. $224 per ton in 1350 (1971-72). Since then the price has doubled or tripled but may soon start decreasing because world sugar production has already risen 6.6% between 1972-3 and 1973-4.[9]

These indicators show that a policy of new sugar factories and increased domestic sugar beet production should be pursued with vigor. In face of the known production and technological problems, the question is how best to carry out such a policy. This subject will be taken up in the following sections of this chapter.

6.5. Sugar as a Domestic Project with Modern Technology

The Afghan sugar industry has been reviewed in the preceding sections as an import project with high risks when world sugar prices fluctuate. The industry has also been considered as a domestic project using conventional sugar factory technology. The problems of this industry and its improvement in Afghanistan have been studied and restudied over the years.

The Baghlan Sugar Factory was conceived in the late 1930s and started production in 1941. It soon ran into trouble for lack of sugar beets and the plant was shut down for two years between 1947 and 1948. The reaction of the agricultural experts was to improve sugar beet yields while that of industry experts was to recommend improvements in the factory facilities. Together they prepared many reports and twenty of them, extending over the period 1953 to 1972, are listed below. Thirteen of the reports concentrate on the growing of sugar beets and seven of them focus on the factories and industry as a whole. The results of these efforts over time in yield and production are shown in Exhibit 6.5.0.1. following the informative list of report titles mentioned above.

1. G. F. Hauser, "Report About the General Sugar Beet Cultivation at Baghlan and the Results of the Beet Experiment Fields There," Ministry of Agriculture and Irrigation, Kabul, three-page mimeo.

2. G. F. Hauser, "Sugar Beet Cultivation in Afghanistan and its Improvement," Empire Journal of Experimental Agriculture, 1953, 21:283-8.

3. E. P. Pattison, "Sugar Beet Production," ETAP Report No. 148, 1953, FAO: Rome.

4. P. R. Bauman, "Sugar Beet Production," ETAP Report No. 723, FAO: Rome.

5. R. P. Davidson, "Improvement of Cotton & Sugar Beet Production," ETAP Report No. 929, 1958, FAO: Rome.

6. HAVA and Wyoming Research Team, "Sugar Beet Production in the Helmand Valley, Afghanistan," HAVA, Lashkar Gah, Bulletin 101 H, 1958.

7. HAVA, "Study of Feasibility of Raising Sugar Beet for a Factory (Helmand)," HAVA Agricultural Department, Bost, 1958.

8. Koransky, "Report on Raw Material for Sugar Factory," Ministry of Planning, Kabul.

9. Faculty of Agriculture, "Observation of Plots of Sugar Beets," Kabul University.

10. H. M. Hepworth, "Progress Report on Sugar Beets in Afghanistan," Wyoming Team, Ministry of Agriculture and Irrigation, Kabul, 1963.

11. M. Hamnish, "Short Description of the Sugar Production in Afghanistan and Program for Increasing Sugar Beet Production," Ministry of Agriculture and Irrigation, Kabul, 1964.

12. H. M. Hepworth, "Terminal Report (Research Agronomist)," Wyoming Team, Kabul, 1964. (Includes results of sugar beet trials.)

13. H. E. Brewbaker, "Sugar Beet Factory for Helmand Valley with Particular Reference to Agricultural Considerations," USAID, Kabul, 1965.

14. S. Ellerton, "Impressions of the Possibility of Establishing a Beet Sugar Industry in the Helmand Valley, Afghanistan," British Embassy, Kabul, 1965.

15. G. Allanson, "The Place of Cotton and Beet Sugar in the Afghan Economy," British Embassy, Kabul, 1967.

16. B. Dinkev, "Improvements of the Sugar Beet Production in Afghanistan," Bulgarian Embassy, Kabul, 1966.

17. H. J. Meadows, "A Report on the Beet Sugar Industry in Afghanistan," British Embassy, Kabul, 1966.

18. Dawlaty, G. P. Owens, Zarghuna Saleh, "Economics of Production of Cotton and Sugar Beets in Kunduz and Baghlan Province," Faculty of Agriculture, Kabul University, Technical Bulletin, 1968.

19. Urwick, Lugg & Gould, "The Sugar Industry of Afghanistan," British Embassy, 1972.

20. C. E. Johnson, "Sugar Production in Afghanistan," Middle East Development Division, Beirut, 1973.

EXHIBIT 6.5.0.1.

SUGAR BEET YIELD PER JERIB WITH WHITE SUGAR PRODUCTION AND IMPORTS SINCE 1940

Year	Sugar beets per jerib	White sugar production (in metric tons)	White sugar imports
1319 (1940/41)	1.5	1,100	n.a.
1320 (1941/42)	2.9	3,500	n.a.
1321 (1942/43)	1.9	2,940	n.a.
1322 (1943/44)	1.55	3,890	n.a.
1323 (1944/45)	2.0	4,360	n.a.
1324 (1945/46)	1.8	4,310	n.a.
1325 (1946/47)	1.1	2,770	n.a.
1326 (1947/48)	(closed down)		
1327 (1948/49)	(closed down)		
1328 (1949/50)	1.4	3,870	n.a.
1329 (1950/51)	2.1	4,580	n.a.
1330 (1951/52)	1.6	4,240	n.a.
1331 (1952/53)	1.04	3,260	n.a.
1332 (1953/54)	1.6	4,880	n.a.
1333 (1954/55)	1.7	5,350	n.a.
1334 (1955/56)	2.56	6,050	n.a.
1335 (1956/57)	1.76	4,760	30,614
1336 (1957/58)	2.06	4,790	30,287
1337 (1958/59)	2.02	4,720	29,281
1338 (1959/60)	2.23	4,480	35,507
1339 (1960/61)	1.80	4,510	30,240
1340 (1961/62)	2.14	4,840	41,008
1341 (1962/63)	2.61	8,000	29,992
1342 (1963/64)	2.38	7,000	20,606
1343 (1964/65)	1.51	3,880	45,895
1344 (1965/66)	2.53	7,428	59,115
1345 (1966/67)	2.49	7,100	96,199
1346 (1967/68)	2.47	7,500	75,325
1347 (1968/69)	2.47	5,300	9,929
1348 (1969/70)	2.55	6,100	42,071

6.5.0.1. (cont.)

Year	Sugar beets per jerib	White sugar production (in metric tons)	White sugar imports
1349 (1970/71)	2.44	8,600	54,057
1350 (1971/72)	2.66	9,099	54,457
1351 (1972/73)	2.67	8,292	51,640
1352 (1973/74)	2.34	7,436	
1353 (1974/75)	n.a.	n.a.	n.a.

Source: Planning Department, Ministry of Agriculture

Thus after thirty-three years of operation and twenty years of reports to increase and improve production, little or no change has occurred and certainly no breakthrough has been made except for an increase in sugar factory capacity during 1961. The status quo seems to have been quite satisfactory to the vested interests in agriculture, the factory, and GOA revenue policy if the above evidence is accepted. The increases in world sugar prices are putting pressure on the status quo and this may be the time to recommend changes that can be implemented.

6.5.1. Problem Definitions and Preliminary Targets

Modern technology presupposes a clear and correct definition of the problem to be solved. For whatever reasons, low sugar beet yields and inefficient sugar factory operations cannot be accepted as the problem definition. There must be much more or so many studies could not have been justified. From a systems point of view we need to consider more problem factors such as investment, utilization, location of income distribution, payment and credit, farm roads, pricing policy, and program commitment in quantified terms. That is, what is the current position or base line with respect to the above factors and what is a reasonable improvement target? Extrapolating from the preceding sections of this report we can construct columns one and two below and then set our own preliminary targets in column three.

Factors VA = value added	Present System	Conventional Improvement	Modern Improvement Target
Beet Farming			
Beet yield, tons/jerib	2.8	2.8	2.8
VA, Afs./ton sugar	4,137	4,137	4,137
Assets, Afs./ton sugar	7,440	7,440	7,440
Tons of sugar beets added	61,404	325,000	447,817
Baghlan Sugar Factory			
VA, Afs./ton sugar	4,017	4,017	3,310
Days utilized	100	100	100
Assets Afs./ton sugar	10,900	10,900	4,600
New Factories			
VA, Afs./ton sugar	-	6,864	5,400
Days utilized	-	100	300
Assets, Afs./ton sugar	-	52,900	36,300
Sugar Monopoly (at high cost of imported sugar)			
VA, Afs./ton sugar	(2,790)	(44)	2,520
Assets, Afs./ton sugar	3,215	2,925	2,925
Other Factors			
Income distribution beneficiaries	high third	high third	low third
Roads per capita, cm.	109*	109*	28 → 56*
Pricing policy	controlled	controlled	controlled
Commitment to program	?	?	?

*109 cm. and 28 cm. are the per capita farm-to-market roads from Chapter V. 28 → 56 cm. represents our immediate road target in the sub-regions of the low third of the agricultural population.

The first observation to be made is that sugar beets in Afghanistan will be grown on marginal land by most farmers. Thus, agricultural research on highly fertile and well-watered test plots as conducted and recorded in the reports on sugar beets are of little or no value. If agricultural research is to be helpful, the test plots will more closely parallel the typical field conditions encountered on the marginal land that sugar beet farmers will be using and will be followed by a wide ranging survey to locate such useable land in the agriculturally poor third of the country.

The second observation is that more modern technological study and attention should be focused on factory utilization. One hundred day campaigns in 365-day years are such a poor use of costly resources that it is strange not to find it forcefully mentioned for improvement in the many reports and studies that have been made.

If we accept the marginal agricultural conditions as given and increase factory utilization from 100 to 300 days a year, the much more favorable target results in column three become feasible and the central problem is changed from agricultural yields and its associated constraints to that of resource utilization and modern technology.

6.5.2. Resource Utilization

Sugar factory utilization of about 100 days a year is due to the poor storage characteristics of sugar beets in Afghanistan. This means that sugar juice must be extracted from the beets and converted to white sugar in a relatively short period of time after the beets are harvested. The conventional technology is to construct a single factory to diffuse sugar juice from sliced beets with hot water and then refine the juice into white sugar. Notice that two distinct technological operations are involved: one, extraction of raw sugar from the beets in the form of juice and, two, refining of the juice into white sugar.

The investment in plant and equipment covering two operations is about equal for each of them, as can be observed in the following list. The equipment for the first operation is greater in quantity but less sophisticated and costly compared with that required in the second operation.

General Operating Steps & Equipment in a Sugar Factory

Operation One

1. Beet washer
2. Beet slicers
3. Weighing device
4. Juice diffuser - - → Pulp
5. Lime kiln
6. Juice carbonators
7. Filter
8. Sulphitation
9. Boiler
10. Evaporators - - → Purified thick juice

Operation Two

11. Boiler
12. Electric generator and automatic controls
13. Juice Mixer
14. Vacuum pans
15. Centrifugals
16. Granulators
17. Sugar bagging
18. & weighing plant

It is this feature of two operating stages that gives rise to the modern technology of sugar production. The first stage must have a capacity and investment in proportion to the quantity of sugar beets harvested for processing just as in the conventional technology. If, however, the purified and thickened juice is stored in tanks, the second or refining stage need only be one-third the daily capacity of the first stage. That is to say, a 100-day campaign in the first stage at harvest time will produce enough suga: juice to run a small second-stage refinery for 300 days by introducing a 200-day thick juice storage capacity.

More important from the point of view of Afghan conditions, stages one and two need no longer be concentrated in a single location. Further, stage one facilities can be scaled down into a number of smaller facilities to match the location and land availability of the many small and dispersed agricultural communities throughout the country. That is, a centrally-located refinery can receive thick juice from a number of small first-stage satellite factories located around it in different directions and distances. It ought to be noted that such satellite thick juice factories should all be of a similar design that can be repeated many times as the number of satellites increases to meet the demand. This means that many of the components can be manufactured in Afghanistan in the Jangalak Factories for example. The refinery and juice storage system will need, however, to rely heavily on imported components. The question at this point is how to specify the optimum scale for satellite factories. A detailed design study is needed that meets Afghan conditions but as a first approximation, a small satellite thick sugar juice factory with a capacity of 5,000 tons of sugar beets during a 100-day campaign appears highly feasible to the writer. Ninety such satellite factories will be needed to process the targeted 448 thousand tons of sugar beets.

It is this matching of small first-stage facilities to marginal land rather than trying to make marginal land conform to a conventional factory design that represents the conceptual turning point whereby current investment per ton of domestic sugar produced can be lowered, rural income and employment can be better distributed, and government subsidies can be converted to revenue.

6.5.3. Sugar Juice Storage

The ability to store purified and thickened sugar juice is the key to transferring this modern sugar technology. The following paragraphs have been paraphrased from "Beet Sugar Technology."[10]

The first-full-scale installation of a plant utilizing the concept of carbonated and concentrated beet juice was made in 1960 at Brawley, California, following successful experiments with storing thick juice for later processing started in 1944 by the Holly Sugar Corporation. Due to the high degree of success of the Holly installations, storage of high-density, purified juices has become popular with many sugar companies both in the United States and Europe. One European company produces and stores excess syrup at one factory and later transports it to another factory which has excess capacity for further processing. Since 1960 many millions of gallons of thick juice have been stored without any measurable loss or deterioration. It has been found that solutions of sugar above 67° Brix and 8.0 pH will not support the growth of yeasts and molds that can cause weaker solutions to deteriorate. Syrup storage causes some loss in thermal efficiency and much greater care and cost in scrupulously observing the necessary sanitary conditions.

6.5.4. Comparative Accounts Analysis

The present Afghan sugar industry and the proposed new factory expansion were summarized in Exhibit 6.4.1.2. In addition, improvement targets were estimated in Section 6.5. In this section, costs for the modern technology are analyzed while maintaining the same basic parameters so that comparative results may be observed.

6.5.4.01. Assumptions

a.	Annual sugar demand, tons	65,000
b.	Controlled retail price, Afs./ton	16,000
c.	B.S.F.* annual production, tons	7,369
d.	B.S.F. increased refining utilization, tons	14,738
e.	New sugar refinery capacity, tons	39,000
f.	Total domestic sugar capacity, tons	53,738
g.	Imported sugar to balance, tons	3,893
h.	Imported sugar price CIF, Afs./ton	18,090
i.	Sugar yield per ton of beets	12%
j.	Sugar beet yield, tons/jerib	2.8
k.	New marginal land for increased B.S.F. beet production, jeribs (rounded)	43,860
l.	New marginal land for new factories' beet production, jeribs (rounded)	116,070
m.	Afs. 80 = U.S. $1.00 (1968-69)	

In order to improve the infrastructure of highways sufficiently to encourage the proposed sugar industry development, there is a need for a minimum of 220 kilometers of all-weather farm-to-market roads based on the ratio 1.5 miles of roads to one square mile of cultivated land (see Exhibit 2.1.0.1.). Eighty kilometers need to be associated with the Baghlan Sugar Factory and 140 kilometers associated with the proposed new sugar refinery to be located somewhere in the Kabul-Jalalabad sub-regional areas. Alternatively, the Kabul-Gardez-Matun axis could be selected or a future refinery located in this area. An estimated cost of two-lane, surfaced roads is 440 million Afs. for 220 kilometers including ordinary small bridges.

The direct asset investment required in the proposed shift of the Afghan sugar industry to the modern technology of thick juice storage divides naturally into agriculture, agri-business, and the government marketing monopoly as in the earlier analysis.

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*Baghlan Sugar Factory

6.5.4.02. The agricultural asset investment needed to upgrade the necessary marginal land is estimated at 2,500 Afs./jerib.[8] The marginal land required, assuming a yield of 2.8 tons of sugar beets per jerib, is as follows:

Baghlan Sugar Factory

Present 100-day campaign, jeribs required	21,930
200 days added for refining operations by change in technology, jeribs required	43,860
New Sugar Refinery and satellite thick juice factories for 39,000 tons of sugar, jeribs required	116,070
New land required for total project, jeribs required	159,930
Total estimated production of sugar beets on new land at 2.8 tons of beets per jerib, tons	447,804
Total new asset investment by agriculture, thousand Afs.	339,820
Total agricultural investment for growing sugar beets, thousand Afs.	454,650

The agri-business asset investment needed for thick juice technology divides into a white sugar refinery, thick juice storage facilities, and thick juice satellite processing facilities.

6.5.4.03. The asset investment required for a white sugar refinery with a capacity of 39,000 tons of sugar in 300 days of operation is estimated as the equivalent of one-half the plant and equipment cost (Afs. 649.14 million) for the new integrated sugar factory proposed by Urwick, Lugg & Gould,[4] that is Afs. 324.57 million. Urwick's proposed factory had an estimated sugar output at 90 percent capacity of 13,000 tons during a 100-day campaign so that with 300 days of operation, the output would be 39,000 tons. An estimated 50 percent of the total cost of the factory is for refining thick juice into white sugar and the remainder for processing beets into the thick juice (Section 3.5.2.), which we now propose to do in small satellite factories.

The plant working capital required is one-twelfth of that previously estimated or 10 million Afs. because working capital is shifted to thick juice storage. The working capital for thick juice storage is first estimated at seventy percent of the annual tonnage because thirty percent of the sugar is being sold in the months that the thickened juice is being processed and delivered. About sixty-five percent of the retail price of sugar has been incurred at the thick juice stage in production (see Section 6.5.4.12; 12,120/16,000). Thus, the average working capital for juice storage is 141.96 million Afs. (.5 x .7 x .65 x 16,000 Afs. x 39,000 tons). The cost of storage facilities is estimated at 15 percent of the plant cost of 48.7 million Afs. In summary then the estimated asset investment in a new sugar refinery and storage facilities is:

Plant and equipment, thousand Afs.	324,570
Storage, thousand Afs.	48,700
Working capital	
Plant, thousand Afs.	10,000
Storage, thousand Afs.	141,960
Total, thousand Afs.	525,230
Imported portion of the plant and equipment, thousand Afs.	240,730

At the same time, the Baghlan Sugar Factory will require asset investment in new storage facilities for thickened juice, as follows:

New storage facilities, thousand Afs.	26,600
Working capital, thousand Afs.	80,470

6.5.4.04. The asset investment required for the thick juice satellite factories is first estimated at fifty percent of the total plant and equipment cost for three sugar factories described in earlier sections because the refining capabilities have been replaced by a separate refinery as just described. This allows for the processing of sugar beets sufficient for 39,000 tons of white sugar. To this we must also add satellite capacity equivalent to twice the sugar output tonnage of the Baghlan Sugar Factory to obtain maximum plant utilization from the proposed change in technology. Thus, satellite asset investment is estimated as follows:

For satellite plants to supply new refinery, 39,000 tons sugar, thousand Afs.	973,710
For satellite plants to supply Baghlan Sugar Factory increasing refining, 14,738 tons sugar, thousand Afs.	367,960
Total fixed assets, thousand Afs.	1,341,670
Working capital for satellite facilities only	
39,000 tons, thousand Afs.	10,000
14,738 tons, thousand Afs.	3,780
Total working capital, thousand Afs.	13,780
Imported portion of plant and equipment, thousand Afs.	536,670

6.5.4.05. The asset investment required by the Sugar Monopoly or its equivalent is reduced by the use of thickened juice technology to the maximum of two months supply because the juice is in storage and covered by working capital, as described above, while white sugar is being produced approximately as the market is demanding it. From Section 6.4.3., the value added without subsidy or tax is 13.3 million Afs., plus sugar imports of 70.4 million Afs., of which one-sixth would be needed as working capital or about Afs. 14.0 million. The asset investment in facilities remains the same as before at 11.9 million Afs. The Monopoly asset investment and working capital is thus:

Present plant assets	11,900
New working capital, thousand Afs.	14,000
Present working capital, thousand Afs.	(203,270)
Net change in asset investment, thousand Afs.	(177,670)
Net change in working capital, thousand Afs.	(139,570)

6.5.4.06. Summary of estimated asset investment requirements added to the Afghan sugar industry for a 94 percent self-sufficiency, with a demand of 65,0[illegible] tons annually, and using the modern technology of thickened sugar juice storage and satellite juice factories is as follows:

New Asset Investment	Amount (thousand Afs.)
Social Investment:	
Farm-to-market roads	440,000
Agricultural assets:	399,820
New Plant and equipment:	
Refining plant	324,570
Refining storage	48,700
New Baghlan storage	26,600
Satellite juice factories	1,341,670
Sub-total	1,742,540
New Working Capital:	
Refining plant	10,000
Satellite factories	13,780
Thick juice storage	222,430
Reduction for Monopoly	(189,570)
Total new working capital	56,640

The above asset investment information covering new plant and operations can be briefly summarized as follows:

	Amount (thousand Afs.)
Agriculture	399,820
Agri-business beet processing	1,987,750
Monopoly reduction	(189,570)
New assets required	2,198,000
The present industry assets as previously estimated and shown in Exhibit 4.3.5.1.	351,600
Total industry assets for comparative analysis	2,549,600

6.5.4.07. The operations analysis starts as before with the sugar beet farmer. In this example, however, resources are of greater importance. The general purpose is to locate development as much as possible in the poorer sub-regions of the country. In order to utilize the Baghlan Sugar Factory more effectively, it will be necessary to expand sugar beet cultivation on 43,860 jeribs of land. With the new thick juice technology, such land can be up to 100 or more kilometers from Baghlan as long as 1,800 - 2,000 jeribs can be farmed in close proximity to a satellite factory and roads can be built to move the beets and thick juice economically.

The sub-regions near enough to Baghlan for the new technology are in the middle and high thirds of the agricultural population. Nevertheless, Baghlan offers a major opportunity for introducing thick juice technology as it already has 66 percent idle refining capacity. It is only necessary to construct several satellite juice factories and the necessary thick juice storage facilities at Baghlan to start receiving benefits. Thus, the large investment required as shown above can be broken down into many small-scale and more manageable steps.

Initially, one satellite factory should be located north of the Hindu Kush and two south of it in strategic locations. The transportation of thick juice from the two southern satellites to Baghlan should be paid for by the Monopoly as it will be the biggest gainer from increased domestic production. Later, when more satellites have been built and are in operation, the sugar refinery south of the Hindu Kush can be built and the project will then get into high gear. This step-by-step approach is sound and very much in the interest of Afghanistan.

Because development will take place both north and south of the Hindu Kush and as we are particularly interested in the southern development where the agriculturally poorest one-third are living, the analysis will maintain this division to the extent practicable. Thus, 43,860 jeribs in new land north and 116,070 jeribs south will be the basis for utilizing the refining capacity at Baghlan and the proposed new refining capacity at a strategic location in the south.

Estimated New Sugar Beet Farming

Account	Northern Area	Southern Area
Land area, jeribs	43,860	116,070
Sugar beets, tons	122,808	325,000
Effective price, Afs./ton*	643	643.
Farm value of beets, thousand Afs.	78,996	209,055
Farm value beet tops, 20 Afs./jerib	877	2,320
Total farm value, thousand Afs.	79,873	211,375

*See discussion, Section 6.3.1.

Account	Northern Area	Southern Area
Costs:		
Purchases		
Imported	3,070	8,123
Interest	615	1,626
Domestic goods and Services	15,218	40,272
Total purchases	18,903	50,021
Value added		
Wages	36,534	96,692
Taxes	2,500	6,614
Depreciation	1,536	4,064
Return to family	20,400	53,984
Total value added	60,970	161,354
Total costs including return	79,873	211,375

6.5.4.08. **The thick juice satellite factories need to service 43,860 and 116,070 jeribs of sugar beet cultivation north and south respectively. At the targeted increase in production of sugar beets of 448 thousand and 5,000 ton capacity per plant, there is a potential for about 25 and 65 satellite factories north and south, respectively. The dispersal of these factories throughout the sub-regions is the best imaginable guarantee of distributing income and employment to rural areas. In addition, the by-product beet pulp makes a good, long-keeping animal feed stuff when properly prepared, and in this system it is produced in the rural areas where it is most needed and useful because of seasonal scarcities in animal feed.**

The operating income and expense accounts for an average satellite factory must, under the circumstances of this study, be estimated on the basis of cost and expense data for the Baghlan Sugar Factory and the factory proposed by Urwick, Lugg & Gould.[4] In addition, some compensating costs and expenses that

balance out are involved due to the satellites being located in rural areas. At the same time, the juice stage in a sugar factory is more labor intensive than the refinery operations of juice mixing, vacuum drying, centrifuging, granulating, bagging and weighing. If we continue the practice of the sugar factory or refinery furnishing the seed, bags and transportation, then a 50 percent division of operating expenses continues to be reasonable. Due, however, to the labor-intensive character of the satellite operations, the payroll and benefits, still within the 50-50 overall division, are better divided on the basis of 60-40, satellite and refinery, respectively. On the basis of per ton costs, the relative accounts appear as follows using the data in Section 6.4.2., Combined Operating Statement.

Item	Cost distribution per ton of sugar Satellites	Refinery
Sugar content in thick sugar juice for:		
Baghlan Sugar Refinery	14,738	-
New sugar refinery	39,000	39,000
Total tons	53,738	39,000
Accounts	Amount (Afs./ton)	Amount (Afs./ton)
Purchase costs		
Sugar beet	5,360	-
Thick juice	-	10,120
Other domestic	877	1,040
Import	369	369
Value added expense		
Payroll & benefits	613	409
Taxes	82	123
Depreciation	1,859	1,859
Net profits	960	960
Total cost, expense, profits	10,120	14,880

The above accounts relate to satellite thick juice factories and the proposed new refinery. It is also necessary to consider the accounts of the Baghlan Sugar Factory and the effect of utilizing its refining capacity for, say, 300 days instead of the present 100 days. In this case we rely on the data provided in Section 6.3.2.

	Cost distribution per ton of sugar Baghlan Sugar Factory	
	Basic Tons	Additional Tons
White sugar output, tons	7,369	14,738
Accounts	Basic cost amounts Afs./ton	Additional amounts Afs./ton
Purchase costs		
Sugar beet	5,360	
Thick juice		10,120
Other domestic	2,863	1,462
Imports	529	265
Value added expense		
Payroll & benefits	1,533	766
Taxes	203	103
Depreciation	611	187
Profits	1,669	835
Total cost, expense and profit	12,768	13,738

The total cost of white sugar to the Sugar Monopoly or its equivalent agency is as follows:

	White Sugar (tons)	Amounts (thousand Afs.)
Basic Baghlan Sugar Factory	7,369	94,100
Added BSF sugar	14,738	202,470
New Refinery sugar	39,000	580,320
Total domestic sugar	61,107	876,890
Imported sugar, Afs. 18.09/kg.	3,893	70,428
Total sugar demand	65,000	947,318

The other Monopoly expenses are determined in a manner similar to that in previous examples.

Sugar Monopoly Operating Statement
(Imported sugar at 18.09 Afs./kg.)

Accounts	Amounts (thousand Afs.)
Regular Baghlan sugar, 7,369 tons	94,100
Added Baghlan sugar, 14,738 tons	202,470
New refinery sugar, 39,000 tons	580,320
Imported sugar, 3,893 tons	70,428
Custom duties, 30 Afs./ton	117
Port fees & charges, 200 Afs./ton	779
Transport of imported sugar from port to Sugar Monopoly Warehouse, 540 Afs./ton	2,102
Cost of sugar at warehouse	950,316
Expenses of Sugar Monopoly (S.M.)	
Salaries, wages and benefits	8,200
Administrative charges	4,900
Depreciation	800
Monopoly expenses	13,900
Average distribution charges:	
Transportation, 550 Afs./ton	35,750
Retail commission, 200 Afs./ton	13,000
Margin accruing to GOA through Monopoly	27,034
Total equals controlled retail price, 16 Afs./kg.	1,040,000

6.5.4.09. Comparative Summary of Accounts for Thick Sugar Juice Technology

The summary of accounts begins with the present domestic sugar industry in and around Baghlan and works through the various steps that we have been illustrating, that is, accounts for the expansion of agriculture, the aggregate accounts for the small satellite thick sugar juice factories, accounts for a new sugar refinery and finally the resulting adjusted accounts of the Sugar Monopoly. These individual accounts are consolidated and presented in the form previously adopted in Exhibit 6.4.5.2. For comparative purposes, the Case Two examples in that Exhibit are repeated along with the new accounts in Exhibit 6.5.4.10.

The modern technology in beet sugar production, in addition to being more suitable to the generally dispersed agricultural conditions in Afghanistan, gives better financial and economic results plus a greater ability to direct benefits to areas in need of development.

The return on investment (ROI) for the modern technology is 22 percent higher than for present conditions and on a seven and a quarter times larger asset base. Compared with the conventional technology, the ROI for the modern technology is 39 percent higher on a 5 percent smaller asset base. In terms of the partial multiplier effect, the improvement is spectacular but any shift from an import industry to a domestic one would give good results. Compared with the conventional technology, the partial multiplier has increased from 1.04 to 2.07, which in percentage terms is from 4 percent to 107 percent, or 22 times. The economic return based on the multiplier and as a proportion of GNP is similarly impressive as it moves from a minus 1.4 percent to a plus 1.06 percent, that is, an improvement of 2.46 percent of GNP, which gives a good idea of how important domestic projects can be compared with import projects and even export projects except where the natural endowment is great as in the case of natural gas on the north slope of the Hindu Kush.

EXHIBIT 6.5.4.10.

AFGHANISTAN SUGAR INDUSTRY FINANCIAL AND ECONOMIC EVALUATION BY PRESENT CONDITIONS, CONVENTIONAL SUGAR FACTORY EXPANSION VERSUS SATELLITE THICK SUGAR JUICE TECHNOLOGY

	Present industry conditions		Conventional factory expansion		Satellite factory technology	
Accounts	Financial accounts	Economic accounts	Financial accounts	Economic accounts	Financial accounts	Economic accounts
			(In thousands of Afghanis)			
Total assets	351,600		2,676,860		2,549,860	
Net sales	1,041,638		1,050,403		1,044,834	
Export sales	-		-		-	
Import purchases, CIF including sugar	1,046,251	(1,046,251)	366,144	(366,144)	123,983	(123,983)
Domestic purchases, except beets, juice or sugar	109,539	109,539	206,125	206,125	222,710	222,710
Interest payments	7,207	7,207	18,247	18,247	29,302	29,302
Employee costs	37,767	37,767	174,016	174,016	231,173	231,173
Taxes	15,950	15,950	21,591	21,591	52,621	52,621
Less· subsidies	(203,645)	(203,645)	(42,040)	(42,040)	-	-
Depreciation	6,068	6,068	155,140	155,140	186,825	186,825
Net profit	22,501	22,501	151,180	151,180	198,220	198,220
Return on investment, ROI	6.4%		5.6%		7.8%	
Partial multiplier effect		-36.80		1.04		2.07
Economic return as % of GNP avg. for 1348-49		-1.40%		0.42%		1.06%

Note: See Section 3.11 for method of data and calculations.

The effect on the GOA revenue position is also a positive gain from a deficit position of 187.7 million Afs. to a surplus of 52.6 million Afs. Compared with the period before the increase in world sugar prices when the surplus was 423.4 million Afs., the improvement seems low. In real terms, however, the difference of 370.8 million Afs. was essentially a subsidy by Afghanistan trading partners that should have gone into agricultural development rather than increased demand-employment in the public sector through the revenue mechanism.

6.5.4.11. Sub-Regional Benefits for Low Third of Agricultural Population

The cultivation of sugar beets and the operation of the satellite thick sugar juice factories directly affect agricultural and rural incomes and employment wherever these activities are located. The white sugar refinery, depending for its thick sugar juice supply on beet farming and satellite factories, will need to be centrally located with respect to these activities. Presumably, but not necessarily, such a location will be in or near a city or large town where a road network is already starting to form. Such a location can be expected to benefit non-agricultural income and employment rather than that of agriculture but the likelihood that it would be outside of the Kabul area meets the study purpose of encouraging industry to locate outside this center.

The benefits to the low one-third of the agricultural and rural population in the south can be summed as follows from the preceding data and methods.

Accounts	Agriculture	Satellite factories	Sugar refining	Total
	(in thousands of Afghanis)			
Assets	290,175	930,710	524,230	1,798,115
Domestic purchases & interest	41,898	34,203	40,560	116,661
Imports	8,123	14,391	14,391	36,905
Employee cost	96,692	23,907	15,951	136,550
Taxes	6,614	3,198	4,797	14,609
Depreciation	4,064	72,501	72,501	149,066
Net profit	53,984	37,440	37,440	128,864
Total	211,375	185,640	185,640	582,655
ROI	18.6%	4.0%	7.1%	7.2%
Partial multiplier	3.36	1.43	1.43	1.83
Economic return	195,040	157,215	157,215	509,470

The low ROI for satellite factories is due to no sales income being shown for beet pulp after the sugar juice has been extracted. The beet pulp has a real value as an animal feed and benefits the livestock portion of the agricultural community but until stock feeding as a commercial enterprise becomes better established, its elimination from the accounts is a conservatively justified measure.

The natural benefits from thick sugar juice technology have already been discussed. The above table of data is for the low one-third of the agricultural and rural population. The projected annual benefits at the planned level of operations, 39,000 tons of white sugar, are 509.47 million Afs. In sub-regions recommended for this project, the average per capita farm value income is 2,075 Afs. (see Exhibit 5.5.0.1.). In other words, the projected benefits are equivalent to the per capita income of 245,500 persons for an asset investment of 7,325 Afs. per person. The thick sugar juice technology should prove to be of some interest to development planners.

The price data on which Chapter VI is based are low compared with present world prices and creeping inflation in Afghanistan. If current prices were used instead, the resulting gains would be even more impressive. The future is uncertain and using the lower prices is a conservative step on which even better results may be obtained when more detailed feasibility studies are conducted.

6.5.5. Organization and Credit

On the basis of 90 satellite thick sugar juice factories processing about 5,000 tons of sugar beets each into juice equivalent to 600 tons of sugar, it will be necessary to associate with each factory between 100 and 300 landowners depending on the average number of jeribs each landowner will plant with sugar beets; the number of jeribs should be between 18 and 6, respectively. Organizing and dealing with such numbers of farmers requires careful planning and management. It is believed that each satellite factory should be a corporate cooperative to work closely with the farmers in the supply of their inputs and credits. Thus, the management of each satellite, in addition to the physical operation of receiving beets, processing and selling thick juice and beet pulp, will need to be a store merchant for buying and selling farm inputs as well as a branch bank for the credit and money management.

Each satellite operation must therefore be organized as three businesses, agri-business manufacturing, farm supply store, and a branch bank operation. The branch banking could be affiliated with the Agricultural or Industrial Development

Banks. Such a banking arrangement would need the Sugar Monopoly or its equivalent as a depositor and client. The supply store operations could be affiliated with the Afghan Fertilizer Company and the manufacturing process could be affiliated with the sugar refinery.

Such interrelations in organization and management are a part of the modern technology which promotes economic growth and employment.

The capital financing of the satellite factories is a sizeable undertaking. Each of the 90 satellite factories is estimated to require assets of about 15 million Afs., of which forty percent should be financed by the satellite cooperative members, that is, 50 to 150 thousand Afs. per member. Such memberships may, of course, be further subdivided. The 60 percent balance will need longer term financing as will the new sugar refinery when it is organized. Long-term credits for the imported portions of the satellite factories and the sugar refinery should be forthcoming from supplier countries or other donor agencies. Such financing should cover 40 percent of the satellite factory asset requirements if the project is planned and scheduled in an orderly manner. Thus, 20 percent remains for local bank financing. The local banks may also be responsible for collecting and administering the obtainable foreign credits. The refinery financing is slightly different with a possible 20 percent paid in assets, 60 percent foreign credits and 20 percent local banking credit. The Sugar Monopoly may be expected to manage its finances in its traditional manner.

6.6. A Domestic Project — Corn and Livestock Example

In this chapter we have considered export projects in general, examined an import sugar project in some detail, and studied its conversion into a domestic project by both conventional and modern technology, in even more detail. Before ending the chapter, a brief look at a typically complex agri-business project in the domestic sector is in order.

The Helmand Valley project area has been declared almost ideal for corn growing. Jalalabad is also a corn-producing area. Though corn can yield two and one-half times the weight of wheat, it sells at a lower price because wheat is preferred by most people in Afghanistan. Wheat keeps well and can be stored for years, while corn has a much shorter "shelf-life" and needs to be consumed within a year or less. In other words, corn has a less satisfactory receiving system.

In order to take advantage of the economics of high corn yields, the United States feeds about 80 percent of its annual crop to livestock, 11 percent is consumed as food by people and 9 percent is used in industry. That is, livestock represents the principal corn receiving system and demand. Food and industry are in effect by-product users and if we wish to develop a substantial corn industry in Afghanistan, we must either change people's taste preferences from wheat to corn or develop livestock feeding as a major consumer. Given the Afghan practice of range or scavenge feeding of sheep, goats and cattle, the prospects may not seem too bright. There is, however, a trend that will have important repercussions in the not too distant future.

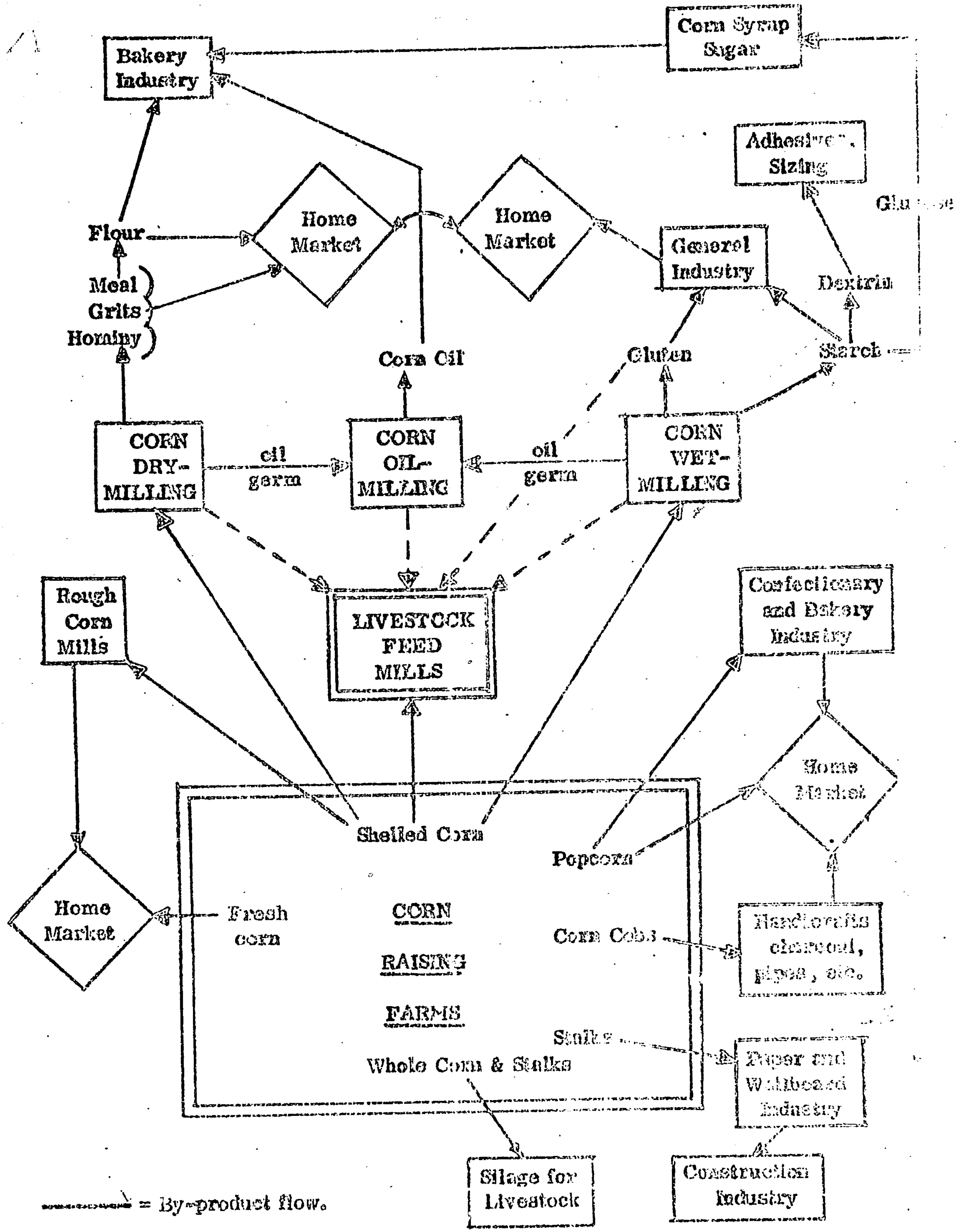
The Afghan government is steadily sponsoring expanded irrigation works that permit year-round water control. As a result, farmers move in to encroach progressively on green grasslands on which semi-nomadic range feeding of livestock depends. This irreversible contraction in animal pasturage is reducing the number of sheep and goats as well as their quality as they try to live on less and less and poorer and poorer grasslands. The traditional buyers of skins and casings report a corresponding decrease in the number and quality of skins and casings sold as well as lower real prices. The premium demand for karakul skins has resisted this trend but has put greater pressure on other kinds of sheep, goats and cattle. In the meantime, the pressure grows on feeding resources and the livestock industry needs to change accordingly.

The agri-business purpose in these circumstances is to join the potentials of corn production using irrigation with the decline in pasturage due to increasing irrigation to produce a symbiotic growth and improvement in the Afghan livestock industry. The complexities of such an undertaking are many but the returns can be on a scale similar or greater than were found when converting imports of sugar to domestic production.

The outputs of a corn products industry are numerous as can be seen in the accompanying Exhibit 6.6.0.1. They are not all necessary initially but indicate future potential. The livestock feed mill, however, is of critical priority. It is the foundation for improving livestock breeds and their growth rates. In so doing, the basic demand for the corn industry is expanded which then permits the other products to develop. Not indicated in the Exhibit is the feed lot operator for growth and

EXHIBIT 6.6.0.1.

CORN PRODUCTS FLOW CHART



fattening of the livestock before slaughtering and marketing.

A detailed study of these interlocking industries is needed and has great potential for Afghanistan. The time and resources for this agri-business research study were not sufficient for this task, and we must pass the unfinished job to others who will certainly follow.

6.7. Chapter Summary

Agri-business projects tend to fall into export, import or domestic categories. Export projects depend on factor endowment to give them the necessary price differential that motivates foreign trade. As a consequence, the top third in per capita agricultural resources are the beneficiaries of export projects. Import projects depress domestic per capita income but are often difficult to convert to domestic resources because of problems in selection and transfer of modern technology. Both export and import projects are high risk in nature because conditions and competitive forces can be changed unilaterally by foreign trading partners.

Converting an import project such as the Afghan sugar industry to a project using domestic resources holds great potential for agricultural development as the analysis following techniques developed in Chapter III amply demonstrates. It is even possible by careful selection of technology to plan in such a way as to direct the obtainable benefits to the low-third of the agricultural population in a major fashion where the average per capita income of a quarter million people can be nearly doubled.

The corn and livestock industries appear to be ready for a similar analytical approach and symbiotic growth of both industries as a result of fundamental changes that new irrigation projects are bringing about. Research in these fields is greatly needed.

CHAPTER VI

BIBLIOGRAPHICAL NOTES

/1/ A. Marshall quoted from "Principles of Economics," 7th Edition, Macmillan, 1916, p. 368, as quoted by I. F. Pearce, "International Trade," Macmillan, 1970, p. xxiii.

/2/ "Exports of Merchandise from Afghanistan," Ministry of Commerce, Kabul, Volumes 1340 through 1345.

/3/ R. Shone, "Pure Theory of International Trade," Macmillan, London, 1972, p. 58.

"The stress of creating export-oriented programs for the purposes of economic growth and development may promote the advanced sector and retard the backward sector and so cause or increase the duality of the economy." Thus theory and the empirical evidence of this study are complimentary with respect to lower thirds receiving little benefits from export projects.

/4/ Urwick, Lugg & Gould, Ltd., "Sugar Industry of Afghanistan," Kabul, April 1972.

/5/ Ibid /4/, p. 27, Annex II.

/6/ "Exports of Merchandise from Afghanistan," Statistical Department, Ministry of Commerce, GOA, for years 1348-1349 (March 21, 1969 - March 20, 1971), and "Imports of Merchandise into Afghanistan," Statistical Department, Ministry of Commerce, GOA, for years 1348 and 1349 (March 21, 1969 - March 20, 1971).

/7/ Ibid /4/, p. 1, Appendix II.

/8/ Personal communications. Fifty jeribs of marginal land were obtained from the government at 1,000 Afs. per jerib. In order to level the land, a tractor and earth-leveling attachments were used that included a driver and three field hands, at a cost with motor fuel of 800 Afs. per day. Twelve working days were required for leveling, irrigation ditch and drainage. An irrigation pump and engine costing 60,000 Afs. were required for lifting water against an 8-meter pressure head. Miscellaneous costs of 4,000 Afs.

were incurred for a total of 123,600 Afs. Rounding to 125,000 Afs. gives a cost per jerib of 2,500 Afs., which figure is used for estimating agricultural assets in this report.

/9/ "World Agricultural Production and Trade, Statistical Report," U.S. Department of Agriculture, June 1974, p. 4.

/10/ R. A. McGinnes, ed., "Beet Sugar Technology," Reinhold Publishing Co., New York, 2nd Edition, 1970, Chapter X, pp. 297-302. Reference supplied by D. D. Leetham, Portland, Oregon (VITA).

CHAPTER VII

PROGRAM

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PROGRAM PROPOSALS

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CHAPTER VII

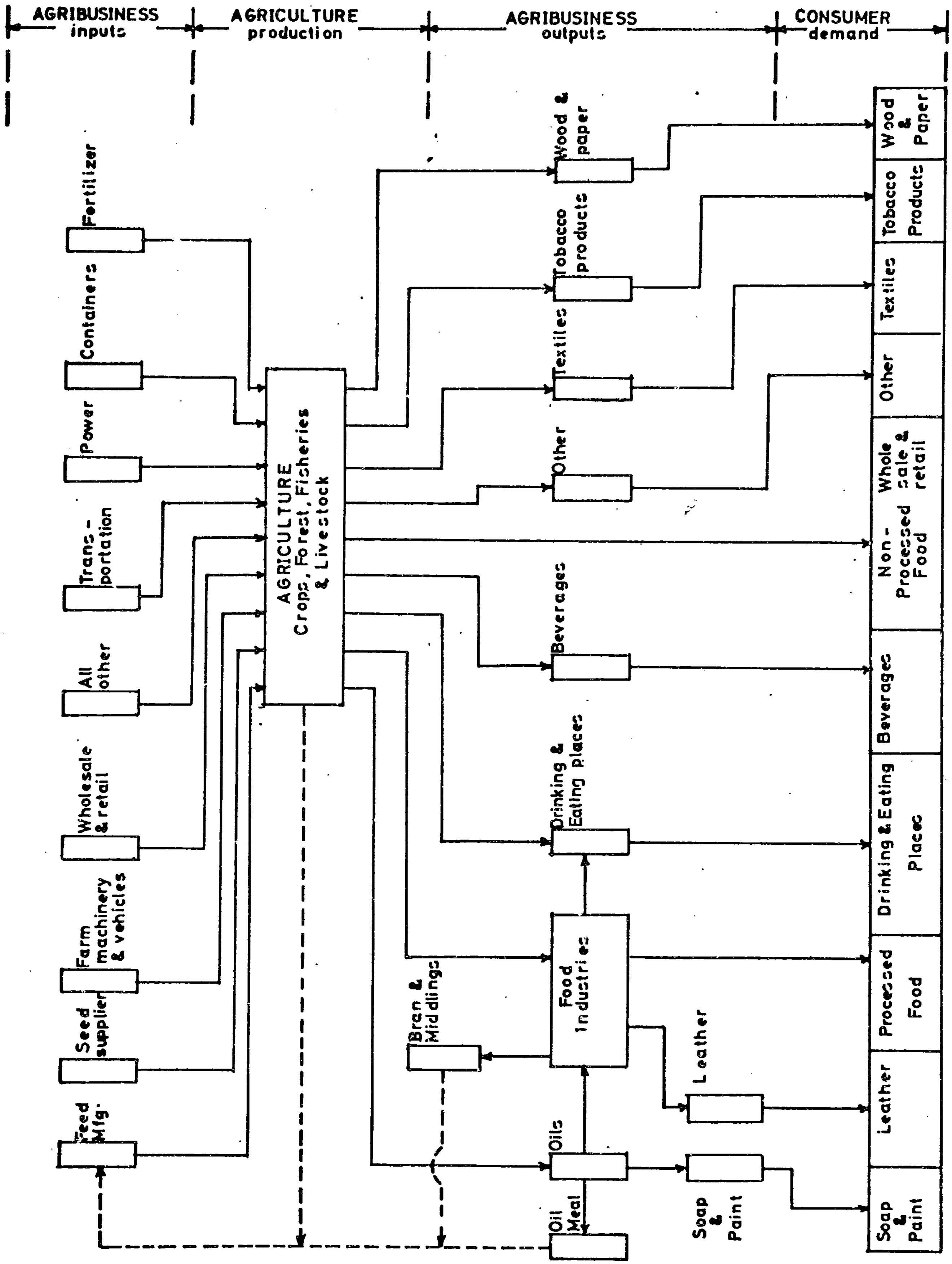
PROGRAM PROPOSALS

7.1. Introduction

Programs are much like the proverbial journey of a thousand miles, they start with but a single step and we might add "in the right direction." As already observed commodity system projects and programs can be aimed in any of three directions: exports, imports or domestic. How well such projects move toward their goals will depend on many factors and varying conditions. Nevertheless, a starting point and an objective direction are essential. Fortunately, agri-business has recognizable boundaries and a finite limit to the available choices.

The examples used so far to illustrate agri-business evaluation techniques are, however, too few to encompass the categories and boundaries of the many enterprises that are actually involved in the agri-business sector of industry. Rather than simply listing them, R. A. Goldberg's diagramatic presentation[1] is adopted to show the principal industrial categories with which we are concerned. The reader will perhaps find his time well spent in closely considering the diagram in Exhibit 7.1.0.1. for the many aspects of agri-business that it contains.

Exhibit 7.1.0.1 AGRIBUSINESS FLOWS



There are four distinct levels of activity involved in any agri-business program or project: agricultural inputs, agricultural production, agri-business outputs, and consumption. Starting at the top of the diagram we find the input industries that provide the supplies, equipment and services necessary for agricultural production, which occupies the second level. At the third level we find the agri-business enterprises that process, transform and distribute agricultural products in their final form. Consumers and consumption of these products are at the fourth level near the bottom of the diagram and they feed back to the industrial levels the frequent changes in demand preferences and quantities.

Agri-business input industries can be importers and/or domestic producers of agricultural requirements as well as being exporters of their various products. Agriculture, of course, is made up of purely domestic enterprises which in the normal course of events neither act directly as importers nor exporters, especially if processing or transformation of their commodities is involved. As producers, their crop-livestock yields, varieties and quantity of production help determine the range of activities at the third agri-business level. The other determining factors are the effective demand and preferences at the consumer level as already mentioned.

One of the critical features of agri-business programs is revealed at the third or output level of the diagram where both import and export projects can and do occur. Exports are naturally part of the agri-business outputs and so represent a beneficial use of well-endowed agricultural inputs and production. In doing so, however, the volume of production available for domestic consumption is reduced without a corresponding reduction in effective demand. The unsatisfied demand then acts as an inducement to increase imports. In turn, major imports at the agri-business output level tend to satisfy consumer demand but in so doing reduce the need for agricultural inputs and production. In effect, such imports short-circuit and impede domestic growth and economic development as already illustrated in the sugar example.

In order to avoid the problems of import and export projects, the following proposals will concentrate on domestic agri-business projects.

7.2. Agri-business Input Level

At the agri-business input level, animal feed and fertilizer manufacturing deserve a high priority in Afghan planning because of their ability to increase agricultural yields from a given resource endowment. The growing distribution of fertilizer by the Afghan Fertilizer Company program is a good example of the potential returns to agriculture. Unfortunately, it is an import project so that many of the benefits to the country cannot be fully realized through the investment multiplier effect. Domestic production of fertilizer is at present caught up in a conventional technology that needs a fresh approach based on modern technology and use of resources.

The manufacture of animal feed is at an embryonic stage with a growing potential. It should receive close attention so that modern rather than conventional technology can be applied at the beginning rather than later on as a corrective measure. Because animal feed milling and manufacture depend on domestic outputs at the second and third levels, they will be discussed again when these subjects are considered.

Container enterprises have been implemented under the FDPIL program and they serve as a good base for further expansion of individual projects as the needs arise. Water pumps are being produced by local manufacturers and many agricultural tools and small equipment are available through bazaar handicraft establishments. The small size of farms in Afghanistan acts as a constraint on larger manufacturing establishments for similar items of a more sophisticated, productive and costly nature. Road vehicles in this machinery and equipment category are assembled and rebuilt in Afghanistan but farm tractors are not and presumably it will be a long time before Afghan projects can expand into this area of manufacture or produce agricultural machinery in general.

Seed production, cleaning and grading have an increasing demand and potential for agricultural inputs. The need for improved seed and standards is essential if export markets are to be developed where a uniform and quality product is most important. Clover and alfalfa seeds are grown and exported from Afghanistan and may serve as a base for developing a seed industry. Wheat seeds need to be constantly improved in varieties now that high yield strains have been introduced into Afghanistan. Such improvements are not permanent and new varieties are needed to maintain production at the demand level. Otherwise yield and production will tend to decline and put additional pressure on the food supply. All of these factors indicate the need for development of the seed industry.

The power inputs to agriculture and agri-business deserve careful project attention because of their contribution to greater productivity. In the form of rural electrification projects, power adds potential to the amenities in rural areas that can be obtained in no other way. Transportation, wholesale and retail inputs to agriculture tend to develop independently of programmed projects. In some cases, as for sugar thick juice technology, special tank trucks for the juice are needed for transportation but they should be included in the project planning of commodity systems. The "other" input category of industries is generally small specialty enterprises that appear as projects only when the need arises and they are difficult to program in advance except as larger projects require them.

7.3. Agricultural Level

Agriculture in response to demand, often by agri-business projects, is a determining factor in what commodities can be produced according to conditions in Afghanistan. Close cooperation with the Ministry of Agriculture and Irrigation and the farmers is needed when agri-business projects are planned in order to expand the agricultural sector or modify it in new directions. All of these factors must be made integral parts of any project or program proposal.

7.4. Agri-business Output Level

The agri-business output level divides quite naturally into food and its by-products and the non-food industries which will be considered first. Working from right to left across the diagram we start with the commodity system for wood and paper.

The forest resources needed for these industries are limited by the generally arid climate in Afghanistan. Only two provinces, Paktia and Konar, have forests sufficient to supply wood products industries. In the case of paper, even these forest reserves are perhaps too limited for an economically scaled pulp and paper mill. A minimum sized mill can produce fifty tons of paper per day but with modern technology a hundred or more tons are needed. The Afghan market for paper is but a small fraction of this capacity and the transport costs are prohibitive of reaching export markets. It appears that the available forest resources have their highest utility for lumber as presently produced.

Tobacco products are manufactured and consumed in Afghanistan but cigarettes are not produced because this industry is dominated by an import psychology. Cigarette manufacturing has been proposed and a project was considered but disapproved by the Investment Committee. If the agricultural production of tobacco leaf suitable for cigarettes should be expanded, such a project might be worth developing, though the use of irrigated land for food crops is likely to retain its higher priority.

Textile manufacturing, particularly of cotton, is being exploited with several fairly large mills. The demand for raw cotton as an export item to the U.S.S.R. is high and tends to constrain the further development of the textile industry. There are some twenty-one rayon weaving projects that have been implemented under the FDPIL program that could be shifted from imported rayon fiber or yarn to cotton if the supply of cotton lint should be increased or exports of raw cotton decreased, the cotton remaining in the country then being used for the domestic textile industry or for export as fabrics. A thorough survey and analysis of the Afghan textile industry might give results that would influence the present cotton policy. Perhaps more important would be the effect on the wool textile industry, if it could lead to improved breeds of sheep with a higher quality wool that would meet export specifications. The textile industry as a whole is in a stagnant or transitional phase that needs specialized studies to pinpoint the problems and recommend acceptable improvements meeting local conditions.

In the food category of agri-business output industries, the first group involves non-processed foods. Cereal grains and fresh vegetables, fruits and nuts delivered to local markets offer few project opportunities. Grading, packing and cold storage projects for commodity export offer some incentives but a great deal in the way of returns will depend on the cost of transportation, probably by air, to reach important markets in the Middle East. The markets in Pakistan and India are not likely to change their demand in response to such superficial treatment.

Beverage enterprises have been implemented under the FDPIL program. Coca-Cola and Fanta have expanded their markets but additional soft drink projects would perhaps have trouble at this time in obtaining a market share sufficient to reach their break-even point. One project for wines and brandy has not been too successful due to policy constraints on the consumption of alcoholic beverages. A beer brewery project appears to have considerable potential but must face the same policy problems.

Traditional eating and drinking places abound in Afghanistan. In addition the major urban centers have various quality restaurants with the better ones usually associated with hotels, including an Inter-Continental Hotel in Kabul with its typically high quality facilities for eating and drinking. The prospects of formal projects in this area of development seem best left to the individual entrepreneur.

The food and oil categories of agri-business represent a far more complex project approach than those previously mentioned because of the many individual products and by-products that are typically part of this industrial category. The diagram indicates these relationships by the flow lines that cross and reverse the general direction. Thus, solving problems in this area has multiple effects and is usually worth the extra effort required.

The principal outputs of the food industries flow is to food consumption, either directly to home consumption or through institutions such as eating and drinking places, schools, hospitals, etc. The major by-product flow from the food processing industries is to the non-food leather industry and the minor by-product flow is to industries processing bran and middlings with their outputs returning to food industries or up to animal feed manufacturing at the agri-business input level.

The oil industries include both animal and vegetable oils, fats and waxes. The flows are in three directions — food, soap and paints, and oil meals. The soap and paint outputs flow to the consumer level while oil meal outputs return to the oil industries or up to the animal feed manufacturing level.

The feed manufacturing industries are clearly of major importance in the development of agri-business and agriculture. The recycling feature is of particular interest because of its ability to give a higher utility to food and oil by-products and waste. In doing so, it encourages expansion of the whole complex of associated input, agriculture (livestock) and output industries.

The animal feed and fertilizer industries are similar in that they provide the principal growth factor on the supply side of agri-business. In turn, as this complex of interrelated industries generates employment and incomes in the non-agricultural sector, there is an increase in the demand for agricultural commodities and other domestically-produced goods and services as well as imports. This interrelationship can be seen in greater detail by turning back to the example of corn in Exhibit 6.6.0.1. where the livestock feed mills hold a central position.

7.5. Potential Commodity Systems

The general agri-business flows in the previous sections are composed of many industry sub-classifications. There are so many of these classification headings at the agri-business output level, industrial classification manuals[2] listing as many as 2,365 in 162 groups, that they cannot be considered within the time and resources available along the lines of sugar beets in Chapter VI. Ideally, each potential commodity system should be analyzed in the manner of sugar beets in order to establish priorities among them. Lacking this opportunity, it is necessary to confine specific program proposals to those activities that appear as a result of this study to be most urgent and opportune.

On the agri-business input level there are three industries of special importance — prepared animal feed, power and fertilizers. Each of the ninety satellite plants for thickened sugar juice offers an opportunity for small-scale feed and power facilities. The feed operations can in this way encourage the development of corn crops at a corresponding number of points. Molasses from the sugar juice refineries is a feed supplement that can be delivered as a transportation back haul and so increase the effectiveness of the sugar refinery as well as improve livestock production. The sugar beets are a cash crop that expands the monetized sector in agricultural areas and makes possible the purchasing of animal feed. Electric power installations can introduce rural electrification as a complement to these activities and with the recommended road improvements to these locations considerable growth in amenities for the rural areas is inaugurated.

The manufacture of fertilizers in Afghanistan has already been mentioned and there is little more than can be added at this time except to reiterate that there is a pressing need for in-depth studies of this industry with particular reference to Afghan sulphur deposits and possible importation of phosphate rock.[3]

The output level of agri-business involves many more industry categories but the need to limit the scope of this study will confine us to the food and oil group with particular reference to the commodity systems of sugar beets and corn and the partial commodity system of cotton seed meal as it relates to animal feed. Regardless of the commodity system involved, the starting point is the Government of Afghanistan administrative structure required in promoting agri-business.

7.6. Administrative Structure for Agri-business

How the government should organize to handle agri-business development is one of the key problems that must be dealt with before progress can be made on a desirably wide scale. Logically, form should follow function and the first step in handling this problem is to determine what functions the government will perform and then let this specification suggest appropriate organizational arrangements.

It is clear that at the outset the government will have to be the prime mover in the effort to improve rural income and employment. In the field of agri-business industries this is particularly true — first because private entrepreneurs chose only those projects and locations which will maximize their returns and second because, as has been shown in the case of the Afghan Fertilizer Company, the government is reluctant to let the private sector own and control substantial or critical elements of the agri-business sytem. There is a role for private enterprise, however, in the small-scale industries that form part of any agri-business commodity system.

The Ministries of Agriculture and Irrigation (MAI), Mines and Industries (MMI), and Planning (MP) will be involved in the substantive aspects of agri-business development; the MAI through its concern with agricultural development, research and extension services, control of distribution of agricultural inputs, creation and control of cooperatives, and influence on agricultural credit. The MMI will be involved through its concern in the creation and operation of state-owned industrial enterprises. The MP, which now includes the Industrial

Promotion and Development Department (IPDD), will also be involved through its promotional and administrative role in the private industrial sector.

In addition there are other ministries concerned with the operation and effects of agri-business on the national economy and welfare. Thus, the Ministries of Commerce, of Finance and of Public Works (for the necessary roads) will have a great deal to say in matters of national policy and government investments in agri-business development. And the Ministry of Health may be involved for obvious reasons.

The interministerial nature of agri-business development and the importance of active support from all concerned suggest that the policy-making and chief executive functions should be vested in an interministerial committee. As a precedent, the above-mentioned ministries, with the exception of the Ministries of Health and Public Works, participate through their Ministers in the existing Investment Committee which administers the Foreign and Domestic Private Investment Law (FDPIL). It is possible to imagine the Investment Committee functions being broadened to include agri-business, except that the Investment Committee is an entity of the private investment law and its responsibilities are proscribed by it. Nevertheless, these Ministers could sit as a Committee for Agri-business Development in the same way that they form and participate on other boards and committees.

Such a committee would have to have the strong support of a professional operating staff to plan the program, to bring major problems to its attention and to monitor the execution and implementation of its decisions. This two-tier administrative system is similar to the Investment Committee and IPDD that achieved success in the build-up of the private industrial sector.

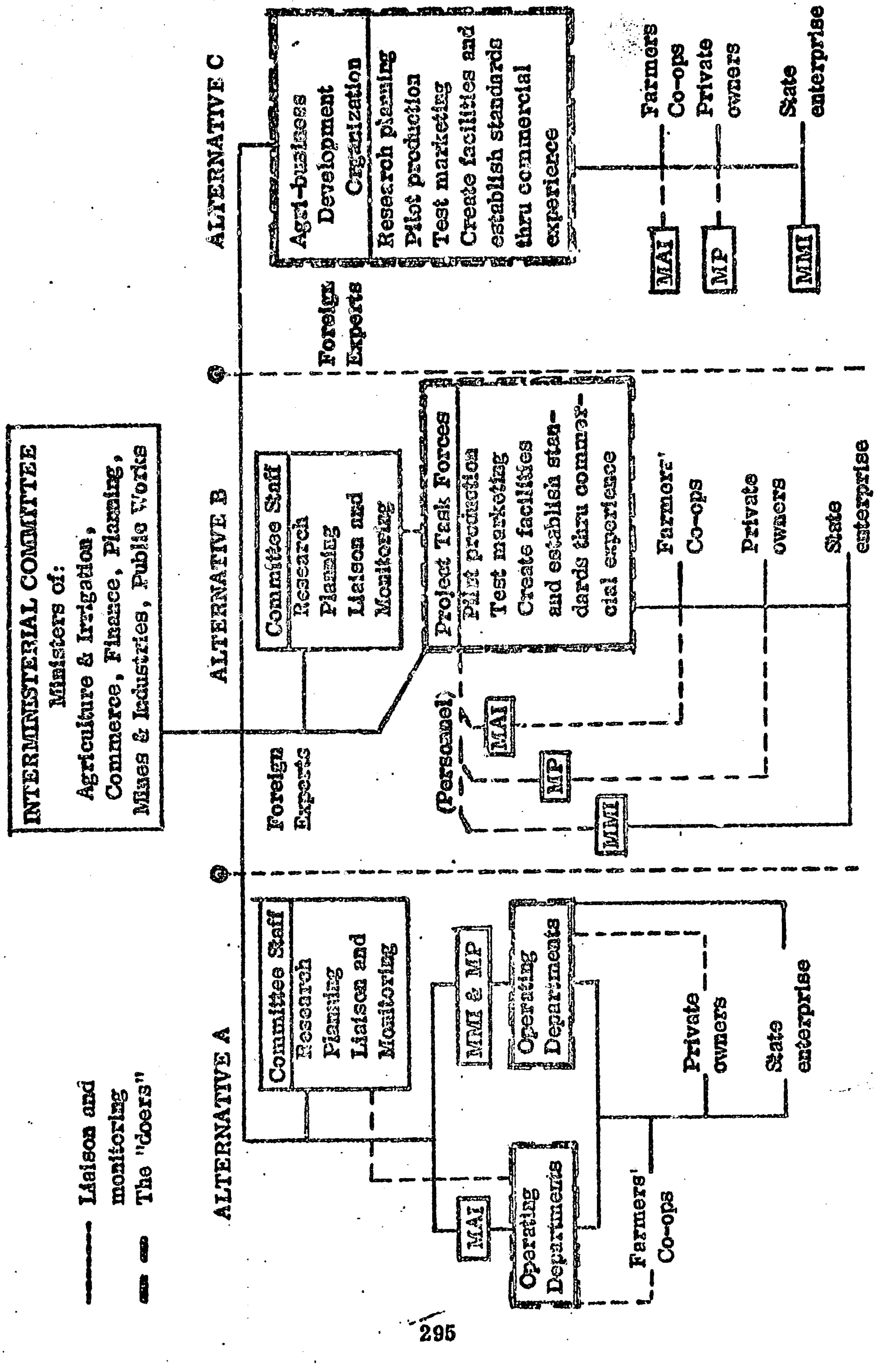
The carrying out of projects can be organized in a number of ways. Three organizational approaches are illustrated in Exhibit 7.6.0.1. Any final arrangement will perhaps be a modified version of one or more of these alternatives depending on relative strengths and personalities.

Alternative A presupposes that the Ministries will not easily surrender or delegate their functions. There are numerous and visible examples of this tendency and two will serve to illustrate the problem. In the case of the Afghan Fertilizer Company, the MAI asserted its control by reorganization of the AFC's private enterprise character and doing away with private wholesale distribution. In the case of the PACCA project, the integrated project approach to agricultural development was reduced to advising on crop development and marketing because PACCA, in principle, was duplicating services supposed to be available from MAI.

Alternative B presumes that commodity system implementation could be organized along project lines with personnel from concerned Ministries being seconded to a task force responsible under the Committee for bringing a particular commodity system into being.

Alternative C also presumes that the government would be willing to set up under the Committee an extra-ministerial organization for agri-business development with complete authority and budget for carrying out the entire range of entrepreneurial functions needed to get a commodity system project operating.

EXHIBIT 7.6.0.1. ALTERNATIVE MODES OF ORGANIZATION



Such an organization would displace the committee staff and the interministry task force although it would have to work closely with the ministries to gain their cooperation in the many overlapping areas of activity. In this scheme, the ministries would maintain their traditional roles rather than act as the prime developers.

In commodity systems such as sugar where distribution is carried out by government monopolies, they will have to be included in the organizational set-up and perhaps have representation on the Committee.

7.7. Ownership of Physical Facilities

Two kinds of physical facilities are involved. The first to be provided will be those needed to carry out the work of the development organization or team, and will include, in addition to the usual office and transportation equipment, the laboratory and pilot plant equipment and facilities for small-scale production. The second kind of equipment and facilities will be commercial scale installations which will be determined on the basis of pilot plant production and test marketing.

Ownership of the first kind of facilities — development facilities — should unquestionably be vested in the government organization charged with carrying out the project work. At this stage, there is no alternative to government initiative to mount sizeable campaigns for launching agri-business projects. At some time in the future, when and if a robust food and agricultural processing sector grows up, it may be possible to visualize private participation in an agri-business association that would perform the development function, but not at present.

Ownership of the commercial processing facilities depends on the nature and organization of a commodity system and how the parts complement one another as well as on the methods and facilities for financing. Each project in the complex will need to be adjusted to the available possibilities. Private ownership and cooperative ownership of commercial facilities is a preferred mode for accomplishing agri-business objectives because of the price squeeze described in Chapter II and the many small-scale enterprises typically involved in agricultural commodity systems. In spite of these questions, the government ownership of certain agri-business facilities has come about because of the default of private owners to meet debt service requirements and government financing. The notable exceptions are the large facilities for grain storage and milling which are so fundamental to the general welfare that the government feels it necessary to take a large position in the industry in spite of some eighteen thousand small grain mills throughout the country.

Cooperative ownership of processing facilities has a certain amount of appeal to those who believe that agriculture and manufacturing can be harmonoiusly blended for the benefit of farmers. The record in this regard is inconclusive because many such cooperatives fail in practice. Farmers generally prefer the least involvement in affairs extraneous to the farm and want maximum cash returns with the minimum investment. As a result, they often fail to understand the problems of managing a processing facility, with the result that financial weaknesses develop.

Modern management techniques have demonstrated that these conflicting interests and experience can be overcome by adopting a form of "joint venture" arrangement between private agri-business companies and farmers' associations or producer cooperatives.[4] The problem in any joint venture is, of course, the transfer price mechanism that assures the farmer that he is obtaining his fair share of the market price. Two methods have emerged for this purpose — formula pricing and profit sharing. Both require bargaining along contractual lines between representatives of the producers' cooperative and the processing company. The government often enters the bargaining process as a third party. In any case, if the cooperative obtains too high a price for the raw product, the company operating margin can be so reduced to meet its selling price that the company is unable to operate. Thus, the farmer can obtain a high-quoted price but ends up with no market for his product. If equitable price bargaining and agreements are achieved, the ownership and financing of the processing company by the private sector can reduce the financial demands on both the farmer and the government while encouraging market expansion and benefits to all concerned.

7.8. Incentives Under the Foreign and Domestic Private Investment Law (FDPIL)

The industrial development program under the FDPIL, Investment Committee and IPDD will be important in the development of agri-business along the lines discussed. For example, if the satellite factories for thickened juice are privately-owned, they would be able to apply for the benefits of the law which include duty-free importation of capital goods, reduced duty on spare parts and raw materials and tax benefits; if they are cooperative-owned, see example two below. The refinery would likewise benefit if it were under private ownership. Nevertheless, several questions would have to be dealt with in order to maximize the effectiveness of the investment law for the promotion of agri-business schemes using the ideas in this report. Examples follow:

-- What relationships should be formalized between the suggested Inter-ministerial Committee and the (presumably) smaller Investment Committee, and between the staff arms of both the Interministerial Committee and the IPDD?

-- If cooperatives are to own in whole or part the processing facilities, is there anything preventing them from obtaining the benefits of the law?

-- Because of the importance of these projects and their beneficial effects, can they be given preferential treatment, for example, through especially low rates on raw materials under the investors' special raw materials tariff?

-- In the case of the proposed sugar program, if there are really to be 90 thickened juice plants, can a way be found to standardize and speed up the application procedure?

-- We have proposed that the electric generation equipment in the 90 sugar units also be used for rural electrificati[illegible]. Can a way be worked out to permit this, both through the FDPIL and by modifying the law or regulations which gives the ABM a monopoly on electricity sales?

-- Are additional fiscal or other incentives needed for this program and can they be provided through the FDPIL?

7.9. Further Studies

The commodity systems included in this study report are limited to sugar, which has been examined in depth, and corn in connection with animal feed mills. Corn as a commodity system should be thoroughly investigated as indicated in Chapter VI and illustrated in Exhibit 6.6.0.1. In addition, other crops and livestock will need similar research studies and evaluations so that those showing positive partial multiplier benefits to the Afghan economy can receive the priority treatment that they deserve.

A short list of commodities that appear to justify early study include:

Corn	Apricots	Walnuts	Sheep
Carrots	Pears	Almonds	Dairy and
Cauliflower	Pomegranates	Pistachios	meat cattle

The Interministerial Committee, its staff and the IPDD should coordinate their efforts in establishing a commodity list that can then be used for negotiating study agreements necessary for commodity system development and evaluation.

7.10. Technical Requirements

A commodity system is made up of a number of parts and individual projects that need to be programmed separately while maintaining the integrated nature of the system. In order to maintain continuity, the following comments are based on the sugar industry as a principal example but corn, livestock feed, and power are included as they appear appropriate.

The ninety satellite factories for thickened sugar juice represent nuclei of a corresponding number of development locations or centers plus a new sugar refinery to be located in the southern sub-regions of low per capita agricultural resources and income. The discussion will concentrate on the satellite locations which contain major elements of interest. The refinery being located in an urban center has a typical single project effect and requires less detailed discussion.

Each satellite factory can be treated as a separate development project. It is a means of introducing new concepts and opportunities in rural areas. As such, it needs to include input and social infrastructure as well as the output activity of the factory itself. In addition the output of by-products generates a chain-effect leading to animal feed and the demand for corn and other by-products from different sources. In other words, each location becomes a system of integrated development and not just an isolated factory. Each system considered below requires separate project treatment with all of the attributes such work implies -- organization, donors, staff, etc.

Location

Ninety locations have been suggested. The actual number that evolve will depend on the response by the government and others to these program proposals. Assuming that there are favorable responses, it will be necessary then to specify each location. An agricultural survey will be needed to find land resources, 1,800-2,000 jeribs, suitable for sugar beets as well as a group of farmers, 100-300, interested in growing them. This task is in the province of the Ministry of Agriculture & Irrigation (MAI), and will need to be part of the coordinating purposes of the Interministerial Committee and its professional staff and advisors. Foreign donor technicians capable of helping in the selection of marginal land suitable for sugar culture will perhaps be needed. They should also have qualifications to judge the advisability of different locations on the basis of logistics and site selection for the necessary facilities. The Interministerial Committee will have responsibility of assuring that land for the factory and buildings is provided unless private entrepreneurs are encouraged in the beginning to participate in the process. In this case they may provide the capital for purchasing a suitable land location.

Roads

Once potential locations are determined, a program for assuring all-weather road accessibility must be undertaken. The Ministry of Public Works will have responsibility, in coordination with the Interministerial Committee, for such undertakings and again foreign donors should be encouraged to participate. Given the specific need and economic benefits to be derived from the total program, this participation will have a sound basis for action.

Irrigation

Each location will need assistance in developing small irrigation systems sufficient for the land area involved. Well and/or irrigation pumps may be a necessary part of such systems. The MAI will be involved in planning such works and USAID is interested in small irrigation projects. The FDPIL incentive program will perhaps need to be amended so that it may include this type of project. Estimates of the cost of works should be obtained from the MAI after they have conducted some sample land location surveys.

Farm Cooperatives

The estimated number of farmers for each location may vary from 100 to 300. In view of these numbers and the need for a regular supply of sugar beets for the factory, it is advisable to organize a farmers' association or cooperative for bargaining with the sugar factory as previously mentioned. Foreign donor specialists may be needed to work with the MAI in establishing such cooperatives after locations have been officially approved and designated as development areas.

One of the functions of the farmers' cooperatives as institutions is to bargain on price for sugar beets purchased by the satellite factories. This price bargaining is but the first step in the bargaining system which includes prices between satellite factories, sugar refineries, and monopoly sugar distribution. The Interministerial Committee will have to take the responsibility for coordinating this price bargaining system. Again, the FDPIL will need amendment in order to work effectively and provide incentives for farmers' cooperatives.

It should also be carefully noted that ownership of the satellite factory processing facilities by the farmers' cooperatives is not recommended because of the differences of interest already mentioned. See page 297 for ownership and management problem.

Satellite Factories

Actual satellite factories and juice storage facilities will have to be designed specifically for this project. Juice extraction equipment is fairly standard and the processes well understood. The need is equipment of the proper scale so each piece will function effectively and economically with the others. A foreign industrial engineer with Afghan engineers from Kabul University and Jangalak should form a design team, presumably under the auspices of the Investment Promotion and Development Department (IPDD) in the Ministry of Planning. After contacting manufacturers of such equipment, some members of the team should visit those companies who show interest and discuss the needs and problems of achieving the design purposes. A beet capacity of 5,000 tons in a 100-day campaign has been suggested. The design team will be responsible for determining the actual scale of the satellite factories and their probable cost. Analysis and a feasibility study is then needed to stay within the bounds of the overall program. The IPDD at present has capabilities for performing pre-feasibility studies. This capability is in the process of being augmented by a UNDP team of experts. The IPDD and the Interministerial Committee will need to coordinate their efforts to assure successful development of the satellite factory system.

The thickened sugar juice technology and storage facilities will also need an expert with experience in this phase of the project to work with the design team. A visit by members of the team to actual installations using this technology is recommended. The Holly Sugar Corporation in California is suggested for the visit as well as the source of the technical expert. USAID is a candidate for assistance in this design work.

It is recommended that initially at least three satellite factories should be planned and installed on a pilot and demonstration basis, possibly one north of the Hindu Kush and two south. Thick juice storage facilities at the Baghlan Sugar Factory (BSF) will need to be added at the same time. Juice output from the satellite factories thus becomes available as produced for increasing the BSF sugar output.

Animal Feed Preparation

Sugar beet pulp, a by-product of the sugar juice extraction process, is a valuable livestock feed component. Molasses from the sugar refining process is also a valuable component. The addition of corn and cotton seed meal, both of which are available in Afghanistan, should provide a base for preparing a well-balanced livestock feed. Such a feed may not be considered an optimum combination but given the conditions in Afghanistan and the seasonal need for feed, something less than the optimum will still be a valuable contribution to the system and development of livestock around each satellite location.

It is therefore recommended that a feed mill be included with each satellite complex. The above design team should thus include an investigation of suitable feed milling equipment in their program. A foreign technical expert should be added to the team in developing this phase of the program. The IPDD, the Interministerial Committee, and the MAI will have to coordinate their efforts if this part of the program is to succeed.

Power

The satellite factories can be operated by steam power from the boilers needed for heat in thickening the sugar juice. Such a power source can also drive a turbine electric generator. Alternatively, a diesel electric generator may be recommended by the design team in balance with the steam boilers. In either case, serious consideration should be given to increasing the size of the electric generating system to provide some rural electrification.

Electric service in rural communities is considered by many authorities on the subject of development to be one of the principal means of adding social amenities in rural areas. The opportunity to expand such development with this program should not be overlooked. Foreign donors are likely to be quite interested in this aspect of the program.

Sale of electric power is a monopoly activity controlled by Afghan Breshna Moasessa (Afghan Electric Company) attached to the Ministry of Mines and Industries. The manner in which the electric power potential of the satellite factories can be taken advantage of for the benefit of rural populations is, therefore, a serious problem which lacks flexibility due to monopoly practices and methods. It will be the responsibility of the Interministerial Committee to sort out this problem, if it can.

Agriculture Supply Store

The agricultural inputs of seed, fertilizer, insecticide, tools, etc. will be needed in conjunction with sugar beet, and possible corn production.

The supply of these items will be needed in a regular fashion and a farmers' cooperative store appears to be a logical candidate for this purpose. The Afghan Fertilizer Company under the auspices of MAI is engaged in developing agriculture supply stores and should be able to assist in developing this feature of the projects under the guidance of the Interministerial Committee.

Credit

The development of this complex of activities will require facilities for working capital loans to farmers, factory and other activities as well as longer term loans for plant and equipment. Such loans require supervision and it is one of the major problems for lending institutions, particularly in rural areas at a distance from central offices. Each of these locations may increase the potential for the Agricultural and Industrial Development Banks to locate personnel in rural areas on a more profitable basis. These possibilities need to be thoroughly studied and evaluated by the banking institutions. The Interministerial Committee can be of considerable assistance in assuring that adequate credit is available throughout the system.

Sugar Refinery

Once the number of satellite sugar juice factories reaches twenty-five (the number required for full utilization of the BSF), a sugar refinery in the southern sub-regions will become necessary. The proposed capacity of this facility is 30,000 tons of white sugar in a 300-day working year. The location of the refinery will depend on the proposed locations for the sixty-five satellite factories and other logistical factors of supply. The design team will be involved in establishing the technical specifications required for the refinery to store and process the thickened sugar juice from the satellites and putting the specifications out for tender. A foreign sugar refinery expert should join the team at this stage of the process.

Depending on the ownership decision by the Interministerial Committee or Cabinet, the refinery may be in either the private or public sectors. If the decision favors private ownership, the IPDD and the FDPIL incentives are available to encourage private investors. The Baghlan Sugar Factory is privately owned and there are reasons of management and financing that recommend a similar approach by the government. In any case, the purchase price for thickened sugar juice is a matter of bargaining between the managements of the refinery and the satellites with the government possibly participating as a third party.

Monopoly Sugar Distribution

The government utilizes monopoly procedures for the purchase and distribution of sugar to retailers throughout Afghanistan. It is expected that this form of organization and distribution with official pricing will continue. Special note should be made of this ceiling price arrangement and the price bargaining between the monopoly, sugar refineries and foreign sources for sugar imports, which will probably continue but in much reduced quantities. The chain of price bargaining on domestic production of sugar runs through three steps -- farmers' cooperatives and satellite factories; satellite factories and refineries; and refineries and the monopoly. Each step adds the problem of balancing prices so that each level receives a rewarding portion of the final price. Failure to achieve a proper price balance will reduce the total amount of sugar produced and is a principal reason for recommending that the Inter-ministerial Committee staff participates at each price bargaining level. Such overall responsibility is an essential requirement when market forces are replaced by controlled pricing.

Financial Requirements

The global estimate of assets required by this program is placed between fifty-five and sixty million dollars. The facilities include satellite factories, storage, feed mills and added electric generating capacity and the improvements relate to land, irrigation works and roads. A possible distribution of the program financial asset requirements is shown below. Many alternative asset distribution proportions are possible but they should wait for analysis when more information becomes available on the basis of negotiations, policy decisions, surveys and feasibility studies.

Estimate of Program Financial Asset Requirements Including Working Capital

A Possible Distribution in Percentages

Facility	Private Sector	Public Sector
Marginal land improvements	5.7%	-
Irrigation works	3.5%	2.7%
Roads	-	14.1%
Satellite Factories	48.1%	-
Baghlan Sugar Factory	3.6%	-
New Refinery	-	18.4%
Monopoly	-	(6.7)%
Feed mills, power & stores	10.6%	-
Total = 100%	71.5%	28.5%
In millions of U.S. $, avg.	41.1	16.4

Foreign assistance is not included in the above schedule. It can only be determined after considerable negotiations between the government and various donor agencies.

It perhaps should be mentioned again that the program is flexible and can progress in relatively small steps over a period of time as resources can be made available. Each step makes a positive contribution to income and employment starting in rural areas. The largest step occurs when the new refinery is being implemented.

The dollar estimate is generated from the analysis in Chapter VI in which Afghanis were used, based on 1972 values using the foreign exchange rate of 80 Afs. = 1 U.S. $. Since then inflation in the industrial countries has increased prices of manufactured goods considerably so that cost estimating has become more speculative. However, the Afghani rate has moved to 55 Afs. = 1 U.S. $ and this figure has been used in arriving at the global assets. To the extent that the appreciation of the Afghani offsets price inflation elsewhere, the estimate is judged to be reasonable as guidance for preliminary planning and programming purposes.

7.11. Timing and Actions

No agricultural commodity system moves ahead of its own volition. Good timing and forceful action are required if success and its benefits are to be obtained for rural income and employment. A number of important steps and actions within a time frame are outlined below under three main headings. Action A is a presentation to the Cabinet and its decision to initiate a program for agricultural commodity system development and implementation. Action Group B covers the general steps that need to be taken in starting the program. Action Group C uses the specific example of the sugar commodity system to describe the principal steps that can be readily visualized at this time. Action A represents time "zero" for the program which may take five years for its complete implementation. The actual time required will depend on the personalities of the Interministerial Committee and their commitment to the program.

Action Group A

1. A decision by the Cabinet to initiate an agricultural commodity systems program.

Action Group B — General

2. Formation of an Interministerial Committee (IC) and appointment of its chairman.

3. Selection and appointment of Afghan IC staff members.

4. Selection and appointment of advisors presently in Afghanistan.

5. Development of a commodity list for commodity systems studies and programs.

6. Conduct negotiations with foreign donor agencies for IC and IC staff advisors.

7. Sign agreements with advisory funding.

8. Approval of commodities by IC for development into commodity systems.

10. Assignment of approved commodity systems to IC staff members.

   a. Timing: This general phase should not take more than six months for completion.

Action Group C — Specific Example (Sugar Commodity System)

11. Formation of project design and management team.

12. Team drafts position papers on specific sub-projects required by the sugar commodity system.

13. IC and team members conduct negotiations with foreign donor agencies concerning project and sub-projects.

14. Signing of project and sub-project agreements for funding.

15. Negotiations with foreign donor agencies for technical experts.

16. Signing of contracts for experts.

17. Arrival of experts according to contract terms.

b. Timing: These preliminary project steps can take anywhere from six to nine months. The determination of IC and its chairman to keep matters moving in this period is critical if the project is to get an early start.

18. Completion of formation of the project design and management team and appointment of team leader by the IC.

19. Preparation of detailed project plan using "pert" (program evaluation and review technique) and critical path techniques.

20. Survey of marginal farm land for sugar beet growing and location of satellite factories.

21. Agronomy review studies and possible tests at selected locations for marginal conditions.

22. Negotiation and signing of agreement with Baghlan Sugar Factory (BSF) for purchase of thick sugar juice and determination of land site for juice storage facilities and delivery system.

23. Design for satellite factory and juice storage (BSF) as well as ancillary feed mill and electric power plant in form approved by the IC.

24. Preparation of financial feasibility studies for individual sub-projects and total project.

25. Modification of designs according to results of studies.

26. Preparation of model agreement for farmers' cooperatives and obtaining IC approval of legal form.

Note: The following actions, where they involve ownership, relate as appropriate to private investors or government inventors depending on earlier policy decisions (9) by the IC.

27. Obtaining of Investment Committee approvals of individual sub-projects as needed for incentives.

28. Negotiation of purchase or assignment of land for satellite factory site(s).

29. Ordering of construction of needed factory structures according to specifications prepared by the project design team.

30. Ordering, according to design specifications, the satellite factory(s) machinery, equipment, etc. including feed mill equipment and electric generator plant. (Three pilot factories have been recommended, but it may be decided to start with only one.)

31. Ordering, according to design specifications, the thick sugar juice storage equipment and piping. (Note: The ordering may be progressive because a number of small tanks are a better design than a single large one.)

32. Formation of farmers' cooperatives according to locations selected and approved by IC.

33. Preparation of approved price bargaining schedules and explanation to farmers' co-ops.

34. Design of necessary irrigation works at selected locations.

35. Negotiation of agreements and incentives with farmers co-ops and individual farmers (as needed) for land-leveling, ditching, wells and engine pumps.

c. <u>Timing</u>: This design and ordering phase will probably take nine months of concentrated effort for its completion.

36. Contract for construction of satellite factory structures.

37. Contract for construction of storage facilities at BSF.

38. Installation of satellite factory machinery, equipment, feed mill and power plant upon arrival.

39. Contract for growing of sugar beets at satellite locations in test quantities.

d. <u>Timing</u>: The construction and testing will perhaps take a year or more depending on seasonal factors. The elapsed time to this point in the program is two to three years depending on the effectiveness of the personnel and the speed of negotiations and decisions in the early phases of the program. (Note: Any sugar factory program will require equal amounts of time.)

40. Contract for increased sugar beet production to match satellite factory capacity.

41. BSF sugar output increased in proportion to (40) above.

42. Location and scheduling of more satellite factories to complete the program following above procedures.

43. Ordering and contracting for additional satellite factories and sugar beet production according to the above schedule.

44. Contract for additional juice storage capacity at BSF.

45. Schedule of construction of new sugar refinery

46. Negotiation and contract for the new sugar refinery.

47. Re-scheduling satellite factory locations and construction according to completion date of new sugar refinery.

48. Construction and start-up of the new sugar refinery, satellite factories and sugar beet production.

49. Completion of initial production phase of the domestic sugar program.

e. Timing: At this point all of the sugar program sub-systems are "go" and the elapsed time should be within the four to five-year limits.

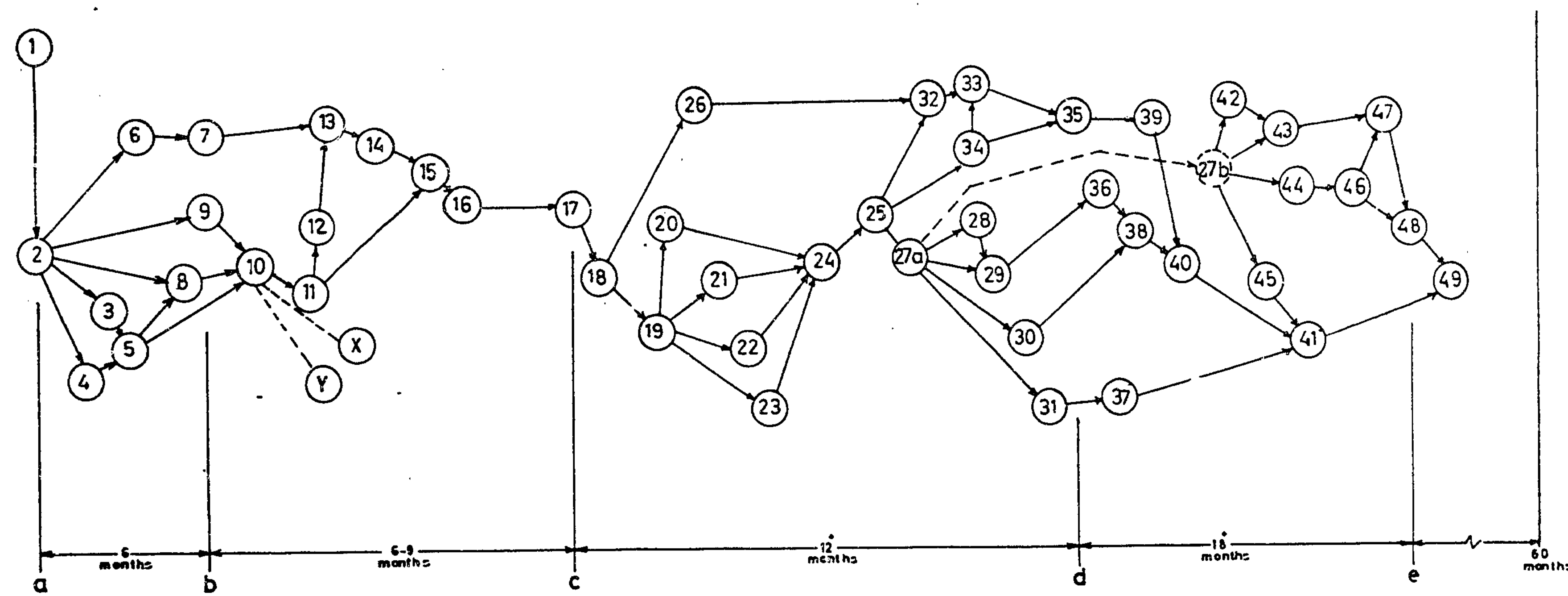
x,y, etc. Other commodity system programs should have been proposed and considerable progress made following Action Group C procedures.

The above commodity system outline is also presented as an informal "pert" diagram in Exhibit 7.11.0.1. The above "activities are represented in the diagram by lines; the "events" resulting from these activities are represented by circles in which numbers appear, corresponding to those introducing each of the activities above. The design team should prepare such a diagram and plan using critical path techniques for more positive project control and implementation scheduling after the necessary early decisions have been made and more information becomes available.

A closing word of caution may be in order. This time and action plan can appear formidable to some readers and they may be in favor of alternative

Exhibit 7-11-0-1

INFORMAL "PERT" DIAGRAM



approaches. For those who believe in simple projects and solutions to economic problems, the short-cut of requesting foreign donor agencies and their contractors to build a number of conventional sugar factories will have great appeal; for those who recognize the "mischievousness" of simple economic solutions, the real but more complex path to improving rural incomes and employment will be more attractive in spite of the greater work and responsibility involved. Hardin's Law[5] is a worthy summary of this problem. It states that in changing something in a complex system, "You can never do merely one thing."

CHAPTER VII

BIBLIOGRAPHICAL NOTES

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