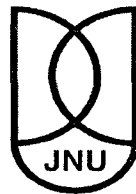


**Agriculture and Economic Development
in
Ferghana Valley**

**Dissertation submitted in partial fulfilment of the
requirements for the award of the degree of**

Master of Philosophy

Alok Kumar



**Central Asian Studies Division
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2010**



Date -----


DECLARATION

I declare that the dissertation entitled "*Agriculture and Economic Development in Ferghana Valley*" submitted by me in partial fulfillment of the requirements for the award of the degree of *Master of Philosophy* of this University is my own work and has not been previously submitted for any other degree of this or any other University.


Alok Kumar

CERTIFICATE

We recommend that this dissertation be placed before the examiners for evaluation.


Prof. G. Jha
Chairperson


Prof. K. Warikoo
Supervisor

Agriculture and Economic Development
in
Ferghana Valley



Three out of every four poor people in developing countries live in rural areas, and most of them depend directly or indirectly on agriculture for their livelihoods.

World Development Report
(2008)
Agriculture for Development
THE WORLD BANK
Washington, DC

*To my father
Sri Indra Kant Prasad
you believe in my dreams and join in them
With love*

Acknowledgements

My greatest intellectual debt is to my supervisor Prof. K. Warikoo, Director of Central Asian Studies, who pioneered this modern developmental approach in International Studies and puts his faith in me for accomplishment of this task. I am and will remain irrevocably indebted to him for encouraging me in all my scientific endeavours, providing me with his most valuable consultations and critiques on all the parts of my dissertation and at all the stages of its preparation.

Understanding economic behaviour of predominantly agriculturist, Ferghana Valley turned out to be far more complex than imagined. A myriad of scholars and other professionals guided me through the labyrinth. The most helpful were Dr. Sharad K. Soni and Dr. Mahesh R. Debata.

I owe my deepest gratitude to my parents, Sri Indra Kant Prasad and Smt Kamini Kumari Verma for their enduring support, encouragement and care. As for individuals, I am also most grateful to my brother, Mr Vikash Kumar and his friend Ms Ketaki Dwivedi for their constructive suggestions. However, words fail to express my profound sense of gratitude to my beloved wife, Mrs Usha Kumari for her constant encouragement, cooperation and forbearance. I express love and blessings from the innermost to my kids Vardhman and Vartika who were indeed deprived of my physical presence during the entire course of research. I cannot but express my respect and thankfulness to Mrs Asha Sharma who helped me through every possible means while accomplishing this research work.

To them, all the innumerable ones, my friends and my well wishers, I offer sincere gratitude.

Preface

This Dissertation makes a critical study of the impact of Agriculture on Economic Development of Ferghana Valley. The term Economic Development here refers to measures of Economic Insurance and Social Welfare. Here Ferghana valley has been studied as a geographical region within the purview of its politico-economic significance to entire Central Asia. The main focus is laid upon agricultural practices which had been and till date remains the main stay of livelihood in the Valley. Against this backdrop, historical background of this region has also been elaborated in the first and introductory chapter, as settled agriculture and irrigation system was in practice through the ages. The second chapter mainly takes into consideration of the policy framework during the Soviet period as well as the current policies being implemented by the three countries, namely Uzbekistan, Kyrgyzstan and Tajikistan that constitute Ferghana valley as a political entity. Third chapter gives an account of agriculture practices and irrigation system as well as the transformations that took place with the course of time. As gardening played an important role and the region being very famous for melons, walnuts, pomegranates, wild apple and vegetables, this chapter also focuses on these major aspects of agriculture. However, another aspect which has been dealt in this chapter is 'Silk culture' which combines both agriculture and household small-scale industry, which is found in one form or another on most native farms. Nonetheless, no study on agriculture could be considered complete without taking into consideration of animal husbandry. While dealing with irrigation, the quest for water which also turns into conflict situations has also been taken into consideration. It is not only the shortage, but also non-rational use of water which is causing serious problems. Therefore, irrigation systems and water management is another major aspect of this chapter. Fourth chapter reviews in detail the economic situation in Ferghana Valley with respect to the wide range of inequality in land ownership and unequal access to water that produces poverty and violence in the Valley. This also includes an in-depth analysis of the factors determining precarious or prosperous situation of agricultural population and their spatial distributions. In later part of this chapter it is also discussed that 'in what way' and 'to what extent' Agriculture can help in economic development. And in the final chapter, the conclusion has been drawn with the help of information available which is intended to establish a close relationship between poverty, inequality and agriculture and allied economic activities.

The implementation of economic reforms in developing countries, particularly those of Central Asia which are characterized by incomplete structural transformation, high levels of poverty and low quality of employment, led to the view that economic development should be concerned primarily with provision of income security, safety nets and social protection to the populace.

List of Abbreviations

CDFs	Collective Dekhan Farms
EA	Environment Agency
EAMP	Environmental Assessment and Management plan
FAO	Food and Agriculture Organization
FVWRMP	Ferghana Valley Water Resource Management Programme
GAO	Gross Agricultural Output
MMWRM	Ministry of Melioration and Water Resources Management
PPU	Project Preparation Unit
SERA	Social and Economic Research Associates

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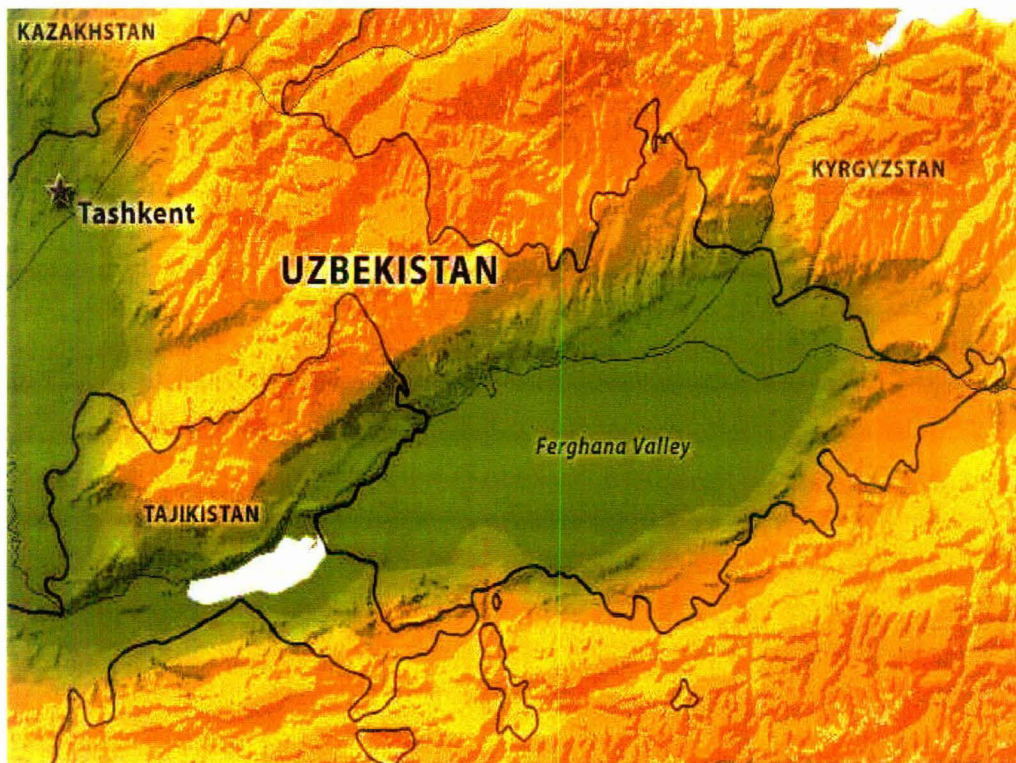
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Central Asia



Ferghana Valley

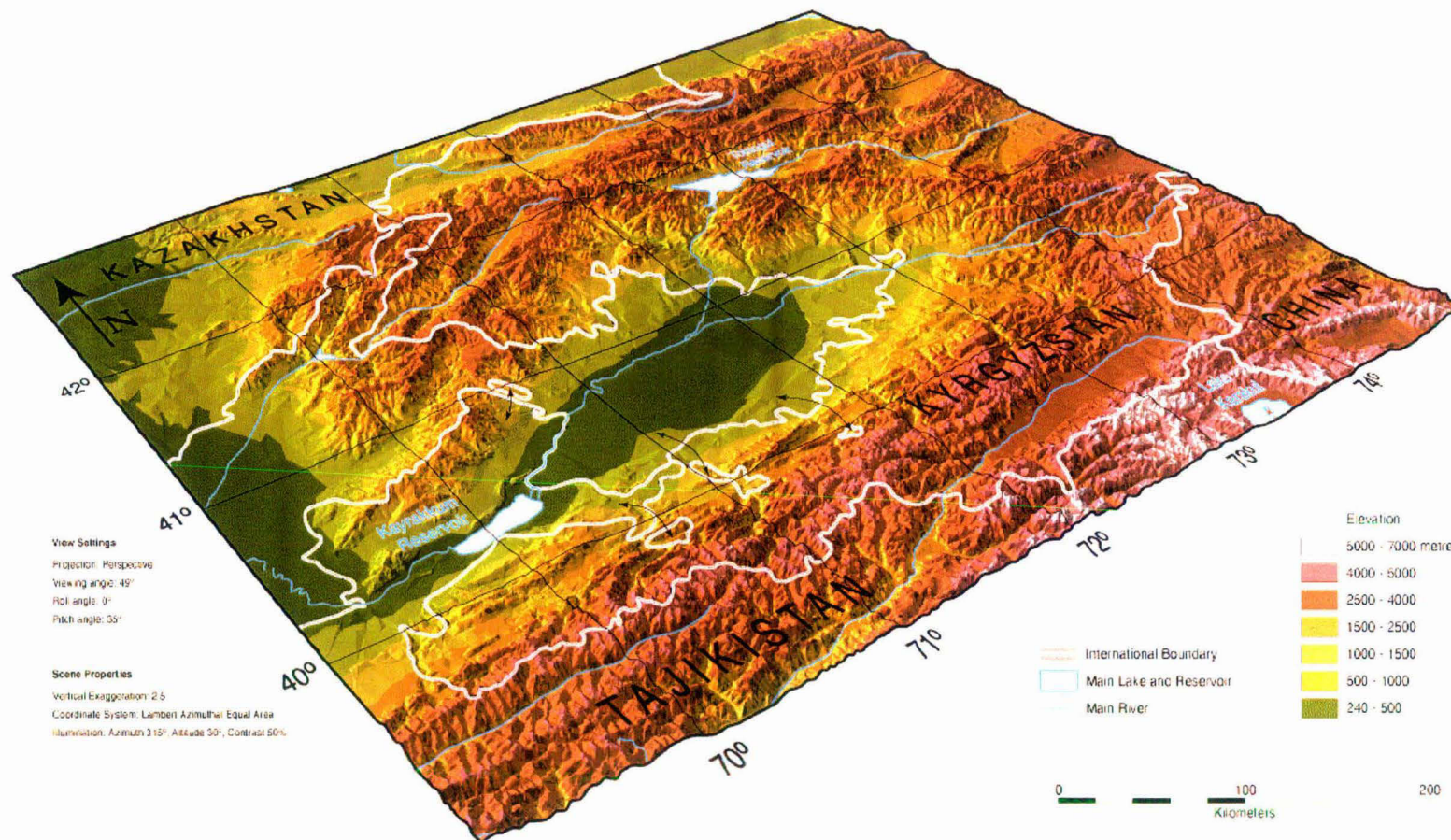


Note: The maps do not imply the expression of any opinion on the part of the agencies concerning the legal status of any country, territory, city or area of its authority, or delineation of its frontiers and boundaries.

Three Dimensional View of the Fergana Valley Region



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Source: KMA Level 3 (30m x 30m extent), KMA; ArcWorld - ESRI, Dem (SRTM30 - USGS)

Source: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

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Chapter: 01

Introduction

The Ferghana Valley is the most cherished among the places on earth where civilisation had imprinted its first steps despite having comparatively inhospitable conditions for human beings than the other ancient civilizations like Mesopotamia and Indus Valley. There had hardly been any other example of such a far-flung and dense human habitations in a rural landscape round the world. The Ferghana occupied the first place in the erstwhile Soviet Union in the production of fruits, grains and cotton however; presently, it forms the backbone of agriculture of entire Central Asia. With vines clad fields and orchards of grapes, apples, apricots, pears, pomegranates and other luscious fruits, this part of the world has a taste and colour and sense of beauty of its own. The *Kalinds* and the mask melons are very tasty. Babur writes in his memoirs that in India the absence of these saddened him immeasurably.¹

Land and People

The Valley is an almond-shaped intramontane basin nested between mountain systems of Tien-Shan in the north and snow capped peaks of Gissar-Alai in the south. The interwoven branches of the tall Chinar, Poplar, Arc, Rusi and Acacia forms a sort of canopy above. At the heart of the Valley are plains and steppe lands that lie at an altitude of 250–500 m above sea level. The statistics on the Ferghana Valley is as ambiguous as there is no consensus on where the valley begins and ends. If we follow its geomorphology, the valley is approximately 300 km long and up to 70 km wide, forming an area of 22,000 sq km. Its position makes it a separate geographic region. Although the valley forms a single, continuous geographic unit, it is politically much divided. At present it encompasses three provinces of Kyrgyzstan – Osh and Jalal-Abad, and the recently created Batken – three provinces of Uzbekistan – Andijan, Ferghana and

¹ Bansal, Ramgopal (1978), *In The Land of Taimur and Babur*, Delhi, Navyug Publishers, pp30-40

Namangan in the centre – and the Khudjant, Province in Tajikistan, at the southwestern end of the valley along with a number of enclaves².

One of the most salient geographic characteristic of the region is its remoteness—the five Central Asian republics are all landlocked. Uzbekistan has the distinction of being one of the only double landlocked countries in the world: the country and all of its immediate neighbors are landlocked. Given its landlocked geography, the Valley is heavily dependent on its immediate neighbours and the international community for access to the rest of the world, for its security, and for support for its economic and social development. Within the region an interesting geopolitical situation can be observed- Uzbekistan controls the lowland and most of the population, Kyrgyzstan the upland and the main sources of water, and Tajikistan the only railroad branch linking the Ferghana Valley with the outside world. There are only four roads (Ferghana-Tashkent, Ferghana- Khujand, Osh- Bishkek and Osh-Khorog) and only one rail-road route (Ferghana-Khujand) link the Valley from outside. Additional peculiarity in interstate relations in the regions are created by the enclaves—Uzbek (Sokh, Shakhimardan) on Kyrgyz territory and Tajik on Uzbek territory (Sarvak) and on Kyrgyz territory (Vorukh).

The Valley is the most populous area in Central Asia, with about 20% of the total population. One can understand the economic importance of this region by the fact; it is the home and source of livelihood to over 10 million people.³ The Ferghana territories account for 50% of Kyrgyzstan's population, 31% of Tajikistan's population and 27% of Uzbekistan's inhabitants (although Uzbek territory only accounts for 4.3% of the total area). In absolute terms, over 6 million Uzbek, 2 million Kyrgyz, and 1.5 million Tajik inhabit the Valley. The economy of the entire region is predominantly agriculture based. Agriculture employs 67% of the labour force in Tajikistan, 53% in Kyrgyzstan and 45% in

² UNEP (2005) *Environment and security: Transforming Risk into Cooperation*, Geneva: United Nations Environmental Programme, p15.

³ UNEP (2005) *Environment and security: Transforming Risk into Cooperation*, Geneva: United Nations Environmental Programme, pp17-18.

Uzbekistan. The distribution of this population is also uneven over the Ferghana Valley. While the most populous areas are in the plains, population density decreases with the foothills and even more so in the mountain ranges. Although there are several urban centres in the Ferghana Valley, more than 70 per cent of the population live in rural areas.⁴

Table 1.1 Oblasts wholly or partially within the Ferghana Valley

Country	Oblasts	Capital	Area (km ²)	Population
Kyrgyzstan	Batken	Batken	17,000	400,000
	Jalal-Abad	Jalal-Abad	33,700	962,000
	Osh City	Osh	n/a	220,000
	Osh Province	Osh	29,200	1,300,000
Tajikistan	Sughd	Khujand	25,400	2,100,000
Uzbekistan	Andijan	Andijan	4,200	1,900,000
	Fergana	Fergana	6,800	2,600,000
	Namangan	Namangan	7,900	1,860,000
Total			124,200	11,342,000

Source: The State Statistical Department of Uzbekistan

⁴ Bucknall, J., Klytchnikova, I., Lampietti, J., Lundell, M., Scatista, M., and M. Thurman (2003) *Irrigation in Central Asia: Social, Economic and Environmental Considerations*, Washington, DC: Environmentally and Socially Sustainable Development Sector (ECSSD), World Bank, p18.

Oblasts in Ferghana Region⁵



Throughout history the Ferghana Valley had been favourable location between oases and mountains pastures which made it a valuable centre for merchants trading with China and the Mediterranean.

Historical Background

At the time when in the surrounding steppes was lived only by nomads, in the confines of the present Khiva, on the banks of the river Syr Darya, people changed early to the settled mode of life and began to occupy themselves with agriculture and to build irrigation canals; there is reason to suppose such a picture here as in ancient Mesopotamia.

⁵ The map doesn't imply the expression of any opinion on the part of the agencies concerning the legal status of any country, territory, city or area of its authority, or delineation of its frontiers and boundaries.

During the next stage of the Bronze Age (second millennium BC), there is reason to suppose a rudimentary agriculture combined with cattle-raising. People even then continued to live on the sand-dunes along the banks. However, at that time they were evidently already carrying on agriculture on the narrow littoral in the form of sowing on non-artificially irrigated fields. Such sowing was possible thanks to the high-standing soil water in the strip near the river, and owing to natural reservoirs which guaranteed the minimum moisture essential for cereals. Evidently a considerable rise of the level of water in the reservoirs, which occurred at the end of the Bronze Age, produced a temporary flooding of the settled points. After the fall of water, life was again resumed there. All the same, at the beginning of the Iron Age (first centuries of the first millennium BC), agriculture remained primitive, and was carried out on the silty beds situated on the narrow littoral strip. There were still no irrigation constructions. This is confirmed by the fact that the settlements of this period were situated far from the large canals which sprang up later. Extension of the area of tilled land in the direction away from the Syr Darya and its tributaries could have arisen only on a foundation of artificial irrigation

Although in Central Asia there are regions where the birth of agriculture occurred at least 1,000-2,000 years earlier, it is important to note that the large river Naryn which flows in the Ferghana regions indicated the earliest settlers irrigated their fields with spring mountain torrents and not with the river. This is explained by the fact that in the early stages the people were incapable of constructing irrigation systems based on the utilization of the water of a large swift river with its level changing considerably in different periods of the year. The natural physical peculiarity of the Syr-Darya is inherent in some degree in all the large rivers of Central Asia. This fact might be responsible for hindrance in a much earlier development of settled agriculture on land bordering these rivers. These rivers have very steep slopes to their beds; their mountain sources are situated at about 3,500-4000 m higher than the level of the Aral Sea into which the waters of these rivers flow. As a result the current is exceptionally swift and

strong. The curbing and control of such a river was not within the capacity of primitive man. During his campaign, Alexander of Macedon also experienced great difficulty in building a crossing. After mastering the lands on the lower course of these rivers, the inhabitants started to expend hard work not only on digging the canals but in their maintenance. The considerable fluctuation of the level demanded measures to protect the cultivated land by special levees, the breaking of which threatened the inundation and destruction of the settlements and the planting.

In spite of the fact that for the first time the Syr-Darya (Yaksartis) became known to the Greeks after Alexander's Campaign to this region. Greek literature became enriched by new geographical information about Central Asia. For the first time the Syr Darya (Yaksartis) became known to the Greeks, although participants in the campaigns of Alexander were still mistaken in taking it for the Don (Tanais).

During medieval period Soviet Turkestan was split into the three comparatively small though important states of Soghdia, Ferghana and Chorasima (the Latin version of Kwarasm). They often enjoyed complete political independence. Among them Ferghana was very fertile country, however, the central part of Ferghana was relatively sandy and its edges were dotted with townlets which had grown up in ancient times at the points where the smaller rivers joined the Syr Darya. There the surrounding foothills were covered with trees and lush grass which provided farmers with admirable pasture on which to rear the thoroughbred horses for which they were famous as far afield as China.⁶

According to ancient Chinese sources, the Ferghana Valley was a major centre of Central Asia as early as the 4th century B.C. The introduction of silk raising from China, the development of cotton cultivation, and its favourable location astride the Silk Route between China and the Mediterranean stimulated the Valley's growth. The Arabs, following the path of earlier invaders, occupied the Valley in the 8th century and introduced Islam. The region was held in the 9th

⁶ Rice, Tamara T. (1965), *Ancient Arts of Central Asia*, New York; Fredrick A. Praeger Publishers, pp75-77.

and 10th century by the Persian Samanid dynasty, in the 12th century by the Seljuk Turks of Khwarazm, and in the 14th century by the Mongols under Jenghiz Khan. The Valley later belonged to the empire of Timur and his successors, the Timurids.

Early in the 16th century, it was overrun by the Uzbeks, who established the Khanate of Kokand. The opening of the sea route to East Asia around that time led to the decline of the prosperous caravan trade through the Valley along Silk Route. Russian conquest of the Ferghana Valley was completed in 1876; the region was then made part of a much larger unit called Fergana, which was a province of Russian Turkistan. Of interest for the historical context of this period is the fact that the American Civil War had caused a severe disruption in the supply of cotton to Europe, and there was a heightened interest in gaining access to the fertile lands of the Ferghana Valley. Furthermore, the time of the most aggressive Russian activity directed successfully toward the south corresponded with a series of military setbacks suffered in the west and east, beginning with the Crimean War in 1854 and ending with defeat in the Russo-Japanese War of 1905.⁷ During the Russian civil war, the Valley was the centre of the anti-Bolshevik Autonomous Turkistan Government, with Kokand as its capital. The crowded conditions in the Valley contributed to ethnic violence in 1989–90, and Ferghana has been one of the hot spots of post-USSR Central Asia.

Despite the vast territory occupied by Central Asia, the population is mainly clustered in and around ancient oases and along the rivers. Ferghana Valley is the most prominent among them where 1000 year old irrigation system have flourished and declined. Access to water determined the living standard and well being of the rural ethnic communities as well as to the urban communities of semi arid and arid regions of the valley. This region has also witnessed the most primitive form of settled agriculture practices. In ancient times, the exceptional flora of the region gave the Ferghana Valley the name "Golden Valley". There is

⁷ Robert A. Lewis (ed.1992), *Geographic Perspectives on Soviet Central Asia*, New York: Routledge, p41.

scarcely a hectare of uncultivated land with the primary crop being cotton. The crops are mainly grown in monoculture in most of the parts of the valley. In a few pockets the crops are grown in association and/or rotation with many other crops which are best suited to the ecological conditions prevailing in particular sub-region. Heavy reliance on cotton and other crops means their economy depends on a great deal of seasonal climate and weather conditions, and the availability of arable land and water for irrigation.

Prior to Russian conquest the agriculture was mainly of subsistence type. Crops grown mainly were wheat, sorghum, barley, millets and alfalfa which were either for self use or merely confined to the local markets. The Tsarist administration strongly promoted cotton production in the valley for export to a rapidly growing Russian textile industry. The emerging cotton economy enabled the Ferghana Valley to participate in agriculture market. As a part of many transformations Soviet Union also restructured irrigated agriculture in Ferghana valley and cotton monoculture reached a new height. For the profound socio-economic transformation that was to follow, the Soviet Union in many respects integrated rather than divided the Ferghana Valley.

The people of Ferghana were able to distinguish between two kinds of water; 'White water' referring to the rivers fed by melting snow and glaciers and 'Black water' that is underground water. First one was particularly important to the settled agriculturists and the later one was important to the pastoral people of the steppe⁸. When water and land are limited, people draw on other resources to sustain their livelihood. The irrigated land is hardly ever the only source of monetary and non-monetary income generation for the households rather it is often supplemented with the income from activities such as horticulture, sericulture and animal husbandry.

Throughout the Valley and particularly in arid zones and mountain slopes the native pastoral culture is in predominance since time immemorial. Indeed it has formed the basis of local economy especially in those areas where

⁸ Bacon, Elizabeth E. (1968), *Central Asians under Russian Rule; A study in Cultural Change*, New York; Cornell University Press, p11.

agriculture could not be practiced. These activities are mainly performed by the nomads who used to seasonally migrate with their livestock in search of pasture.

During the past two decades or since independence there is a lack of qualitative research works on the diverse aspects of Ferghana Valley, particularly in the area of agriculture and economic development. Most of the studies are concentrated on the issue of Geopolitics and Conflict transformation. However, through the labyrinth of existing literatures I gathered up relevant materials for my dissertation.

Review of Literature

In the light of the above background it becomes imperative to explore the existing literature dealing with agriculture and economic conditions of this region from various perspectives to benefit this study. The literatures under review are intended to assess the current state of research, trends and debates on this issue. This literature review is structured in two main segments. Agriculture practices from primitive stage to contemporary stage are highlighted first and then in later segment there is an assessment of impact of agriculture on the economic wellbeing of rural ethnic communities.

In his book *The Soviet Economic system*, Alec Nove (1977) has dedicated one full chapter for agriculture in which he has categorically mentioned that agriculture deserves separate consideration because, firstly, it has three categories of producer; state, kolkhoz and private. Secondly, it has unique history of prices, incentives, procurement and land tenure system. Thirdly, it is associated with living organisms and also organizational-economic and social conditions. Fourthly, the very nature of the productive units is unique to the system. In a book intended to introduce and analyse the Soviet type of economy, agriculture does merit separate consideration. In the same way, of the five sections of the book (*Russian Central Asia (1867-1917); A Study in Colonial Rule*, Pierce, Richard A. (1960) has dedicated the third section to Agriculture, Native Pastoralism, Land Tenure, Taxation and Water Laws. The native system of land tenure and water rights formed the basis of a complex structure of taxes, duties and obligations. As

the economy was primarily agricultural, the greatest burden lay upon land and it was the main source of revenue. Land tenure in Central Asia was closely associated with the question of water rights. Because of the region's aridity, irrigation was of prime importance. Life itself depended on the available water supply and how it was apportioned.

Alec Nove's another book, (1961) *The Soviet Economy: An Introduction*, takes into account various productive enterprises (which includes co-operative artisans, the collective farms etc), Public Finance and credit, Wage and prices (peasant income, agriculture price, principles of wage determination), Micro-economic problems and some basic concepts of Soviet economy.

Henry Field and Kathleen Price (*Southwestern Journal of Anthropology* vol. 6, no.1, 1950), who has translated, edited and summarised the pioneer work of G. F. Gaidukevich named as *Early History of Agriculture in Middle Asia* (*Vestnik*, no.3 1948, pp. 1993-204), began their work with the question - in which region of Central Asia sprang up the very earliest centre of agriculture? According to the opinion of the several investigators like V. Geiger and A. Hermann, one of the most ancient cultural regions of Central Asia including the regions of most ancient agriculture is the land of lower reaches of Amu and Syr Darya. At the time when the surrounding steppes lived by the nomads, on the banks of the rivers, people changed to the early mode to settled mode of life and began to occupy themselves with most primitive form of agriculture. During the next stage of Bronze Age people started rudimentary agriculture combined with cattle-raising. At the beginning of Iron age (first centuries of the first millennium BC) agriculture remained primitive, and was carried out on the silty beds situated on the narrow littoral strips. There were still no any irrigation constructions. Only after the extension of tilled land in the direction away from the rivers has arisen a foundation of artificial irrigation. Archaeological evidences found at the northeastern borderland provide ample example of oldest agricultural settlements in the foothills of Kopet-Dagh and deduction of irrigation methods.

Between 139 and 122 BC Chang Ch'ien travelled across Eastern Central Asia and visited many cities, which he or his successors describe in some detail. As mentioned by Christopher I. Beckwith (2009) in his highly acclaimed work *'Empires of the Silk Road: a history of Central Eurasia from the Bronze Age to the present'* all the Central Asian cities depended primarily on irrigated agriculture in the valleys and alluvial fans of the Central Asian rivers, most of which begin in the mountains and end in the desert. Yet, despite their urbanity, the peoples were just as nomads—who were as interested in trade as the urban peoples—and each of the great lords among both peoples maintained a comitatus. The ancient Chinese travellers to Sogdiana found it an intensely cultivated agricultural region with many cities.

Beatrice Forbes Manz in his article, 'Central Asian Uprisings in the Nineteenth Century: Ferghana under the Russians' published in *The Russian Review* (vol. 46, 1987) has mentioned that the central region of the Kokand khanate was the rich farmland of the Ferghana Valley. The sedentary population of Ferghana consisted primarily of settled Turks, known as Sarts, and a Persian-speaking population—the Tajiks. These peoples made up much of the peasantry, the bureaucratic classes and the religious hierarchy, as well as a sizeable part of the army. The Khanate also contained a large nomadic and semi-nomadic population of Turks, the Qip-chaqs and Kirghiz, who were concentrated in the eastern part of Ferghana near the mountains—the regions of Namangan, Andijan, Osh and Marghelan. As this area was also an important agricultural centre, the nomads lived close to the settled population, but they retained a strong sense of separate identity. Speaking about migration the author says, continuous immigration into Ferghana from Sinkiang and the northern steppes during the seventeenth to nineteenth centuries had put pressure on the land available for pasture and agriculture, particularly in the foothills of the mountains that ringed the valley.

A report on the issue of "Economic Dimension of Security in Central Asia" (2007) which was prepared by the RAND Corporation has covered

extensively about the agriculture practices in Central Asia with focus on Ferghana Valley. In the chapter three which deals with 'Sectoral Trends and Implications' it is stated that The agricultural sector accounts for a very large share of the workforce and is the employer of last resort in Ferghana Valley. Since poverty is disproportionately severe in the countryside, agriculture will play a critical role in providing employment opportunities throughout the region. Approximately 70 percent of the land in Ferghana Valley is agricultural land, of which only 14 percent is arable and the remainder under permanent pasture. Agricultural land is dominated by the areas irrigated by the two large river systems—the Amu Darya and Syr Darya—whose headwaters begin in the glaciers and snowfields of the Pamir and Tian Shan mountain ranges, respectively. However, the agricultural sector is still one of the largest employers in the country, and despite significant subsidies, is not a very profitable enterprise for farmers.

The period of transition proved to be very painful for the rural populations in the Ferghana Valley, shared by Kyrgyzstan, Tajikistan and Uzbekistan. More than 50 per cent of the population became poor. The research into '*Rural Livelihoods and Irrigation Management Transfer: Case-Study of Three Countries in the Ferghana Valley of Central Asia*' conducted by Nargiza N. Nizamedinkhodjayeva (International Water Management Institute, Tashkent , Uzbekistan), investigates the role of irrigation water for rural livelihoods and highlights the current constraints, impacts and potential of Irrigation Management Transfer (IMT) to contribute to poverty reduction in the Ferghana Valley, shared by three countries of Central Asia, namely Kyrgyzstan, Tajikistan and Uzbekistan.

The research findings confirm that the limited access to water is one of the principal constraints for improving rural livelihoods in the Ferghana Valley. Firstly, agriculture, such as arable farming and livestock rearing, appears to be the major source of income and food security for the rural poor. Secondly, the better access to irrigation water enables the rural people to diversify their income sources, including non-farming livelihood activities, and to make savings.

Therefore, the improved access to water has a considerable potential to decrease livelihoods vulnerability and reduce poverty in the research area.

Christine Bichsel (2009) in her book “*Conflict Transformation in Central Asia: Irrigation Disputes in the Ferghana Valley*” has strongly advocated that irrigation has played a crucial role in the economic wellbeing of Ferghana valley, and has greatly influenced the social, political, and economic development of this region. The climate of the region is arid and sharply continental, characterised by an extended frost-free period. The existing arid climate limits the possibility for rain-fed agriculture in the plains and in parts of the foothills and necessitates the supply of additional water. As geographic conditions are conducive, the Ferghana Valley is one of the most hospitable areas to irrigated agriculture in Central Asia.

Upon colonisation, the Tsarist administration strongly promoted cotton production in the basin for export to a rapidly growing Russian textile industry. The emerging cotton economy enabled the Ferghana Valley to participate in agricultural markets. The cotton production in this era temporarily ended with the Bolshevik’s seizure of power in 1917. For the profound socio-economic transformation that was to follow, the Soviet Union in many respects integrated rather than divided the Ferghana Valley. As part of these transformations, the Soviet Union also restructured irrigated agriculture in the Ferghana Valley. From the 1930s on, collectivisation processes re-organised agricultural production in collective (*kolkhozy*) and later state farms (*sovkhozy*). Cotton production remained the central priority and was accordingly intensified in the plains. In the foothills, however, agriculture concentrated on growing fodder for the production of meat and dairy produce. Large-scale infrastructure development considerably amplified the scale of irrigation networks by regulating the flow and transportation of water over long distances. The irrigation system saw particularly big financial and technological investments from the late 1950s on. Starting from this period, irrigated agriculture expanded upwards and outwards from the plains to the marginal areas of the foothills. Due to topography, expansion was in many cases

only possible with the installation of pumps in addition to the customary canals operating by gravity. As a consequence of this expansion, the irrigated area of the Ferghana Valley (Uzbek SSR) increased between 1950 and 1985 by a factor of 1.3.

Igor Lipovsky in his article '*The Central Asian Cotton Epic*' (Central Asian Survey, 1995, Vol. 14, No. 4) suggested that although, cotton has been cultivated in Central Asia for more than two thousand years, it began to play an important role in the Central Asian economy only after the region became part of Russia. The Tsarist regime divided Central Asia into two parts on the basis of cotton cultivating southern region and cotton non cultivating north and north-east region. This functional classification suited the interest of both individual capitals with its need for home-produced cotton. The main region for cotton cultivation was Ferghana Valley, famous for fertile land and favourable climatic conditions. From the beginning of 20th century cotton began to play a dominant role in economic life of Central Asia; its importance continued to grow right up to October Revolution of 1917. The establishment of Soviet rule did nothing to change the region's specialization in cotton; rather the opposite: proceedings from the strategic military and economic interest of the new ideology, the central leadership of communist party placed even more importance on the production of cotton in the region.

Philip L. Forsline in 29th volume of *Horticultural Reviews: Wild Apple and Fruit Trees of Central Asia* (2003) has categorically identifies that Central Asia is the cradle of evolution of apple and wild germplasm of apple still exists here. According to Forsline in ancient times, apple seeds and trees were likely dispersed from Central Asia, east to China and west to Europe, via trade caravan routes popularly referred to as the "Silk Road" (Juniper et al. 1999). This flow of apple germplasm declined over the last few centuries as overland trade through the region decreased and ceased in the twentieth century as Central Asia was isolated for political reasons. In the 1920s, Vavilov (1930) traveled through Central Asia and reported that large wild stands of *M. sieversii* existed in specific

localities and suggested the region as a center of origin for the domesticated apple. Dzhangaliev (1977), while confirming the contemporary existence of the wild apple forests, also noted that they were under pressure in some areas due to urbanization, agriculture, grazing, and wood harvesting. In the 1980s, the U.S. Department of Agriculture (USDA) National Plant Germplasm System recognized that *M. sieversii* was a critical species that lacked representation in its *Malus* collection at the Plant Genetic Resources Unit (PGRU) in Geneva, New York.

While discussing about Native Pastoralism, Pierce, Richard A. (1960) advocates that throughout the areas of steppes, deserts and mountain slopes, animal husbandry formed the basis of regional economy wherever agriculture could not be practiced under the existing conditions of native technology. The livestock of various nomadic groups satisfied not only the main food, clothing, shelter, and transportation needs, but was the substantial source of products which could be traded for the foodstuffs and manufactured articles of the settled people.

Carol Kerven (2003) in his edited volume "*Prospects for Pastoralism in Kazakstan and Turkmenistan: From state farms to private flocks*" gives an account of importance of livestock in the countries based primarily on agriculture. This book also documents some of the impacts of transition from state to private management of livestock and pasture land in Central Asian Republics.

Nomadic pastoralism has an ancient heritage in the vast natural pastures of the Asian steppes. After incorporation into the Soviet Union, pastoralists were collectivised into state farms, building an industrialised nomadism that was highly productive. Independence from the Soviet Union brought new policies that dismantled or reorganised the state farms, withdrawing most state support, and decontrolled markets. Nonetheless, according to author's opinion, pastoralists now confront a market system where only the fittest may survive. Many have lost their livelihoods and more are at risk of doing so.

Central Asian Republics have attracted extensive attention of developed and developing countries ever since the dissolution of Soviet Union. This attention contributes to the economic and social development of these republics.

Nurlan Mamtov, the prominent theoretician, in his wide-ranging collection of essays, *The Effect of Water Resources on Socioeconomy of Central Asia*, engages with recent and perennial problems related to water resources. He argues that an important key to the balanced economic development is the optimal use of natural resources. During the Soviet era, the natural resources were not considered to be the resource of one country rather as the common resource of the entire Soviet Union as a whole. Ever since the independence, the relationship between the republics is getting bitter on the issues related to the proper use of water and other natural resources. In order to avoid these circumstances, while planning for the development of economy and living standard of the populace, each of the republics must have to be cognizant of the needs of others and collective common interests.

According to Norton T. Dodge and Charles K. Wilber's view, (1970, *Soviet Studies*, Vol. 21, No. 3), one can estimate the historical significance of any recent development, the USSR seems to have opened a new chapter in the world economic history which is referred to be as the era of forced economic growth in agriculturally over-populated countries. The USSR produced world's first example of rapid, centrally planned and directed economic development; and this example that the both Soviet strategy and planning procedure exercise today a deep influence on the under developed countries of Central Asia.

Nonetheless, Charles K. Wilber (1969) in the third chapter "Agriculture and Economic development" of his book '*The Soviet Model and Underdeveloped Countries*' argues that one of the major consequences of the social revolution in the Soviet model is the feudal-minded landlord class. This agrarian revolution is not a matter of mere "land reforms" but rather is an integral part of the change in social structure generated by the social revolution.

M. Lewin's book (*Russian Peasants and Soviet Power; A Study in collectivisation*, 1968) deals with a key period of Soviet History, with the events which led up to the decision to convert the peasants into collective farmers. Indeed the traditional peasant communities were strengthened by land seizures of

the revolution, which affected not only landlords' land but also that of many of the better-off peasants. Lewin has devoted much space, very properly, to setting out the features of peasant society and establishment of Soviet Regime in Central Asia.

Chapter: 02

Agricultural Policies: Past and Present

Agricultural policy is concerned with the relations between agriculture, economics, and society. This includes a set of laws and policies relating to domestic agriculture and imports of foreign agricultural products. Governments usually implement agricultural policies with the goal of achieving a specific outcome in the domestic agricultural product markets. Outcomes can involve, for example, a guaranteed supply level, price stability, product quality, product selection, land use or employment. Agricultural policy making can be seen as the outcome of a political bargain between politicians and their citizens. Citizens can be atomistic individuals who demand policy action in exchange for political support (votes) or they can be organized in lobbies that defend special interests.¹

The focal area of this chapter is that agricultural development in Ferghana Valley is mainly driven by policy factors, and only changes in policies (whether agricultural or general economic) cumulatively affect growth, employment, and productivity in the large rural sector. International developmental organizations, such as the World Bank, USAID, and FAO, have a clear role in this region because of its large rural population and the strong dependence on agriculture as a source of family incomes. Continuing policy advice can help on two interlinked levels: (a) helping farmers achieve higher profitability and thus accelerate capital formation through farming activities; (b) helping farmers use their accumulated profits to diversify into non-agricultural activities as an essential component of a new rural (as distinct from agricultural) development orientation.

But why agricultural policies differ from other economic policies? The answer would be that the mode of production of agriculture differs from the other sectors of production in a way that a definite proportion of output must be held back for use as a means of production. That's why agriculture always deserves

¹World Development Report (2008) *Agriculture for Development*, Washington DC: The International Bank for Reconstruction and Development, pp42-43.

separate consideration in every economic development studies. Moreover, the higher the rate at which farm production develops, the bigger is the amount of produce that must remain at the disposal of agricultural enterprises for expanded reproduction provided that the other independent variables remain constant. A certain proportion of the total output of production of grains, tubers and other crops must be left for seed and fodder, and a certain number of cattle, for reproduction or expansion of the main herd. Thus, while preparing policy for agricultural sector we cannot follow the similar strategy of manufacturing sector or service sector.²

The main objective of the agricultural policies is to meet the steady growing requirement of the population and to ensure access to a hygienic quality of food and built up an adequate supply of raw materials for manufacturing sector or processed products for either export or state reserves. As we have already seen, the Ferghana valley has very high population densities for geographic and historical reasons. One of the first questions when dealing with land must consequently be the issue of its availability. High demographic pressure on limited land resources coincides with a lack of jobs and economic prospects – especially in marginalized areas but increasingly in the irrigated areas of Uzbekistan too. Limited land availability has another impact: because of the population pressure and scarce resources all available land is used for agricultural purposes, including areas rich in endemic and endangered species.

Prior to Russian conquest the policies regarding land use pattern and land tenure system was virtually guided by the ‘*Sariyat/Shariat*’.^{3*} The main problem in front of Russians was to understand the system of land ownership. The

² Koval, Nikolai and Boris Miroshnichenko (1972) *Fundamentals of National Economic Planning in the USSR*, Moscow; Novosti Press Agency Publishing House, p127.

³ Pierce, Richard A. (1960) *Russian Central Asia; A Study in Colonial Rule*, Los Angeles: University of California Press, pp139-145.

* The term ‘Shariat’ literally means "the path to a watering hole." The Guardian newspaper in the UK describes Shariat as: "... a religious code for living, in the same way that the Bible offers a moral system for Christians." It is used to refer both to the Islamic system of law and the totality of the Islamic way of life. Accessed on 9/10/10 from <http://www.guardian.co.uk/theissues/article/0,6512,777972,00.html>

settled population inhabiting the irrigated oases of Turkistan including Ferghana Valley had a more complex system of land ownership. The principles of land utilisation were already ancient which roots back to the beginning of eighth century when Arabs conquered the region. It was Arabs who not merely regularized but defined more accurately on the basis of *Sariyat*. As the region was governed by *Sariyat*, there was a theoretical absence of land ownership. The Emir or Khan was recognised as having supreme control over all lands. Land used by the population was considered a part of state holdings, loaned out in perpetuity. Land tenure in Ferghana Valley was closely related with the issue of water rights. Because of the aridity of the region, irrigation was of prime importance. Life itself depended on the availability of the water and how it was apportioned.⁴

The native system of land tenure and water rights formed the basis of a complex structure of taxes, duties and obligations. As the economy was primarily agricultural, the greatest burden laid upon land. The Russians began to extend their boundaries into Central Asia in the nineteenth century. Following the Russian conquest of the 1860s, Tsarist rule in Ferghana did not bring an overnight transformation, but was, rather, the start of a gradual period of change. Some traditional practices (those relating to water, for example) were hardly touched by the new administration. Others were subject to new stresses, as occurred with the arrival of Russian settlers towards the end of the century, and the rapid spread of cotton cultivation during the 1880s. Near about 90% of the cotton output of Uzbekistan and Tajikistan was taken outside the republics for textile factories in Russia.

Agricultural Policies after Independence

Since the collapse of the Soviet Union, the states of Central Asia have experienced different degrees of de- collectivization through their land and agricultural sector reform programmes. Past experience has shown that such reforms are critical to the development of agricultural sector, particularly when rural unemployment is a problem. China and Vietnam are examples of socialist

⁴ Ibid.

countries that experience rapid rural per capita income growth as a result of agricultural reforms. Land and agriculture sector have progressed farthest in Kyrgyzstan and to some extent in Tajikistan, however Uzbekistan has been the most conservative in promoting genuine reforms.

Uzbekistan has shown least interest in transformation of Agricultural sector and land reform. Although the government provides subsidies to farmers, farmers must sell cotton and other commodities well below market prices, resulting in a net tax from the agricultural sector to the rest of the economy and the impoverishment of rural workers. Genuine reforms in the agricultural sector, such as liberalization of prices for wheat and cotton followed by long-term reforms in land distribution, would significantly increase rural incomes and potentially help stabilize rural unrest. However, Uzbekistan maintains that it cannot reliably implement a transition strategy in the agricultural sector as other Central Asian Republics did, since more than 40 percent of government revenues come from cotton exports, and 70 percent of the population is employed in agriculture. However, the sustainability of the cotton industry, often referred to as the "white gold" of Uzbekistan, is affected by the deleterious effects of irrigation, including soil erosion, increased salinity, and contamination of drinking water. Nevertheless, Uzbekistan is pursuing long-term plans to leverage its cotton production into value-added industries, such as cotton processing and textiles, which will likely be a target for state intervention in the future.

Agrarian reform in the different parts of the Ferghana Valley is going at different rates. In many examples the state still owns the land in Uzbekistan and Tajikistan. Land in Kyrgyzstan, on the other hand, was transferred to private ownership, and at present some 90% of all the farms in the republic are privatized, but, despite the differences, agricultural producers everywhere are encountering the same problems. Kyrgyzstan and Tajikistan are one of the smallest states of Central Asia and also the two most rural and agrarian. Tajikistan grows only about 40 percent of its food needs and remains dependent on food aid and imports from abroad. The lack of arable land and farm credit for crops other than cotton has



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discouraged private investment in such crops as fruits and vegetables in Tajikistan. Malnourishment remains a challenge facing Tajikistan and Kyrgyzstan, both of which depend on international assistance, such as the European Union's (EU's) Food Security Program. Rural development in Tajikistan and Kyrgyzstan depends, to a large degree, on progress in agricultural reform and on Uzbekistan opening up its borders to trade⁵.

Although agricultural privatization has achieved varied level of success in the states of Central Asia, some common characteristics of small farmers throughout, can be identified. Private farmers with modest plots are generally poor and have very little access to credit. As a result, they have difficulty procuring basic production inputs, such as seeds, fertilizer, and equipment. In the state where collective farms typically are still beholden to the goodwill of the collective leadership and local agricultural officials for water and other agricultural inputs.

During periods of tight water supply, small private farmers are frequently denied water, whereas those who own plots near the point of withdrawal from the river (the upstream portion of the irrigation networks) are generally in a more favourable position to secure steady water supplies. These coveted plots are typically claimed by former managers of the collective or other local officials. As a result, national policies are often ignored by local agricultural officials, leaving farmers discontented and frustrated.

Agriculture's contributions differ in the three constituent countries.

The way agriculture works for development varies across the three countries depending on how they rely on agriculture as a source of growth and an instrument for poverty reduction. The contribution of agriculture to economic growth and poverty reduction can be seen by evaluating the share of agriculture in aggregate growth over the past 20 years, and the current share of total poverty in rural areas, using the \$2-a-day poverty line.

⁵ Mahnovski, Sergej (2006), *Economic Dimensions of Security in Central Asia*, Santa Monica, CA: RAND Corporation, p36.

Implications of agricultural policies after independence in Kyrgyzstan, Tajikistan and Uzbekistan

Kyrgyzstan

After independence, the Kyrgyz government privatised agricultural lands and reformed the law governing private property. Former collective and state farms were abolished. The land was divided into shares, whose size was determined by the density of the rural population and the amount of land available. As indicated in the Social and Economic Research Associates (SERA) report and the study by Bauman, the land reform and distribution of land and farm assets created inequity amongst the rural population. Inequity of wealth is a direct consequences of the time at which the individual employees left the state and collective farm. Owing to the rising debt of the state and collective farms, and the equal distribution of assets and of debts, the early leavers were better off than those who left later. In addition, the studies show that the former state farm managers are still in powerful situations, controlling land and farm assets.⁶

The irrigated areas increased marginally after independence. However, without the guidance of the Government, the agriculture production increased rapidly. The area under cotton, wheat, rice and vegetables increased drastically but number of livestock declined for the same period.⁷ The change in agriculture pattern led to higher water demand due to a shift from fodder to food and cotton crops. Only the comparatively rich farmers were able to plant riskier crops like cotton. Overall the agriculture sector became more important and since independence it has come dominate the Kyrgyz economy.

Land reforms in Kyrgyzstan

Land reform in Kyrgyzstan has been highly successful by the measures of privatization and individualization. However, the progress with land ownership and land tenure reform has not been matched by reform or upgrading

⁶ Wegerich, Kei (2003) 'Water : The difficult path to a sustainable future for Central Asia' in Tom Everett- Heath (ed.), *Central Asia; Aspects of transition*, London: Routledge Curzon, p250-251.

⁷ Ibid.

of farm support services and infrastructure for agriculture. The transition from the Soviet command system to a market-oriented economy has inevitably disrupted the old supply and marketing channels, while insufficient attention has been given to the creation and development of new channels. The situation is further exacerbated by the fact that the Soviet services were geared specifically to a few hundred large-scale agricultural enterprises, whereas land reform has produced over a million small- and medium-sized producers with fundamentally different needs. The recommendations in this study address the need for creating market services specifically geared to small farms, such as service cooperatives and extension services.

Uzbekistan

Since the disintegration of the Soviet Union and independence of Uzbekistan in 1991, the policies of Uzbek agriculture have simultaneously been subject to both inertia and change. On the one hand, the government has maintained significant aspects of the central planning system. The state still controls the area and quantity of cotton produced, as well as the purchase prices. On the other hand, it has allowed a shift towards increased farmer control of many aspects of production, in particular, those related to land and water management. At the same time, it has been forced to develop new trading relationships with other former Soviet states and the rest of the world, which has led to the mandated expansion of the wheat area to meet local food needs⁸.

At the time of independence, the countrywide status of land redistribution was collective and state owned farms covered 4.2 million hectares of irrigated land of which major part is constituted by Ferghana Valley itself. In 1992 and 1993 the first privatisation of land took place. Some 500,000 hectares-around 12 percent of cultivated land was distributed among former state and collective farm employees as household plots. A further 100,000 hectares of land

⁸ Iskandar Abdullaev et. al.(1999) 'Agricultural Water Use and Trade in Uzbekistan: Situation and Potential Impacts of Market Liberalization' in *Water Resources Development*, Vol. 25, No. 1, March 2009, New York: Routledge, pp47-63.

was allocated in 1994 to establish live stock farms. The allocations were made on the basis of 0.3 and 0.2 hectares per head of cattle. In the mid-1990s the land was still distributed unevenly among the different users such as household plots (530,000 hectares), peasant farms, (350,000 hectares) and collective and cooperatives, (3,500,000 hectares).

At the beginning of 2000, another wave of land distribution took place. Unprofitable collective and cooperative farms gained independence; their land was distributed among their former employees. Land allocation was dependent on the location and pressure on the land, the number of family members and the amount of livestock on farms. Article 16, of the Land Code of the Republic of Uzbekistan reads “Land shall belong to the State...” At first, the government laid special emphasis on the support of large agricultural cooperatives (*Shirkats*). But the program is being carried out in Uzbekistan, and in the Ferghana Valley in particular, to transform the *Shirkats* into private farms. After replacing the collective farms and state farms of the Soviet era, *Shirkats* proved just as unviable, despite the resources saved from their enlargement. After rising out of the ruins of Soviet state farms and collective farms, the *Shirkats* were to embody elements of market relations. According to the law, the *Shirkat* is a cooperative enterprise, the members of which manage its activity through their own shares in the holding. But the *Shirkats* in fact only changed the name of the form of property, while the operating mechanism remained the same. Relations between the *Shirkat* chairmen and the district leaders did not change. The unrealistic plans to turn in agricultural produce to the state and the outmoded technical base led to the fact that the plans for turning in cotton and grain to the state have not been fulfilled for several years now in the regions of the Ferghana Valley (the only exception being 2005 when the bumper harvest and mobilization measures—not only were enterprise employees, students, and senior schoolchildren sent to gather in the harvest, but also junior schoolchildren and rent debtors—made it possible to fulfill the cotton plan). *Shirkat* members who do not fulfill the plan do not receive their wages, but the *Shirkat* cannot withdraw

from the state management system and independently dispose of its production. The transformation of *Shirkats* into private farms was called upon to expand the members' management powers. But the state contract system is still in effect in the country for the main agricultural products—cotton and grain. This system does not give farmers the opportunity to independently dispose of the produce they grow, regardless of the form of ownership, be they agricultural cooperatives or farms. Agricultural workers are obliged to give their produce to the monopolistic state purchasing agency at prices much lower than those on the market. Meanwhile, practice has showed that farms are much more profitable than *Shirkats*. Since 1999, when farms first arose as a form of economic management, they became an important part of the economy's agrarian sector. Whereas in 2004, they produced 51.6% of cotton and 46.9% of grain, in 2005, these figures already reached 66.3% and 56.4%, respectively.

Ideally, farms are entirely independent private enterprises, but they are also responsible for executing the state contract. Farmers must fulfill the plan, and if they do not, they are more severely punished than *Shirkat* chairmen. At worst, a *Shirkat* chairman who does not fulfill the plan may be removed from his post, but a farmer is deprived of his right to rent land. Farmers are frequently punished even when they do not fulfill the plan for reasons beyond their control, for example, because of unfavourable weather conditions, or if the state did not supply them with seeds, fertilizer, or water for irrigation on time. The last factor is particularly important for the farmers of the Ferghana Valley, since, due to the water scarcity, they are faced with constant breakdowns in water supply for irrigation.

According to the law, farmers are exempt from land tax for the first two years, but they must pay off the debt of the former *Shirkats*. What is more, they have to fulfill the cotton and grain plan of the former *Shirkat* within ten years at the same rates that were set for the *Shirkats*. Contradictions in legislation complicate the situation even more. Although the law on farming states that "A farm shall independently define the sphere of its activity, structure, and

production volumes...,” this regulation of the law is violated by a government decision stipulating the procedure for reorganizing agricultural enterprises into farms. According to this procedure, the farmer does not have the right to change the crop he grows; he does not have the right to allow a drop in harvest yield, and so on. Violation of these regulations is considered a gross violation of the rent agreement, and it could lead to loss of the right to rent land. Another form of agricultural entrepreneurship—*Dekhkan* farms—functions on the periphery of large agricultural producers (*Shirkats* and farms). As a rule, such farms are made up of one family that works a small plot of land of up to two hectares. Despite their small size, *Dekhkan* farms are much more productive than *Shirkats*. In 2004, they produced 89.7% of the potatoes, 77.3% of other vegetables, and 61.4% of the melons and gourds in the republic, while in 2005, these indices rose to 92.4%, 77.7%, and 61.6%, respectively.

Tajikistan

The situation of Tajikistan is a bit different in comparison with the other Republics. It is a mountainous country with an area of 143,000 square km and a population of about 6.2 million people. It is a landlocked country, the poorest among the Central Asian Republics. Estimates are that 85 percent of the population is not able to satisfy their food, education and health care needs. Agriculture is a dominant sector of the economy and forms 30 percent of GDP. Some 50 percent of the population is engaged in the agricultural sector and about 70 percent of the population lives in rural areas. The overwhelming majority of poor people (around 5 million people) live in poverty due to economic breakdown and civil war in the country. Decreasing unemployment by means of economic growth will improve their living standards.

One of the main obstacles to rehabilitation of agriculture in Tajikistan is the bad condition of irrigation infrastructure. The Ferghana Valley forms an important part of the Syr-Darya River basin in Central Asia (see map in Figure 1). It is rich with fertile lands and water resources, including ground waters, with a population of 11 million people, 70 percent of whom live in rural areas. During

Soviet times the Valley was the main object of water resources infrastructure investment. The Syr Darya river and its tributaries were the basic sources of water for 1.5 million ha suitable for agricultural irrigation and for huge potential for electric power production. Unfortunately, severe budget cuts and insufficient appropriations for irrigation and drainage system maintenance led to its present state of deterioration. This deterioration resulted in significant decreases in soil fertility and in agricultural crop yields and in increases in problems connected with drainage, such as impoundment of lands and decrease in cultivated area suitable for agricultural production. Further deterioration of irrigation and drainage systems will affect agricultural production and the living standards of the local population involved in agriculture. Furthermore, poor land and water resources management has led to additional problems, including an increase in strained relations with different neighboring countries due to the conflicts connected with water supply.

The situation in Tajikistan is also developing along the same lines as in Uzbekistan. According to Article 2 of the Land Code of the Republic of Tajikistan, "land in the Republic of Tajikistan shall be the exclusive property of the State." But since 1997, collective farms have been actively disbanded and land divided up in Tajikistan. Tajikistan legislation envisages the transfer of the land of former collective farms and state farms to the *Dekhkans* for their use and the creation of *Dekhkan* farms. By 2003, they accounted for about half of the total number of farms. But this did not change the crux of economic relations in the agrarian sector. Land reform is going very slowly. Former state farms and collective farms throughout the entire country have changed only their name and stamp during the reform, which fact contradicts public relations in the agro-industrial sector regulated by legislation.

The *Dekhkans* still operate according to the team method. Each individual member of a *Dekhkan* farm does not know where his share of land is located. The chairmen of *Dekhkan* farms still report to the local government bodies. Land allotment is accompanied at all stages by bribes and additional

payments. The *Dekhkans* do not know the current laws regulating the course of the reform. Some former state farm and collective farm chairmen abuse their powers while distributing land by taking advantage of the illiteracy of the *Dekhkans*: they dispose of land at their own discretion or do not want to distribute it at all. In almost all regions of the republic, instances are known of regulating land relations by means of rent agreements, which contradicts the current laws and violates citizens' right to land. As a result of various land manipulations, only a small percentage of *Dekhkans* become landholders, one third rent it and the rest are deprived of access to land at all, retaining only estate plots. There are cases when former collective farm and state farm heads established certain fees or distributed land in exchange for property. For example, in the Asht District of the Sogd Region, a *Dekhkan* at the Bobodarkhon farm was supposed to give two rams for each hectare of land he was to receive.

During the division of collective and state farms, the main assets go to large landholders. The chairmen of Khukumats of the districts are trying to unite *Dekhkan* farms by issuing decisions. In their attempt to fulfill the plans, they are making farmers sow more cotton to the detriment of other crops, determining independently which investor a contract should be entered with, and at which factory raw cotton should be processed. As a result of this, *Dekhkan* farms are falling into debt and going bankrupt. This is leading to a significant increase in the number of landless peasants and undermining the position of the small farmer. It is also giving rise to the widespread migration of farmers to the cities and maintaining a high level of foreign work migration.

In contrast to the neighbouring states, radical agrarian reform was carried out in the Republic of Kyrgyzstan. Its legislation envisages different forms of land ownership, including the private one (Art 4 of the Land Code of the Republic of Kyrgyzstan). But here too farmers are encountering numerous problems. The fragmentation of land plots and technology, and the scattering of them among numerous peasant, farm, and private holdings created during the agrarian land reform make it impossible to carry out scientifically justified crop

rotation aimed at obtaining high harvest yields and to accumulate the resources needed for purchasing and using modern, powerful and, at the same time, economical technology. Problems are also arising in selling the produce grown due to its limited amount. More than 85% of the agricultural machinery has been in use for more than 15-20 years, that is, 2-3 fold longer than its standard lifetime, and is already due to be written off. The high price of fuel and lubricants, spare parts, mineral fertilizers, pesticides, and technical services are making it unprofitable to grow agricultural produce. Many farmers are complaining about their insufficient core financial resources, as well as the shortage and incompatibility in terms of maturity and interest rates of loans offered by credit institutions. The expensiveness of electric energy used for pumping stations supplying irrigation water for agricultural crops and the unclean state of a large part of the inter farm and intra farm channels are making irrigated and provisionally irrigated land unproductive.

The early land reforms had no discernible negative impact on the production of cotton and wheat production remains centrally controlled and ordered by the Uzbek Government. Hence, from 1992 to 2000, the total area planted with cotton declined only marginally, from 1,666,700 hectares to 1,425,000 hectares. This change is largely the product of the government aim of achieving self-sufficiency in food production. However, the farmers do not receive a market price for their cotton and wheat. According to UNESCO data, the agriculture sector generates only 20 percent of the GDP; however cotton accounts for 40 percent of total Uzbek exports.

Land reforms in Uzbekistan and Tajikistan

Tajikistan and Uzbekistan embarked on the process of land reform in 1991-1992, immediately after gaining independence. However, the first years were characterized by hesitant and indecisive progress, largely attributable to lack of experience with the huge task on hand. In Tajikistan in particular further difficulties were created by the civil war that raged in this country until 1997. After 1997-98, however, both countries began to implement resolutely a

comprehensive program of land reform and farm restructuring that culminated in a massive shift of agricultural land and agricultural production to small individual and family farms. These achievements of land reform in Tajikistan and Uzbekistan are particularly remarkable because the two countries are generally regarded as slow reformers and are assigned low ranks for their reform performance by international organizations.⁹

The ultimate goal of land reform in all transition countries is to increase the incomes and the standard of living of their large rural populations, which rely on agriculture for a substantial part of the family budget. Every CIS transition country attempts to achieve this goal by encouraging growth in the agricultural sector and, whenever possible, improving farm productivity.

Legislative Framework for Land and Farm Reform

The process of land reform in Kyrgyzstan, as in all former Soviet countries, had to move agriculture from the Soviet model of state-owned land and predominance of large-scale farm enterprises to a market-oriented model of privately owned land with predominance of small- and medium-sized family farms. Land reform accordingly consisted of a two-pronged effort: (a) change in legal ownership of land from state property to private property (privatization); (b) shift in farming structure from corporate to individual farms (individualization). To the extent that large corporate farms continued to exist for various political and pragmatic reasons, their internal organization and management structure had to be radically changed from the old command-economy orientation to compliance with market-economy principles.

Kyrgyzstan was the latest among the former Soviet Republics to allow private land ownership. While Russia was the privatization trailblazer abolishing the monopoly of the state in agricultural land ownership at different stages between 1990 and 1993, Kyrgyzstan recognized private land ownership as late as June 1998 following a referendum. The referendum resulted in a

⁹ Csaki, C. and Kray, H. (2005), *The Agrarian Economies of Central-Eastern Europe and the CIS: An Update on Status and Progress in 2004*, ECSSD Environmentally and Socially Sustainable Development, Washington DC: World Bank, Working Paper, No. 40, pp2-7.

constitutional change that explicitly allowed private ownership of land, in addition to municipal and state ownership: Land... is the property of the Kyrgyz Republic, used as a foundation of life and activity for the Kyrgyz people and enjoying special protection by the state. (Article 4, para 2)¹⁰ Land may also be in private, municipal, and other forms of ownership... as determined by law. (Article 4, para 3)

Prior to 1998, all land was state owned, as in the former Soviet Union, but usage rights were secure for 99 years and, after 1994, fully transferable. Having recognized private land ownership in 1998, Kyrgyzstan immediately imposed a 5-year moratorium on all transactions in privately owned land (1999 Land Code), thus moving backward by measures of land transferability compared with the pre-referendum period. Kyrgyzstan motivated the moratorium by the need to let the new landowners get used to the entire set of their property rights and fully recognize the implications of irrevocable decisions.

Changes in farm structure and land tenure since independence

Soviet agriculture was characterized by co-existence of two farm structures: large collective and state farms (“farm enterprises” or “agricultural enterprises”), which represented the formal commercial farm sector, and very small subsistence-oriented household plots, which constituted the “private” sector all through the Soviet era. Land reform processes in all CIS countries substantially enlarged the household plots through land allocation programs and in addition created a new private sector of so-called “peasant farms”, which by design were larger and more commercially oriented than the traditional household plots. The farm structure in almost all CIS countries today is characterized by the existence of three farm types that span the entire spectrum of sizes: large corporate farms (“enterprises”) that succeeded the former collective and state farms; mid-sized peasant farms; and small (albeit enlarged) household plots that survived the Soviet regime. Household plots and peasant farms are classified as individual or family

¹⁰ The Land Code of the Kyrgyz Republic 1999, Republic of Kyrgyzstan, Bishkek June 2, 1999, # 46

farms. By contrast, the successors of agricultural enterprises are referred to as corporate farms.

All the Soviet leaders from Stalin to Gorbachev—before he began his reforms—viewed the USSR as a single entity. They had a penchant for Union-wide economic autarky, and they viewed this in the context of a highly centralized system of economic planning. As a result, different republics in Central Asia were assigned specific production tasks and rigid quotas. In deciding these tasks and quotas, little attention was paid to the development of at least a moderately diversified and self-sufficient regional economy, to the development of regional transport and communications networks, or to environmental safety. What was important was meeting the production targets set by the central planning organization, Gosplan.¹¹

Table 2. 1. Changes in farm structure: Soviet period and post-independence

Soviet period	Since Independence
Corporate farms	Corporate farms
<i>Collective and state farms (Kolkhozes, Sovkhozes)</i> Large-scale agricultural enterprises with thousands of hectares of land run by appointed managers subject to centrally set production plans	<i>Limited-liability partnerships, joint-stock companies, agricultural production cooperatives</i> Successors of agricultural enterprises reorganized as share-based companies run by hired managers and greatly downsized (hundreds instead of thousands ha)
Individual farms	Individual farms
<i>Household plots</i> Small (less than 0.5 ha) family farms producing mainly for subsistence and selling their surplus output in the market; managed by rural residents (employees of corporate farms, employees of rural services, pensioners)	<i>Household plots</i> Basically the same as in the Soviet period, with substantially enlarged land holdings, but still very small; mix of subsistence and commercial farming with predominance of livestock <i>Peasant farms</i> Mid-sized family farms (1-10 ha) created outside the corporate framework under new (post-1992) legislation on land allocated from state reserves to qualified applicants; mainly commercial farming with predominance of crop production

¹¹ Hunter, Shireen (1991) *Central Asia since Independence*, Washington DC: Greenwood Publishing Group, pp67-88

Until 1990, Soviet agriculture in Tajikistan and Uzbekistan, as in all other former Soviet Republics, was characterized by total dominance of large collective and state farms, which controlled over 90% of both agricultural and arable land in the pre-reform era. The dominance of large agricultural enterprises began to wane when serious land reform measures were launched in the second half of the 1990s. The share of arable land in enterprises dropped steadily from the Soviet level of over 90% to around 20% in 2007. Much of this land shifted to new emergent farm structures – the so-called peasant farms, which now control 60% of arable land, more than double what remains in corporate farms. The remaining 10%-20% of arable land is in household plots – the traditional private agriculture carried over from the Soviet era. Their share also increased markedly through allocation of additional land in the process of land reform (again at the expense of agricultural enterprises).

The changes in land holdings depicts that the share of the individual farming sector – both household plots and peasant farms – increased from about 3% to 30% in agricultural land since 1991. The share of individual farms – both household plots and peasant farms – in arable land rose from less than 10% to around 80%, but it is the newly created peasant farms that now control most of the arable land in Tajikistan and Uzbekistan. Pastures are still largely managed by agricultural enterprises, which are reflected in their higher share of agricultural land; especially in Uzbekistan (agricultural land includes pastures as well as arable land).

Agriculture, land reform and agricultural policies have also taken center stage with the unrest in Uzbekistan in 2004 and 2005. Since late 2004, the Ferghana Valley and neighboring regions of eastern Uzbekistan have been the site of protests against restrictive state policies on commerce. The events leading to the crackdown on protestors in Andijan may have been an expression of the rising expectations of the population, as demonstrated by the emergence of a small group of businessmen seeking their own solutions to the economic situation in the

Ferghana Valley.¹² Economic reform in the agricultural sector may have a direct effect on stability in the Valley. In particular, the Governments in near past were able to stabilize the situation by liberalizing prices for wheat and cotton which would significantly increase rural incomes and commencing long-term reforms in land distribution, trade regulations, and the judicial system. As well as the political transitions in Tajikistan and Kyrgyzstan have served notice to the regimes in the region, which have steadily delayed economic reform and increased pressure on political opposition groups and nongovernmental organizations, to different degrees.¹³

Future Prospects of Ferghana Valley

The FVWRMP (Ferghana Valley Water Resource Management Programme) will be the World Bank's first project in the irrigation and drainage sector in the Ferghana Valley in the upstream area of Tajikistan and represents part of the Bank's overall program for improving water resources management in the Ferghana Valley countries of Tajikistan, Uzbekistan and the Kyrgyz Republic. The proposed project is designed to help the Government of Tajikistan to improve the overall state of water management and irrigated agriculture in Soghd Oblast, the Tajik portion of the Valley. The Valley's principal water control features are the Toktogul Reservoir on the Narin River (main branch of the Syr Darya river) located in Kyrgyzstan and the Kayrakkum Reservoir located on the Syr Darya river upstream from Khojand. The Kayrakkum Dam functions to control irrigation releases to downstream agricultural areas in Uzbekistan and provides hydropower generation for Tajikistan. Adjacent irrigated valley lands are served from the reservoir and river by large pumping stations, two main irrigation canals and a number of tributaries of the Syr Darya River.

¹² Kholmuradov, Kamol, (2003) "Farmers Express Discontent in Uzbekistan, Despite Projected Record Wheat Crop," Eurasianet.org, p29.

¹³ Mahnovski, Sergej (2006), *Economic Dimensions of Security in Central Asia*, Santa Monica, CA: RAND Corporation, p67.

The main sources of groundwater flows into the area are inflowing groundwater from irrigated uplands in Kyrgyzstan and inflows from the Kayrakkum Reservoir (whose head has a huge negative role in increasing the local water table). Numerous drainage pumping stations and irrigation/drainage tubewells are designed to discharge drainage flows and control high groundwater levels.

This water resource management infrastructure has both physical and operational problems that significantly impede effective management of the water resources in the valley. The FVWRMP is designed to address some of these problems by rehabilitating selected irrigation and drainage infrastructure in irrigated areas south of the Kayrakkum Reservoir in Kanibadam and Bobojon Gafurov Raions (covering about 30,000 ha.) and by undertaking needed Kayrakkum Dam and Reservoir safety and regulation improvement measures. A more detailed description of the proposed project can be found below.

The Government of Tajikistan's Ministry of Melioration and Water Resources Management (MMWRM), based in Dushanbe, is responsible for land melioration and management of water resources in Tajikistan and has field offices in Soghd Oblast and in the two project raions¹⁴. MMWRM established a Project Preparation Unit (PPU) to work with the World Bank and manage preparation of the FVWRMP. The PPU is composed of irrigation engineers, financial and procurement officers, but no environmental specialist. MMWRM and the World Bank asked that the UN Food and Agriculture Organization (FAO) to provide an international environmental specialist to identify and manage a team of national environmental specialists for preparing the Environmental Assessment and Management plan (EAMP).

The Syr Darya and Isfara Rivers and the Kayrakkum Reservoir, which provide most of the water to the irrigation systems to be addressed in the proposed project, are international waterways and thus trigger safeguard policies. The Environment Agency (EA) examined the potential impacts of the project on these

¹⁴ A type of administrative unit of several post-Soviet countries.

waterways. The proposed civil works do not include construction of any new canals or head works that would allow increased water abstraction from these international waterways. Therefore, the EA concluded that the project would not have a significant impact on the quantity or quality of water flowing through these waterways and thus has no adverse effect on the rights of the other riparian states. Therefore, given the expected negligible impacts of the project on international waterways, the EA recommends that the Bank seek a waiver pursuant to paragraph 7(a) of OP 7.50 of the safeguard policy¹⁵.

¹⁵Document of The World Bank (2005), *Ferghana valley water resource management Project*, Washington DC: World Bank, p67.
[as accessed on 25/06/2010 from <http://www.cawater-info.net/library/eng/reports/pad.pdf>]

Chapter: 03

Agriculture Practices and Irrigation System

*Better to have a field at the head of the canal than the brother who is a Mirab**

_____ A popular wisdom in Ferghana Valley

Geographically Ferghana Valley lies in the mid-continental arid climatic zone with a perennially extended frost-free period. Most of the region is located in semi-arid area, where natural evaporation significantly exceeds precipitation. Although, aridity of the climate limits the possibility for rain-fed agriculture, the long frost-free period is most recommended for cotton cultivation. Annual rainfall varies from west to southeast, from 109mm to 226 mm; however, the foothill regions receive slightly higher rainfall with up to 500 mm per year. The extensive large fertile agricultural has been developed and fed by Syr Darya and its tributaries over centuries in this Valley. In case of necessity, the supply of additional water is provided by glaciers, snow runoff and natural springs from the adjacent mountain ranges to the middle plains and in some parts of the foothills regions. Thus, in a temperate or warm arid region, the flow of water from springs or from exotic rivers or the availability of fresh ground water derived from distant rainfall or snow-melt may create green oases of productive agriculture. Having conducive geographical conditions the Valley is most hospitable to irrigated agriculture in Central Asia which accounts for 45 per cent of the total irrigated area within the Syr Daria basin¹.

Ferghana Valley is blessed with abundant natural resources, including fresh water and vast areas of rich in biodiversity. These resources are, however, unequally distributed across the areas of the constituent countries, and their extraction, management and utilization require significant regional

*A local canal overseer who used to plan and arrange the canal maintenance work. Mirabs were technologically experienced elders who enforce local agreement on how water was used and the amount to which people were entitled.

¹ Bichsel, Christine (2009), *Conflict Transformation in Central Asia: Irrigation Disputes in the Ferghana Valley*, Oxon: Routledge, p16.

cooperation. Virtually all fresh water originates from permanent snowfields and glaciers in the mountains of Kyrgyzstan and Tajikistan. Although the sources of water are in upstream countries, whereas, water as a source of irrigation is mainly used in Uzbek part of Ferghana Valley. The Syr Darya river system carries this precious resource to Ferghana Valley and finally to the Aral Sea (Map 3.1). Moreover, resources like fresh water and fertile land which is essential for human survival are in increasingly short in supply. Arable land for agriculture and high-density settlements are limited to the irrigated flood plains of the major rivers.²

However, irrigation has long played a crucial role in rural life of entire Central Asia, and has aptly influenced the socio-economic development of the Ferghana Valley. Irrigation practices date back to the second century BC but the first detailed historical insights on irrigated agriculture stem from accounts describing the period of the Kokand khanate.³ The successive Kokand khans significantly invested in irrigation, and furthered infrastructure building and territorial expansion. They upgraded irrigation systems primarily around major urban centres which form in many respects the historical and cultural heartland of the Ferghana Valley.

In 1876, the Kokand Khanate was conquered by Tsarist Russian troops and it became part of the Russian Empire. The Khanate was abolished and much of its territory incorporated into the newly created Ferghana Oblast' of the General Governorate of Turkestan. The Ferghana Valley was home to both sedentary and nomadic populations, and this co-existence affected the formation of colonial administrative borders. Nomadic, semi-nomadic, and sedentary people were all to be found in each of the administrative units. The Ferghana oblast was made up of five 'uyezds' (sub-regions) namely: Andijan, Namangan, Kokand, Ferghana (formerly Skobelev) and Osh. The land distribution among the various *uyezds* varied greatly. (See table no. 3.1). Upon agricultural policies, the Tsarist

² World Bank (2005), *Central Asia Human Development Report*, UNDP: Bratislava

³ Bichsel, Christine (2009), *Conflict Transformation in Central Asia: Irrigation Disputes in the Ferghana Valley*, Oxon: Routledge, p16.

administration strongly promoted cotton production in the basin for export to a rapidly growing Russian textile industry.

Table: 3.1 Land distribution in Ferghana Valley

<i>Uyezd</i>	Land owned by sedentary population (%)	Land owned by nomadic and semi-nomadic population (%)	Total area of land (square verst)
Andijan	40.76	44.18	>13,000
Osh	11.82	88.18	23,357
Ferghana	34.18	54.51	13,239
Namagan	32.14	45.61	23,423
Kokand	20.56	68.30	13,237

Source: Tom Everett-Heath (2003:46).

At the time of conquest, Central Asian agriculture was either on a subsistence basis or confined to the local market. The staple crops grown in the Ferghana Valley were mainly wheat, sorghum, barley, millet, rice and alfalfa. Gardening played an important role; the region was famous for its melons, fruits and vegetables. There were orchards wherever land was cultivated, and besides domestic fruit trees many species also grew wild. Lucerne (alfalfa) was grown as fodder⁴. In the beginning, subsistence farming was the fate and the peasant farmers were only concerned with feeding themselves. They were hired by the landlords or richer peasants (Kulaks), and much of the harvest went to pay for the rent of the land and other services. The land was utilized in a very primitive way. Rye was preferred to be sown and harvested, and then the land had to be left fallow. Crop rotation and fertilizers had not been introduced. In Central Asia rye, flax and oats were grown because they provided cheap food and clothing with little regard to suitability of the soils.

⁴ Pierce, Richard A. (1960) *Russian Central Asia; A Study in Colonial Rule*, Los Angeles: University of California Press, p163.

Agriculture of Central Asian Republics under the Tsarist system was identified as mono-culture characterised by cotton cultivation. This was done as a matter of the policy by the then planners⁵. Under colonial rule, a series of incentives led to a considerable increase in the total area of cotton plantation between 1885 and 1916 (see Table 3.2). The emerging cotton economy enabled the Ferghana Valley to participate in agricultural markets, but also brought about poverty and inequity. The heydays of cotton production temporarily ended with the Bolshevik's seizure of power in 1917. The ensuing civil war brought about political turmoil, famine and violent resistance in the Ferghana Valley. This led to a sharp drop in the total irrigated area and cotton production in the early 1920s (see Table 3.2).

Table 3.2 Irrigated area and cotton production in the Ferghana Valley (1885–1990)

<i>Year</i>	<i>Total irrigated area (ha)</i>	<i>Irrigated area sown with cotton (%)</i>
1885	593,246a	09.6
1901	719,400a	31.9
1916	833,850a	42.0
1922	322,640a	05.7
1930	529,918b	77.6
1950	650,000b	63.1
1970	720,900b	76.3
1985	861,500b	—
1990	711,500b	62.3

Source: Christine Bichsel (2009:17).

Notes: i.) Ferghana Valley refers to the Ferghana Oblast' of the Turkestan General Governorate.

ii.) Ferghana Valley refers to the districts of the Uzbek SSR as delimited in 1924–1925.

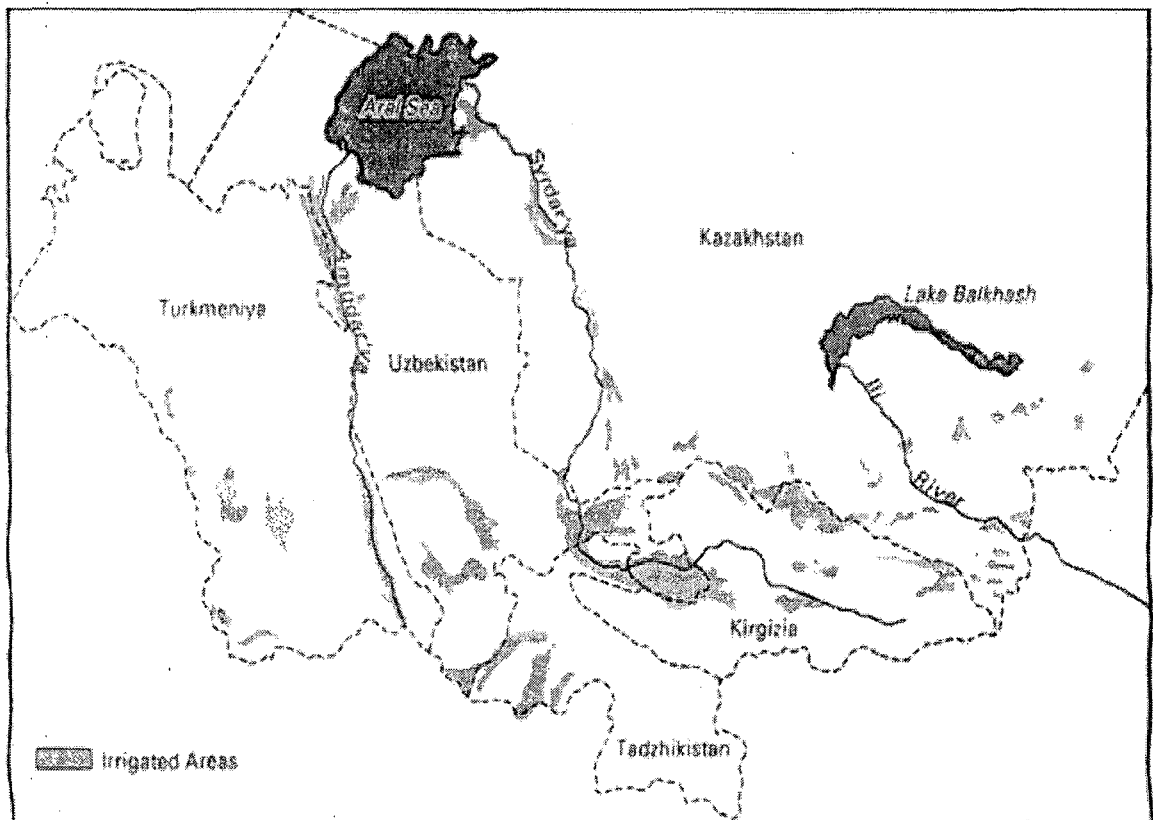
⁵ Jayashekhar, (1996) 'Economic stabilization and Structural Changes: Some Implications' in K.Warikoo (ed.) *Central Asia; Emerging New Order*, New Delhi: Har-Anand Publication, pp136-138.

Agriculture Practices and Irrigation System

As part of transformation, there were two methods to be applied to invade and extend area under crops where agriculture was in practice in rudimentary or traditional style.

First method was the use of new varieties which had capability to adapt in new environment and the second method was the expansion of irrigation facilities. The idea was with the expansion of irrigation facility the dry mid-continental steppes will be made fertile. Irrigation was in practiced since many centuries ago in the oases of Central Asia like Samarkand and Ferghana Valley. So the idea was old but the circumstances in which it was implemented and the rationale behind was quite different. The Tsarist administration restructured irrigation facility in Central Asia including the Ferghana Valley which was traditionally known as irrigated (map 3.1).

Map 3.1 Irrigated areas of Central Asia, 1988.



Source: adapted from, Robert A. Lewis (Ed. 1992:131)

Irrigation and Water Management in Syr Darya Basin

At the core of the region's natural resource challenge lies the management of regional water resources, which requires a careful balance between irrigation, generation of electricity and human consumption. Kyrgyzstan and Tajikistan, the upstream countries along the main river system of the region—the Syr Darya—prefer to maximize the use of the water for generating electricity for export and to meet domestic energy demand, especially in the winter. The downstream country Uzbekistan, where the major part of the Valley is situated, prefers to have maximum access to water for irrigation during the summer months⁶.

Agriculture in Central Asia is especially distinguished by its dependence upon Irrigation. Ninety-two percent of the surface water resources of the region are in the Aral Sea drainage basin out of which 30 percent is constituted by only Syr Darya basin. However, interestingly, most surface water for irrigation comes not from the large rivers but from smaller streams of the Syr Darya system. In Uzbekistan, the long-irrigated areas of the Fergana basin (the single most important cotton-growing region of Central Asia) and the Hungry Steppe were joined by numerous projects extending westward from the Tashkent Steppe, and in Tajikistan and Kyrgyzstan the Vakhsh and Chu valleys received intensive irrigation development, adding to the already important irrigation projects those republics had in the Fergana basin.

Agricultural land is dominated by the areas irrigated by the large river system of Syr Darya—whose headwaters begin in the glaciers and snowfields of the Pamir and Tian Shan mountain ranges. The Syr Darya River is the second largest river in Central Asia. The main tributary of the Syr Darya is the Naryn River, which rises in the glaciers of the Tian Shan Mountains in

⁶ UNDP Regional Bureau for Europe and the CIS (2005) *Central Asia Human Development Report*, Bratislava: Calder s. r. o. p5.

Kyrgyzstan, as shown in Figure 3.2. Approximately 10 million⁷ people depend directly or indirectly on this irrigation system in Ferghana Valley. Although a native irrigation infrastructure existed for centuries in this region, Soviet irrigation and distribution plans vastly increased the irrigated area in the Syr Darya river basins between the 1950s to the 1980s⁸

The quest for hydropower dams on the Naryn River is central to irrigation-energy conflicts in Central Asia where five big hydroelectric power plants are located (Toktogul, Kurpsai, Tashkumyr, Shamaldysai, and Uch-Kurgan). The Naryn is joined by the Kara Darya River, which flows from the Ferghana and Alay Mountains in Uzbekistan and Kyrgyzstan. Together, they form the Syr Darya. This river flows through Tajikistan, returning into Uzbekistan, and finally entering Kazakhstan before reaching the Aral Sea over a distance of approximately 2,200 km. The mean annual discharge of the Syr Darya is 37 cubic km, and varies between 21 and 54 cubic km over the period of reliable records. It must, however, be borne in mind that reporting such global figures is fraught with dangers and difficulties, depending upon how the resource is defined (where it is measured) and how drainage return flows are dealt with⁹.

During the Soviet period, the regional water infrastructure was managed centrally and its costs were mostly borne by Soviet Union-wide agencies. As the republics became independent, dam and canal management and maintenance became the responsibility of the individual republics, and suffered from poor coordination and inadequate spending due to severe fiscal constraints and lack of regional cooperation¹⁰.

⁷ UNEP (2005) *Environment and security: Transforming Risk into Cooperation*, Geneva: United Nations Environmental Programme, pp17-18.

⁸ Mahnovski, Sergej (2006), *Economic Dimensions of Security in Central Asia*, Santa Monica, CA: RAND Corporation, p32.

⁹ Biddison, J. Michael (2002), *The Study on Water and Energy Nexus in Central Asia*, Natural Resources Management Program; Tashkent.

¹⁰ UNDP Regional Bureau for Europe and the CIS (2005) *Central Asia Human Development Report*, Bratislava: Calder s. r. o. p88.

The “upstream” and “downstream” states of Central Asia differ not only in their endowment of water and Soviet-era hydrological infrastructure. The lion’s share is consumed by the downstream states of Uzbekistan. As a result, water is a key security issue, particularly for Uzbekistan, which has a high demand for irrigation water to support agriculture. However, the hydrological infrastructure is controlled by the upstream states, Kyrgyzstan and Tajikistan. This has resulted in an interdependent trading relationship¹¹. It is known that one of the fundamental functions of countries is the paying importance to benefit of irrigation and the value of water in agricultural activities. There has been interesting connection between water resources and the management of the established civilizations. Ruling dynasties and local level authorities have established their seating near water distribution facilities or at the start of irrigation canals, in order to control water. This has been one of the best ways of controlling the remaining population. In Ferghana Valley., water has always been the most critical natural resource. The civilizations of this region have been using water in agriculture long before many parts of the world. With the experience of building larger irrigation facilities, use of water and its distribution has been (and will continue to be) an inseparable part of economic development of peoples of Ferghana Valley¹².

Centuries of Ferghana people’s history contains a lot of struggles to control water and its distribution. According to the written sources from 18th-19th centuries, use of water resources has caused important problems between neighbouring tribes, and these problems have caused wars. With the incorporation of the Valley into the Soviet Union, central administration has realized many reforms in order to achieve optimal use of water. There has been increasing discussion of water shortages and better use of water reserves has been as the

¹¹ Mahnovski, Sergej (2006), *Economic Dimensions of Security in Central Asia*, Santa Monica, CA: RAND Corporation, pp30-37.

¹² Nizamedinkhodjayeva, N. (2006) ‘Critical Literature Review: Irrigation Water Against Rural Poverty – Lacunae in Research’. A Paper Submitted in Part-Fulfilment of the Requirements for the Degree of Masters in Research. Norwich: School of Development Studies, University of East Anglia (UEA).

water level in Aral Sea has declined rapidly. Especially the concerned Countries, Tajikistan, Uzbekistan, and Kyrgyzstan need high amounts of water for agricultural activities in the summer months¹³.

Water resources are the most important factor affecting economic development. Among the Central Asian countries, in the long term, the water rich ones are Tajikistan and Kyrgyzstan. Tajikistan is known to have richer water resources than her neighbors. Amu- Darya river is the biggest water source for Tajikistan, it forms 72% of total water flow. In addition to this, Tajikistan has 200 lakes of various sizes. The dams are used for both electric production and irrigation purposes. Research shows that Tajikistan's overall energy potential is 300 Billion kw/hour. According to experts if Tajikistan uses its water resource effectively she can both satisfy its agricultural water needs and produce electricity to export to neighboring countries. While Kyrgyzstan has the potential to produce cheap electricity, Uzbekistan needs both water for agriculture and also electrical energy. The water regime in Kyrgyzstan and Tajikistan has been designed to address the water use in Kazakhstan, Uzbekistan, and Turkmenistan. If water regime in Kyrgyzstan and Tajikistan are re-designed to produce electricity instead of agricultural use, they will have important increases in the electrical power productions. Thus, an important contribution will be made to these two countries' economies by selling electricity. As it is today, 80% of water in dams on Kyrgyzstan and Tajikistan are provided to Kazakhstan and Uzbekistan without making benefit for themselves.

Water Resources in Central Asia

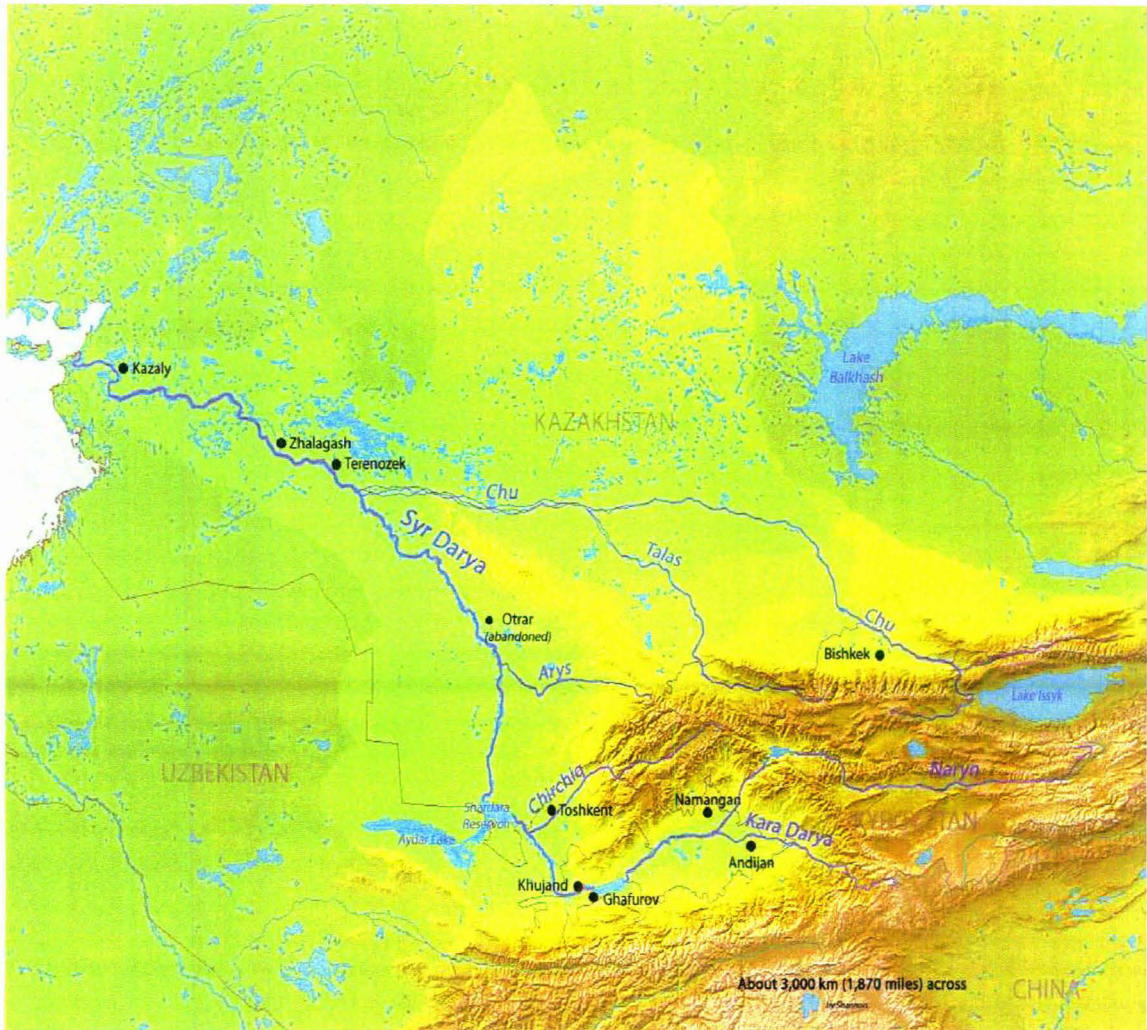
Kyrgyzstan and Tajikistan both need petrol and natural gas and buy them at would be market prices, while they provide another important natural resource, water, for free which causes problems between these countries. Such

¹³ Grigoryev, A. A., (1952), *Soviet Plans for Irrigation and Power: A Geographical Assessment*, The Geographical Journal, Vol. 118, No. 2 (Jun., 1952), pp. 168-179. Accessed on 23/07/2010 from <http://www.jstor.org/stable/1791946>

contrasts existed between Uzbekistan and Tajikistan too. For both of these countries Amur Darya is very important. In September 1995 there was a conflict between these countries because Uzbekistan was over using the water of this river [Usubaliev T.U. 2002 Bishkek]. The biggest of such conflicts was between Kyrgyzstan and Uzbekistan. The mass media of Kyrgyzstan reported that water from the mountains in the country was going to Uzbekistan for free, and it wasn't useful for the Kyrgyz economy. That's why Kyrgyz government kept much more water in the Toktogul Hydroelectric Power plant on Naryn River decided to decrease the water flow to Uzbekistan. In 1992 Toktogul Hydroelectric Power plant by the decision of Kyrgyz government changed the watering-energy regime of Naryn River to only energy regime, thus, comparing to previous years the energy production increased by three times. 80% of this energy was being produced in the winter time. Yet, Tajikistan and Kyrgyzstan had to buy gas from Uzbekistan at the world price. At the end of 2002 year "AO Kyrgyz gas" was in debt of 600 000 US \$ in money and the merchandise debt was more than 1.150.000 US \$. "Interfax-Kyrgyzstan" agency quoting Kyrgyz government Prime Minister's first Assistants reported that because Uzbekistan cut gas submissions in 15 April 2001. He said that "It means that next year in Autumn-Winter period Toktogul Dam lake can't provide a water volume which is needed for submission to Uzbekistan. In this document water was registered as an international worth. Kyrgyzstan was reported as an owner of water which is in the borders of the country"¹⁴.

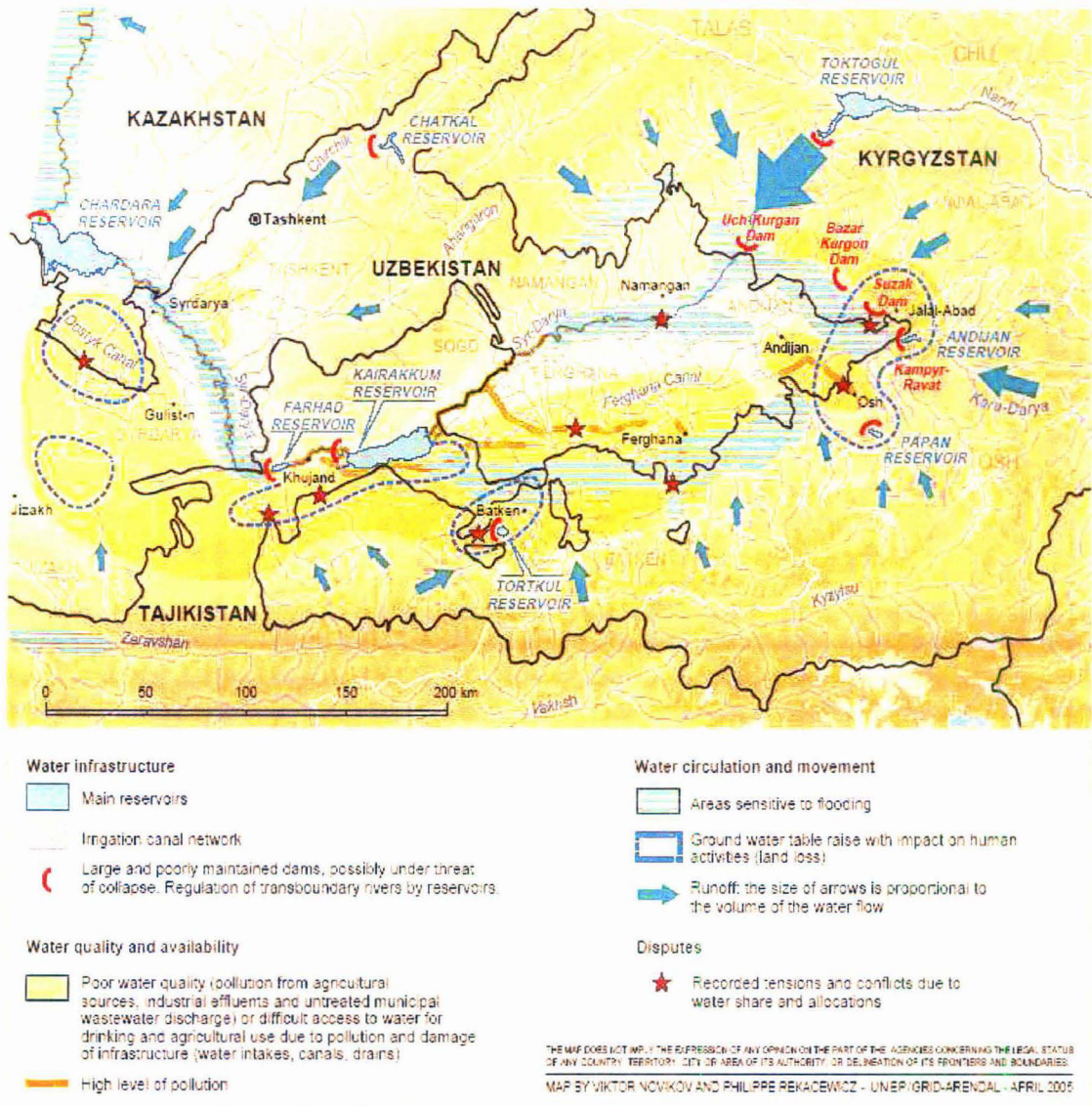
¹⁴ Mamatov, Nurlan, *The Effect of Water Resources on Socio-economy of Central Asia*, As assessed on 14/01/2010 from http://www.dsi.gov.tr/english/congress2007/chapter_1/11.pdf

Map 3.2 Syr Darya River Systems



Source: <http://upload.wikimedia.org/wikipedia/commons/3/33/Syrdaryamap.png>

Map: 3.3 Drainage Pattern and Surface Runoff in Syr Darya Basin



Source: [http://maps.grida.no/go/graphic/water issues in the ferghana valley](http://maps.grida.no/go/graphic/water%20issues%20in%20the%20ferghana%20valley)

Map 3.4 Topography and Hydrography of Ferghana Valley



THE MAP DOES NOT IMPLY THE EXPRESSION OF ANY OPINION ON THE PART OF THE AGENCIES CONCERNING THE LEGAL STATUS OF ANY COUNTRY, TERRITORY, CITY OR AREA OF ITS AUTHORITY, OR DELINEATION OF ITS FRONTIERS AND BOUNDARIES

Source: <http://maps.grida.no/go/graphic/topography-and-hydrography-of-the-ferghana-valley>

The Trend of Soviet Agriculture: Change from Private to Collective Farming

In the first ten years of revolution there were very few changes in the countryside. What was more important, this peasant type of agriculture produced only one-tenth of the harvested grain required for the urban centres. It was insufficient to fuel the contemporary industrial growth. However, the bulk of land remained in the possession of private peasants. Stalin's government needed assured supplies of food for the towns and a exportable surpluses to pay for machinery for industrialization. They needed labour to move from village to town. They needed finance for investment, and, in a market situation favourable to the peasant sellers, they were anxious to obtain produce without having to pay full market price¹⁵. In this regard, about 1928 when first five year plan was started¹⁶, a big drive was launched by the Soviet Government to reorganise the farms. In small strip fields neither machines could be used nor could a planned rotation of crops be grown. It was unavoidable to draw the agricultural programmes scientifically and everyone had to work collectively. Therefore collectivisation of farms came into being. Of Course, agriculture was collectivised but not overnight. It took several years to be organised. At first 'cooperatives' of the farmers were organised and theses marketed the produce of the farms. Now the farmers realised the multiple advantages of working together in a collective farm or *artel*.¹⁷

A Collective farm, "Kolkhoz"

The collective farm is nominally a form of cooperative. The peasants of a certain village join together to cultivate land in common, under an elected

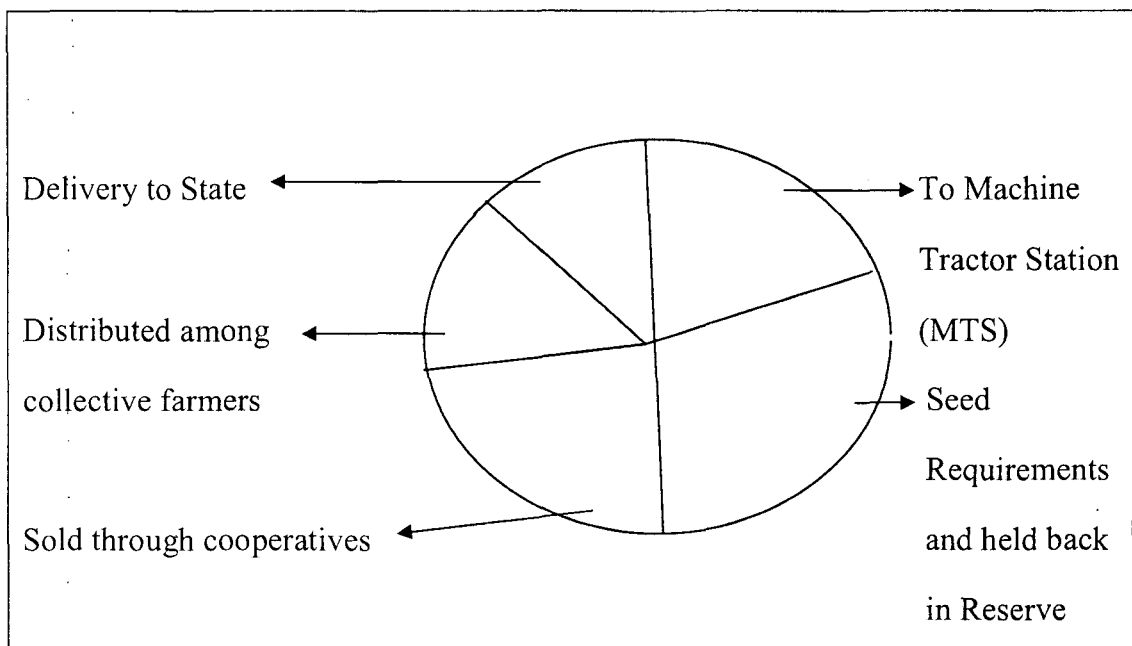
¹⁵ Nove, Alec (1961), *Soviet Economy; An Introduction*, New York: Fredrick A. Praeger Publishers, p45.

¹⁶ Jasny, N. (1949) *The socialized Agriculture of the USSR*, Stanford: Stanford university Press, p779.

¹⁷ *Kolkhoz* (plural *Kolkhozy*) is a Russian abbreviation of the two words '*Kolletivenoye khozyaistvo*, literally collective economy. The word *artel*, a peculiarly Russian term designating a team of man working together in a self-governing group, was and is also used to describe this general organisational form. The term *Kolkhoz* is also used to describe a significant group of fishing co-operatives, whose members also cultivate some land.

management committee headed by an elected a chairman. The boundaries of the farms were determined by the law and the state allowed them to use for ever. The boundaries of individual peasants were removed and the farms turned into one unified area. One was at liberty to withdraw, and eligible for getting his contribution returned. However, it occurred but very rarely. The concept of personal belongings was annulled as the cattle, seed supplies, implements and farm buildings belong to the collective farms. It is important to notice that the individual members of the collective farms had their own personal property. They lived in homely cottages, not like barracks. The farmers keep their money, they earned and they also had right to a small plot of land attached to his house on which he can grow vegetables or keep his cattle, pigs or poultry. However, the size of personal plot was small in irrigated areas of Central Asia like Ferghana Valley where the land was of high value¹⁸.

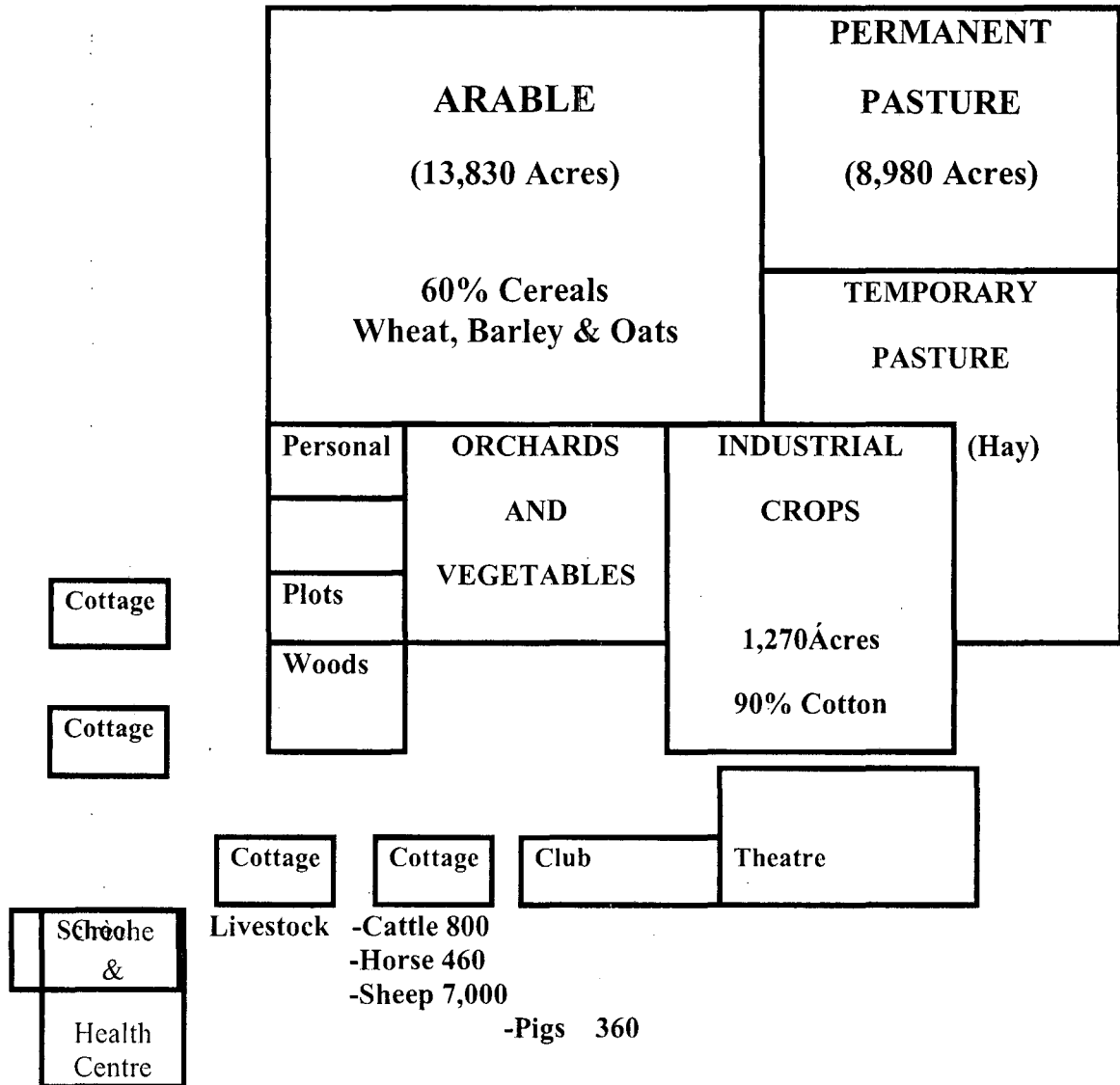
Fig 3.1 The Distribution of The Produce at a Typical Collective Farms



Source: Adapted from Gray, G.D.B. (1947:143)

¹⁸ Gray, D.G.B. (1947) *Soviet Land; The Country, Its People and Their Work*, London: Adams and Charles Black, pp142-143.

Fig: 3.2 Diagrammatic representation of A Typical Collective Farm.



Source: Adapted from Gray, G.D.B. (1947:145)

Thus collective farm production involved the joint effort of the farm and a state owned machinery operator, the MTS. The basic duty of the collective farm was to meet the state's compulsory delivery quota, and to hand over produce in payment for the services of the MTS. Income was mainly obtained from the sale of the produce. A certain amount of this had to be sold to the state at fixed price, and a further quantity was paid to the Machine Tractor Station. After these commitments were met a portion of produce was sold at slightly higher prices through the cooperative markets. Some of the produce was held by the farm in reserve for seeds or for emergencies and rest of the produce was divided among the farmers in proportion to their work days. Another type of production farms were the State Farms.

The State Farms "Sovkhoz"¹⁹

On a state farm people were working same as in industry. The working hour was eight hours and they also had annual holidays with pay. The state farms were huge grain growing farms followed by large scale stock rearing farms. They were intended to use machines at large scale for almost every farm operations. They were ubiquitous in nature. Some of them were specialised on grain production, cotton, citrus- fruits or market gardening and some were especially designed for stock rearing, cattle breeding, sheep rearing, pigs or poultry. Although, these farms were not as numerous as collective farms, their economic importance can be realised by the fact that in 1938, they had sown area of 30 million acres and kept 2,597,000 cattle, 1,883,000 pigs and 5,676,000 head of sheep. The number of workers employed was over 2 millions²⁰. The 'steel horse' or a tractor made it possible to till these millions of acres many of which were previously neglected or were simply virgin lands. Onions, tomatoes and other vegetables were grown for metropolis. In most of the cases state farm

¹⁹ A typical Russian terminology for state farms.

²⁰ Gray, D.G.B. (1947) *Soviet Land; The Country, Its People and Their Work*, London: Adams and Charles Black, p146.

produces were mainly market oriented. Both state and collective farms had been established well within the Ferghana valley.

Soviet land use was mono-functional and dependent on high levels of inputs such as chemical fertilizers, machinery, concentrated feed, and subsidies and was neither ecologically sustainable nor economically viable. In the process of political and economic transformation after the collapse of the Soviet Union in 1991, state farms have been dismantled, land and livestock privatized, and specialized employees such as technicians have suddenly become independent farmers. Today, large farms and herds no longer exist, having been replaced by a multitude of small household enterprises. Each household's socioeconomic situation is unique, and so are household livelihood strategies.

Agriculture

The agricultural sector accounts for a very large share of the workforce and is the employer of last resort in Ferghana Valley. Since poverty is disproportionately severe in the countryside, agriculture plays a critical role in providing employment opportunities throughout the region, as shown in Table 3.3. Agricultural productivity and growth, however, are constrained by major state interventions in both input and output markets and by severe water shortages, particularly in the cotton and grain-growing areas in Uzbekistan and Turkmenistan.

Table 3.3 Rural Population and Agricultural Employment

Rural Population and Agricultural Employment in Central Asian Republics who share Ferghana Valley			
Country	Rural Population (%)	Agricultural Employment (%)	Irrigated Cropland (% of Agricultural Land in 1999)
Tajikistan	72	67	84
Kyrgyzstan	66	55	75
Uzbekistan	63	44	89

SOURCE: Micklin (2000).

Food security has been a problem in some parts of Central Asia, particularly in Tajikistan and Kyrgyzstan. Severe unemployment has led to a northerly seasonal migration from all the Central Asian states to Russia as well as internal migration from rural to urban areas. Although the statistics on internal migration are scant, authorities have imposed and enhanced Soviet-era administrative and financial barriers to internal migration, particularly from the rural regions to the cities²¹. This has effectively segregated labor markets, particularly in Uzbekistan and Turkmenistan, leading to regional differentials in wages and unemployment rates.

Cultivation Patterns of Various Cash Crops, Grains and Vegetables

Sugar-beet Cultivation

Sugar-beet cultivation in this region was started in 1929-30, and it developed rapidly. During Second World War it became widely developed in most of the parts of the Valley. Beet cultivation was flourished as a result of collectivisation of agriculture, the introduction of new techniques and the mechanisation to the field work, the use of fertilizers at large scale and use of canal irrigation for the beet-fields. The local natives were trained to Stakhanov Methods and the farms resulted into record harvest. Not only was a high yield obtained but also beets with the greater content of sugar. Moreover, a cheap method of beet preservation by air and sun drying was worked-out, for which this region is especially suitable. In the early fifties of twentieth century many factories, equipped with the most up to date machinery and techniques were established within a few years. By the application of scientific methods the production season for sugar factories had been extended to seven to eight months, without reducing productivity and percentage of sugar extraction.²²

²¹ Mahnovski, Sergej (2006), *Economic Dimensions of Security in Central Asia*, Santa Monica, CA: RAND Corporation, p32.

²² W.P. and Zeldia K. Coates (1951) *Soviets in Central Asia*, London: Lawrence and Wishart Ltd, pp97-115.

Land Use Pattern and the Cotton Economy

Mono culture was the rule in Ferghana Valley. This is the only region which supplied most of the cotton to the then Tsarist Russia. It is important to be noted that all the cotton till the revolution came from irrigated areas of Central Asia except few exceptions²³. However, some wheat was also grown in these irrigated areas. And, naturally a slump in the demand of cotton or a poor yield proved disastrous to the inhabitants of these areas.

Food Processing Industry

Ferghana Valley possesses huge resources of raw materials for the development of food processing industry and it has a great potential for agricultural produce processing. The natural and climatic conditions of the region provide ample opportunities for the development of fruit and vegetable production (for example: the average sugar content of grapes worldwide amounts to 12%, but in Ferghana it is 18%)²⁴.

Pastoral Life in Ferghana Valley

The term pastoral life in agriculture practices is applied to a mode of human activity characterized by two essential features. It is founded on the exploitation of live stock: it involves periodic movements of the stock as they exhaust the resources of their encampment. Pastoral life has remained the necessary outcome of natural condition in Ferghana Valley. As all other forms of agricultural activity has been presupposes active intervention on the part of man in utilizing the resources furnished by his surrounding environment. In this region due to the wealth of live stock and extent of suitable domain, man has taking advantage of resources. Such animal stocks as the cattle, musk and Rocky Mountain sheep have thus remained immensely productive. Broadly speaking,

²³ Gray, D.G.B. (1947) *Soviet Land; The Country, Its People and Their Work*, London: Adams and Charles Black, p181.

²⁴ Vakhobov, A.V. et al (2006) *Uzbekistan's Accession to the World Trade Organization: Challenges and Opportunities for the Food Processing Industry*, National University of Uzbekistan, pp2-6 As seen on 11/08/2010 on www.bearingpoint.uz

pastoral life was in common practice until the advent of the Russians. In the Valley people were absorbed in a traditional practice of agriculture and made greater use of their mountains for pastoral purposes which embrace the greatest realm of pastoral life.

Pastoral life can be presented under three principal forms: nomadism, transhumance, the pastoral life of the mountain. 'Nomadism' is that primitive form of economic activity under which the entire human group is accompanied by the flocks and herds during their migrations. In 'transhumance' care of the animals is delegated to shepherds and the rest of the group remains sedentary. The term 'pastoral life of the mountain' is applied to those movements which simply involve passage between the lower and higher parts of the same mountain slopes. For example the Kyrgyz annually drive 260,000 sheep, 800 kilometres between the plains of Ferghana and the mountains of Tian-Shan.²⁵

Today the triumph of the husbandmen is almost complete. The transhumans, deprived of their privileges are forced submit to themselves to common laws of respective countries. They have even lost their old highroads, of which only the memory remains. Their territory has been encroached by the neighbouring landowners, who have extended their fields thereon. However, these agricultural zones have long furnished support for man as well as his animals. During the bad season the flocks find asylum in the agricultural zone which occupies the lower portions of the mountain valleys.

Sustainable Pasture Management in the Kyrgyz Tien Shan and the Tajik Pamir of Ferghana Valley

For many centuries, (semi)nomadic pastoralists used pasture areas in the Tien Shan and Pamir mountains. Under Soviet rule, sedentarization began in the 1930s and collective farms replaced socioeconomic units based on kinship. After the collapse of the Soviet Union in 1991, state farms have been dismantled

²⁵ Arbos, Philippe (1923), *The Geography of Pastoral Life*, in 'Geographical Review', Vol. 13, No. 4, American Geographical Society, pp 559-575.

and farmlands and livestock were privatized in the process economic transformation. Large farms and herds no longer exist now a day. Thus activities focusing on sustainable pasture management must therefore take account of this new socioeconomic situation. For example, out of roughly 20 million ha of Kyrgyz territory, more than 9 million are pastures, but only 1.4 million can be used for crop production because of topographic and climatic limitations. Arable land is restricted to valley floors primarily in Ferghana Valley, where crops are grown on irrigated land. In Tajikistan the situation is similar, with almost 80% of the agricultural land consisting of pastures. Summer pastures at altitudes between 3500 and 4700 m are an important natural resource in the valley.

The livestock sector

Different types of pastureland exist in Kyrgyzstan. First, there are pastures close to villages, managed directly by the community. Second, vast but underused areas of remote mountain pastures in the Tien Shan are still under the administration of the Oblast. And third, intermediate pastures, usually located in the foot zones of mountain ranges, are defined as intensive pastures and are currently leased out to individual households in pilot areas for periods ranging between 1 and 99 years. The size of the pasture to be leased to households depends on the number of animals, on the ecological characteristics of the pasture area (eg, fodder production, ecological carrying capacity, and water availability), and on accessibility. As a consequence of the individualization of agricultural production, combined with decreasing support, farmers are more dependent on natural resources close by. Those households not in a position to lease pasture areas keep their animals on pastures near villages. Because the number of animals on these pastures is often very high, vegetation and soil degradation are widespread. Remote pastures, on the other hand, are currently underused because individual herds are too small and it is not profitable for a household to use such pastures. Moreover, accessibility is severely constrained by deteriorating road infrastructure-which results in exorbitantly high transport costs-and social services

in these remote pasture areas are no longer available. The livestock sector in the mountainous areas of Kyrgyzstan and Tajikistan was dramatically affected by economic decline after 1991. In Kyrgyzstan, the sheep population decreased from 13 to 4 million animals in 1999.

In Tajikistan, state farm assets, mainly sheep and yak, were distributed to individual households after 1999. However, land still belongs to the state and no formal system of land leasing exists. Households move with their animals from winter to summer pastures. Summer pastures are located farther away from the villages in high mountain valleys, whereas winter pastures are near to settlement areas. Patterns of mobility differ according to the socioeconomic situation of households. Usually, the larger the herd and the richer the household, the greater the distance between winter quarters and summer pastures. Because many households cannot afford transport costs to move with their herds to summer pastures, animals frequently graze in the proximity of villages year round.

During the Soviet period, large herds were transported to remote pastures in the Tien Shan and the Pamir during the summer months. This involved an extensive road network, a fleet of trucks, provision of herders with everyday goods, and cultural centres with modest infrastructure and social services. Using these remote pasture areas again will require considerable investment by government or donor agencies to refurbish infrastructure. To decrease dependency on livestock, investment in the agricultural sector must be promoted whenever possible. This includes refurbishment of infrastructure such as the irrigation system, rehabilitation and maintenance of agricultural machinery, provision of credit, establishment and support of an agricultural input and output marketing system, and establishment of agricultural extension systems. Niche production, including both live-stock and crops, should be promoted to make the best use of the diverse ecological conditions in these mountainous areas and the specific situation of households. Adaptation of government structures is expected to contribute to the development of marginal areas as well. A federal system based

on the principle of subsidiarity could strengthen the decision-making power of people living in marginal areas. Revising legislation designed to improve the investment climate, especially in mountainous areas, is necessary to take advantage of economic opportunities.

Current Scenario

The government of Uzbekistan is taking appropriate steps for the development of livestock breeding in Uzbekistan, which would help in the future to decrease the price of meat in the country. Poultry produced in Uzbekistan is uncompetitive by price indicator. One ton of local poultry meat is sold in Uzbekistan at the price of USD 1900 (author's calculations). As regards the price factor, Uzbekistan ranks in 17th place among the top twenty global exporters of poultry.

Despite the decrease in the growth rate of production, the food industry still plays a key role in the economy of the Valley. For the period of 2000-2004, the volume of the food industry in the structure of GDP, gross industrial output, and the total volume of exported and imported produce has decreased. For example, if the gross output of the food industry in 2000 amounted to UZS 250.3 billion, or 1.9 % of the country's GDP, employing 117,400 people, then in 2004 the gross output of food processing industry reached UZS 774.9 billion or 1.6% of GDP, and employed 95,600 thousand people. At the same time, the number of economic entities operating in the food industry is growing steadily. In 2002 there were 3352 enterprises operating in the food industry, and in 2004 this indicator reached 3646 units. One of the main indicators of food processing enterprises' successful operation is capacity utilization ratio. In 2004 the capacity utilization at the following enterprises of the food processing industry was as follows:²⁶

²⁶ The State Statistics Committee of the Republic of Uzbekistan

Agriculture Practices and Irrigation System

1. Nonalcoholic Beverages 16%
2. Macaroni 35,6%,
3. Grape Wines 37,7%,
4. Margarine 38,2%,
5. Processed Fruits and Vegetables 40,2%

This indicates the existence of a large growth potential of the food processing industry in future. An analysis of the physical volume of food industry production showed that there was a slowing down in some branches of production. The greatest decrease in production volume occurred in canned fish production (decrease of 73% versus the physical volume of production in 2000), cheese, including brynza (43%), dried, non-fat milk (51%), canned fruit (56%), fruit juices (45%), vegetable juices (95%), dried fruit (54%), cereals (74%), rice (75%), macaroni (pasta) (40%), ethyl alcohol (58%), cognac (58%), champagne (50%), nonalcoholic drinks (74%) and soda waters (54%). These decreases can also be explained by the fact that some of the abovementioned commodities are produced by individual entrepreneurs, who do not submit production data to the statistics body. Hence, the official data can exclude the data on production growth of some individual producers. However, there were steady growth trends in certain branches of production of the food industry. For example, sugar production in 2004 increased 19 times as compared to the physical volume of production in 2000. There was also increase in the physical volume of production of meat and meat products (139% over the year 2000), dried vegetables (198%), chocolate and chocolate products (164%), mayonnaise (257%), beer (159%), mineral water (140%), natural tea (6.4 times) and packed fruit juices (Tetrapak) (168%). The production growth of these commodities was provided by the growth of external demand for these products (juices, dried vegetables, mineral water), as well as by the high level of protection against imported commodities in the form of customs duties and excise taxes (meat and meat products, mayonnaise, beer, mineral water).

Analysis of the dynamics of the import and export of food products showed that during the period 2000-2004, the import volume of food products surpassed the export volume. At the same time, the worst negative trade balance was registered in 2002, when it reached USD 174 million. Furthermore, the volume of the foreign trade balance has tendency to decrease. In 2004 the total export volume of food products amounted to USD 193 million, and the total import volume was set at the level of USD 260 million. The countries of Central Asia have significant competitive advantages in raw tobacco production. For example, the export cost of 1 ton of tobacco from Tajikistan is USD 468, and Kyrgyzstan USD 873. The cost of 1 ton of tobacco leaves exported from Uzbekistan is USD 711, while the export price of this product from the USA is USD 6631, Greece USD 3834 and Germany USD 3657. In accordance with the price factor, Uzbekistan comes in second place after Tajikistan among twenty top global exporters. According to the purchasing prices of the main local producers of dairy products, the price for milk in Uzbekistan is USD 220 per ton. Among CIS countries, Belarus and Kyrgyzstan have the lowest cost for milk, which they export at the price of USD 177 and USD 196 per ton respectively. The cost of 1 ton of whole milk in countries is as follows: Holland USD 389, Austria USD 415, Germany USD 421 and Denmark USD 567. The highest export costs for 1 ton of milk are in China and Thailand: USD 673 and USD 830 per ton respectively.

Uzbekistan is one of the most competitive producers of cottonseed oil; the export cost of 1 ton of this oil is USD 500. Singapore and South Korea export cottonseed oil at the price of USD 917 and USD 1176 respectively, which are the highest indicators among twenty top global exporters of the given product.

The analysis of the market of nonalcoholic drinks includes local soft drinks of different producers as well as producers of mineral water. Thus, as of 1 September 2005, 1 ton of soft drinks in Uzbekistan cost USD 325. Other CIS countries had the following prices for 1 ton of soft drinks: Kyrgyzstan USD 252,

Kazakhstan USD 254, Russia USD 361. The highest price for 1 ton of soft drinks was in the UK at USD 717.

Based on the preliminary results of this study and in order to obtain access to the markets of the developed and developing countries, it is advisable, during negotiations on accession to the WTO, to accept a decrease in import duties and an adjustment of excise taxes in accordance with the rates of local producers for the following groups of commodities: ready dairy products (yogurt, kefir, cheese, curds), apples, pears, quince, vegetables, some edible roots, edible fruit and nuts, melon rinds, as well as products of processed vegetables, fruits, nuts and other parts of plants; water, including natural or artificial, mineral, carbonated, with or without additives, cottonseed oil and its derivatives.

The group of commodities with specific competitive advantages consists of: fruit juices, alcoholic drinks, ice cream, beer and wheat flour, all of them are agriculture products. The geographic position of the Ferghana Valley, as well as its natural climate, imparts a particular flavor to all fruit and fruit products. Just because of this, Uzbekistan ranks in 5th place among the twenty top global exporters of fruit juices, ranked by price indicator. The price of one ton of fruit juice on the internal market is USD 800. Tajikistan produces the cheapest fruit juice, which is exported at the price of USD 207 per ton. Considering the list and prices of alcohol drinks sold wholesale in Uzbekistan, the wholesale cost of one ton of local alcoholic production, which is USD 325. At the same time, the export cost of alcoholic beverages in Kyrgyzstan and Kazakhstan are USD 252 and USD 254 per ton respectively, rendering them the cheapest producers of this product. The export cost of alcoholic production of Russia is USD 361 per ton.

Ice cream of local production is also competitive by price indicator with that produced in developed countries. Thus, one ton of locally made ice-cream is sold on the internal market at the price of USD 1600. Producers from Kyrgyzstan and Russia export their ice cream at the price of USD 868 and USD 1020 per ton respectively. Analysis of the prices for beer in other countries revealed a relatively high cost for beer on the internal market of Uzbekistan, at

USD 520 per ton. It is recommended to decrease import duties and excise taxes for the abovementioned products within 2-3 years to enable local producers to adapt themselves to the higher level of competition. In the short-term period, a certain decline of local production of these products, as well as an increase in unemployment, is expected. However, in the medium-term period, the increase in the intensity of competition will provide positive results (decrease in price and increase in quality).

The cost of beef in Uzbekistan is USD 2800 per ton. According to this indicator Uzbekistan ranks in 10th place among the top global exporters of beef, ranked by price indicator. Ukraine and Belarus export their beef at the price of USD 1360 and USD 1429 per ton respectively. Among CIS countries, the most effective producer of poultry is Belarus, which exports poultry at the price of USD 1327. The price for rice grown in Uzbekistan is not competitive by price factor with world prices. The wholesale price of one ton of rice on the internal market of Uzbekistan is USD 700. All these calculations indicate that a possible decrease in the volume of production and the results of the impact on revenues of the state budget are insignificant, taking into account the assumptions in the table above.

In this section attempted has been made to make a quantitative assessment of the food industry and processing of agricultural products. Quantitative assessments refer to possible changes in the dynamics of the revenue portion of the state budget and non-budgetary funds caused by the increase/decrease of local production and by changes in the dynamics of imports and exports of foodstuffs and agricultural products²⁷.

²⁷ Vakhobov, A.V. et al (2006) *Uzbekistan's Accession to the World Trade Organization: Challenges and Opportunities for the Food Processing Industry*, National University of Uzbekistan, pp1-6 As accessed on 11/08/2010 on www.bearingpoint.uz

Chapter: 04

Economic Development and Agricultural Population

Agriculture plays a leading role in the economy of Ferghana Valley, since it provides 30-40% of the GDP and up to 50% of the able-bodied population is engaged in it. Commerce and the services (20-30% of the GDP) play a perceptible role, while the significance of the extractive and processing industries is much lower (16-19% of the GDP)¹. According to the predicated estimates, the agrarian sector will continue to retain its leading role in the region's economy. So those measures the authorities are undertaking to reform and raise the efficiency of the agriculture deserve particular attention.

In most of the Ferghana Valley, agriculture is a strong option for spurring growth, overcoming poverty, and enhancing food security. Agricultural productivity growth is also vital for stimulating growth in other sectors of the economy. But in this region to accelerate economic growth it is required to increase productivity mainly in smallholder farming combined with a more effective support to the millions of populace coping as subsistence farmers in rural areas. The agriculture sector constitutes the basic foundation of the economy and especially for this region; no programme of economic development can be succeeding unless it is built upon this foundation.

There are many success stories of developing countries where agriculture has driven engine of economic growth early in the development process and also it has proved as a major force for poverty reduction. Most recently, China's rapid growth in agriculture is based on the household responsibility system, the liberalization of markets, and rapid technological change that has been largely responsible for the decline in rural poverty. Agricultural growth was the precursor to

¹ Dankov, Artem., (2007) *Ferghana Valley: Problems of Maintaining Economic Stability in Central Asia and Cacasus* No.2 (44), 2007, p119.

the acceleration of industrial growth, very much in the way agricultural revolutions predated the industrial revolutions that spread across the temperate world from England in the mid-18th century to Japan in the late-19th century. Agriculture has also offered attractive business opportunities, such as high-value products for domestic markets (dairy farming in Kenya, aquaculture in Bangladesh, vegetables for supermarkets in Latin America) and international markets (specialty coffee in Rwanda, horticulture in Chile, Guatemala, and Senegal). There have also been successes in traditional crops with new demands, such as feed-maize exports to China from Laos and sugar cane for bio fuels in Brazil. Agriculture has features that make it a unique instrument for economic development of the Ferghana Valley

Agriculture can work in concert with other sectors to produce faster growth, reduce poverty, and sustain the environment. For us, agriculture consists of crops, vegetables and fruits, livestock, and agro forestry. It does not include extensive forestry and commercial capture fisheries because they are not very common in this valley as well as they require vastly different analyses.

Agriculture as an Economic Activity

Agriculture contributes to development as an economic activity, as a livelihood, and as a provider of environmental services, making the sector a unique instrument for economic development.

Agriculture can be a source of growth for the national economy, a provider of investment opportunities for the private sector, and a prime driver of agriculture-related industries and the rural nonfarm economy. Two thirds of the world's agricultural value added is created in developing countries. In agriculture-based countries, it generates on average 29 percent of the gross domestic product (GDP) and employs 65 percent of the labor force. The industries and services linked to agriculture in value chains often account for more than 30 percent of GDP in transforming and urbanized countries. Agricultural production is important for food security because it is a source of income for the majority of the rural poor. It is

Economic Development and Agricultural Population

particularly critical in a dozen countries of Central Asia, with a combined population of about 200 million and with highly variable domestic production, limited tradability of food staples, and foreign exchange constraints in meeting their food needs through imports. These countries are exposed to recurrent food emergencies and the uncertainties of food aid, and for them, increasing and stabilizing domestic production is essential for food security.

Mainstay of Livelihood and Employment:

Agriculture is a source of livelihoods for an estimated 86 percent of rural people worldwide. It provides jobs for 1.3 billion smallholders and landless workers, “farm-financed social welfare” when there are urban shocks, and a foundation for viable rural communities. Of the developing world’s 5.5 billion people, 3 billion live in rural areas, nearly half of humanity. Of these rural inhabitants an estimated 2.5 billion are in households involved in agriculture, and 1.5 billion are in smallholder households. More than 80 percent of the decline in rural poverty is attributable to better conditions in rural areas rather than to out-migration of the poor. So, contrary to common perceptions, migration to cities has not been the main instrument for rural (and world) poverty reduction.

Source of Cheap Food

Economic Development is characterised by a substantial increase in the demand for food. Apart from autonomous change in demand, the annual rate of increase in the demand (D) for food is given by:

$$D = p + ng$$

Where p and g are the rates of growth of population and per capita income, respectively, and n is the income elasticity of demand for food. If food supplies fail to expand in pace with the growth of demand, the result is likely to be a substantial rise in food prices, leading to political discontent and pressure on wage rates, with consequent adverse effect on industrial profits, investment and economic growth. The inflationary impact of a given percentage increase in food prices is much more severe

in developing countries like Kyrgyzstan, Tajikistan and Uzbekistan, than in the high-income economies. This is a simple consequence of the dominant position of food as a wage good in under-developed countries, where 40 to 50 percent of the total consumption expenditure is devoted to food, compared with 20 to 25 percent in developing economies. There are, thus, severe penalties attached to the failure to produce adequate food in developing countries.

Basically, Developmental Economics is a science of utility seeking under constraints. It claims to illuminate the rationality of individual behaviour, and social welfare. This usually can be accomplished by analyzing comparative microeconomic efficiency and per capita income on the supposition that pathologies of various kinds are subsidiary. A study in Isfara Raion of Sughd Oblast of Kyrgyzstan indicates that here, as in lowland Khatlon, there has been a form of pseudo-privatisation but no individualisation of agriculture. The population density in relation to irrigated land is very high but the climate is good, offering two crops per year. High value crops such as rice, fruit and vegetables are grown for nearby markets in Khojand and the Ferghana. In the study area most collective and state farms had been renamed as CDFs (Collective *Dekhan* Farms). In these collective farms households may sometimes be described as 'share holders', but in reality their true status is that of a farm labourer rather than a private farmer. Land distribution has in fact been little more than a bureaucratic process of assigning workers a theoretical fraction of land (usually between 0.02 and 0.05 ha). Applicants seeking independent tenure may be told by officials that there is no land available or simply receive no reply from the Land Committee. Thus only about 2% of households in Isfara Raion are private farmers in the true sense of the word, but even these may be subject to state production quotas. Ironically those renting CDF land are the only ones able to make production decisions for them. On collective *Dekhan* farms access to agricultural inputs, irrigation water and machinery is tightly controlled by the CDF head; workers may also rely on him for loans and even for mediation on issues such as electricity access and building permits. This makes secession from the collective

all the more difficult. Workers salaries are between about \$4.4 and \$7.4 per month, but even this may often be paid partly in kind².

Agricultural development

Agricultural development in Tajikistan and Uzbekistan, as represented by changes in Gross Agricultural Output (GAO), exhibits four distinct stages- robust Soviet growth (up to 1980), stagnation during the Gorbachev period (1980-1990), transition decline (from 1991 to 1996-97), and finally recovery (since 1997-98). The transition decline that began in 1990-91 exhibited the classic features of decline observed in all post-Soviet countries: the disintegration of the traditional Soviet agricultural system, with its rigidly planned supplies of inputs to and purchases of outputs from collective and state farms at fixed prices, caused a dramatic fall in agricultural production after 1991. This fall in production was largely due to the fall in the use of purchased inputs, including feed, machinery, and fertilizers, and the shrinkage of the livestock herd as a production resource.

The transition decline was much more pronounced in Tajikistan than in Uzbekistan. By 1997 agricultural production in Tajikistan had fallen to levels not seen since the early 1960s. The perception of the transition decline in the 1990s was undoubtedly all the more negative because it was preceded by decades of steady agricultural growth during the Soviet period, as the GAO index in both countries doubled between 1965 and 1988, despite the relative slowdown during Gorbachev's rule in the 1980s.

Massive ethnic riots in the summers of 1989 and 1990 in the Ferghana Valley were caused partly by the difficult rural economy, with heavy unemployment and shortages of agricultural land among the root causes³.

² Robert A. Lewis (ed.1992), *Geographic Perspectives on Soviet Central Asia*, New York: Routledge,pp 179-185.

³ Ibid p168

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Most of the population of Central Asia is concentrated in the river valleys and along canal systems. The bulk of the population is concentrated in the eastern half of the region in the Zeravshan and upper Syr Darya river valleys. Areas with rural densities of more than 200 people per square kilometer are found in these valleys, especially:

- (a) the Fergana Valley of the upper Syr Darya
- (b) The Leninabad and Tashkent areas downstream on the Syr Darya, including the Chirchik River, a major branch of the Syr Darya; and
- (c) The Samarkand and Bukhara areas of the Zeravshan River valley.

Furthermore, in 1989, three of the four most densely populated units (oblasts or equivalent units) of Central Asia were all located in the Fergana Valley of the upper Syr Darya River: Andizhan, which is the most densely populated unit in the then USSR (411.4 people per square kilometer), Fergana (303.2), and Namangan (186.7)⁴.

The Valley is important to each country: nearly half of Kyrgyzstan's population lives there, and half of its industrial and agricultural output comes from its two valley oblasts, Osh and Jalalabad; most of Uzbekistan's sources of oil and water originate in the Valley, as does about 25% of its cotton supply; 75% of Tajikistan's arable land and 65% of its industrial production come from one Valley oblast, Leninabad (also known by its capital city, Khujand). Uzbekistan possesses huge resources of raw materials for the development of food processing industry and great potential for agricultural produce processing. The natural and climatic conditions of the country provide ample opportunities for the development of fruit and vegetable production (for example: the average sugar content of grapes worldwide amounts to 12%, but in Uzbekistan it is 18%)⁵.

⁴ Ibid p225.

⁵ Vakhobov, A.V. et al (2006) Uzbekistan's Accession to the World Trade Organization: Challenges and Opportunities for the Food Processing Industry, National University of Uzbekistan, p1. As assessed on 11/08/2010 on www.bearingpoint.uz

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Recent studies indicate that sustainable rural livelihoods have become a significant challenge for households even in the most productive areas of Central Asia such as Fergana Valley. While a more general picture of land and water degraded areas in the region would indicate that rural communities are trapped in a vicious cycle of deteriorating land and water quality, poor yields, declining incomes and purchasing power, increasing poverty, poor investments in land and water resource rehabilitation, there is evidence that many communities do have considerable capacity to adapt to environmental degradation.

Unemployment and underemployment are fundamental parts of the economic landscape of Ferghana Valley today. The partial recovery in economic output during the 1990s was not accompanied by sufficient employment opportunities for the growing populations of the region. Despite a decreasing fertility rate, population growth in the region remains high and over next 30 years is estimated to average around 1.4 percent per year, the highest among the transition states.

The main causes of poverty in the region were the massive output collapse in the 1990s, combined with changes in income distribution. A sharp increase in income inequality throughout the Valley particularly affected some subgroups, such as the rural populations, the less educated, and groups outside patronage networks. The states of Central Asia began the early 1990s with fairly equal distributions of income, with Gini coefficients ranging from 0.26 to 0.30. The most unequal income distributions emerged in the relatively resource-rich economies of Uzbekistan because of its lack of proper economic reform efforts⁶.

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Rural development entails increased incomes, reduced vulnerability, improved sanitation and health, better access to services, and enhanced human

⁶ Mahnovski, Sergej (et.al.) (2006), *Economic Dimensions of Security in Central Asia*, Santa Monica, CA: RAND Corporation, p10.

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capital. These improvements have further cross-effects. For example, enhanced human capital has a positive impact on incomes. Yet, these improvements will still be inadequate if they are not distributed equitably among households, across various social and ethnic groups, and between men and women. In the area covered by this study and perhaps across Tajikistan, a number of factors act as barriers to development while a set of opportunities also exists.

Despite reported economic growth in Tajikistan, there is a general feeling of poverty among the population of this region. The overwhelming majority of the households feel they have only enough money for the absolute minimum of clothes and food, or even less than minimum. Indeed, the roughly estimated median and mean annual incomes are quite low with remittance constituting about a quarter of the money households receive. Many households have a feeling that their financial situation is stagnant or getting worse (indeed against the background of rising prices). Households are vulnerable to shocks and there is little access to formal borrowing. Working on large farms is a main formal-sector, income-generating channel for many rural household members, in particular women, although it brings in little. Workers continue to labor at the large farms for small amounts of cash, some in-kind wages, and cotton stalks used for fuel. There are few new opportunities available in the industry. Most manufacturing units and workshops that existed in the past were closed down during post-independence economic disruption. There is also a social structure at work made up of households, large farms, and power institutions, acting among other things through the provision of water from large farm networks to individual houses and household plots, which pushes many villagers (in particular women) back to the low wage jobs at the collectives. On this last point, note that village water comes from the canals irrigating the cotton fields, making these settlements wholly dependent on maintaining the existing cotton production set-up (despite the possibility of higher returns from fruits and vegetables the sale of which could also benefit women).

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Large farms pay low wages mainly as a result of several factors. Labor productivity is low on these farms. Machinery and equipment are obsolete or non-existent and application of scientific know-how is minimal due in part to migration of high-skilled labor and the disruption of the previous knowledge system. The water and drainage networks and electricity shortages exacerbate the situation. The wages are also low since the farms have significant debts to future companies and others (including water debt). Yet, debt has been accrued due to financial mismanagement and possibly malfeasance. Finally and quite importantly, large farms must meet state cotton quotas while they sell their outputs at low prices due to both prevailing international low cotton prices and the monopsony through which cotton is purchased from the farms. This situation is operationalized and exacerbated by a collusive structure that extracts and takes away surplus from lay workers at the large farms, thus precluding both increased rural household consumption and reinvestment in productive activities of the collectives.

The fact that few large farm workers have a clear understanding of the land shares they are supposed to have is an indication of this convoluted structure. Indeed, land reforms are meaningless from the point of view of a majority of households. In particular, there has been reluctance to relinquish control over prime as opposed to marginal farmlands. Cotton-growing kolkhozes and sovkhoses have been turned into a few smaller collectives that operate more or less on the old principles and large-scale cotton production still predominates as under the Soviet period (although in non-cotton-producing areas there are some evidence of more meaningful land reform).

Thus in cotton-producing areas, a complete and relatively closed low-wage, low-productivity cycle is established that keeps many rural households in poverty with the only exogenous factor affecting it being migrants' remittances. What should be emphasized is that exploitation per se does not hamper poverty reduction or development. The developmental obstacle here is rather the particular exploitation structure whereby surplus is extracted but is not reinvested in the

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localities. There is no evidence either that the proceeds are invested domestically elsewhere in productive activities that may lead to increased demand for labor. If the surplus was reinvested where it was extracted (or for example in manufacturing units around urban areas), it would be possible for an upward spiral to be established through which gradual improvements in productivity coupled with an expansion of the economy and job opportunities could take the population out of poverty.

Every system of exploitation must have its labor reproduction mechanisms. Yet, of necessity, in the above-mentioned low-wage, low-productivity rural exploitation structure, the reproduction mechanism continues to preserve poverty in order to keep the increasingly feminized labor at work in the large farms. Gender relations against the background of removal of previous socialist programs are thus an important part of the reproduction mechanism of the low-wage, low-productivity structure of exploitation and poverty cycle. Despite high levels of educational achievements in the Valley (and in fact across Tajikistan's rural regions) among females, formalization of women's work, and high prevalence of female-headed households, traditional forms of family structure remain the norm with their implications for gender relations. Against this background, the feminization of low-wage labor keeps the exploitation and production structure operating. Whereas female labor at the large farms has low bargaining power, male labor is either recruited by the collusive structure or can find income-earning opportunities in some businesses and quite importantly through migration. On this last point, one can observe that the absence of overwhelmingly male migrants does not empower women and weakens the cohesion of the family and by extension the society by depleting it of high-skilled human resources. All these help reproduce the low-wage, low-productivity (female) labor required at the large farms.

Furthermore, with such low wages offered at the large farms, household plots and presidential lands are significant in providing food security and supplementary incomes for many households. Yet, households covered in this study believe that their produce on these types of land is stagnant or even decreasing.

Notwithstanding the small sizes of these land holdings and their meager potentials, the main reasons behind their low level of output are water shortages in some places and water-logging in others due to deteriorated water and drainage network structure, little possibility to apply scientific know-how, limited access to inputs, migration of able bodies, and low productivity of land or inaccessibility in the case of presidential lands. Also, despite the importance of livestock in the overall livelihood strategies of the households, livestock assets are for the most part modest a further manifestation of poverty or at least lack of productive opportunities in this area. All these mean that household plots and presidential lands only act to reproduce labor for the large farms, rather than release the households from the poverty trap.

Environmental Determinism Revitalized

A proverb on irrigation in Ferghana Valley distinguishes between the '*mirab*' literally the 'water master' and geographic position. It says that, 'Even if your brother is the *mirab*, may your land be located at the inlet'. The proverb acknowledges the influential social position of the *mirab*, a local canal overseer who used to plan and arrange the canal maintenance work and they were technologically experienced elders who enforce local agreement on how water was used and the amount to which people were entitled, however, it give emphasis that the geographic position is a more powerful one. The climate of the region is characterized by aridity due to its mid continental situation and agriculture is confined only to the oasis or irrigated areas. In the larger part of the steppes, semi-arid regions and mountainous slopes, nomadic herding is the main stay of life, wherever agriculture cannot be practiced. Despite the region being inhospitable for human habitation, it has witnessed the most primitive settled agricultural practices. The earliest settled agriculturists were confined to the lower stream areas of the Syr Darya. The earliest settlers couldn't get settled in upstream areas because the flow of the river was very high and they didn't have appropriate technology to divert the flow of water for the possible use in irrigation. One can observe that environment has played the role of a

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major determinant of human economic activities. Natural laws are still guiding principles for all economic activities. The man with his all possible means can only change the course of Syr Darya or divert the flow of water but he cannot stop the entire flow. It seems like the approach of environmental determinism postulated by Griffith Taylor is justified.

The agricultural revitalization in Ferghana Valley during recent decades brought a major expansion of the area of irrigated land, increases in yields through use of fertilizers, biocides, and improved cultivation techniques, and large improvement in levels of mechanization for most types of crop and livestock production. Growth in cotton production in the Valley enabled the Republic of Uzbekistan to become not only one of the world's largest cotton producers, but one of the largest exporters as well.

In the 1970s and 1980s, however, a series of accumulating problems began to erode the earlier successes. Irrigation expansion has now become increasingly limited, both by inefficient use of water and by the need to preserve the Aral Sea. Salinization of irrigated lands, partly as a result of the incorporation of large areas of salt-plagued soils, not only reduces crop yields but pollutes irrigation water for other users downstream. Agricultural pollution from these salts and from fertilizers and pesticides in drainage waters has become a major health threat to rural populations, especially in the lower Syr Darya Valleys.

States' pressure to increase cotton production has caused a virtual cotton monoculture in many regions, with a lack of the proper cotton-alfalfa rotations. The result was stagnating or declining cotton yields in the 1980s and a severe shortage of the fodder needed to increase animal production. Overemphasis on cotton production also limits the ability of the region to produce food, keeping per capita consumption of many food products especially animal products at the lowest levels in the USSR. Local outrage over the cotton monoculture and its effects on the food situation has become an important issue of nationalism among the indigenous population.

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In rural areas, rapid population growth has outstripped the ability of agriculture properly to employ the growing work force. Labor that should ideally have been displaced from agriculture as mechanization increased remains on the farm, often

in only a semi employed state. As a result, labor productivity declined in the 1980s. Cotton mechanization, the most important means of raising labor productivity, also declined in the 1980s, after major improvements in the late 1970s. With the large inventories of machinery on farms, especially cotton harvesters, while cotton harvest mechanization lagged, capital productivity has been cut.

Rising labor costs are directly related to the fall in agricultural wages as compared with USSR levels. In spite of all of these stresses on the rural economy and rural incomes, however, very little rural out-migration has taken place. The share of the rural population in the total population of many of these oblasts continues to increase. It is difficult to determine whether the critical situation in Ferghana Valley itself has awakened the leadership of the concern Republics to the need for change there, or whether resources, including the acceptable amount to allocate to saving the Aral Sea. This shift to republics' self-financing or even economic sovereignty, however, will make generation of the capital needed to accomplish many of the agricultural reforms more difficult. In addition, interest in the Russian Republic in allocating capital investment to the diversion of some of its water resources into Ferghana Valley will certainly bring the in a better situation for sovereign republics. In spite of the new freedom to control their agricultural economies for the sovereign republics, there is a need to mitigate the structural problems outlined in this chapter including rural population growth and labor over supply.

Chapter: 05

Conclusion

The conclusion begins with the line borrowed from Gray, D.G.B. (1947: 147), which approves agriculture as a driving force behind the march of economic growth, reads as:

the growth of Soviet industry has only been possible because agriculture has been able to produce the food and raw materials (e.g. wheat, cotton and rubber).

The agriculture sector occupies a place of pride in Ferghana Valley's economy and will continue to do so in the foreseeable future. As a matter of fact, the share of agriculture in GDP is gradually declining since 1991, when it came out of Soviet rule. The declining share of agriculture in GDP does not, however, mean a retrogression of agriculture; it only means that the secondary and tertiary sectors of the economy are expanding at a higher rate. And this is what one would anticipate as the process of economic development moves forward. This has happened in developed countries all over the world. In general, the more developed a country, the smaller is the share of agriculture in its national income. For example, in 1995, the share of agriculture in the GDP was only 2 percent in UK, 3 percent in USA and 4 percent in Japan (World Bank 1997:236-37). Thus it could be concluded with emphasising that as agriculture is the most important sector of Ferghana Valley's economy, development must directly act on agriculture, if the majority of the country's people are to be affected by development.

The information available indicates a close relationship between poverty, inequality and agriculture and allied economic activities. Difficult economic situation makes social disparity more pronounced, which creates a potential opportunity for extremist groups as resentment for perceived social injustice. Additionally, there is a threat posed by growing number of unemployed men and women to a social stability and security as the already overburdened

agriculture is indicating towards negative growth, which if ignored, may impinge upon human development.

Under the centralized Soviet system, specialized *Sovkhozes* and *Kolkhozes* were responsible for either crop or livestock production. When these state farms were dissolved and economic support for marginal mountain areas ceased after 1991, people reverted to subsistence agriculture. Households today are engaged in crop production and livestock rearing, mainly to meet subsistence needs. Many households were forced to take up employment in the agricultural sector, although many of the people who did this used to be specialized employees during the Soviet era, and lack comprehensive agricultural knowledge. When the state farms were dissolved, assets were usually distributed among the inhabitants of the area. Households received small areas of cropland and some animals, depending on the number of family members. Few households were able to maintain their herd size or increase the number of animals during their first years as independent farmers. On the contrary, it was observed that households had to sell assets to be able to purchase other vital goods. L. Alibekov and D. Alibekov (2006) are of the opinion that agriculture in Ferghana Valley was mismanaged for decades under a centralized command economy. The continuing legacy of this period is severe land degradation in the form of soil salinization and erosion, elevated groundwater levels caused by poorly managed irrigation systems, the drying of the Aral Sea, and the chemical and nuclear pollution of water and soil. Desertification takes place within naturally delimited geographical and ecological systems; it must also be studied and prevented within the framework of these natural systems.

The monoculture of cotton destabilized the regional agricultural system by constraining the growth of other agricultural subsectors such as horticulture and grain, forage and livestock production. Monoculture and the expansion of irrigation also led to shortages of irrigation water, the drying of the Aral Sea, and eventually to the Aral ecological crisis and the spread of desertification processes across a large territory. The diversion of water for

irrigation needs from Syr Darya river, disturbed the balance between the flow of water into the Sea and the loss of water to evaporation, which has been disastrous not only for the sea itself, but for the whole Aral basin, leading to large scale and potentially irreversible environmental transformations.

Another important factor has been inappropriate irrigation, which has led to salinization. This salinization leads to the process of desertification in The Valley. Large-scale dams were built in the early 1960s. These have promoted salinization and increased ground water levels in low lying areas characterized by poor natural drainage. The expansion of areas of irrigated land at higher elevations also damaged the productivity of older irrigated areas in The Valley. The margins of plains adjacent to mountains are being waterlogged by underground flows from higher areas of newly developed cultivation. A clear example of this process is the declining productivity of older irrigated lands in the Andijan region of Ferghana Valley, after people started to irrigate surrounding areas of the upper slope. Cotton yields decreased from 30–35 centners/ha in the 1960s and 1970s to 20–22 centner/ha.

Although Ferghana Valley has a long history of irrigated agriculture, there has been a problem of institutional competency in recent years, because of the high turnover of personnel in government offices and the highly politicized nature of agricultural targets and institutional reform. Agricultural productivity has been disappointing in recent years in Uzbekistan, as a result of drought, mismanagement, and lack of incentives for farmers. In order to develop the water use strategies in Ferghana Valley, involved countries need to get together (by also considering international law) and come up with an approach in the interest of all of them. Some studies are being made by United Nations solve water problem in The Valley. In 2003 an international open meeting was organised the Central Asia Program on "Regional Water Resources". This meeting was attended by scientists, experts, and official representatives of five Central Asia countries. The joining of United Nations experts in such a study has been very important for having a realistic approach on the subject. With this program a forum called "TREK-2" has

been formed by experts of Central Asia. In addition to this, with the initiative of World Bank an agreement has been reached on the shared use of regional water resources and joint investment projects. Besides, with the proposal of Central Asian countries, International Fund for Saving the Aral Sea and Intergovernmental Water Agriculture Coordination Commission has been given official status in United Nations. A series of scientific conferences have been organized in the Kyrgyzstan International University¹.

By considering international law and "International Water Treaty" and other documents, it is necessary to develop a water use program which addresses requirements and interests of all of Central Asia countries. Water use plans should contain neighboring countries and develop approaches such as below:

1. Development of legal aspects of rational use of water resources.
2. Bilateral and multilateral treaties for use of border-forming water resources.
3. Modern technologies in water use.
4. Precautions against torrent and flooding.
5. Prevention of unauthorized use of water resources.
6. Joint works in international projects

Implications of Population growth

Human population growth and dependence on agriculture has exacerbated the situation. For example the population of Uzbekistan grew by approximately 3.5 times during 20th century². Considerable population growth and hence increase in densely populated areas (e.g. Fergana Valley) combined with inadequate land use activities led to widespread land degradation, water pollution, fall in production levels general and degradation of the ecological situation by over grazing by herds³. Therefore, a comprehensive approach to the economic

¹ Mamatov, Nurlan, *The Effect of Water Resources on Socio-economy of Central Asia*, Bishkek: Kyrgyz -Turkish University of Manas, pp2-6.

² Behnke, Roy (ed. 2008), *The Socio-economic causes and consequences of desertification in Central Asia*, The Netherlands; Springer, pp33-35.

³ Ibid p7

development of an entire country or region based on systematic and coordinated scientific research is required. A Scientific research becomes an increasingly important component in the search for ways to sustainably develop vulnerable ecosystems. Given that a significant part of Ferghana Valley's natural resources have been exhausted and the ecological situation continues to deteriorate, urgent action is required.

Taking into account the above, emergency measures must be carried out to improve the socioeconomic situation in the region. The set of measures should include those aimed at developing the agrarian sector of the economy, attracting foreign investments, and forming a system for exporting manpower.

Reliance on Agriculture

Despite 70 years of Soviet emphasis on industrial development, plus some efforts at spreading industrial units across the Soviet Union as a means of reducing regional disparities, most Central Asian countries still depend on agriculture as the mainstay of their economies and the principal source of national income and employment. Moreover, the Soviet-era pattern of agricultural development was determined by the consumption and export needs of the center rather than by those of the individual republics, leading to overreliance on a single crop as the mainstay of the economy. However, despite the growth of industry in Central Asia, especially during World War II, the region's economy remained predominantly based on agriculture and natural resources, with relatively low productivity even by Soviet standards. Because of high transfers from the central government and artificial price supports, Ferghana Valley was able to maintain a higher level of development than its productivity would have supported, even as its standard of living indicators were the lowest in the Soviet Union.

In Ferghana Valley, cotton has been the main crop. Even today, in Uzbekistan, which is industrially developed country in Central Asia cotton export constitutes its principal source of foreign exchange. For example, according to CIS statistical committee figures, 81 percent of Uzbekistan's exports in 1994 consisted of cotton fiber, while cotton accounted for 98 percent of Tajikistan's

exports. In Kyrgyzstan, cotton accounted for 50 percent of total exports³. Although, the difficulties of these single commodity export and their extreme vulnerability to the slightest fluctuations in the commodity markets are well known. On the other hand, concentration on cotton production contributed to the Ferghana Valleys' inability to diversify their agricultural production according to their own consumption needs.

Methods of Soviet-era agricultural production, such as the excessive use of fertilizers and pesticides, also adversely affected the natural potential forms of agricultural activity by eroding soil fertility and polluting water resources. The negative effects of these practices are today evident in the shrinking water resources of some Central Asian countries, notably in Ferghana Valley of Uzbekistan. Environmental pollution, partly from the excessive use of fertilizers and pesticides, has made underground water resources unusable and crippled the ability of region to become self-sufficient in food⁴.

Development of the agrarian sector of the economy

In order to resolve this situation in the agrarian sector of the Ferghana Valley, one should keep in mind the specifics of the processes going on in each republic and take the following measures:

1. Improve the legislative base of all the three Republics and adopt regulatory acts aimed at economic stimulation of priority branches of agriculture.
2. Cancel VAT on agricultural produce in general, including on technical and other services.
3. Create government support funds for agricultural cooperatives and farms, where financial resources should be used for the centralized purchase of new machinery, spare parts, mineral fertilizers, high-yield seeds, pesticides, and so on intended for stimulating and supporting agricultural cooperatives and farms under conditions of credit recovery after a certain period of time (leasing system).

⁴ Hunter, Shireen (1991), *Central Asia Since Independence*, Washington, DC; Washington Papers and Praeger Publishers, p168.

4. Cancel the existing system of mandatory state purchases of cotton and grain in Uzbekistan and Tajikistan.
5. Introduce a system of open auctions for purchasing agricultural produce to assist the formation of market mechanisms in the agrarian sector.
6. Lower electricity rates fixed for pumping stations and pumps supplying irrigation and drinking water in all the three republics.
7. Develop, including with the aid of foreign investors, enterprises for the advanced processing of raw agricultural material.
8. Take urgent and comprehensive measures to oppose corruption in the government power and local self-government bodies.
9. The mandatory introduction of private land ownership in Uzbekistan and Tajikistan proposed by some experts is inexpedient, since private land ownership in itself is not a panacea against the difficulties in agricultural development. The example of the Republic of Kyrgyzstan vividly illustrates this. Therefore, the system of long-term land rental for 20-50 years is entirely acceptable.

Regarding the role of agriculture in foreign trade; the given study has revealed that the export structure of agricultural and food production has been shaped in accordance with the competitive advantages based on the favorable geographic position and climatic conditions of Ferghana Valley. At the same time, the major exports of food products from Uzbekistan consist of labor-intensive produce such as onions, grapes, tomato paste, some fruit and vegetables, wheat, flour and raw tobacco mainly produced in Ferghana Valley. Uzbekistan mainly imports capital-intensive products with high added value, such as processed meat products, including sausages, fish products, dairy products including butter, flour and vegetable oil (not cottonseed oil) and margarine. For the purpose of further increasing the competitiveness of this industry it is necessary to transfer to the production and export of products with high added value by:

- (i) the application of high technology and the improvement of the quality control system

- (ii) the development and design of products which take into account the preferences of customers on the world market.

This study has pointed out some areas which need series attention.

1. The inefficient system of gathering agricultural products from households and farms leads to a certain loss of such produce. This requires that agricultural enterprises and households be encouraged to improve the process of collection. It is worth extending to other types of products the right of processing industries to pay private households in cash for whole milk.
2. The absence of any direct connections between scientific-research institutions, farms and representatives of the food industry leads to the lack of transfer of new technologies, to purely scientific research of an academic nature (not applied and not commercial), to the lack of participation of the representatives of the real sector of the economy in this research and to the waste of resources. This requires the creation of certain mechanisms for the quick transfer of new technologies to the regions via an extensive network of research institutions with a central scientific-research institute at the national level and subsidiaries with test centers and laboratories all over the country.
3. The application of state-of-the-art capabilities of biotechnology in Ferghana Valley has great potential and should be encouraged among enterprises.
4. Foreign trade liberalization in the area of foodstuffs will not bring about large reduction of tax revenues under optimistic scenario.
5. In the long term, the most effective measures of economic policy which can improve the food security of the country and provide food sufficiency in the countries must be investments in agricultural production in general and in new scientific developments in particular.

The people of the area have shown a remarkable capacity to deal with unemployment and inadequate social provision from the public sector by entering

into the informal economy, cultivating subsistence plots, emigrating abroad, accessing latent social networks, and, to a much lesser extent, receiving assistance from international organizations. Extended families and communities have become the principal source of assistance to poor families. For example, the *mahalla*, a traditional Uzbek system of neighborhood governance, has been a long-standing informal institution in Uzbekistan and within Uzbek communities outside Uzbekistan, particularly in the Ferghana Valley. For centuries, *mahallas* have provided assistance to the poor in addition to performing other social functions. More recently, the government of Uzbekistan has enshrined the *mahalla* system within its legal structure by appointing the *mahalla* leadership and channeling some government aid through this structure

One point of discourse among analysts is, whether Ferghana's strong economic growth will gradually raise incomes in the region or will simply divide Central Asia into a wealthy few and an impoverished and isolated rest i.e. intra regional economic disparity. Ferghana Valley has posted impressive economic growth figures for several years and very soon it will become a leading supplier of oil and food to the world market and, with Tajikistan, an important regional supplier of electricity, as discussed in Chapter Three. In this way, the prospects for foreign investment in Ferghana Valley in primary sector other than oil extraction and mining are very bright.

Thus it is being predicted among the international relations practitioners that Uzbekistan will be pivotal to long-term economic development initiatives in the region. Uzbekistan's trade and border policies will be crucial for Tajikistan's and Kyrgyzstan's economies and its financial sector reform may determine whether the considerable financial resources can be directed toward the rest of Central Asia. Even if Uzbekistan becomes increasingly marginalized in the economic future of the region, a failed Uzbekistan would invariably have important regional consequences, including potential political and economic restrictions in all the neighboring states. As a result, prevention of this outcome may be central to Central Asian and regional security goals in the region.

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