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MULTIPLE BARRIERS TO TECHNOLOGY CHANGE
IN RURAL UZBEKISTAN:
A DEVELOPMENT PERSPECTIVE

A thesis presented in partial fulfilment of the requirements for the degree of

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in
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at Massey University,
Palmerston North,
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ABSTRACT (ENGLISH)

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Technology transfer in rural Uzbekistan is constrained by a complex of interrelated barriers. These barriers to technology transfer include the economic, political and social dependencies created during the period of Russian Soviet rule. These created dependencies are shown to coalesce with the repressive nature of the post-Soviet regime. This thesis examines the nature of the multiple barriers to technology transfer that exist for a specific development project working in Khorezm, Uzbekistan. By adopting a dependency theory perspective, complemented by Black feminism, three interconnected facets of technology transfer are discussed. Farmer priorities and preferences are analysed in light of the unique regulatory framework of agriculture in Uzbekistan. These preferences are compared to the opinions of farmers on acute problems in Khorezm. Finally the intersection of farm decision making autonomy, negative incentive systems and the economic system are considered. This is then positioned within a model of multiple barriers to technology transfer, which tests the ability of dependency and Black feminist theories to 'travel' beyond their intended locations.

The field research conducted for this thesis adopted an ethnographic approach, placing a primacy on the locally articulated views of farmers in Khorezm. It was assumed that farmers had the best understanding of the manifold challenges to affecting change in the farming systems of Uzbekistan. To access these opinions a variety of individual and group-based methodologies were used, including focus groups, decision trees, informant-structured interviews and simplified H-Forms.

КОНСПЕКТ (RUSSIAN)

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Факультет: Исследование Развития

Технологическому переходу в сельской местности препятствует комплекс взаимосвязанных барьеров. Данные преграды включают в себя экономические, политические и социальные зависимости, возникших в период Советского правления. Такие созданные зависимости показаны для соединения в одно целое с репрессивным характером пост-советского режима. Данная диссертация рассматривает характер многочисленных существующих преград на пути перехода в рамках особого проекта развития, работающего в Хорезме, Узбекистан. Применяв перспективу теории Зависимости в совокупности с Чёрным феминизмом, обсуждаются три взаимосвязанных стороны технологического перехода. Проводится анализ приоритетов и преимуществ фермеров в свете уникальной системы управления сельского хозяйства в Хорезме. Такие преимущества сравниваются с мнением фермеров по вопросам насущных проблем в Хорезме. И наконец, рассматриваются пересечение автономии на принятие хозяйственных решений, негативных систем поощрения и самой экономической системы. Затем это размещается внутри модели множественных преград к передаче технологий, которая тестирует возможность теорий зависимости и Чёрного феминизма «путешествовать» выше предназначенного расположения.

Полевые исследования по этой теме были проведены по этнографическому подходу, уделяя особое внимание на местных выраженных фермерами точек зрения. Предполагалось, что у фермеров существует лучшее понимание множественных проблем, влияющих изменению в сельскохозяйственной системе Узбекистана. Для оценки этих мнений было использовано множество индивидуальных и групповых методологий, включая фокус-группы, структурные схемы принятия решений, структурные интервью с информантами и упрощенные Н-формы.

(Translated by Elena Kan)

ABSTRACT (UZBEK)

Асосий илмий ращбар: Профессор Джон Овертон
Иккинчи илмий ращбар: Профессор Марилин Варинг
Былим: Ривожланишни тад=и=от =илиш

Ўзбекистон =ишло= щыжалигидаги технологик ытиш жараёни комплекс ызаро бо\ли= тыс=инликлар билан чегараланган. Маз=ур тыс=инликлар Рус Совет щукумати давридаги пайдо былган и=тисодий, сиёсий ва ижтимоий бо\ли=ликларни ыз ичига олади. Бу яратилган бо\ли=ликлар пост-совет режимининг репрессив характери билан бо\лаш учун кырситилган. Мазкур диссертация Ўзбекистон, Хоразмдаги махсус ривожланишлар буйича фаолият олиб бораётган лойища доирасида технологик ытиш жараёнида мавжуд булган кыпгина тыс=инликлар характерини кыриб чи=ади. +ора феминизм билан бирга Бо\ли=лик назариясининг келажagini =абул =илган щолда, технологик ытишнинг учта ызаро бо\ланган томонлари мущокама =илинади. Хоразм =ишло= щыжалигини бош=аришда фермерлар афзалликлари ноёб асос тари=асида ташлил =илинган. Бундай афзалликлар фермерларнинг Хоразмдаги долзарб муаммолар ща=идаги фикрлари билан та==осланади. Ва, ощир о=ибатда, фермерларнинг =арор =абул =илиш автономияси, салбий ра\батлантириш тизими ва и=тисодий тизимнинг ызи кыриб чи=илади. Кейин бу технологик ытишдаги кыпгина тыси=лар модел ичига жойлаштирилади, ва шу тари=а Бо\ли=лик назарияси ва +ора феминизмни мылжалланган щолатдан ю=орида «саёщат =илиш» имконини текширади.

Бу мавзуга йыналтирилган дала тад=и=отлари махаллий фермерлар ну=таи назарига алощиди эътиборни =аратган щолда этнографик ёндашув быйича олиб борилди. Фермерларнинг Ўзбекистон =ишло= щыжалигининг ызгаришига таъсир =илувчи турли муаммоларни жуда яхши англиши ташмин =илинганди. Бу фикрларни бощалаш учун кыпгина индивидуал ва гурущ методологиялари щамда йуналтирилган гурущ, =арорлар =абул =илиш схемалари, информант структурали сухбатлар ва одийлаштирилган Н – формалари =ылланилди.

(Translated by Dilfuza Jumayeva)

ABSTRAKT (GERMAN)

Der Technologietransfer im ländlichen Usbekistan wird durch einen Komplex zusammenhängender Barrieren behindert. Sie beinhalten wirtschaftliche, politische und gesellschaftliche Abhängigkeiten, die während der Herrschaft des russischen Sowjetregimes entstanden sind. Es zeigt sich, dass diese erzeugten Abhängigkeiten in die repressive Natur des post-sowjetischen Regierungssystems übergangen (verschmelzen).

Die vorliegende Arbeit untersucht die Art der vielschichtigen Beschränkungen des Technologietransfers, die für ein besonderes Entwicklungsprojekt in der Khorezmregion in Usbekistan bestehen. Durch die Übernahme der Perspektive der „*Dependency theory*“ (Abhängigkeitstheorie), ergänzt durch „*Black Feminism*“ (Schwarzen Feminismus), werden drei miteinander verbundene Facetten des Technologietransfers diskutiert. Die Prioritäten und Präferenzen der Bauern werden im Licht des einzigartigen „*regulatory framework*“ der Landwirtschaft in Usbekistan analysiert. Die Präferenzen werden mit den Ansichten der Bauern über die akuten Probleme in Khorezm verglichen. Abschließend werden die Schnittpunkte der „*farm decision making autonomy*“, des „*negative incentive systems*“ (negativen Anreizsystems) sowie dem Wirtschaftssystem in Betracht gezogen. Die gewonnenen Ergebnisse werden dann in ein Modell multipler Barrieren des Technologietransfers eingebracht, welches analysiert, inwieweit die „*Dependency and Black feminist*“ Theorien über ihr eigentliches Gebiet hinaus Erkenntnisse liefern.

Die Feldforschung, die für diese Arbeit durchgeführt wurde, übernahm einen ethnographischen Ansatz, bei dem die Ansichten der ansässigen Bauern in Khorezm den Vorrang erhielten. Es wurde angenommen, dass die Bauern am besten die vielfältigen Herausforderungen einschätzen können, die einen Einfluss auf Veränderungen im Agarsystem im Usbekistan haben würden. Um Zugriff auf diese Ansichten zu erhalten, wurden eine Vielzahl von individuellen und gruppenbasierten Methoden verwendet, unter Einbeziehung von „*Focus Groups*“, „*decision trees*“, „*informant-structured interviews*“, und vereinfachten „*h-forms*“.

(Translated by Inga Haller)

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GLOSSARY OF TERMS

Aliy Majlis	Parliament of Uzbekistan
Amu-Darya	One of the two great rivers of Central Asia, formerly known as the Oxus River
Basmachis	Muslim “bandits” who opposed Sovietisation and collectivisation from 1917 until their defeat in 1930. Often compared to the Mujahedeen of Afghanistan
Dekhan	Smallholder
Desiccation	Drying up, leading to desertification
Hokim	Governor of a province
Hokimiyat	Governorate
Intersectionality	The analysis of multiple forms of oppression as inter-related and inseparable.
Khanate	City state under the authority of a ‘khan’ or ruler (historical)
Khiva	Ancient city in Khorezm
Khorezm	Administrative District in which this research is conducted
Kolkhoz	Collective farm (Russian), often also used to identify rural towns.
Mahalla	Neighbourhood
Neo-Marxist	New Marxism, here Latin American neo-Marxism.
Nomenklatura	Soviet ruling elites
Oblast	Province (Russian), viloyat in Uzbek
Raskreposhchenie Zhenshchin	The ‘Liberation of Women Campaign’ (Russian)
Rayon	Province governed by Hakim
Shirkat	Joint-Stock farm (former collective farm)
Sum	Uzbek currency –approximately 1000 sum = US\$ 1 at 01/11/2003 (black market rate)
Syr-Darya	Northern most of the two great rivers of Central Asia, formerly known as the Jaxartes River.
Tashkent	Capital city of Uzbekistan (population circa 4 million)
Urgench	State capital of Khorezm, region of research in this thesis

ACRONYMS

CIS	Commonwealth of Independent States
CPUz	Communist Party of Uzbekistan
ECLA	United Nations Economic Commission for Latin America (CEPAL in Portuguese)
GWL	Ground Water Level
I&D	Irrigation and Drainage
IMF	International Monetary Fund
MTP	Machine Tractor Park
MUHEC	Massey University Human Ethics Committee
SSRU	Soviet Socialist Republic of Uzbekistan
UNESCO	United Nations Educational, Scientific and Cultural Organisation.
USSR	Union of Soviet Socialist Republics
WUA	Water Users Associations
ZEF	Centre for Development Research, University of Bonn (German: Zentrum für Entwicklungsforschung).

CHAPTER ONE: INTRODUCTION

This thesis discusses two periods of field research undertaken during 2003 in the Khorezm region of Uzbekistan. The objective of this research was to identify what barriers existed to technology change in Khorezm, Uzbekistan. By adopting a range of participatory techniques, both male and female opinions were solicited and positioned within the two theoretical frameworks of Dependency and Black Feminist theories.

Aware of the need for this research to contribute to development outcomes and policy options, this research was situated under the aegis of a specific development project in Khorezm. Specifically, the Bonn University Centre for Development Research (ZEF) and United Nations Educational, Scientific and Cultural Organisation (UNESCO) project (hereafter ZEF/UNESCO). This practical application of the research was balanced against the need to identify farmer needs and priorities from the perspective of farmers, not from the techno-centric view of a Western development project. It is hoped that this balance ensured the research was of benefit both to academia as well as to the participants in the research process. The practical application of these findings is an important justification for conducting the research, and goes some way to validating the requests for participant's time and knowledge. It is hoped that the potential for long term benefits both from improved technological adoption as well as increased academic understanding, justified the conduct of this research.

Research Purpose

The specific research problem addressed was the low rate of technology uptake by farmers. Whilst the technical and environmental problems that exist Khorezm are well documented, appropriate social research into methods to mitigate these problems remain sparse. Whilst a number of development projects on agrarian reform exist, there is little evidence of the effective transfer of technologies from research to practical application

and dissemination. Part of this problem is the unique regulatory and economic structure of Uzbekistan, which provides negative incentives for innovation and investment. The Soviet history of forced collectivisation, mechanisation and cotton production also militates against the ready uptake of new technologies by farmers. It is the intersection of these manifold barriers to technology change that form the basis of the research in this thesis.

This research hoped to elucidate a development studies perspective of agrarian reform in Khorezm, Uzbekistan. Special attention was paid to the challenges to technology transfer that exist in Uzbekistan. The challenges examined are less technical in nature, but concern the social, political and economic complex. It was hypothesised from the benefit of past work in the area that the barriers to technology change and agrarian reform are numerous, and interconnected. For this reason dependency theory was used to analyse the impact of created dependencies in restricting farm level autonomy. This was complemented by Black feminist theory, which is instructive in analysing the interaction of several forms of oppression and dependence.

In order to assess the barriers to technology change, and to test the application of the two theoretical perspectives, a sequence of three lines of enquiry was adopted. In the first stage of the research, discussed in Chapter Five, participatory research was conducted to document the articulated priorities of both men and women farmers, and to assess the areas of conflicting and complementary interests. Farmer opinions were then sought on the causes and solutions to acute problems in rural Khorezm. This second phase, reported in Chapter Six, drew both upon the rapport and relationships established in the first phase, as well as contributing significantly to the findings of phase three. The third phase then attempted to define the practical challenges to agrarian reform in Khorezm, Uzbekistan. These practical constraints are discussed in Chapter Seven, and represent the policy implications of the development aspect of this thesis. Finally the conclusions reached in Chapter Eight hope to provide specific policy and ZEF/UNESCO project focused recommendations, as a practical outcome of the research.

Summary of Findings

The specific findings of the research should be read collectively. Perhaps the greatest finding of the research was the interconnectedness of various challenges to technology adoption. It would be mistaken to assess only one section of this research without purview to the complementary sections. For example farmer opinions on soil salinisation cannot be read independently of the specific policy problems of land tenure and water management. It is possible, however, to examine the three phases of the research as a process, beginning with an ethnographic focus and concluding with broader policy implications and practical findings. Likewise these three phases contribute collectively to an analysis of the wider social, political and economic complex. This complex is shown to be based on perpetuated dependencies, reinforced by multiple forms of oppression. To enable the reader to better understand this socio-economic-political complex, Chapter Two gives a brief historical introduction to Uzbekistan. Outlined briefly below is a précis of the main findings. For greater detail and full discussion it is necessary to refer to the relevant chapter, however this summary is provided in the hope of making the inter-connectedness of the problems more apparent to the reader.

Farmer Priority Setting

The Priority Ladder methodology elicited a number of interesting results. Amongst these was the fact that the lowest farmer priority was given as the market price of vegetables. Also very interesting was the low priority farmers accorded to the quality of both cotton and wheat. Further ethnographic research exposed that the economic system of Khorezm created the perverse situation of farmers having little concern for the quality of produce. The excessive focus on production to targets based solely on weight is an unfortunate legacy of Soviet rule, yet a legacy that is being perpetuated and strengthened by the current government.

Of considerable importance for policy was the primacy that farmers afforded to soil quality. Soil quality ranked highest in the priority ladder methodology. Almost as high a concern was water quality and timing, demonstrating that the priorities of farmers were in many cases complementary to those of technology transfer and agrarian reform. There was also evidence of a high degree of farmer concern about a lack of financial resources.

In the most part this is a function of the settlement accounting system, a key barrier to development that is discussed at length in Chapter Seven.

Farmer Opinions on Acute Problems in Khorezm

In many cases the priorities of farmers from phase one were complimentary to their opinions on acute problems. Specific problems discussed with farmers included the lack of access to technology, poor maintenance of infrastructure, a shortage of spares parts and the low level of post-harvest processing. Poor water use efficiency was also discussed with specific mention of the impact of soil salinisation and drainage, deteriorating infrastructure, land levelling and poor governance.

Farmers indicated that the lack of access to technology was a key constraint in the farming system. This finding spurred further research into the settlement account system, which was examined at length in the third phase. The lack of access to technology was also found to be a function of poor competition policy and insufficient incentive systems as established by the central government. Low water use efficiency was not always seen by farmers as a direct problem, despite the high priority attached to water quality and irrigation timing.

Barriers to Technological Adoption

This phase involved using the findings of the earlier stages to identify serious barriers to technology adoption. Primary amongst these problems was a lack of farm decision making autonomy incorporating a lack of land tenure, politicised cropping decision making and centralised farm management. It is argued that because cropping decisions remained a political, rather than a practical decision, that farm management and cropping decisions were distinct areas for analysis. Similarly, this research suggested that there is a need for reform of the cropping decision system and a move away from state production planning.

Secondly the negative incentive systems for efficient water management and the disincentives for innovation also posed constraints to technology change and agrarian reform. Specific interviews identified numerous preconceptions held by farmers and decision makers. These preconceptions are made worse by an economic system that

restricted farmer options, especially because of continued economic dependence, the settlement account system and because of a limited margin for experimentation.

Importance of the Research

Uzbekistan, especially the Khorezm region, faces severe economic and environmental challenges due to the effects of excessive irrigation and unsustainable land use practices. Excessive irrigation has resulted in a drastic rise in the saline levels of soils and ground water supplies, a raising of the water table (which subsequently worsens salinity), as well as the desiccation of the Aral Sea. There is a clear need for international assistance in providing sustainable livelihoods for the people of the Aral Sea basin. This assistance will require the development of appropriate technologies and farming practices, which can provide for ecologically and economically sustainable livelihoods. However, for these changes to be effective, farmers must be involved as “agents of change” and be empowered to act with ownership and control of their own development “rather than as passive recipients of development assistance” (Rathgeber, 1990, p494). Furthermore, this research must recognise the “critical, if unacknowledged contribution to economic growth” of women in the farming sector (Moser, 1989, p1810). This will require involving farmer’s opinions, needs and priorities into the research process to avoid a “top heavy and top-down” approach to technology development, creating technologies that are inappropriate or unacceptable to the community they aim to help (Swanson et al., 1997, p9). As such, there is a need to work in partnership between researchers and farmers. This thesis contributes to this partnership by identifying and assessing local needs, priorities and constraints to technological adoption, in order to ensure the technologies developed are cognisant of the social environment in which they must work. In this respect this research endeavoured to work with both local farmers as well as project scientists. Whilst much of the field research was conducted independent of the ZEF/UNESCO project, it certainly benefited from the knowledge and advice of project staff in Khorezm.

Hypothesis and Key Concepts

At the beginning of the research process, the central hypothesis was that household needs and priorities were focused on ecological and economic considerations, and would in many cases be similar between genders. However it was expected that in terms of vegetable production and off-farm income men and women exhibit different, and at times conflictive, priorities. It was assumed that in some instances the ZEF/UNESCO project was equipped to meet these priorities, but that in other cases some technologies may need to be refocused. Central to this thesis is the concept that Khorezm faces numerous barriers to technological adoption, especially based around the economic system of negative incentives for experimentation and the high presence of corruption. Integral to this is the idea that a Western development project can, and indeed should, contribute to the solution to these problems.

From a theoretical perspective it was suggested that the dependency of Uzbekistan, an ex-Soviet country, could be compared to the dependency of Latin American countries, which evolved from capitalist modes of exploitation. This theoretical tenet held that this dependency created multiple forms of oppression which militated against economic and environmental improvement in Khorezm and Uzbekistan. In order to better understand the interaction between these manifold dependencies, Black feminist theory was drawn on, with focus on the intersectionality of multiple forms of oppression. This required an analysis of whether Black feminism was able to travel both spatially and conceptually. That is to say whether Black feminism could be applied to Khorezm in a pure theoretical sense, as well as examining the ability to intersectionality as a model to be applied to multiple forms of oppression, distinct from gender or sex based analysis.

Assumptions and Limitations

Several assumptions were made in the conduct of this research. A methodological assumption was an ethnographic assumption, which favoured the knowledge of local farmers and the resource poor over technocratic approaches. The main limitation of this research is that it was focused solely on the Khorezm region, very much at the periphery and riparian downstream of Uzbekistan and the Central Asian region. Thus care must be taken in applying the findings of the research beyond Khorezm.

Ethnographic Assumptions

It was assumed in this research that the priorities and opinions of local farmers was the most important and valid information. This ethnographic approach sought to elicit responses from individuals who were very much at the periphery themselves. The choice of dependency theory, as a view of exploitation from the periphery was intentional for this reason. Likewise, the use of Black feminist theory reflects an attempt to access views from oppressed groups in society. The methodologies chosen favoured the knowledge of the insider for this explicit reason. This research deliberately avoided accessing the views of governmental decision makers and the technocratic elites. This may be a severe limitation of the research, however it was considered necessary given the scope and time span of the research. Thus this research should be considered with a view to further enquiry into the opinions of stakeholders beyond the scope of this thesis.

Limitations of Khorezm

The fact that this research was conducted in only the Khorezm region of Uzbekistan is a key constraint. Khorezm is very much a peripheral district within the republic, and the ecological problems are atypical for the Amu-Darya and Syr-Darya basin. Thus care needs to be exercised in extrapolating the results of this study to other districts of Uzbekistan. Also, because the political system plays such a role in the rural economy, it would be mistaken to apply findings of this research to ecologically similar regions in other Central Asian republics. The range of socio-political differences between these seemingly similar republics makes application of research findings across borders somewhat perilous.