Contents

List of illustrations vii
Contributors x
Acronyms and abbreviations xii
Acknowledgements xiv
Preface xv

1 The emergence of the capacity development initiative on social and gender analysis in MENA 1
MALIKA ABDELALI-MARTINI AND LIL FAJR

2 Marginalisation of women’s work as a result of changes in pastoral societies and natural resources 16
MOHAMED KANOUL, AMEL MEGUELLATI-KANOUL, MALIKA ABDELALI-MARTINI, JOHANN HUGGEN, MOHAMED LARBI CHERRI, ABDELHAKIM SIISSANE, ABDELMAJID BENMEBAREK, MALIKA MAHMOUDI AND SOUHILA FOUI

3 The potential loss of traditional know-how of qashahuia production in Djelfa, Algeria 37
AMEL MEGUELLATI-KANOUL, MALIKA ABDELALI-MARTINI, MOHAMED KANOUL, ABDELMAJID BENMEBAREK AND MOHAMED KANOUL

4 Gender and marketing of qashahuia in Djelfa (Algeria) 56
ABDELMAJID BENMEBAREK, MOHAMED LARBI CHERRI, MOHAMED KANOUL, MALIKA ABDELALI-MARTINI, AMEL MEGUELLATI-KANOUL, MOHAMED KANOUL AND SOUHILA FOUI

5 Occupational health and prospects of empowerment for female weavers: evidence from a home-based activity in the informal sector in Djelfa, Algeria 74
MALIKA ABDELALI-MARTINI, ABDELMAJID BENMEBAREK AND AMEL MEGUELLATI-KANOUL
The effects of changes in climate and water resources on gender inequality in Boudinar community in Morocco

The case study approach

Abdellatif Khattabi¹, Soumaya Ibrahim Huber¹, Naima Faouzi¹ and Manar Matah¹

Introduction

Despite decades of agricultural research and development efforts, the challenges of poverty and gender disparities in access to resources, markets and technologies, are still persisting. This persistence highlights that existing approaches to integrating gender into agricultural research don’t go far enough. Many approaches aim to close gender gaps without understanding or addressing their causes, Kantor (cited in Holmes 2012) explains. The persistence of poverty, hunger and gender inequality calls for a change in the way we integrate gender in agricultural research and development. This is because conventional efforts that fill gender gaps, but do not address the underlying causes of existing inequalities, are not sufficient. Accordingly, there is a call for transformative interventions that address the social norms and power relations causing disparities in access to resources. This is along with markets and technologies, innovative organizational processes and activities that ensure gender research as standard practice in agricultural research and development (WFC 2012).

This research is a reply to that call. It is research which harbors exemplary case studies that report the data in a way that transforms a complex issue into one that can be easily understood. It adopts a social relational approach that involves placing women and men in their wider social settings, not only their households, but also their community and portrays how rigid structures impinge on the gender activities, as well as the factors affecting these.

The paper explains how the case study method was used and then applied the method designed to various households in the rural commune of Boudinar, Morocco, to examine why women are more vulnerable in agriculture and examines how external factors influence this gender relationship. This report is a narrative description of case studies presented to showcase the uniqueness and complexities of the context.

The paper is composed of five main sections. The first section is the introduction and covers the basic overview of the problem to be discussed, states the research
questions guiding this work and their importance and development implications and ends with a brief description of the study group. The second section describes and justifies why the case study method was chosen as the approach and presents the five main steps adopted to carry out this work. Section three portrays the actual four case studies, each as a story, which presents the concrete narrative detail of the actual living conditions of men and women in Boudinar. It is descriptive in nature and attempts to give as much context as possible. The section is composed to handle each case as a separate case study or a story and treats each case as a chronological recounting. Section five presents the discussion and starts with the explanations of how the findings compare with other findings in the literature and whether the results confirm previous results or create a new understanding of the problem and ends with the way forward, presenting new, emerging questions.

The fundamental research questions in this study that will address the root causes of the existing gender inequalities, as described in the background, follow the general principles of the case study research questions which begin with 'how' or 'why'. They are as follows:

The first research question is: why are women more vulnerable? This led to the interview questions: 1) What are the gender division of roles and responsibilities in water management from the different sources? And 2) what are men’s and women’s access to and control over resources?

The second research question is: do external factors such as climate change impact on women’s livelihoods and gender relations in water management in agriculture? The following interview questions were: 1) what are the effects of changes in climate and water on gender relations? And 2) what are the adaptation strategies of the family? Accordingly, the research questions conforming to the cases study principles of the ‘why’ and ‘how’ were used, as they enable the understanding and indeed challenge the root causes of gender inequality. In this sense this study is not a conventional research effort that addresses the consequences of gender equality. Its developmental implications lie in its attempt to improve gender equity, by revealing that it is the challenges ingrained in societal beliefs that limit what women can and cannot do or the assets they can and cannot hold. It thus contributes to the record to close the gender gap with consequent opportunities to sustain agricultural productivity. Thus this research should be understood in the context of the wider call for a transformational approach to gender.

The case studies

The four cases studies presented here have been selected from a pool of 28 other case studies undertaken in Boudinar community: one of the eldest communities in the region located in the northern part of Morocco, west of Nador Province. The Boudinar community is considered as the mother community for the other four communities which together compose the Tamsaman tribe; namely Tamsaman, Trogout, Awlad Almghar and Beni Marghaneen. The four cases, two men and two women, have been selected from the villages of: Akchab Amghar, Boudinar haut and Abalkhach, three of the 13 villages composing the whole commune of
Boudinar. The four cases have been selected as they represent the various segments of society such as; sex, age, social status and class.

Methods

The method adopted here is the case study which is a detailed qualitative investigation of a single individual or group. The defining feature of a case study is its holistic approach, meaning it aims to capture all of the details of a particular individual or group, relevant to the purpose of the study, and living within a real-life context (NCTI 2012). The case study method is defined as an empirical inquiry that investigates a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used (Yin 1984: 23).

While reports on case studies from many disciplines are widely available in the literature there are critics of the case study, who believe that the study of a small number of cases can offer no grounds for establishing reliability or generality of findings. In this study however, the case study method was found very useful and successful as an exploratory tool of real-life situations, issues and for generating critical findings.

The case study methodology was chosen here for several reasons: a) its descriptive, explanatory, or exploratory purposes (Yin 1993); b) it enabled the adoption of two distinct case study designs: the single-case study design and multiple-case study design. Single-case studies are just an examination of one individual or group and multiple-case studies use replications, which is despite the deliberate process of choosing various different cases, they are still likely to show similar results. This in turn helped to examine how ‘generalizeable’ the findings may be. The participant pool of case studies was done on a small number of cases, whereby each case focused on one participant each.

c) Further, the case study approach was adopted because it excels at facilitating an understanding of a complex issue and adds strength to what is already known through previous research. d) Because case studies emphasize detailed contextual analysis of a limited number of conditions and their potential influence, they were found useful to help in understanding the impact of climate change on the contemporary, real-life conditions and on gender relations.

The well-known case study researchers such as Robert E. Stake (1995), Helen Simons (1980), and Robert K. Yin (1984 and 1993), who have written about case study research, suggested techniques for organizing and conducting the research successfully. Drawing upon their work, the case study research followed the following steps:

- Determine and define the research questions (as mentioned earlier).
- Select cases and determine techniques for data gathering and analysis.
- Prepare for the data collection.
- Collect the data in the field.
- Evaluate and analyze the data.
Determine and define the research questions

The research began with a review of the literature to determine what prior studies have been conducted on the issue of gender inequality and climate change, particularly in Morocco. Using the general focus of the study, the research questions were formed about the situation and the specific purpose for the study was determined. The research object in the case studies was defined as the group of households (or individuals) from among the Boudinar community. The research then investigated the object of the case study in depth, selecting a variety of data gathering methods to produce evidence that leads to understanding of the case and answers the research questions.

Select cases and determine techniques for data gathering and analysis

During the design phase of the case study research, it was determined to use the approaches of single or multiple real-life cases to examine in depth and other data gathering instruments. It was decided to use multiple cases, whereby each case is treated as a single case and its information contributes to the whole study. The cases were selected because they were either unique in some way, or considered typical, or represented a variety of geographical aspects of Boudinar, and according to parameters such as female-headed, nuclear or extended families, as well as migrants. A useful step in the selection process was to repeatedly refer back to the purpose of the study in order to focus attention on where to look for cases and evidence that will satisfy the purpose of the study and answer the research questions addressed.

A key strength of this case study method are the multiple sources and techniques in the data gathering process. The research determined in advance what evidence to gather and what analysis techniques to use with the data in order to answer the research questions. Data gathered was normally largely qualitative, but included some quantitative data, for example changes in the cost of water, income or harvests, to obtain as complete a picture of the participant as possible. The case study research employed a variety of tools for data collection, namely interviews, field studies and participant-observations.

The data collection process followed a funnel-like design resulting in less data gathering in later phases of the study as the information began to be repeated, which in turn confirmed the findings during the analysis phase.

The research used the designated data gathering tools systematically in collecting the evidence. The design of the case study selected ensured that the procedures used were well documented and can be repeated with similar results relevant to the context at the time over and over again.

Prepare for the data collection

For the exemplary case studies, a clear framework with procedures was prepared before the field work. Prior to this, a pilot study was conducted in the field with
four cases, in order to provide a solid design and remove potential barriers and problems. Guidelines for field procedures and data collection using multiple techniques were prepared and used. The preparations also included exercises on asking questions and interpreting answers.

Field data collection

Investigators first arranged for official permission to conduct a field work study involving interviewing the local population. The researchers then started collecting and storing the multiple sources of evidence systematically, in formats following the guidelines prepared beforehand. The investigators took written notes and recordings during interviews which were transcribed into field notes after interviews were completed. Although the interviews were open-ended, they were structured around the research questions defined at the start of the case study.

Evaluate and analyze the data

The data was analyzed holistically. Holistic analysis does not attempt to break the evidence into parts, but rather to draw conclusions based on the findings as a whole. Thus inferences were made from entire sections of the case studies rather than searching through the transcripts to look for isolatable characteristics (CSU 2012).

Thus for each individual case study, we studied its written documentation and response data as a separate case to identify unique patterns within the data for that single case. Detailed case study write-ups for each individual person met, categorizing interview questions and answers and examining the data for within-group similarities and differences were then prepared.

We examined the raw data in order to find linkages between the research objective and the outcomes with reference to the original research questions. The quantitative data collected was used to corroborate and support the qualitative data which was most useful for understanding the rationale underlying relationships.

A brief cross-case analysis followed, where we examined the cases, categorizing the similarities and differences. Patterns began to emerge, which were then tied as evidence to the findings and their relationships in answering the research questions.

Finally the 'multiple investigators' technique was adopted: the ones tested during the pilot phase were compared with the later ones in order to gain a variety of perspectives and discover the patterns. The multiple observations that converged increased confidence in the findings.

In all cases, we treated the evidence fairly in order to produce analytic conclusions answering the original 'how' and 'why' research questions.
The case studies

Hassan

Livelihoods

Hassan (78) is a married farmer who lives in the village Akhchab Amghar and heads a family of eight members. The family's main source of income is derived from agriculture as well as the seasonal work of the eldest son. The father owns in his name four plots of irrigated land and eight plots of 'bour' or rainfed land. The harvest collected from their fields is primarily intended for home consumption and the rest is sold in the market ('the souk'). For several years, his net revenue from agriculture is not significant, the harvest barely manages to cover actual expenses. Neither Hassan nor any of his children have gone to school due to their meagre resources. Hence they lack skills, and cannot perform any other activity apart from agriculture. In addition to crops, he raises some livestock, namely six sheep, two cows, two kids, three goats and two lambs. On the whole his net total revenues from agriculture do not exceed 5000 to 7000 dh per year. His wife raises some poultry, which is mainly for the family's own consumption, but can sometimes sell some of these.

Gender division of roles and responsibilities

All reproductive roles of cooking, dish washing, housework, laundry, bathing, are done with spring water and performed by females of the household, who are also responsible for the transport and saving of water. Productive roles are performed by both males and females, who practice traditional agriculture. Females, for example, are always responsible for the preparation of the field, for sowing the seeds of wheat and barley, cleaning crop produce in the river, or at home, and then transporting it back home on donkeys.

Male members are always responsible for some activities, such as: ploughing using an uncle's horses, sowing wheat and barley, repairing water courses and irrigation channels, which are often damaged by the flood of the Amevrane River. The seguas (irrigation channels) are sometimes repaired by the authorities or farmers. Sometimes both males and females are responsible for picking the fruits as well as performing some gardening activities.

Animal husbandry is entirely a female task. Females of his household are responsible for feeding animals, getting drinking water from the spring and cleaning the livestock locations. Thus in addition to household chores, his daughters are involved in agricultural work as well as animal husbandry. The daughters bring back the forage from the field, clean the barn and take care of the cattle during periods of rain. Selling livestock in the market, however, is confined to males, while selling poultry to the neighbors is the women's role.
Access to and control over resources

In general men have full access to and control over all financial and real estate resources. They are involved in transactions for sales and purchase of agricultural products or livestock and manage the revenues generated. Women do not participate in this process.

Although Hassan's daughters are in charge of much of the work on the land as well as the livestock as presented, they receive neither information nor monetary compensation for their work. All decisions are entirely made by the father, such as the choice of seeds, grains, pesticides; setting the price for the harvested products and all other issues related to the management or operation of the land.

His wife and his young daughters possess no source of income to cover their personal needs, and hence sell their poultry products to neighbors. As all the other women in Boudinar, his female family members never go to the souk. Hassan and his daughters practice traditional agriculture and hence do not own any agricultural technology.

Effects of changes in climate and water on gender relations and their adaptation strategies

The village Akchab Amghar, where Hassan lives, is one of the thirteen villages of Boudinar and hence its problems, traditions and customs and living standards are similar to those of the other places within the commune. Its only peculiarity is that it is relatively accessible as it is closer to the center of Boudinar, although when river flooding occurs, it is also difficult to reach. The main activity for its inhabitants is subsistence agriculture. There are no other job opportunities with the exception of a few opportunities related to building construction and the collection and cleaning of sand in the river to sell it for entrepreneurs.

Collecting water from wells and springs at the village Akchab Amghar is free of charge. Currently, as the last two years brought much rain, water is available in springs and women are well served with water to perform their tasks.

Now as before, men retain access to and control over all financial and real estate resources. They are involved in all types of transactions for sales and purchase of agricultural products or livestock and also the management of the money generated through commercial transactions. Women do not participate in this process.

In the past, the harvest was always sufficient to meet the needs of the family. As present, but in rare cases, when the harvest is not sufficient, the father resorts to the sale of livestock, and the mother and her daughters sell their poultry to their neighbors. Job opportunities have become scarcer except for the few opportunities in the building sector, in transportation and harvesting of sand from the river. Today, due to personal reasons such as aging and the health issues of Hassan, a small part of the land is planted and the rest is left abandoned.

For Hassan the main specific problems related to water or climate change are:

a) storms and droughts, because they cause crop loss and
b) plant diseases as they result in loss of harvest and increased use of pesticides.
Ahmed

Livelihoods

Ahmed (50) is an illiterate farmer, who is married and lives with his 10-member family in the village of Abalkhach. Ahmed owns two plots of land: one in irrigated agriculture and another in the ‘bour’ or rainfed agriculture. The harvest of both lands is primarily for the family’s consumption and also for marketing purposes. On this land they grow wheat, potatoes, beans, watermelons and melons. They have also 500 olive trees for the production of oil. According to Ahmed, the planting of fruit trees is better suited to the region and involves less work. The harvested products from agriculture yield a net revenue of 15,000 dh per year, which is sufficient to meet the needs of the family.

Gender division of roles and responsibilities

Ahmed’s household uses water from the neighboring river during summer for all household chores, such as cooking, dish washing, house cleaning, bathing, toilet and laundry. It is the female members in his household who are responsible for all these reproductive activities. Transporting and getting rid of waste water is also a female activity, but purchasing potable water is done by the male household head. Both male and female family members can sometimes be found to clean the water cistern. Ahmed’s daughters collect the drinking water once per day from the spring, which is a half an hour walk from home. In summer they collect water from the spring several times a day. Often during summer water is purchased with 150 dh per week to fill in the tank, which amounts to at least 600 dh per month.

Ahmed’s daughters participate in all reproductive as well as productive activities. Men are always in charge of irrigating the land with water diverted from the river, repairing the irrigation channels and protecting agricultural lands from the flood by setting up terraces on the sloped land. Harvesting is an activity that is always done by women and seldom by men. Sometimes female family members can participate in work protecting land from the floods and men can also contribute to washing the harvested products, though the latter is usually performed by women. Washing the harvested products in the home however, is always a women’s activity. Animal husbandry is always an entirely female responsibility; they feed the animals and clean their locations.

Access to and control over resources

All agricultural activities are performed by his daughters and his son; together they clean the land, do the sowing, harvest and collect agricultural products. The sale of the harvest, however, is undertaken solely by his son, who is responsible for the management and control of the resources as well. He is in charge of all commercial transactions, seed selection, and all decision making regarding farm management. The land was owned by Ahmed’s deceased father, and it is his son who succeeded him, who continues to operate it now. His daughters can practice
agriculture as long as a male member of the family is present in the village and participates, even if only symbolically. His daughters hold as much knowledge and experience in agriculture as his sons, and some tasks are done only by his daughters, such as harvesting and cleaning of the harvest, and maintenance of livestock. Farming is not an important activity in the village, and the little that is done is primarily for the household subsistence.

**Effects of changes in climate and water on the gender relations and adaptation strategies**

In recent years, due to erosion and flooding, the family stopped field seasonal crops agriculture and moved more towards the planting of fruit trees including olive trees. Even though this change reduced substantially the amount of agricultural products intended for home storage, the olive trees remain relatively good and generate a reliable income. No precaution, however, is taken to ensure the proper conservation of the stored agricultural products that degrade very quickly because of air humidity.

Nevertheless, the expenses constitute an important concern in the family's finances: first of all because of the losses and damages caused by the floods and erratic rainfall, and then because of the increase in price of fuel and other products such as fertilizers and pesticides, and finally as the labor force has become scarce and expensive. While the expenses remain high, the prices of agricultural products in the market have decreased. Farmers sell their products at low prices, because they do not have the means to store and retain them. The purchasing power of local people has also dropped due to the economic crisis and the sudden losses due to the impact of climate change. Similarly the financial aid coming from abroad has also decreased dramatically as migrants have also encountered economic difficulties in places where they live.

**Changes in the water sources**

Indeed, all of the villages are devoid of basic infrastructure, roads are defective or non-existent and only three out of 13 villages benefit from piped potable water. Households resort to the use of the water collected from wells and springs. The collection of water, which always remains the responsibility of women and children, occurs more easily, with less waiting and less conflict during rainy years. The purchase of water occurs only during the summer period, when sources dry up, and access to water gets difficult and this happens generally during drought years. As the waiting time to collect harvest water gets longer, conflicts arise between the inhabitants (the last to arrive are less well served). During winter time water becomes more available and women can easily access the water sources.

The water situation is exacerbated through the isolation that the area faces during rainy periods, as well as the lack of transport vehicles to get to the village centre or the neighboring cities. In recent years, the 13 villages that make up the rural commune of Boudinar get separated by the Amekran River and its heavy floods, as they are each located on different heights. The rain is always beneficial as
Changes in climate and water resources on gender inequality

...it feeds the underground water table and hence some wells and springs that have dried out for a long time get revived. The availability of water has allowed for a relative development of agriculture in the region and also reduced the farmers' expenses for purchasing potable water to fill up their tanks, especially during the summer season when water gets expensive. For girls especially, water collection from sources endowed with much water make it easy and fast for them and thus the time spent fetching water is reduced. However, the torrential rains are usually accompanied by strong winds which break the irrigation channels and trees in the farms. The region often also faces seismic events that still endanger some water sources and facilities especially for drinking water.

In addition to these natural and economic problems, there are scanty state interventions to fully address these problems. Even though the authorities may be aware of these issues, they still lack enough material and financial resources necessary to address fully the encountered problems. There are almost no other alternatives available for income generation. Men can, on rare occasions, get involved in building construction activities, gathering and cleaning sand from the river, and some small businesses trading various goods in the market.

To avoid some of the problems caused by climate change, including plant and tree diseases and loss of production, many people have abandoned agriculture or changed the type of plants they farm. Ahmed for example, because of flooding, has shifted to the planting of fruit trees, such as olive trees and fewer cereal cultures. This has meant an increase in women's tasks as they are the ones involved in harvesting olives. There is however a withdrawal of men, who prefer to work in building construction or migrate to large cities.

For Ahmed, the main problems related to changes in water and climate are, in order of importance: a) frost or cold days, as they destroy the seeds and plants, b) wind, because it knocks the plants, c) droughts, because they create water scarcity and d) high intensity rain storms, which ruin the harvest and erode the soil.

Changes in gender roles

The distribution of gender division of roles and responsibilities in Boudinar has varied and changed over the years, which has also meant a change in the status of women, socially, economically and culturally. This change, however, was directly related to either men's absence or presence in the community as well as their participation in economic activity. Women have often been used as an overriding element to perform the tasks which are usually performed by men, such as irrigation, plowing and transportation of agricultural products. This development of course allowed women more access to and control over the resources during times of men's absence.

Before the 1960s, for example, as some local persons have mentioned, women were traditionally granted more freedom and could move easily in the village, have access to the market and carry out commercial transactions, such as the purchase or the sale of products. The drought of the 1970s greatly impoverished villagers, some of them had to give up agriculture and immigrate abroad or to some big
cities looking for a job. Because of this important migratory flow, the villages were abandoned by a lot of their male population. Women and girls, who were left behind, were bound to remain in the villages.

Thus, because of their absence, men have imposed movement restrictions on women, not allowing them to go out, hence it has now become a tradition and married women cannot go to the market or work publicly in agricultural activities. Now young girls are involved in agriculture, in addition to the collection of fuel wood and drinking water. Although migration flows today are almost nonexistent, young men have become accustomed not to participate in agricultural tasks.

The role of the state

The state did not integrate in its forecast any specific activities for female agricultural workers and those who have no means other than agriculture to meet the needs of their families, including women heads of households. Indeed, fruit tree planting actions carried out by the state under the Green Morocco Plan to overcome the problem of erosion, have helped some farmers and women to overcome their difficult financial situations, especially if their only resource is agriculture. Harvesting fruit trees is primarily a female occupation. Another gap is also reflected on the education level of girls and boys of different villages, where the illiteracy rate is very high and where school absenteeism is a real problem. Both young girls and boys, generally, have to leave school to help their families in agriculture and with house work. The lack of secondary schools in the villages and the absence of paved roads and of transportation means are also a part of the reason why young boys leave school at the primary level of education. There are few young girls who continue their studies up to the end of primary school. Usually lack of security and traditional customs often necessitate that girls leave their schools at an even younger age.

Aziza

Livelihoods

Aziza (43) is an illiterate housewife, who lives with her husband and their five children in the village Boudinar-haut. Her family's source of income is agriculture in dry land farming, which the family uses for its own consumption as well as for marketing. The family cultivates carrots, turnips, potatoes, wheat and barley. The agricultural revenues, however, do not cover the needs of the family. To close the gap, her son works as a seasonal worker in buildings construction and agriculture. Recently Aziza bought some chicks for 12 dh each, which she raises in order to sell them a year later for 100 dh a piece.
Gender division of roles and responsibilities

As a normal housewife, Aziza is responsible for all the reproductive activities and is assisted by her daughter. She never goes to the fields, but participates in the agricultural work in the land parcel adjacent to her house.

Aziza uses tap water for all the house activities, such as dish washing, laundry, bathing, and cleaning of the house. The water is usually reused for some household maintenance purposes as well as for the toilet. Aziza is the one responsible for storing and throwing out of waste water. The males in her household are responsible for purchasing and transporting of water.

The water supply has not been impacted by climate change as it is provided through a piped network. All households have benefited from the supply of piped potable water, but water is not always available and there are often cuts of water especially during the summer period. As all Aziza’s household activities are using water from the tap, the family resorts to the collection of water from springs only during the times of water cuts. The water is often available in springs and in the river, and waiting time during water collection is therefore shorter. For the needs of her family Aziza and her daughter collect water from the spring three to four times per day, and each trip takes 30 minutes. In the summer, when the water is not much available in the river or in the spring, the family uses tap water to clean the harvested vegetables, which consequently raises the water bill to 250 to 350 dh per month.

Her daughter participates regularly in all agricultural activities, such as weeding the fields, sowing, and harvesting agricultural produce. Male farmers are always responsible for irrigation, repairing of water channels and protecting the land from floods. Sometimes as well her daughter and other female members of the family help with irrigating the fields. Washing and cleaning the agricultural products (vegetables) on the land is usually performed by both males and females. Washing the harvest, however, at home is an entirely female activity.

Animal husbandry is usually a female responsibility. Women wake up at 7 am to clean the barn where the livestock stay. Feeding the animals, however, can sometimes be taken over by children in the household. Men are the ones in charge of grazing the animals in the camps.

Access to and control over resources

All agriculture related decisions are taken by the father; he takes care of the sale of the crop and the management of the resources and decides on the types of grains and agricultural inputs as well as the sale price of the harvest. His wife Aziza can be informed but can never access revenues. The fruits of the harvest are transported in a pickup truck by the father to the market and the revenues are used to meet the needs of the family and agricultural inputs. Aziza has never received any credit. In case of need, she requests the support of her friends or family. For the family’s travel, the father rents a car.

Livestock related decisions, especially small ones (sheep, poultry and rabbits), are
taken by her, the mother, as she uses their products for the household’s consumption. In case of need, her husband sells the sheep in the markets and she sells the poultry and rabbits in the neighborhood, and hence can benefit from that money.

**Effects of changes in climate and water on the gender relations and adaptation strategies**

In previous times, Aziza used to collect the water on a donkey, and wash the laundry and the harvest at the river. Currently, and since there is a supply of drinking water by the connection to the municipal water network, everything is done at home, even washing the agricultural harvest and the laundry. Women resort to the collection of water from outside (springs and wells), only during water cuts, which are recurrent. The time, however, allocated for this task is relatively short. Fetching water for the animal husbandry has also become easier so that women work less at night now and sleep a little longer in the morning.

On the other hand, working in the fields to remove weeds has increased. Because of the floods, however, farmers suffer big losses, as the irrigation channels are destroyed and the harvests are spoiled. To offset these losses, her husband and sons go to work in the building construction sector as daily workers and abandon agriculture and it becomes women’s duty to repair the damage.

To support her family during periods of rain, it is her duty as the mother to store a portion of the harvest, which can sometimes also be marketed if needed. The storage is done randomly.

The family’s eating habits have experienced some changes; nevertheless, the potato is still the main food because it is easily storable. Because of the cold and humidity, family members often suffer from colds and infectious diseases during the winter season. Her eldest son often gets sick because of cold, which prevents him from working.

Aziza, like the other inhabitants, suffers from the decrease in the quantities and prices of the harvest, due to the loss of crops and the decrease in the purchasing power of communities. While men abandon agriculture for work in the building construction sector there are fewer agricultural activities available for women.

For Aziza, the main problems related to water and climate change are constituted in the difficulty of accessing health centers and purchasing drugs in case of flooding. Due to the cold and humid weather, her children are often sick with infectious diseases. The problems with regard to agriculture depend not only on the availability of water, but also on the increase in prices for seed, fertilizer, fuel and transport systems.

Aziza’s family has no access to any information on climate change and they don’t know any active cooperative or association in the municipality that could possibly help them out. The adaptation strategies of Aziza’s family to manage budget deficits and meet food insecurity with lower harvests compel her husband to work as a daily laborer in building construction. She resorted to raising chickens or rabbits to meet the needs of her family as well as for marketing purposes.
Louisa

Livelihood

Louisa (30) is an illiterate and single seasonal farm worker, who lives together with her small family composed of a sister and mother in the village of Boudinar-haut. Their main source of income is from their seasonal work in agriculture, from which she earns 30 dh to 40 dh per day during regular working days and 50 to 70 dh per day during agricultural products harvesting time. On average she works 15 days per month. Louisa is the main income provider for her small family and her mother has been sick for many years and depends on her support.

Gender division of roles and activities performed with different water sources

Louisa is responsible for all reproductive activities inside her home. For all household chores such as cooking, washing dishes, bathing, cleaning, she uses tap water. Washing the laundry is done in the river. They do not, however, have any tank to store rain water. Louisa is also responsible for getting rid of the waste water. After her work in agriculture, and upon her return from the fields, she collects firewood in the fields once every three days. This firewood she uses for cooking, bread baking and water heating. Louisa is as well responsible for the housework maintenance, such as repair and construction of roofs and barns.

As for the productive activities, Louisa participates as a daily laborer in all agricultural works except for irrigation. There are some other female laborers like her, who are engaged as manual laborers on farms. Usually the farms resort to their own family members for help in the fields. The tasks she performs as a female laborer are soil preparation, repair of water channels and washing the harvest in the river. She carries the harvest either on her back or on her donkey. It is primarily the male workers’ responsibility in the fields to do the irrigation and repairing of irrigation channels.

Animal husbandry is also Louisa’s sole domain. She is always the one to feed her animals, clean their places, and repair and construct the barns.

In the area of community management, Louisa rarely invests much time. Yet in a few cases after the floods she helped other community members in the conservation and rehabilitation of their houses.

Access to and control over resources

On the land, where Louisa works, the land owners are the only ones who are in control of everything, because they have the land title in their names. They are the ones who decide on the type of seeds and agricultural inputs and purchase them from the market and arrange for prices of products. Louisa is there only as a worker, who plants the seeds and harvests the product. Through her work on the land, however, she and her sister as well as the other workers have access to the traditional knowledge about techniques. Louisa for example gets access to information about adaptation techniques. Louisa receives credits from her grocery
owner in order to buy her food. She does not have access to any education and has no means of transportation.

Effects of changes in climate and water on the gender relations and adaptation strategies

Louisa has witnessed several changes with regard to the water sources. In earlier times, Louisa, like other people, had used the spring water. She and all the other women woke up very early to fetch the water which was a 30 minute walk from her home. When it rained, the roads became impassable, and it was difficult for her to go to fetch water, as she was landlocked.

Now with the recent changes and the introduction of water pipelines, a change occurred in the cost of water. While in the past water was free, since the village has been supplied with piped drinking water, she pays 30 to 40 dh per month. Louisa is the sole person responsible for paying the cost. The laundry is done at the river to reduce the monthly water charge.

The introduction of water pipelines has also changed her use of time. Previously she had to go fetch water four–five times per day (four cans of five liters). The first time was very early in the morning so as to be able to focus her entire attention later on her work. Now she can spend more time with her ailing mother and in particular earn some money. Previously, she used also to interrupt her field work during the day and go back home to do some work and care for her mother.

Closely related to this is also the impact climate change had on her workload. Due to the massive precipitations, she has to repair water channels (seguis) in the field, as well as her home, which is built of adobe, and is hence very vulnerable to rainstorms. Thus, she must evacuate water and repair the damaged roofs and walls. After heavy rain storms, Louisa and her sister spend the night in the drainage of the rooms and in the morning they start rebuilding what was destroyed by the rains. The activities related to home maintenance are expected to be performed by women. Sometimes she and her sister work in roof construction and repair other homes and get paid for the service.

Over the last years, work opportunities available in the community have decreased drastically. Due to the floods, water channels were destroyed and the number of plots available for farming dropped. Indeed, several people following the floods have abandoned agriculture. Thus in agriculture, labor opportunities are very little now as there is less harvesting and gathering. Many who did not give up agriculture completely started planting fruit trees, but only in the barren dry land. In addition, farmers are more and more investing in livestock. As Louisa's income from agricultural work dropped because of the recurrent flooding, she started as well to raise sheep and poultry to improve her income. While her agricultural activity decreased, much of her time is devoted to the evacuation of water from the houses and rooms.

In terms of food security, Louisa's household has also witnessed changes. They now consume more legumes and vegetables and less meat and couscous, and pasta substitutes bread. During rainfall, the family eats mostly pasta and couscous instead of bread, due to lack of fuel wood. Due to their meager livelihood means, they do
not possess facilities for storing agricultural products. The family depends only on their purchases from the grocery shop as she never goes to the market.

The health status of her family members has also been impacted by the climate change. Because of the recurrent cold weather and humidity, her mother suffers from rheumatism. The mother is often bedridden and can no longer participate in the work of any of the reproductive activities. This of course increases the workload of her girls and impedes their working opportunities in the fields, as they need to attend to their mother. Needless to say they have fewer resources as a result.

Due to these cold winters, which are getting ever colder as well as the lack of means of protection, people get sick more often and work in the fields becomes very difficult for them. Sometimes, there are periods of high rainfall or lasting droughts, when the agricultural activity stops completely and some people even abandon farming. In the summers, on the other hand, it gets very hot and work during the harvest becomes very difficult.

In general the work has decreased in agriculture and there are also several other changes noted in the agricultural resources. For example now there are more fruit trees, as they require less investment and less water. Men are not as heavily involved as women in that. Even though the female labor has increased, they continue to be paid less than men. Sometimes women are paid in kind, for example through a few liters of olive oil. In this they have no control, as pointed out before.

The climate changes did not result in any conflicts over water or land title among family members. For Louisa, the main problems occurring due to the changes in water and climate are due to the floods, as they result in destruction of their houses, isolation of the area and loss of crops, or droughts that impact on agricultural production and hence the opportunities for work.

Coping and adaptation strategies (present and past)

Louisa has neither access to any type of institutional support, nor to any type of information about the latest changes in water or climate change. To cope with the shortages of income, Louisa's family resorts to the water available at the water sources in order to save the cost of the tap water. The saved money enables her to buy food from the grocer and do some poultry production. During floods Louisa disposes of rainwater.

In order to maintain themselves, the two sisters earn their living through casual and low paid labor. They work as agricultural workers, they also serve in private households as maids and during summer they get involved in some construction work such as repairing roofs for urgent work, caring for animals and moving furniture.

At present their work opportunities are limited to agriculture and household serving. This is because previously the houses were built of adobe and hence after the rains there was a lot of repair work that needed to be done. Now people are building concrete houses, which requires less work.

Louisa observed that none of the techniques for water harvesting, storage, carrying and saving had changed. For agriculture, some people use tractors for tillage and combine harvesters to harvest. Because such technology requires a lot of
investment and as the land plots are small due to the recurrent floods, it is only used by a few farmers.

Over the past three years, and with the increased availability of water in wells and springs due to regular precipitations, farmers resort to pumping water from the river and wells. They use pipes to bring water from springs and from the river to the fields. They also use the water channel system which is often damaged by floods and the overflowing of the river. Especially during the winter, water is abundant in the river for irrigation. In summer, there is less water and this creates conflicts between different users.

Discussion

The findings in this study converge with many other studies which started immediately after the publication of Boserup's book in 1970, as they frame women and men in agriculture in policy, development practice and research. They draw attention to the roles, interests and the asset bases of women and men in agriculture, and link these to gender relations. Key elements of these framings include the following ideas:

- women perform most of the agricultural work in addition to their responsibility for the reproductive work and have limited control over their own labor and time.
- women lack access to land and latest innovations.
- women's lack of control over resources such as land and education as well as mobility restrictions, prevents them from economic undertakings and limits their new opportunities, including accessing new markets in the agricultural sector.
- women's work burdens increase as a result of the out-migration of men seeking other income earning opportunities, and as access to water and fuel has deteriorated with environmental change.
- women have limited control over the outputs from their labor and therefore lack incentives to increase their production. They are relegated to the few meager income earning opportunities such as poultry.

In summary, in relation to where these findings fit into the four decades of work on women in development, the findings in the literature collectively paint a picture of rural women working in agriculture who are vulnerable, overburdened, least rewarded, and poor. Nevertheless, equally, though less evident, they play the main role in the provision of food security and the well-being of their households primarily during the absence of the males (IFPRI 2002).

In this literature there always remained the need for more context-specific evidence that documents what women and men do in agriculture and how social institutions, including the household, impinge on these activities, in order to better define areas of intervention that do more than deliver technical inputs without addressing the wider structural factors influencing whether and how women engage in agriculture.
The findings in this study however expanded our understanding of the problem as well as created a new awareness by highlighting and confirming two main conceptual points:

First: that gender relations are dynamic, as women and men seek to maintain their livelihoods in response to their day-to-day realities in addition to changes occurring at the meso and macro levels. Unlike the orthodox understanding of gender analysis as promoted by the Harvard framework, which provides a static view of women in agriculture, and that aims at presenting women as the disadvantaged and highlights the nature of their disadvantage by focusing on time inputs, assets (especially land but also credit conditional on land access) and women’s caring roles (March, Smith and Mukhopadhyay 1999), the case studies presented here provide an alternative approach. This approach began by examining the various compositions of households (meaning male-headed or female-headed) in various locations of Boudinar, and detailed how they account or how they operate in terms of livelihood and meet their responsibilities.

It then proceeded to examine their access to and control of available household resources and the implications for individual decision-making and household livelihoods that extend over time and over the reproductive and productive range of activities. Such an approach led to a different set of questions, different data, and particularly qualitative data on gender relations unlike the existing, simply sex-segregated role data (Leach, Scoones and Stirling 2010). Further on, such a shift from this kind of analysis proved useful because it did not detach women and men from their social environment, but asked instead about their own clarifications and perspectives about their changing contributions amidst the changing circumstances of their social and natural living environment. Hence it did not take gender role data as the end point of gender analysis. It is hoped that its design might also result in a more effective approach to address disadvantage and thus support a strategy for closing the gender gap.

Second: that women and men, who must be understood as diverse social groupings that encompass multiple identities as individuals, spouses, workers, parents, siblings etc. (Okali 2011a), are governed and influenced in their relations by the legitimacy of social norms. These norms are the ingrained societal beliefs that limit what women and men can and cannot do, or the assets they can and cannot hold. The limit also extends to the personal level and impregnates the mindset. This case study approach enabled a detailed analysis, which facilitated a more complex and more nuanced understanding of the relations between women and men and even of the understanding around assets control. Here the case studies were able to highlight the dynamic nature of these relations and the less obvious aspects than under the conventional framings (Okali 2011a).

Two patterns appeared in this dynamic nature. One during the first drought era in the 70s, when men migrated outside or inside Morocco and women no longer enjoyed the social norm that allowed their mobility. Hence women were not able to go to the markets and sell their products anymore. The second pattern appeared during the later phase of the recurrent floods and droughts, which led to the decrease in the quantities and prices of the agricultural harvest, and the decrease in
the purchasing power of communities, hence agricultural activities decreased for both men and women. While men easily abandoned agriculture for work in the building construction sector, women were faced by several social restrictions. Current social norms restrict women’s geographical mobility, and enforce as well a horizontal division of labor, by restricting their movements between working sectors or occupations.

The findings have thus highlighted that decisions taken by household members to change their economic activities depend partly on what is going on outside households and not only on what goes on within households as presented by the women in agriculture literature as the central theme.

**The way forward and new emerging questions towards achieving sustainable transformative change for women**

As brought forward by this study, it is essential that research efforts move away from their classical patterns of focusing on women as a bounded group or framing the rural communities as a group of isolated individuals who have their separate interests. Rather the new emerging research questions should address women and men as active social agents and place them within their wider social and dynamic contexts of gender, age, class and focus on identifying how women and men experience and value ongoing changes and use them to meet their own interests while addressing their family’s concerns.

New transformative questions should investigate closer women’s and men’s mind sets to help them delve more into themselves and bring out what, why and how they would envision themselves as empowered. Privileging sex-segregated data or a purely production-oriented view of development over a relational and well-being oriented one will never help achieve this aspiration. The transformative research questions should focus on the decision-making roles of men and women in light of attitudes, norms and beliefs at the level of households, community and beyond as called for in the collection of papers by Kate Young and others published 30 years ago (Young, Wolcottiz and McCullagh 1981).

These different sets of research and policy questions should of course reflect the specifics of particular locations and situations of different categories of rural women and men. The assessment should not focus on women themselves for change to be sustainable but also on attitudes of those around them within households, wider family units, and communities, simply the circumstances external to them, bearing in mind that the focus of change starts in the persons themselves who further affect their surroundings.

From her comparison of Bangladeshi women in London and Dhaka, Kabeer confirmed that women will not be in a position to either gain any sustainable advantage from participating in new opportunities, or alternatively, to protect themselves as resources become scarcer for example, if the wider social, economic, political and institutional environment is not supportive of any claims they make (Kabeer 2000). Social legitimacy is essential for realizing gendered claims, not just legal and policy support.
Most importantly, transformative research should through its questions allow 
women and men as active change agents to start the change process (occupation, 
market, policy etc.) up till the envisioned outcome even during the research prac-
tice. The development and policy implications of the research findings can be seen 
on two levels: a 'deeper impact' and 'wider impact'. Deeper impact because policy 
needs to go to the deepest inner core of the change agent and strengthen the men's 
and women's individual capabilities. Wide impact is a call for policy to widen its 
understanding of the wider social dynamic interrelations which frame the deci-
sion-making levels.

Conclusion

In this research, case study was used to explain the situation, to explore, or to 
describe the phenomenon of gender inequality and how it can be exacerbated 
through external factors such as climate change or migration. The case study 
method proved to be useful because of its applicability to real life, contemporary 
human situations and its facilitation for an understanding of complex, real-life situ-
ations. The cases used are illustrative case studies, primarily descriptive studies, 
which utilize four typical instances of individuals to show what the situation is like. 
The illustrative case studies served primarily well to make the unfamiliar familiar.

In other words, this research is an effort to reveal how climate change can affect 
productivity but importantly can widen the already existing gender gap due to the 
underlying gender norms. Productivity in this case becomes much broader than 
crop yields and the exerted efforts of women on sustainable food security. 
Productivity in these cases becomes paramount with gender equality.

In conclusion, this work is a documentation hailing the call that for any agri-
cultural effort aiming at benefiting both men and women in Boudinar, gender 
equality is a prerequisite and hence needs to be understood in its complex, real and 
dynamic life situations, which can best be accomplished through a case study 
approach.

Notes

1 École Nationale Forestière d'Ingénieurs (ENFI), Salé.
2 Consultant, Cairo.
3 Consultant, Casablanca.
4 Haut Commissariat aux Eaux et Forêts (HCEF), Chefchaouen.
5 For ethical reasons the real names of the case study interviewees have been exchanged 
with symbolic names instead.
6 1 Moroccan dirham = 0.1172 US.

References

CSU (Bronwyn Becker, Patrick Dawson, Karen Devine, Carla Hannum, Steve Hill, Jon 
Leyden, Debbie Matuskevich, Carol Traver, and Mike Palmquist) (1994–2012) Case
Studies. Writing@CSU. Colorado State University. Online at: http://writing.colostate.edu/guides/guide.cfm?guideid=60


