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PALACKÝ UNIVERSITY OLOMOUC
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THE EFFECTIVENESS OF JOINT FOREST MANAGEMENT APPROACH ON THE SUSTAINABLE LIVELIHOOD OF RURAL PEOPLE: A CASE STUDY FROM KYRGYZSTAN

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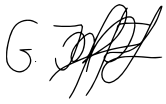
Declaration

I, Zhyldyz Toktorova, declare in lieu of oath, that I wrote this thesis myself. All information derived from the work of others has been acknowledged in the text and the list of references is given.

Olomouc, 31/05/2019



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Zásady pro vypracování

Joint Forest Management (JFM) is one of the relatively new social forestry approaches implemented in selected areas of Kyrgyzstan. JFM has been developed mainly due to two main reasons- deteriorating forest conditions in densely populated areas and constantly increasing importance of forest resources for livelihoods of the local population in those areas. Several reports undertaken by non-governmental organizations working in a country indicate that JFM has resulted in restoration and regeneration of forests in some areas. However, not much work has been done in evaluating the effect of JMF on livelihoods of the local people who collaborate to manage the forests jointly. Therefore, this thesis work aims to assess the role of JFM on sustainable livelihood generation of rural people through the case study from Kyrgyzstan. The analysis will use both qualitative and quantitative methods and will be based on primary and secondary data collection.

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Abstract

The Joint Forest Management (JFM) approach in Kyrgyzstan has been officially operated for over a decade, setting a stage for its current status investigation. This thesis work aims to assess the effectiveness of JFM on sustainable livelihoods generation of local people and identify the changes in the forest coverage occurred due to JFM implementation in the period from 2007 to 2017 through the case study of Arstanbap-Ata Forest Management Division of Arslanbob Forest, Kyrgyzstan. The study has been conducted on a sample group of 80 households based on the recall analysis method.

The research found out that, on an average, JFM has increased the livelihood assets for almost half (44,03%) of the respondents, with the highest improvement reported in financial (72,81%) and physical (48,90%) assets, but in the case of social, natural, and human capitals, the enhancement has not been as high as the other two ones. The investigation has also revealed that unfortunately, the forest coverage of Arstanbap-Ata Forest Management Division has been diminishing in the last ten years by putting its sustainability at stake in the long-run period.

It is recommended that the Forest Agency should address the problem of weak incentives within the Forest Management Division by revising its current administrative and financing conditions, set clear-cut separation of duties between stakeholders, ensure equal treatment in the competition process and fair allocation of forest plots, and put a greater emphasis on outreach and forest conservation awareness.

Key Words: *Joint Forest Management, Sustainable Livelihoods, Livelihood Assets.*

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CHAPTER I INTRODUCTION

1.1 Background of the Study

For over decades, the Joint Forest Management (JFM) approach has been known as a type of forest management tool which incorporates the partnership between the government and village communities initiated to fulfill the twofold objectives of establishing sustainable forest management and provision of sustainable livelihoods for participating village communities (Padney, 2005). The term "Joint" is determined as "any forest activity or situation that ultimately involves the participation of government and local people" (FAO, 1978). So, unlike other approaches where the forests are fully managed either by the state or private users, JFM evolved as a synergy of two but with a vast range of social objectives. Today the government of any developing country is trying to implement some kind of communal programs that could benefit not only forests, but also people whose livelihoods depend on those forests. According to recent data provided by (FAO, 2016), it is estimated that, to-do-date, almost thirty percent of world forest areas are operated under some form of JFM approach. These forms nowadays could be referred to other names such as the participatory forest management (PFM), community forestry management (CFM), forest co-management and community-based forest management (CBFM), and the variability of each of them depends on different characteristics like the specific context, formal property rights and duties of stakeholders (Pagdee, Kim, & Daugherty, 2007; Angelsen , et al., 2009). Moreover, its current progress is at various stages across the countries (Murali, Jagannatha Rao, & Ravindranath, 2002).

The earliest practices of JFM approach among people took several decades or even a century ago, however the term as such was officially recognized and conceptualized in 1990s only (Sahays, 2001; MOEF, 2017; GFMC, 2017). The impetus for its adoption was given by important factors such as accelerated forest degradation, increasing population number and overdependence on natural resources (Pathan, Arul, & Poffenberger , 1990; Sundar, 2000; ISS, 2000). Due to constant conflicts between villagers and forest staff, the states alone in the face of Forest Departments were not able to manage the forests efficiently and thus, had to shift from "solely governmental" to "joint" approach and diffuse the power from central to local authorities (Maryudi, 2011; Larson, Pacheco, Toni, & Vallejo, 2007).

Recent studies undertaken to see the performance of JFM approach have indicated that the outcomes are rather ambiguous, hence, it is not possible to draw any generalized conclusive opinion. On one hand, there is a group of countries like India and Nepal where JFM has had positive effects in some selected areas where it has been implemented, and on another, the case of other states as Indonesia

and Papua New Guinea, where it has had neutral or even adverse result on forest regeneration and community empowerment. Such contrast can be explained by multiple macro and micro level issues the first comprising of observed deficiencies in political will, lack of strong policies and appropriate legislations, and the latter consisting of power usurpation by local elites, lack of incentives for forest user groups, failure to wean people away from the forest dependency and lack of local people participation (Banerjee, 1998). Wherefore, this approach is arduous and complex (NFPI, 1988; DFGWB, 2016). Moreover, JFM is multidimensional, so that solely improvement of one factor such as the forest coverage or creation of livelihoods for people alone cannot determine the sustainability and success of this approach until unless it can improve ecological, social and economic factors simultaneously in long-term use (MOEF, 2017).

Although JFM cannot solve all the problems of forest governance, indeed, with due implementation, it can address many issues: lessen the government management burden, yet still bring revenues, increase forest areas and contribute to the livelihood of people (Pagdee, Kim, & Daugherty, 2007). Encouraged by its multifold advantages and driven by devastated economy, increased population number and high dependence of people on forest resources, Kyrgyzstan has also introduced Joint Forest Management approach. And nowadays, JFM has been actively implemented in different parts of the country, and even become one of the long-term goals of the national forest policy (as stated on the "Concept of the Forest Sector Development until 2025") (Undeland, 2012).

1.2 Statement of the Problem

It has been more than 10 years since Kyrgyzstan has officially recognized the Joint Forest Management approach as a means to find a right balance between the forest use and forest conservation (KIRFOR, 2015). Albeit, throughout this time, not many studies have been conducted to investigate the outcome of this tool. The reports provided by (Undeland, 2012; GIZ, 2015) indicate that, in general, it has resulted in restoration and regeneration of forests in some selected areas of Kyrgyzstan, however, the information about its effect on livelihoods of local people in general has been very sparse. Therefore, this thesis work mainly intends to assess the role of JFM approach on sustainable livelihood generation of rural people who help to manage the forests jointly. This work is based on the case study of Arstanbap-Ata Forest Management Division of Arslanbob Forest Area which is considered as the largest natural walnut forest in the world (Ford, 2017).

1.3 Aim and Objectives of the Study

Aim of this academic work is to assess the effectiveness of JFM approach on sustainable livelihood of rural people through the study of Arstanbap-Ata Forest Management Division of Kyrgyzstan.

Objectives:

1. To assess the role of JFM in improving livelihood assets of rural people living in Arstanbap-Ata Forest Management Division
2. To assess the changes in walnut forest coverage of Arstanbap-Ata Forest Management Division observed in the period from 2007 to 2017.
3. To construct a SWOT analysis table for Arstanbap-Ata Forest Management Division.

1.4 Rationale of the Study

As it is well known, the application of this approach does not necessarily guarantee the improvement of forests itself, let alone the increase of livelihoods of people. Due to manifold reasons, the success of JFM can be easily put at a stake. And this is why, its implementation status and ongoing progress should be systematically assessed and examined. This academic research will not only help to detect JFM's current challenges and prospects, but also on the basis of it offer some corrective measurements.

When it comes to the study area, Arstanbap-Ata Forest Management Division of Kyrgyzstan, the area where this approach has been first adopted a decade ago, provides a good opportunity to fully study its effectiveness at the grass-root level. Overall, this study is helpful for local state forest authorities, policy makers and international organizations working at a place to understand the effect of JFM on livelihoods of people and forest coverage, identify its weaknesses for further improvements and consider possible ways of increasing its effectiveness in solving ecological, financial and social problems of the Forest Division.

1.5 Scope and Limitations of the Study

This thesis work is mainly focused on assessing the role of JFM approach on livelihoods of people living in Arstanbap-Ata Forest Management Division of Arslanbob Forest, Kyrgyzstan. Scilicet, the study evaluates only a specific type of forest management tool- Joint Forest Management approach regulated by the Government of the Kyrgyz Republic under Decree №482, at a specific area for a specific time period. The analysis is based on qualitative methods through primary and secondary data collection. However, due to the fact that the primary data for this study has been collected from Arstanbap-Ata Forest Management Division only, the findings of this investigation might not be

enough to draw any generalized conclusions in regard to JFM's status in other forest areas of Kyrgyzstan. The effectiveness of JFM approach on livelihood of people has been assessed through recall analysis of the participants of JFM program. And the analysis has been drawn based on their responses, so consequently, the conclusion acquired might not be totally free from certain biases and external influential factors. Furthermore, this academic work has been carried out a decade after JFM's implementation, therefore, during these years, the number of historical and unobserved factors could have influenced the changes in the forest condition, competency of stakeholders, people's opinions and, as a consequence, might not fully show the true capacity of JFM approach.

1.6 Thesis structure

Overall, this thesis work is organized in six chapters: chapter 2 considers the literature relevant for the study; chapter 3 gives description of the conceptual framework and the methodology used in undertaking the research; chapter 4 covers results and discussions of the data collected through household surveys, focus group discussions and interviews with experts and key informants; and chapter 5 concludes the main findings and proposes recommendations.

CHAPTER II LITERATURE REVIEW

PART A. THEORETICAL REVIEW

2.A.1 Emergence of Joint Forest Management

Originated several decades ago, the notion of Joint Forest Management (JFM) has been considered as term used to define the type of forest management tool which "incorporates the partnership between the state forest departments and local communities to ensure the sustainable use of forests to meet local needs equitably while ensuring the environmental sustainability" (Francois; Guha, 2009). The first practices of JFM approach over forest resources has come to the forefront of rural development policy in developing countries since early 1990s (Menon, et al., 2007). The ground for its official recognition was prepared by Indian National Policy of 1988, which reviewed the role of people's participation in forest management and opt for their inclusion (Bhavan, 2016). The rationale behind it was in the fact that initially the forests in India were mainly managed by the government through state forest departments, and emphatically excluded the so-called "dis-interested" local communities from engagement. However, by time, the increasing number of population led to the large-scale forest losses and rapid degradation, and the devastation level reached up to the point when almost no recovery measures were effective in enforcing the poor biodiversity regeneration. In place, luckily, the very first experimental works with JFM in West Bengal succeeded as forest management departments collaborated with local people. Moreover, it brought benefits to both of the sides: income generation opportunity to communities and forest regeneration to the state (Bhavan, 2016).

Nowadays the schemes of Joint Forest Management can take different forms such as the Participatory Forest Management (PFM), Forest Co-Management and Community-Based Forest Management (CBFM), and although all of them consider people's inclusion in the forest management, they differ from one each other depending on the country context and legislative frameworks (Pagdee, Kim, & Daugherty, 2007; Angelsen , et al., 2009).

2.A.2 Policy Frameworks in the Forest Sector of Kyrgyzstan

The forest coverage constitutes just a small part of the mountainous and landlocked Kyrgyz Republic, roughly 5.6 percent of the country, but plays a vital role (FAO, 2017). According to (Undeland, 2012)'s estimates, today over 20 percent of country's population depends on the forest resources.

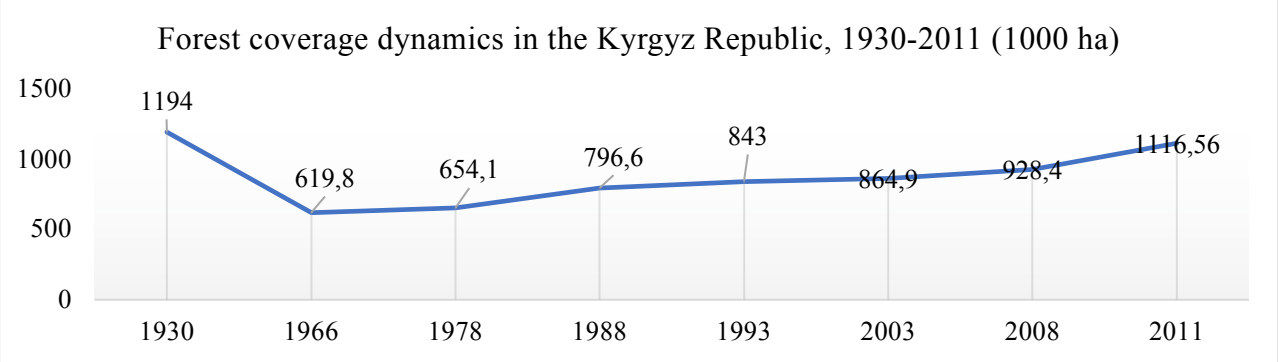
Overally, the history of forest sector has seen many sharp transformations starting from centralized solely governmental way of management ending with more decentralized joint forest management approach.

Pre-Independence Period

For nearly half a century, the forest sector of the country, as well as other industries, has been managed by centralized Soviet Union government. Generally, the decisions and policy regulations were developed with a focus on the preservation. When it comes to the model of ownership, forests were entirely state-owned, and the government was solely responsible for undertaking conservation, management and development activates over forest resources (Undeland, 2012).

Albeit, according to the information provided by the Forest Agency of the Kyrgyz Republic, the first decades under Soviet Union auspices were detrimental: massive losses of forest coverage took place in the period from 1930s until 1960s. It happened mainly due to the fact that the forest policy was mainly considering the forests as productive assets, as a consequence, they decreased twofold from 1194 ha to 619,8 ha, as seen on Figure 2.1.

Figure 2.1 Forest coverage dynamics in the Kyrgyz Republic, 1930- 2011 (1000 ha)



Source: State Forest Agency of the Kyrgyz Republic

The establishment of Ministry of Forestry to maintain supervision over forestry enterprises called Leskhozes in 1947 only enhanced the centralized governance and policy-making. Lezkhozes were established with the aim to undertake the economic use of forest resources with a perspective of long-term period, which prompted more sustainable way of usage and greater consideration for conservation and preservation throughout the Soviet Union, and hence, in Kyrgyzstan. After implementing in 1960s the Government Resolution №315 on forestlands and soil protection, the State policy shifted from intensive harvesting towards forest conservation. As a result of this policy, the forest coverage started to increase gradually in subsequent years.

Post-Independence Period

The collapse of the Soviet Union in 1991 caused vast destructuralization of the whole economy of the country, including the forest sector. Termination of full funding and provision of Leskhozes, increased poverty rate levels, high human and livestock pressure on forests, made the Government of the country to take some urgent actions in the form of development of new *Action Plan*, reconsideration of *Concept of Development*, and finally, adoption of *National Forest Program*. These documents were mainly prepared with the notion of three fundamental pillars- State, Man, and Forest. Working together, these mainstays presented the base for the sustainable forest management. At the same time, the focus on preservation has been continuingly increasing in the last 20 years.

To undertake a more proactive policy and integrate other policy elements such as the introduction of more decentralized decision-making power concerning management of forest resources and the community inclusion, the Government developed the model of Joint Forest Management approach. The main idea behind this policy is to rearrange and move from the exclusion of possibility to use forest resources to greater incentives and increased awareness among local population to utilize the forests in a more sustainable manner.

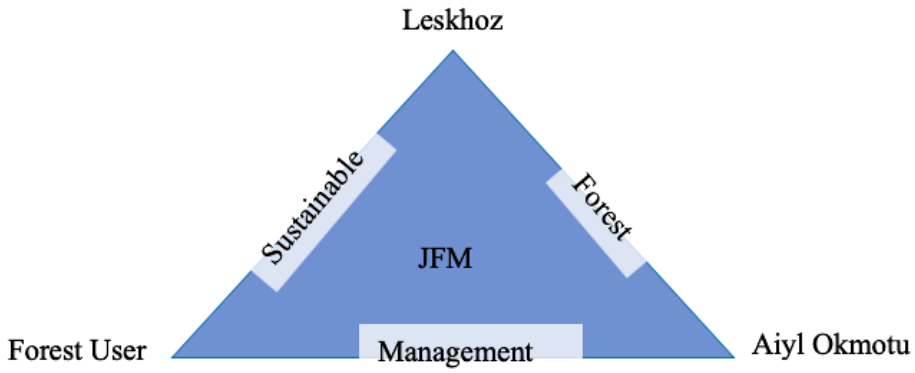
2.A.3 Joint Forest Management in Kyrgyzstan

The Concept of Joint Forest Management approach in the Kyrgyz Republic implies the forest management which is mainly undertaken by the Government in the face of the State Forest Administration Divisions (Lezkhozes), local communities living near forest areas (Forest Users), and partly by Local-Self-Government Authorities (Aiyl Okmotu) (see the schematic structure on Figure 2.2) (KIRFOR, 2015). JFM is carried out by leasing state forest areas to local population (under certain conditions) for long term use.

The main objectives of Joint Forest Management approach are as follows:

- promotion of rational and sustainable use of forest areas;
- protection of forest lands against deforestation, fires and other violations;
- improvement of living standards of rural population through providing them an opportunity to collect forest products and generate income;
- increment of forest coverage through conducting restoration and afforestation activities;
- support of local population's initiatives on creation of forest lining-out nurseries;
- involvement of local population in active forest management.

Figure 2.2. Structural construction of JFM approach



Source: (KIRFOR, 2015)

Legal Framework and Procedure of Joint Forest Management in Kyrgyzstan

The Joint Forest Management approach in the Kyrgyz Republic is regulated under Decree №482 approved on October 19, 2007.

a. General conditions

The lease of forest plots is carried out based on the principles of continuous, rational and sustainable use of forest resources. The procedure of distribution of forest land plots under Joint Forest Management approach is conducted only on the basis of formal contracts which are first drawn up for the period of 5 years, and in case of fulfillment of all terms and conditions, could be subjected to further prolongation up to 50 years. The maximum size of one walnut forest land plot area leased by the household is limited within 5 ha.

b. The procedure of distributing land plots

The provision of forest land plots for leasing is carried out on competition basis. All community members have the equal right to participate and use the forest plots. To ensure fair and objective distribution of forests, the Government creates the Commission Group consisting of representatives from State Forest Administration Divisions and Local-Self-Government Authorities (Aiyl Okmotu), in accordance with the rules and regulations "On the procedure for holding a forest competition", the Forest Code and civil legislation. After identifying target area for distribution, the state officially announces about the competition to people through public media channels. Interested households submit their plans indicating the characteristics of forest plots they want to lease (location, size and etc.) and indicate what kind of ecological benefits they can bring (f.e. forest planting). The Commission reviews plans, conducts personal interviews with applicants and based on that, makes

final decisions on forest land distribution. In case of more than one household wishing to lease the exact same area, the Committee chooses one of them based on their demographic and socio-economic profiles.

c. The Composition of Joint Forest Management Committee

The supervision of conducted activities, compliance with rights and obligations is performed by the Joint Forest Management Committee consisting of representatives of State Forest Administration Division, Local-Self-Government Authorities and activists among Forest User Groups. Notably, the number of people involved from each group is proportional.

d. Leasing fee

The use of forest areas in the Kyrgyz Republic is chargeable. The tenant pays the rent fee established by the contract. The fee is usually withdrawn in monetary form or in the form of fixed share of products (in kind), derived from the use of the forest plot.

e. Rights and obligations of Forest Users

Forest Users engaged in JFM have the right to:

- rationally use the leased forest plots in accordance with their purpose, terms and types of forest usage;
- dispose forest products resulting from their forest activities;
- terminate the contract;
- protect their interests (in case of their violation) in a judicial proceeding;
- extend the agreement after its expiration in accordance with the legislation of the Kyrgyz Republic;

Forest Users engaged in JFM are obliged to:

- use the forest plots only in accordance with its defined and approved purpose;
- carry out activities to promote the natural regeneration of forests;
- keep the fire safety rules and carry out fire safety measures, and in case of fire, ensure its extinguishing;
- to protect the forest from unauthorized cuttings, unsystematic grazing of livestock and other forest violations;
- comply with sanitary and environmental regulations;
- not to build unauthorized buildings and fences on the territory;

- notify the relevant authorities about the cases of windbreak, windfall and snowbreak that occurred in the territory.

In turn, the Forest Administration Committees consisting of chief forester and forest crop engineers should undertake control and monitoring actions over condition of forest plots, check on seedlings and planting projects.

PART B. EMPIRICAL REVIEW

The empirical analysis on assessing the effectiveness of Joint Forest Management (JFM) approach in building sustainable livelihoods has been sparse, and moreover, the results have been rather ambiguous to get any generalized conclusive idea. From one side, there are the cases when JFM has improved living conditions of local people and increased the forest coverage, but on another, there are the examples when this approach did not have any effect or even deteriorated the initial conditions.

(Banerjee, 1998) in his paper considered the effectiveness of JFM after eight years of its implementation in seventeen Indian states, and found out that, overally, it had a positive effect. It contributed to the improvement of livelihoods and protection of forest areas. In many of the places where JFM had been adopted, the forests revived dramatically. Another quite recent research of (Ahmed & Jana, 2017) conducted in six Forest Protection Committees of West Bengal, India, also revealed the tremendous potential of JFM in increasing living standards and quality of life of the forest fringe poor people. The approach has been beneficial in boosting five types of capitals, which in turn, played an instrumental role in livelihood generation through earnings from the sale of forest products, and social participation in the forest management process.

On the contrary, the work of (APFC, 2010) reports that JFM does not necessarily lead to community empowerment and forest regeneration. In the case of Papua New Guinea, there has been an adverse result due to multiple macro and micro level issues the first comprising of observed deficiencies in political will, lack of strong policies and appropriate legislations, and the latter consisting of power usurpation by local elites, lack of incentives for forest user groups, failure to wean people away from the forest dependency and lack of local people participation.

Overall, there is an empirical confirmation that JFM can result in increased livelihoods and forests restoration, however, micro and macro level factors should be carefully taken into consideration.

CHAPTER III RESEARCH METHODOLOGY

PART A. CONCEPTUAL FRAMEWORK

3.A.1 Forest and Poverty Linkages

The role of forests in people's livelihoods is immense (TCRN, 2009). According to (FAO, 2015)'s estimates close to 1.6 billion people, around 20% of total population on earth, depend on forest resources for their livelihoods, majority of whom are poor and vulnerable. The fact that so many poor people live near forest areas suggests that there is an intrinsic relation between forests and poverty (Wiersum & Mirjam , 2005). From one side, it is a common phenomenon that poorer people are usually more attracted to forest livelihoods (Kraaijeveld , 2013). This can be explained by numerous reasons. First of all, majority of poor people usually tend to suffer from lack of education and job opportunities to generate any livelihood in any sector, but as for the forestry sphere, it is relatively much easier to get engaged in there, because the entry capital and competence requirement level is low. And second of all, until quite recently the access to forest goods was not that difficult, especially in the areas with full open access. From another side, poverty and forestry livelihoods are connected by the feature that they lack possibilities to overcome the poverty. Because of forests' isolated location and lack of contact with wider economy, communities usually do not have sufficient access to markets, adequate infrastructure facilities, healthcare and education services (Sunderlin & Thu Ba, 2005). Moreover, the uncertainty and insecurity in land ownership makes them even much weaker and more vulnerable for adverse conditions and external shocks (Chagutah, 2013; IFAD, 2015).

Another aspect which considers the forest-poverty linkage refers to the notion of deforestation and sustainable development. (Siyanga & Muyoyeta, 2012) states that high poverty levels and lack of alternatives sources of livelihood resulting from overdependence on natural resources exacerbates environmental degradation putting forests' sustainability in jeopardy. This, in turn, leads to inability of communities to generate livelihoods in long-term period pushing them into much more severe poverty.

Apparently, above given connections are not clear-cut. Indeed, rural people's overreliance on forest products is falling over time. This is happening because nowadays they relate to the forest sector as an opportunity to generate additional income putting an actual effort in non-forest sectors such as agriculture or aquaculture. Noteworthily, the forestry is most beneficial in coping up with seasonal shortages which agriculture sphere has. Talking about agriculture and other non-forest activities, their development decreases the livelihoods reliance on forest resources. This is because recently these forest areas have been actively used for crop production either in sustainable or unsustainable way.

Moreover, this change towards forestry indicates that other sectors are much more profitable from economic point of view.

In fact, depending on which way forest resources are governed, the role of forests in rural communities' livelihood is different, hence, very context-specific and diverse (Kraaijeveld , 2013). And the efficiency and enthusiasm level of people to administer the forest lands sustainably mostly relies on their dependence on forest goods and the level of access. Consequently, to assess the effectiveness of JFM approach on people's livelihoods, one should understand what kind of role the forests play in their lives. For that, it is recommended to look deeper at cluster of livelihood assets.

3.A.2 Conceptual Framework of the Study

The current study is based on the Sustainable Livelihood Framework of (DFID, 1999), which presents the main factors and processes that affect the livelihoods, particularly the livelihoods of the poor. It is considered as a tool to conceive the complicacy of rural forest communities and their livelihood changes (Kraaijeveld , 2013). But before diving into specifics of this Framework, it is essential to explain the Concept of Sustainable Livelihoods first.

The definition of **Sustainable Livelihood** given by (Chambers & Conway, Sustainable Rural Livelihood: practiocal concepts for the 21st century, 1991; Morse, McNamara, & Acholo, 2009) is determined as follows: *"A livelihood comprises the capabilities, activities required for a means of living and assets, including both tangible and intangible; and is termed sustainable when it can get through and recover from stresses and shocks, maintain and preserve its capabilities and assets both now and in the future without threatening the natural base".*

The idea of sustainable livelihoods was first proposed by the Brundtland Commission on Environment and Development in 1987, following the 1992 United Nations Conference on Environment and Development, which broadened the concept, by linking the poverty eradication with the use of natural resources in a sustainable way (Krantz, 2001; Solesbury, 2013).

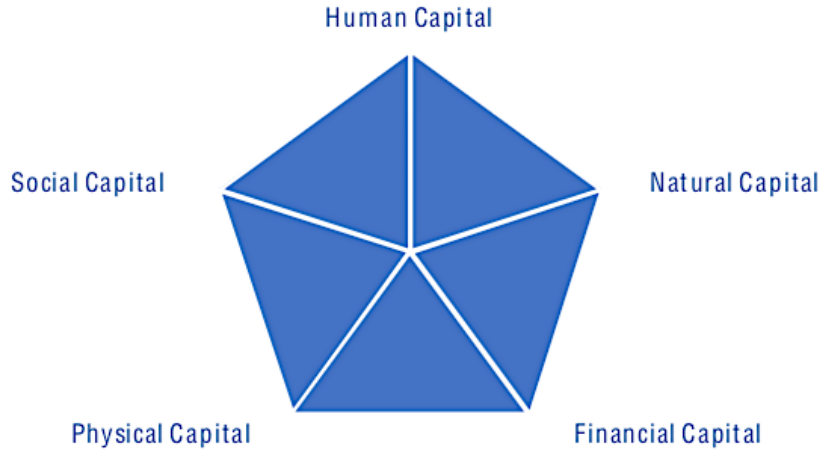
According to (Krantz, 2001), the notion of Sustainable Livelihood approach is an endeavor to capture the manifold aspects of poverty, in a point of fact, not only income, but also equally important constituents such as vulnerability and social inclusion, which offers a more coherent and integrated approach to poverty. So over time, by development of new theories, the prominence from materialistic terms has been shifted to non-materialistic ones embracing people's well-being, their

daily living needs and current social, political and cultural values held among them (Kraaijeveld , 2013). Another unique idea that evolved as part of new theories is Amartya Sen's capability approach. (Alkire, 2002) states that this approach can be coherently and substantially implemented in any participatory poverty reduction activities and works with a particular consideration of poor people's capabilities and abilities, voices and values. All these concepts have further affected the development of the Sustainable Livelihood Framework, which enhanced people-oriented, holistic, participatory and sustainability aspects of other approaches.

The Sustainable Livelihood Framework is a tool that elicits the factors that have an impact on livelihoods, and the way how these factors are interconnected with each other. It puts an emphasis on people's possibilities and constraints that they have to fight the poverty. They are determined by their different level of access to livelihood assets which gives them the capability to act (Serat, 2017; Bebbington, 1999). As for the assets, the standard set consists of 5 types of capitals: natural, financial, human, physical and social (DFID, 1999). And the balance between all five of them is crucial in reducing the vulnerability of people to external factors (Chambers & Conway, 1991).

The assets in the Framework are presented in the form of pentagon (see the Figure 3.1) which allows to see the differences in people's access to livelihood assets more clearly. The main notion is that, the focal point, where the livelihood asset lines intersect each other, states zero access, whereas the outer lines represent the maximum access to assets, therefore, depending on different groups of people and their status, variously-shaped pentagons can be created (DFID, 1999).

Figure 3.1 Model of livelihood assets



Source: (DFID, 1999)

These above stated five capitals are expressed as follows:

Natural capital

Natural capital implies the natural resources base from which the other resources and services necessary for people's lives can be derived. The type of resources can vary vastly starting from *public goods* like biodiversity degree and air quality, ending with *private* ones like access to land, forests or fertile soil (DFID, 1999).

Within this Sustainable Livelihoods Framework, the connection between the current type of capital and Vulnerability term is very tight (UNDP, 2017). It is also because the natural shocks and disasters that destroy the livelihoods of people are themselves the part of natural processes.

Certainly, this capital is very important for people in general, especially for those whose livelihood partly or fully rely on any kind of natural resources such as forestry, crop production, cattle breeding, fishing, extraction of mineral resources and etc. However, the issue of access to these natural resources is a huge obstacle for them. To help to solve this problem, JFM targets to ensure them securement and provide more rights through proper government forest regulations and norms (Padney, 2005). Besides improving the livelihoods of people, JFM approach intends to preserve and enlarge biodiversity and nature resource base (UNDP, 2017).

Financial capital

Another important element of livelihood pentagon is the financial capital. This capital represents the financial resources that are needed for achieving the livelihood objectives (UNDP, 2017). According to (DFID, 1999) the financial capital can be gained either through *available stocks* or *regular inflows* of the money: the first consisting of savings, which, by the way, are much more preferred due to absence of liabilities attached, and the latter comprising of income, pensions, any governmental transfers and remittances.

It is stated that among all others, this capital is most flexible and adjustable in a sense that it can be easily converted or transformed into other forms of capitals. Another distinguishing feature is that, it can be used directly for attainment of livelihood outcomes, for instance, the case of reduction of food insecurity through procurement of food. Albeit, this is also the capital which is least available to most deprived livelihoods (UNDP, 2017).

To improve the conditions of the poor, JFM approach aims to increase their earnings through providing them an opportunity to collect and sell forest goods (Belcher, 2005), so that with gained income, they can own or get access to some other types of capitals (Padney, 2005).

Physical capital

Physical capital is the category of assets which is created by livelihoods themselves (Padney, 2005). It includes *basic infrastructures* such as buildings, telecommunication, roads; *produced goods* like machines and equipments that can make people's work much more productive; and s*ervices* as clean and affordable energy, affordable transportation, adequate water supply and sanitation and etc. (DFID, 1999).

Many studies have proved that the lack of proper infrastructure can be one of the main reasons of poverty, because, for instance, without the adequate access to water and sanitation, human healthcare condition weakens, which in turn, deteriorates his general well-being (UNDP, 2017). Therefore, in most of the cases, JFM approach targets at involving direct investments such as roads, bridges, wells in the areas where it is implemented (Padney, 2005). It is also a typical case when the earnings from these facilities is again invested in physical assets, creating a positive chain of benefit circulation.

Social capital

Although it is usually not that easy to describe what exactly "social capital" means, in this particular framework, it is referred to social terms on which people rely on to achieve their objectives. They include *networks and connections* that increases the confidence level of livelihoods to work and act together with others and *relationship of trust* which can increase the partnership between community members (UNDP, 2017).

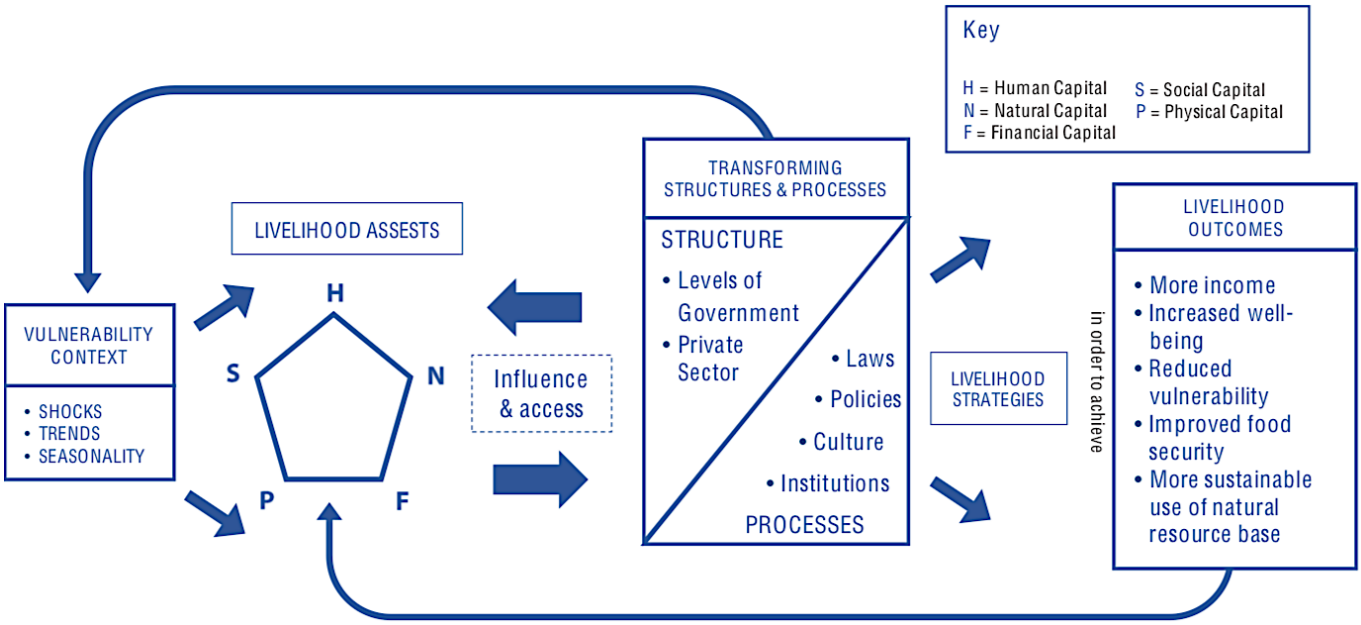
Social capitals as such has much capacity to act. It can not only help to solve the problem of "free-riding" associated with public goods, but also improve the management effectiveness over common resources through improving the institutions that should help to develop human capital in collaboration with communities, families, schools and others. JFM program intends to contribute to social capital and build a strong social network (Padney, 2005).

Human capital

Human capital considers education, knowledge, abilities, skills, experience, information, health condition and motivation of people (UNDP, 2017). JFM plans to contribute directly to human capital by organizing educational trainings. It is expected that the income earned from trading of forest goods will be invested for the development of this capital (Padney, 2005).

The level of livelihoods' accessibility to all five assets differs from case to case. As presented on Figure 3.2, the Sustainable Livelihood Framework represents the comprehensive picture demonstrating that people's livelihoods are determined by multiple groups of auspicious and restraining factors. Within this Framework, there are four elements that have an influence over livelihood assets (Kraaijeveld , 2013).

Figure 3.2 Sustainable Livelihood Framework



Source: (DFID, 1999)

Livelihood strategies

Livelihood strategies impart "the range and combination of measures that people take in an attempt to achieve their livelihood targets and outcomes" (DFID, 1999). These strategies show how people blend their income-yielding activities, the way how they manage and use their possessions and capitals, which one of them they prefer to invest in, and the way how they maintain to hold and save their available assets. At the same time, livelihoods are different at each level, for instance, people may rely on income coming from different activities simultaneously (Warren, 2002).

Livelihood outcomes

Livelihood outcomes appear as a result of above described livelihood strategies (Kraaijeveld , 2013). It said that the outcomes might also have an effect on other capital assets. For instance, if we consider the usage of fertilizer (included in physical capital), it might increase the agricultural harvest.

Vulnerability context

The Vulnerability Context can be referred to some sort of external occasions which can bring insecurity to people's lives and might even destroy their livelihoods. They are the factors over which people usually do not have any control (Padney, 2005). The examples of such shocks can be floods, earthquakes, dry season, conflicts and others (DFID, 1999).

Transforming structures and processes

As the name itself is saying, this element is responsible for undertaking some reformative actions. These processes shape livelihoods and assets later on. The structure consists of institutions and organizations that create legislations and policies and determine the so called "rule of games" that every stakeholder at all levels opt for (Padney, 2005).

All in all, this above stated Framework consisting of five capitals and web of various factors is very helpful in understanding the overall picture. It helps in guiding the entire process and defining the data that should be collected, which in turn, is essential in assessing the overall role of JFM approach on livelihoods of rural people.

3.A.3 Livelihood Indicators

As stated above, the Sustainable Livelihood Framework forms the base element of this study.
The table below shows the key indicators that are related to the assessment of JFM approach on people's livelihoods:

Table 3.1. Livelihood Assets and Key Indicators

Asset	Key indicators
Human	Education and Trainings
	Access to healthcare services
	Child enrollment in school
Social	Social harmony and social bonding
	Social status in the society
	Mobility level
	Decision-making power
Natural	Ability to bring any productive change in the forest
	Awareness of environment

	Perception of natural resource use
	Use of wood for cooking purposes
Financial	Income level
	Propensity to savings
	Access to credit markets
	Creation of other income generating opportunities
Physical	Access to markets
	Land ownership
	Disaster resilient housing
	Renovation of housing
	Access to information
	Access to safe drinking water
	Access to sanitation
	Infrastructure facilities

Source: (UNDP, 2017)

PART B. DATA COLLECTION

This thesis work has been conducted in one of the Forest Divisions of Arslanbob Forest Area, Kyrgyzstan. The research has been based both on primary and secondary data collection. The primary data has been obtained through household surveys, key informant interviews, focus group discussions and personal observation. More detailed information about the research has been described in below given subsections.

3.B.1 Research Objectives and Questions

This research aims to assess the effectiveness of JFM on sustainable livelihoods of rural people living in Arstanbap-Ata Forest Management Division of Arslanbob Forest, Kyrgyzstan through primary data collection from sample group of households among participants of JFM program.

Research questions:

1. What kind of changes have occurred in livelihoods of rural people living in Arstanbap-Ata Forest Management Division as a result of their participation in JFM program?
2. What transformations have been observed in the walnut forest coverage of Arstanbap-Ata Forest Management Division in the period from 2007 to 2017?

3. What are the strengths, weaknesses, opportunities and threats of JFM approach in Arstanbap-Ata Forest Management Division?

3.B.2 Selection of Study Area

The study has been conducted in Arslanbob Forest Area of Jalal Abad Oblast, Kyrgyzstan with a particular consideration of Arstanbap-Ata Forest Management Division consisting of 5 villages. Such precise site selection can be explained in the following way.

First of all, Arslanbob Forest Area is one of the first sites in Kyrgyzstan where JFM approach has been officially implemented for over 10 years. Second of all, the matter which makes this place so unique is the fact that Arslanbob is considered as the biggest natural walnut forest in the world (Ford, 2017).

Image 3.1 Arslanbob Forest, Kyrgyzstan

Source: (Ford, 2017)

Covering approximately 60,000 hectares of total walnut area, this unique forest is located in western side of the country at an altitude of 1700 meters in the territory of Fergana and Chatkal Mountains and distributed over Arslanbob Kugart and Khoja Ata forest ranges stretching across 630,900 hectares (TOOKG).

Like in any other places in developing country, where the majority of rural communities tend to live near natural resources, Arslanbob Forest has also been a hot spot for thousands of people. The

economic activity of the entire region concentrates around the walnut collection, and hence, the wellbeing of residents falls and rises based on its harvesting (IUCN, 2018).

Image 3.2 Location of Arslanbob Forest in Kyrgyzstan

Source: (Wismayer , 2014)

Overall, Arslanbob Forest of Bazar-Korgon region consists of one Protected Forest Reserve Area-Dashman, and 6 Forest Management Divisions: Toskool-Atinskiy, Kabinskiy, Jai-Terek, Arstanbap-Ata, Kyzyl-Unkur and Achi. The government of the Kyrgyz Republic in 2007 implemented JFM approach in 5 of them (Kabinskyi, Jai-Terek, Arstanbap-Ata, Achi and Kyzyl-Unkur), however, among others, Arstanbap-Ata rises a particular interest. Unlike others, where the walnut area is in abundance, Arstanbap-Ata Division distinguishes with very high population number and insufficient walnut land plots available for leasing (see Table 3.2 below) (SCKR, 2016). The total population of this Division accounts for about 20000, while in others the numbers are two or three times less. Therefore, precisely this Division provides the best opportunity to assess the effectiveness of JFM approach on sustainable livelihood of people in its full capacity.

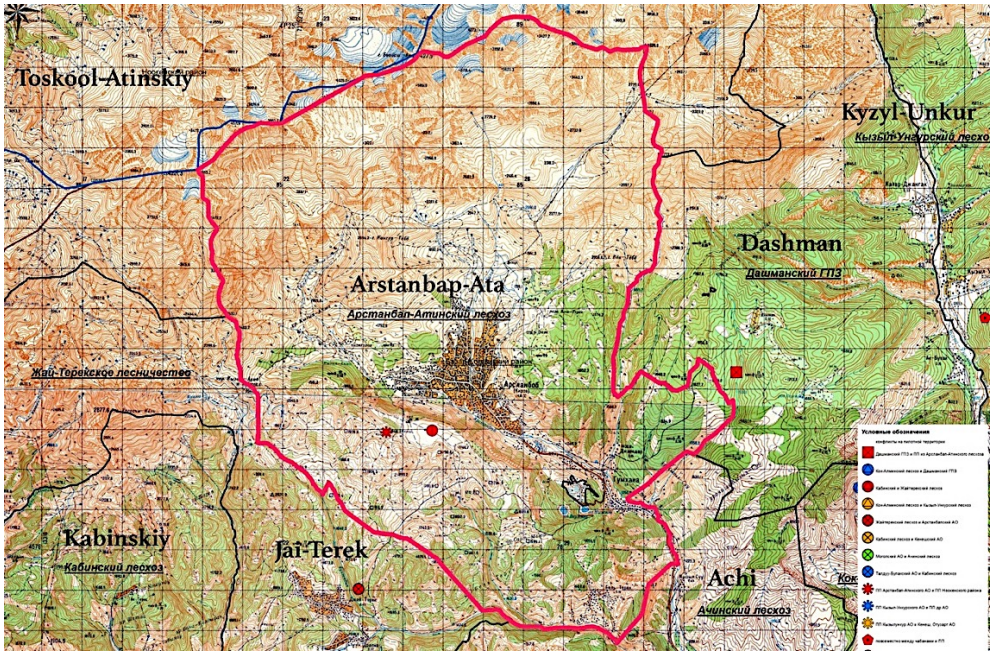
Table 3.2. Distribution of Walnut Forest Coverage by Forest Management Divisions, 2017[1]

Forest coverage of Forest Management Divisions (in ha)				
Arstanbap-Ata	Kabinslyi	Kyzyl-Unkur	Achi	Jai-Terek
4651,9	5121,2	25 478,3	7026,9	3217,0

Source: Annual report prepared by Administrative Office of Arstanbap-Ata Forest Management Division

[1] Note: The information about forest coverage for Toskool-Atinskiy Division was not available

Image 3.3 Geographical location of Arstanbap-Ata Forest Management Division



Source: (FFI, 2018)

Description of Selected Study Area

1. Location

The Arstanbap-Ata Forest Management Division (Leskhoz) is located in the territory of Bazar-Korgon Administrative District of Jalal-Abad Oblast, Kyrgyzstan. The territory of the forest enterprise consists of a single array. The Division borders with Toktogul region in the north, Dashman Forestry Reserve in the east, Achi Forest Division in the south-east, Jai-Terek Forest Division in the south-west, and Toskool-Atinskiy Forest Division in the north-west.

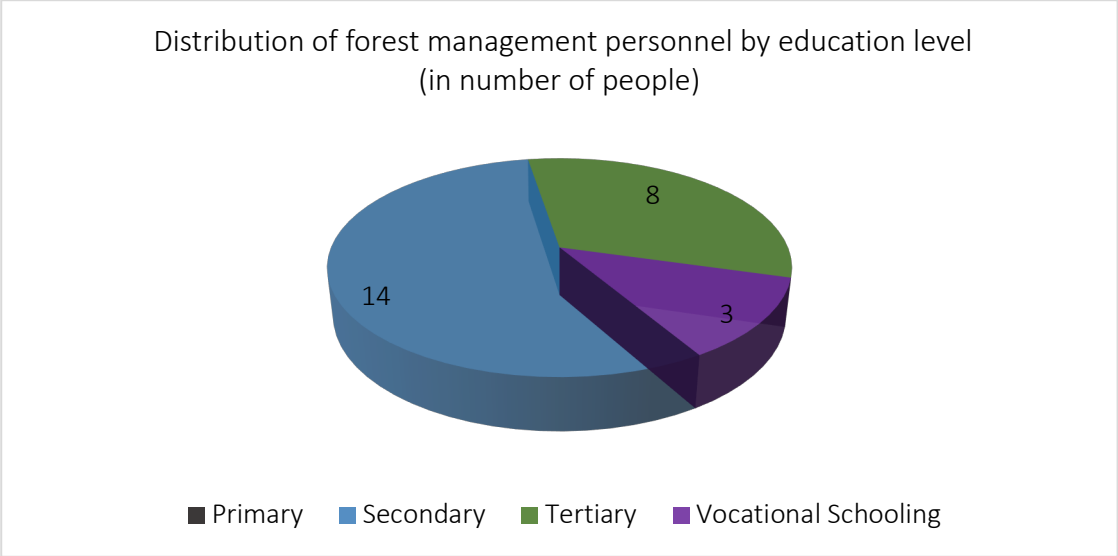
2. Total territory

The total territory of Forest Management Division constitutes 13234 ha of which 4651,9 ha is covered prevailingly by walnut forest.

3. Administrative Office and Personnel number

The main Administrative Office of the Division is located in Gumkhana village, 80 km away from Jalal-Abad city. The management personnel staff represents a team of 25 people (of whom 13 are Kyrgyz, 12 are Uzbek): 1 director, 5 forest engineers (one for each forest subdivision), 18 forest officers and 1 booking-clerk.

Figure 3.3 Distribution of forest personnel by Education level



Source: Annual report prepared by Arstanbap-Ata Forest Management Division, 2017

4. Main responsibilities of the Forest Administration Division

As a state body, the leskhoz implements forest policies on its territory in accordance with the Forest Code and aims to protect the forest estate, carry out reforestation and afforestation activities and improve the living standards of local communities.

5. Population

The Division consists of 5 villages: Arslanbob, Bel-Terek, Gumkhana, Jai-Terek and Jaradar. The cumulative population of all five villages is 20 124 people. Arslanbob village is considered as the district center, which is why the high number of people reside there[2].

Table 3.3. Population of Arstanbap-Ata Forest Management Division by villages

Village name	Population number
Arslanbob	13269
Bel-Terek	1272
Gumkhana	2089
Jai-Terek	2856
Jaradar	638
Total	**20124**

Source: (SCKR, 2016)

[2] Information was obtained from Administrative Office of Arstanbap-Ata Forest Management Division and Arslanbob Village Administration (Aiyl Okmotu).

6. **Infrastructure and social services**

There is the main asphalted road which connects five villages with the regional center. For the convenience of local residents, there is the service of public bus available on the daily basis. In Arslanbob village (district center), there are two schools, two kindergartens, one hospital, one bazar (central market), one central park, one post office and one telegraph.

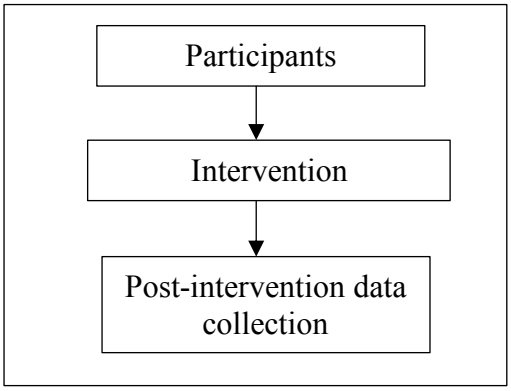
7. **Main economic activities**

The population is mainly engaged in forestry and cattle breeding activities. Noteworthily, people in Arstanbap-Ata Forest Management Division are less involved in agricultural sector than in other places due to lack of terrain suitable for crop production.

3.B.3 Research Method

The study aims to assess the effectiveness of JFM approach on sustainable livelihoods of people based on Recall Analysis Method (Grimshaw, Campbell, Eccles, & Steen, 2000).

Figure 3.4 Structural representation of Recall Analysis Method



Source: (Grimshaw, Campbell, Eccles, & Steen, 2000)

In this Recall Analysis, the Joint Forest Management approach is considered as "Intervention" and its results are analyzed port-test only due to the fact that the data prior the intervention cannot be obtained (Robson, Shannon, Goldenhar, & Hale, 2001).

The analysis relies on the recall ability of respondents to record the changes in their livelihood assets that occurred as a result of JFM implementation. To minimize the so called "history threats", a very careful consideration has been given to the events that could affect the outcome of the survey.

3.B.4 Sampling Method and Sample Size

At the moment of field survey conduction, there were **1219** households in total leasing particularly walnut forest plots under JFM approach regulated by Decree №482 adopted in 2007[3]. All of them have been leasing the forest plots from 12 to 8 years as minimum. There were mainly the cases of households which prolonged the contract for another term or transferred the leasing rights to another family member within the same household.

The population size constitutes 1219 households. The list with detailed information has been provided by Administration Office of Arstanbap-Ata Forest Management Division for further consideration, so that after analyzing it, it turned out that 49% of households were Uzbek and 51%-Kyrgyz. Since the ratio of two of them has been equal, the researcher divided the population into two different lists: one with Kyrgyz and another with Uzbek households, and picked up sample randomly from these two lists respectively in the following way:

- 40 households were randomly selected from Uzbek list
- 40 households were randomly selected from Kyrgyz list

Table 3.4. Population and sample size

Population size (N)	1219
Sample size (n)	80

3.B.5 Data Collection

a. Source of Data

Primary Data: Field Research.

Secondary Data: Administration of Arstanbap-Ata Forest Management Division, Statistical Committee of the Kyrgyzstan Republic, State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic.

b. Methods of Data Collection

The study is based mainly on qualitative methods of data collection.

Data collection tools: Questionnaire Survey, Interviews with Experts and Key Informants, Focus Group Discussions and Personal Observation.

[3] Data obtained from Administration Office of Arstanbap-Ata Forest Management Division

c. Primary Data Collection

Timeframe of Primary Data Collection: March 7-31, 2019.

Primary Data was collected through conducting household surveys, focus group discussions, interviews with experts and key informants and personal observations.

Household Survey

The Household Survey is a core part of this research. It provides the main information about people's livelihood assets and strategies and the relevance of JFM approach to rural households of Arstanbap-Ata Forest Management Division. Moreover, the analysis is entirely based on this household survey. The Questionnaire (see in the Annexure) was developed with the help of (UNDP, 2017) guidelines. It includes both closed and open-ended questions. The closed questions are related to the livelihood assets (see the Table 3.1). And the open-ended questions regard participants' opinion and thoughts concerning the role of JFM approach in their lives.

The researcher conducted the pretest of the questionnaire and changed the details accordingly to finalize it. Additionally, the researcher knew both of the local languages- Kyrgyz and Uzbek, and the area context, which in total made the process of data collection much easier.

Focus group discussions

In total 3 Focus Group Discussions (FGDs) have been carried out in order to understand people's overall opinion and visions in regard to the role of JFM approach in the community. The discussions have been related to its effect on forest condition and rural livelihoods; pros and cons and possible recommendations. The purpose of conducting FGDs was in obtaining additional information for data triangulation. The questions were mainly open-ended and less structured to trigger the discussion between participants.

Table 3.5. Details of Focus Group Discussions

Focus Group Discussion	Date	Village	Number of participants
1	12-03-2019	Gumkhana	5
2	15-03-2019	Arslanbob	7
3	21-03-2019	Bel-Terek	5

Interviews with Experts and Key Informants

To acquire more information about JFM approach, 11 interviews with experts and key informants have been conducted in total, of which 5 have been carried out with Forest Department staff, 2 with Village Deputies, 2 with Village Chiefs, 1 with Representative of International Organization and 1 with Head of Women's Club Association. All the interviews have had a semi-structured character which offered a certain structure at the same time, allowed new issues and questions to be brought up.

Table 3.6. Details of Interviews with Exerts and Key Informants

№	Date	Interviewee	Organization
1	09-03-2019	Mr. K. Pinazarov	Head of Arstanbap-Ata Forest Management Division
2	09-03-2019	Mr. Y. Hasanov	Main Forestry Officer of Arstanbap-Ata Forest Management Division
3	09-03-2019	Mr. S. Arinov	Main Forestry Officer of Arslanbob Village
4	11-03-2019	Mr. U. Shamshiev	Main Forestry Officer of Bel-Terek Village
5	16-03-2019	Mr. N. Egemberdiev	Main Forest Engineer
6	13-03-2019	Mr. T. Ibraimovich	Deputy of Bel-Terek Village
7	14-03-2019	Mr. O. Bolotov	Deputy of Gumkhana Village
8	18-03-2019	Mr. A. Davletaliev	Chief of Jaradar Village
9	19-03-2019	Mr. I. Asanov	Chief of Jai-Terek Village
10	22-03-2019	Mr. B. Tagaev	Representative of Flora and Fauna International Organization in Kyrgyzstan
11	11-03-2019	Ms. B. Pazylova	Head of Women's Club Association in Gumkhana Village

Some of the questions asked:

- What are the activities carried out by JFM?
- What changes have you observed as a result of JFM approach in the community?
- What changes did you record in the forest condition after JFM implementation?
- What are the remaining challenges that could be improved?

Observation

Personal observation has been used to find answers to major questions required to identify the effect of JFM approach on the livelihoods. Questions like:

- People's attitude towards JFM approach?
- People's attitude towards forest resources?
- Living conditions of respondents?

d. Ethics

Research sample has been fully informed about the purpose, methods and intended possible uses of the research. Moreover, formal consent notes developed with the help of (SC, 2018) (see in the Appendix) have been obtained from all of the respondents. The confidentiality of information provided by research subjects have been respected by ensuring the anonymity of respondents in the study. Furthermore, the participation of survey respondents has been voluntary, and participants were free to withdraw themselves at any point of the research.

e. Quality indicators

1. Prolonged engagement:

The researcher contacted the Director of Administration Office of Arstanbap-Ata Forest Management Division and Representatives of International Organizations working in a place to establish communications and obtain general information about JFM approach in a local context one month prior before the start of the field survey to further ensure the smoothness of work from its the very first days. And devoted longer period of time for persistent observation.

2. Triangulation:

In order to cross-validate the data and capture the different dimensions of JFM approach, researcher analyzed collected information through the use of variety of data collection methods listed above (household surveys, focus group discussions, interviews with experts and key informants, and observations).

3.B.6 Limitations

Lack of previously conducted studies: Reports and researches related to the assessment of effectiveness of Joint Forest Management approach on sustainable livelihoods were scarce. Therefore, this study had to reckon on limited guidance available from the literature.

Short time span and small sample size: The time available for primary data collection was restrained by three and half weeks. This, in turn, limited the sample size- 80 households. Basing the work on higher sample size could have given more accurate results. However, the researcher did not intend to perform any statistical analysis (which needs a restrictive sample size), therefore, she invested her time and energy on quality rather than quantity of the performed work.

Problems of stakeholders' participation: Some of the representatives of international organizations involved in JFM approach in Arstanbap-Ata did not take keen interest in reviewing the process and were not ready to share with the information they have had in their database for undeclared reasons (f.e. progress reports).

CHAPTER IV RESULTS AND DISCUSSIONS

4.1 Sample Characteristics

Sample distribution by Gender

Out of 80 participants, 73 are male and only 7 are female. Such an uneven gender distribution can be explained by the fact that the researcher attempted to survey mainly household heads under whose name almost all the contacts were drawn up[4]. The percentage of Male Headed households constitutes 92%, while Female ones only 8%.

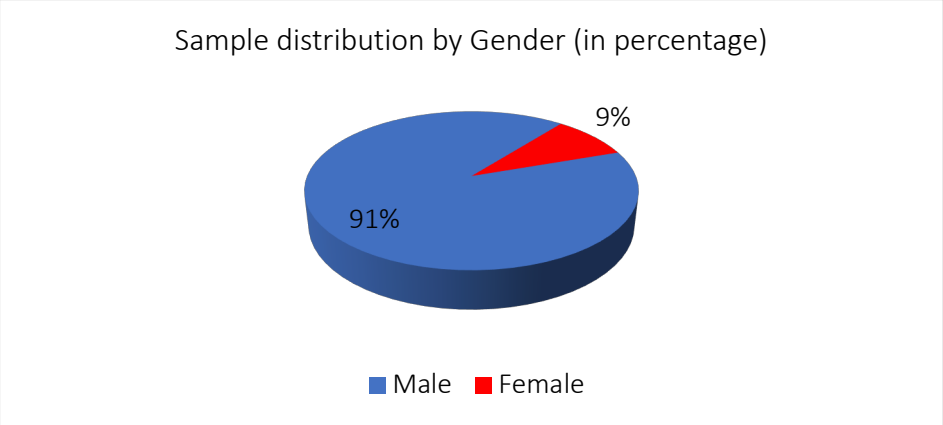


Figure 4.1 Sample distribution by Gender

Sample distribution by Marital Status

87,5% of respondents are married, 8,75% are divorced and the remaining 3,75% are widowed. Absence of respondent with "single" marital status is natural, as the land plots are leased to households, not single individuals.

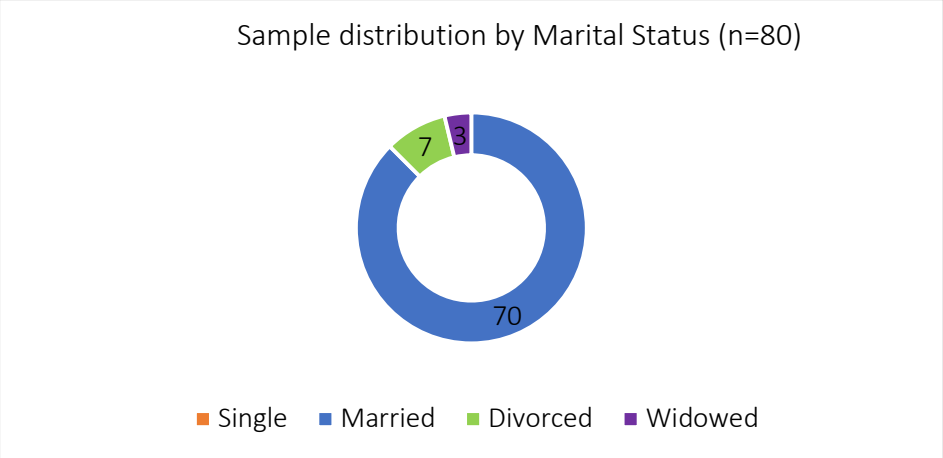


Figure 4.2. Sample distribution by Marital Status

[4] Household head is a person who represents the entire family. Due to social and religious characteristics, the households in Kyrgyzstan are prevalently male-headed

Sample distribution by Age Groups

Out of 80 respondents, majority belong to the age group of 30-59.

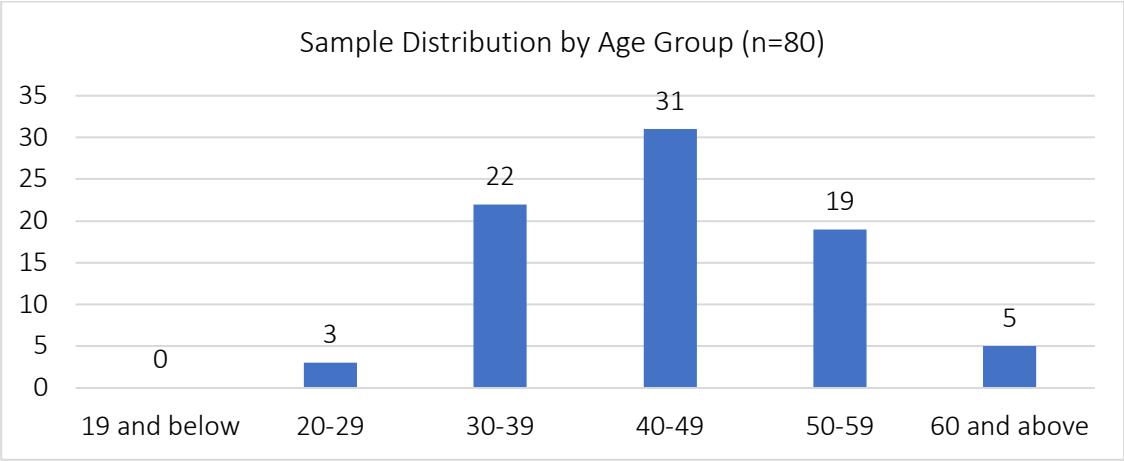


Figure 4.3 Sample distribution by Age Groups

Sample distribution by Ethnicity and Village

As stated before, the population size is almost equally represented by Kyrgyz (51%) and Uzbek households (49%). Hence, the sample size of 40 Kyrgyz and 40 Uzbek families has been selected. It turns out, that Arslanbob village mainly consists of Uzbek and other four ones of Kyrgyz, forming naturally the ethnic separation.

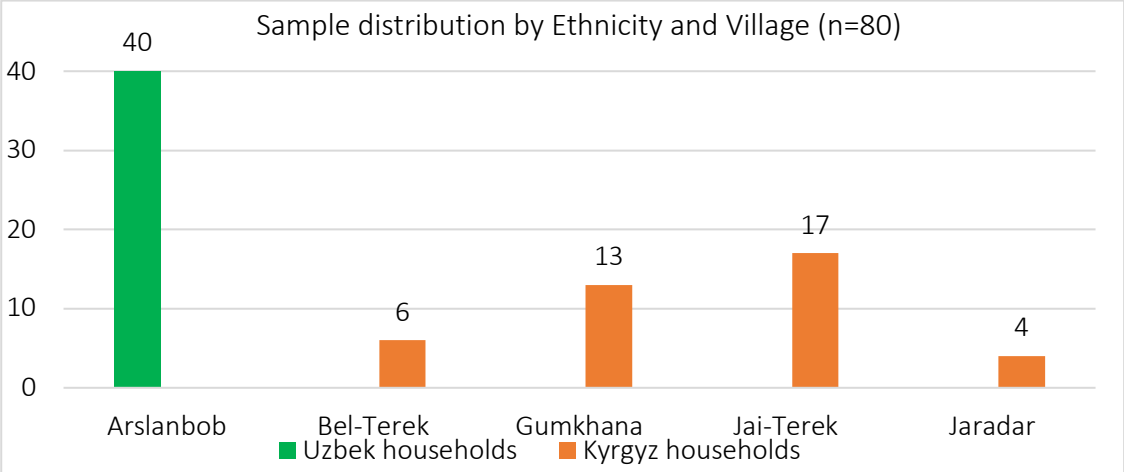


Figure 4.4. Sample distribution by Ethnicity and Village

Sample distribution by Education level

All of the respondents are literate, with at least 9 years of schooling as the highest level of education attained for most of the participants as evident in the below presented chart. Overally, the high literacy rate of entire population has been achieved thanks to the free universal compulsory education policy emulated from Soviet period time. Noteworthily, in 2015, adult literacy rate for Kyrgyzstan constituted 99.5% (WDA, 2015).

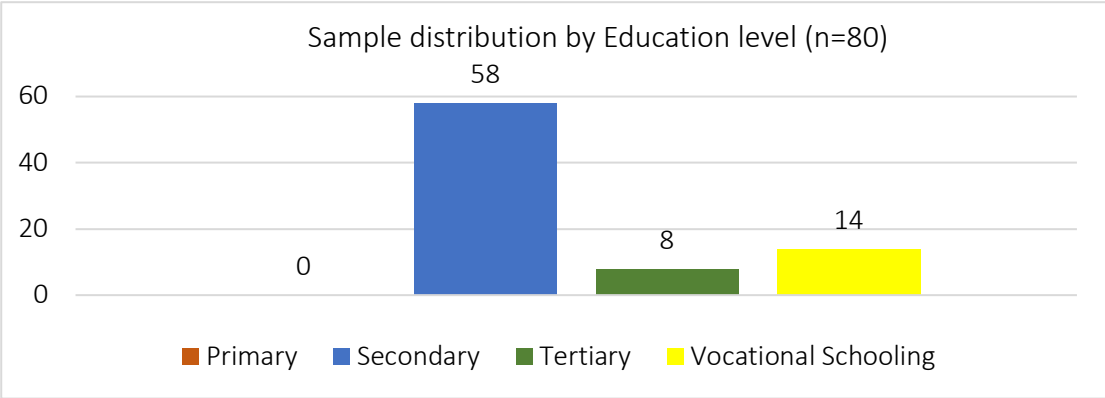


Figure 4.5 Sample distribution by Education level

Sample distribution of Respondents by Occupation

As evident on the graph, majority of the respondents were mainly involved in forestry (66%), followed by livestock-breeding (12%), agriculture (8%), and construction sectors (6%).

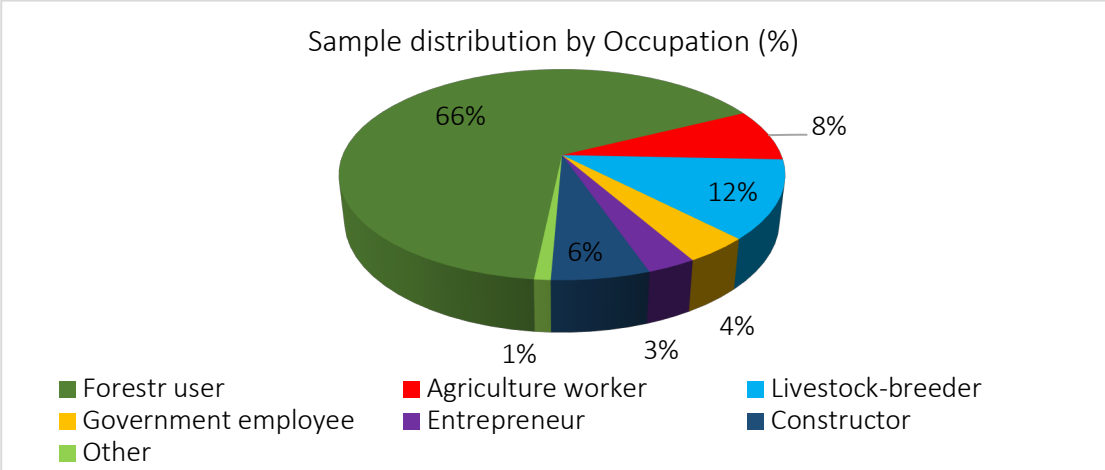


Figure 4.6 Sample distribution by Occupation

To have a better idea about the demographic characteristics of the households in general, let's consider the household roster data. The information collected states that the average respondent's family comprise 5 individuals (number of family members living under one roof).

Sample distribution of Respondent's Household Members (HM) by Age Groups

The majority (59%) of respondent's household members are in working age (15-64).

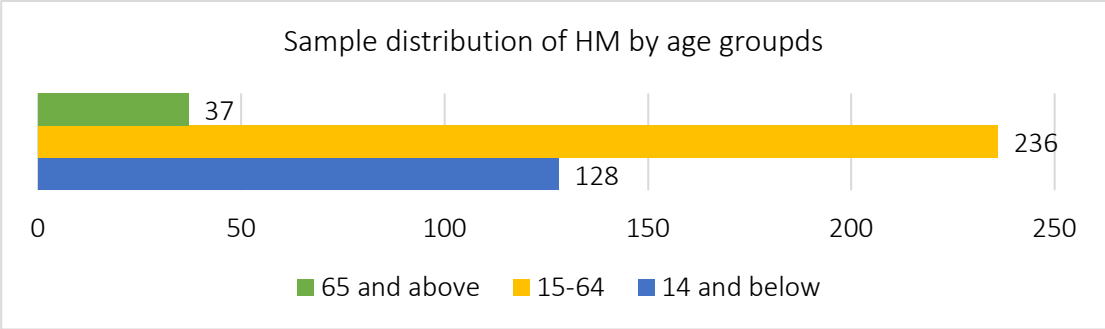


Figure 4.7 Sample distribution of Respondent's Household Members by Age Groups

Sample distribution of Respondent's Household Members (in working age) by Occupation

As shown on the Figure below, the prevailing share of the household members were also mainly occupied in forestry sphere, which indicates the high dependency ratio of families on the forest natural resources.

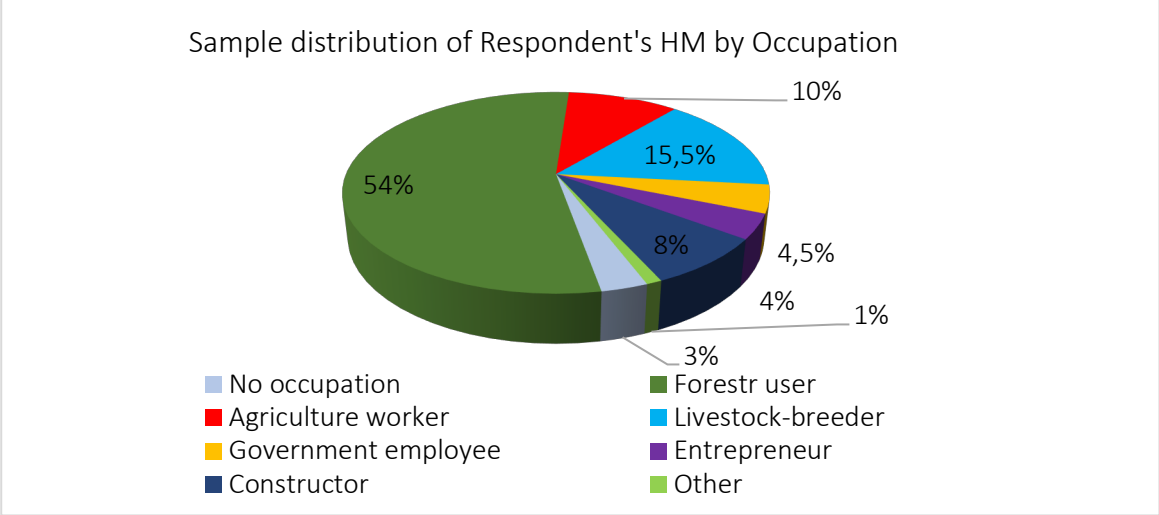


Figure 4.8 Sample distribution of Respondent's Household Members (in working age) by Occupation

4.2 Characteristics of JFM Activity

On an average, the households have small forest plots of 1,49 ha, which is explained by overall high population number and scarcity of land area available for leasing. As stated before, Participants joined JFM gradually within 4 years and therefore, have been helping in managing forests jointly for at least 8 years. All the contracts have been prolonged by the same households, and even though there were the cases of new contracts, it was mainly due to transfer of leasing rights to another family member within the same household.

The households consisting of nearly 5 people from the sale of forest products earn on an average nearly 61089,08 som (783,086 EUR) per year, which is very law. Notably, the National Statistical

Committee of the Kyrgyz Republic in 2017 set 32093 som (410 EUR) of annual income per person as the poverty line and 17741 som (227 EUR) as extreme poverty.

Clearly, the income varies vastly from household to household depending on many factors such as the size of the forest plot, number of trees on an area, tree fertility level and etc. Based on the same reasons, the payment fee differs accordingly too, constituting 1170 som (14,99 EUR) per annum per one household. Notably, 96,25% of respondents indicate that the sum they pay is affordable for them.

Distribution of income share by type of forest activity

From the Figure below, it is clearly shown that the biggest share of income comes from the walnut collection-87%, while other type of forestry activities account for only 13% in total.

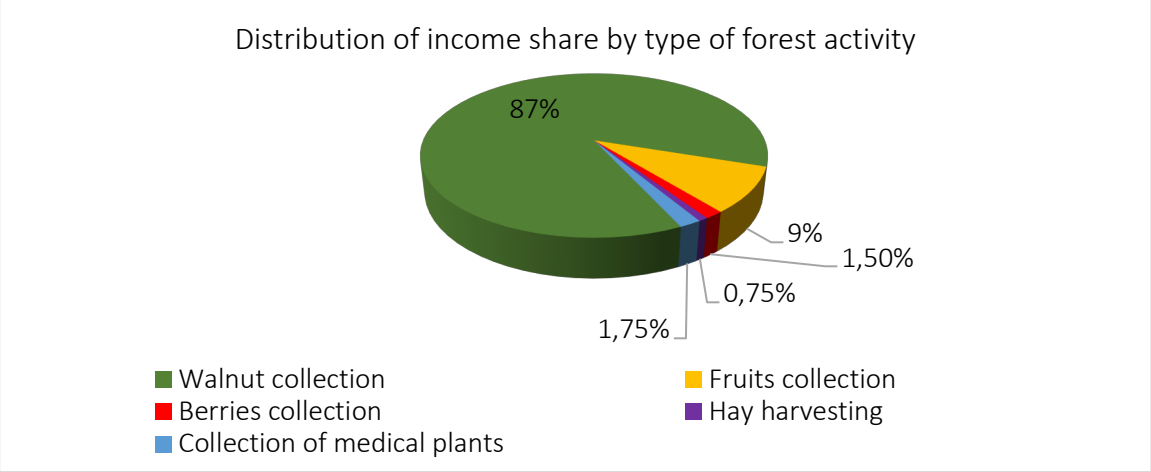


Figure 4.9 Distribution of income share by type of forest activity

Distribution of type of forest natural resources by the purpose of use

It is evident from the survey data that the prevailing share of walnut and fruit collected is used for commercial purposes, while wood gathering and hay harvesting is used mainly for self-consumption.

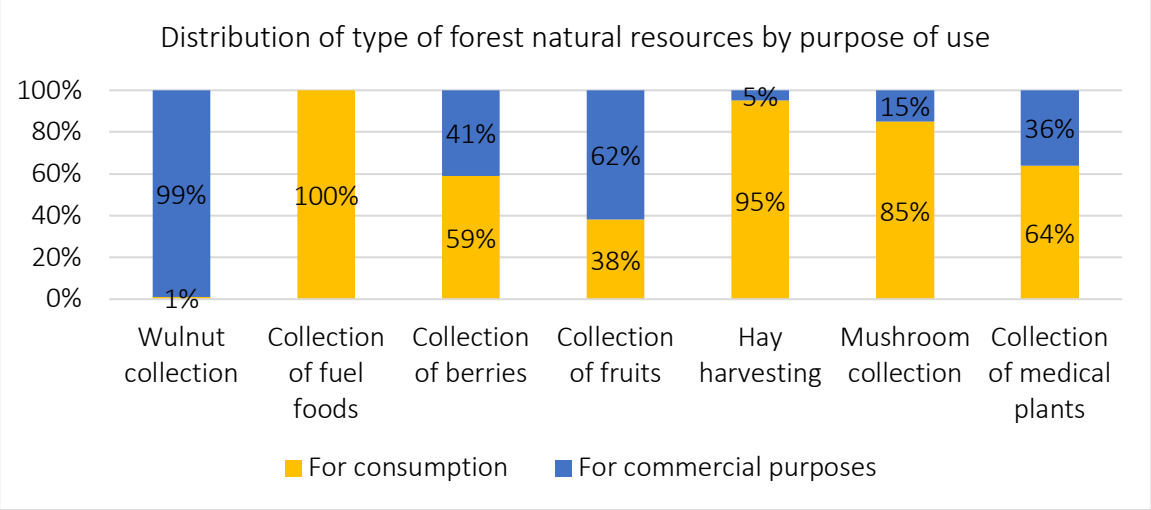


Figure 4.10 Distribution of type of forest natural resources by purpose of use

4.3 Results and Discussions

Part A. Effectiveness of JFM on livelihoods of local people living in Arstanbap-Ata Forest Management Division

1. Human Capital

In order to assess the state of human capital of respondents, several questions have been asked concerning their knowledge and skills level, access to healthcare services and children education level.

a. Knowledge and Skills level of respondents

According to the information provided by key stakeholders, besides providing households an opportunity to collect and sell forest products, as part of JFM program, the Administrative Office of Arslanbob Forest Management Division, in partnership with local self-government authority (Aiyl Okmotu) and International Organizations such as German Development Agency (GIZ), United Nations Development Program (UNDP) and Flora and Fauna International (FFI), annually organizes trainings to increase public awareness on environmental protection, gives general knowledge in forestry and tree cultivation and diversification, and conducts campaigns on energy efficient technologies. They also try to introduce alternative income generation methods by teaching participants about construction of greenhouses, improvement of livestock quality, water and soil conservation technologies and others.

Out of 80 participants, 62 indicated that they attended at least one type of specialized trainings within last 2 years. As seen from Figure 4.11 below, the training on "tree cultivation and diversification" was the most attended one.

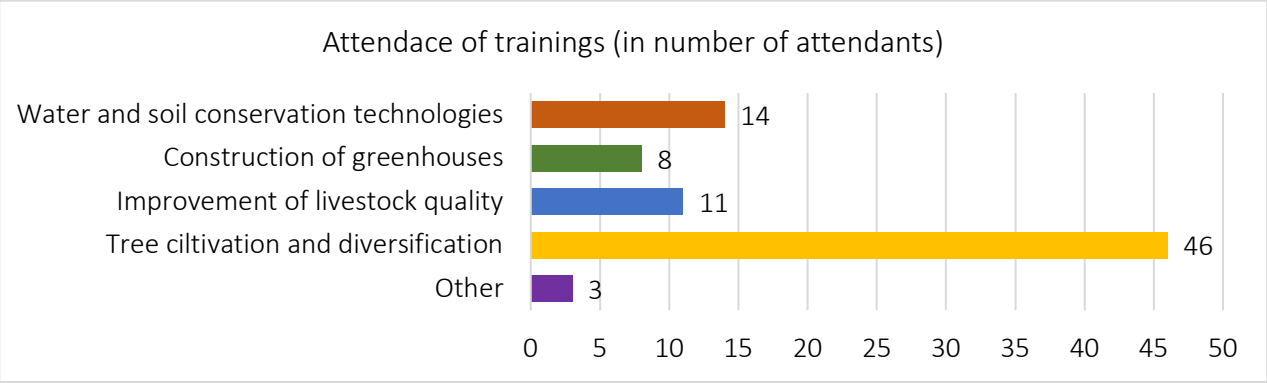


Figure 4.11 Attendance of trainings

The analysis of interviewees' responses indicated that 47,5% of respondents gained new knowledge as a result of activities organized by stakeholders under Joint Forest Management Approach.
And this is what one of the respondents said:

"I participated in tree cultivation and diversification training last year. I would say, the session was quite informative. I leaned about new sorts of nut and fruit trees that can be grown in our region. You know, not every type of crops and plants can be assimilated here due to the special mountainous soil feature."

Another quarter part of respondents (25%) said that they were able to gain some new skills, f.e. learned how to construct a greenhouse and improved their livestock quality, which in turn, helped them to increase income in their family.

b. Access to Healthcare Services and Education Services

Although JFM does not have any direct effect on healthcare and educational services, it is assumed that the income earned as a result of JFM would be partly invested in there.

So, in case of JFM sample group, 58,75% reported that their access to healthcare services has improved. They state that in case of any sickness, they pay for the treatment mainly with the money earned from the sale of walnuts. When it comes to the child enrollment in school and generally the educational level of children within the household, 35% of respondents state that it has improved (see the Figure 4.12). Notably, as stated above, the primary and secondary education in Kyrgyzstan is free, which is why, they usually spend on uniforms, books and school supplies, and pay for college tuition for family members who decide to go for higher education.

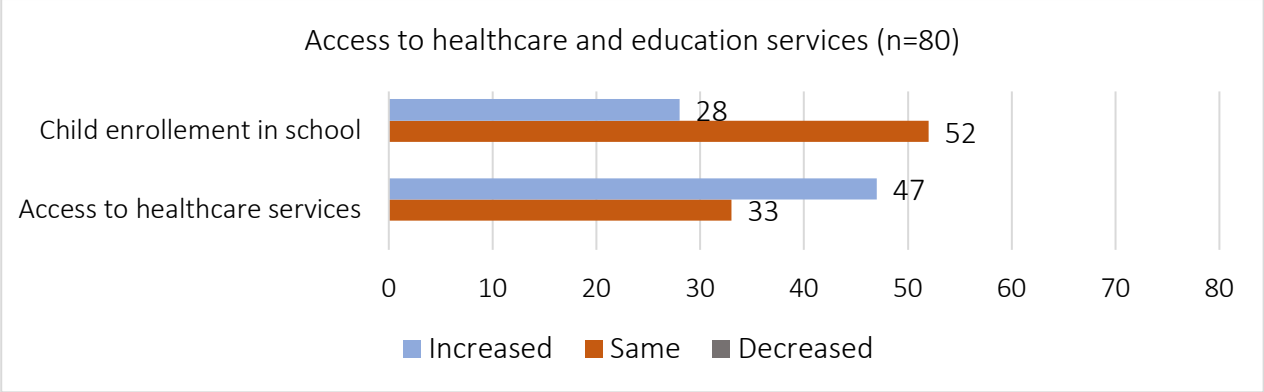


Figure 4.12 Access to Healthcare and Education Services

Overall, on an average, **the human capital has increased for 41,56% of respondents**.

2. Social capital

Social capital includes the social harmony bonding, decision-making power, level of mobility and general status in the society.

a. Social harmony and social bonding

In the process of conducting interviews, different points of view have been expressed in regard to JFM effect on social harmony aspect in the community. From one side, they informed that within JFM program, they form social groups to conduct different communal works with the aim of improving infrastructure facilities, which in turn, strengthened their communal spirit. Additionally, as a result of earnings from forest products, they participate in social occasions such as weddings and funerals, which also improves social bondings. However, from another side, some respondents said that they have had multiple conflicts with other households due to the problems risen as a result of unequal distribution of forest land plots, not clearly established boundaries and uncontrolled cattle grazing, which worsened their relations.

All in all, the responses have been distributed as follows (see Figure 4.13): 42,5% thinks that the social harmony has been improved, 50% states that nothing has been changed, and the remaining 7,5% says it has been worsened mainly because of above given reasons.

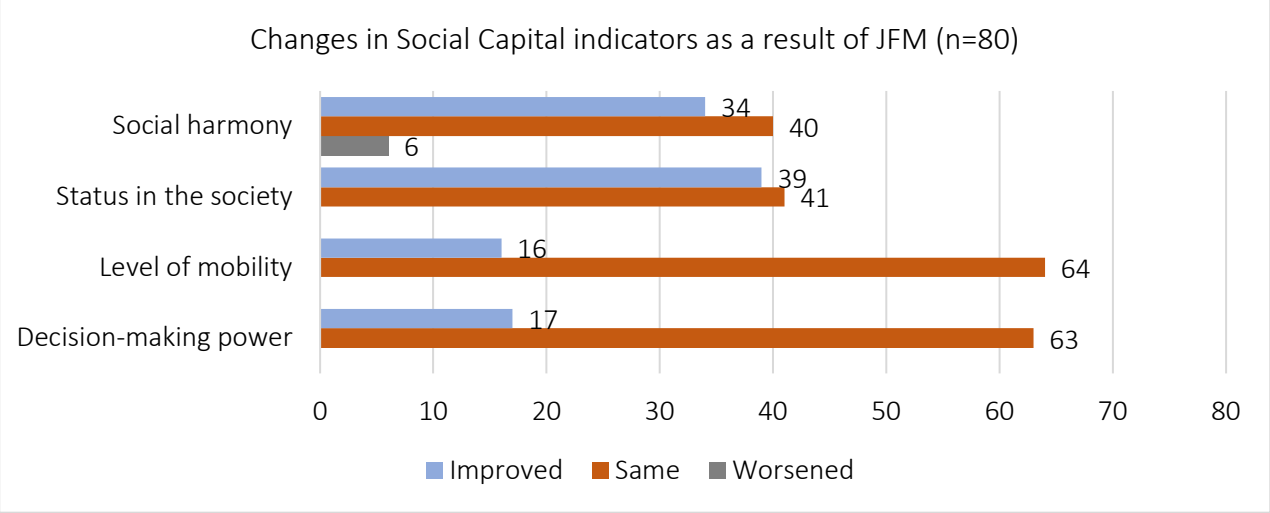


Figure 4.13 Changes in Social Capital indicators

b. Social status, level of mobility and decision-making power

As presented on Figure 4.13, the opinions regarding the changes in the status level of respondents have been almost equally distributed between "improved"- 39 (48,75%) and "same"- 41 (51,25%) categories of replies. The reasons behind the first group of response are mainly related to higher level of income, better access to healthcare and education services and improved lifestyle.

When it comes to mobility level and decision-making power of respondents, it is evident from the Figure 4.13 above that JFM didn't have much effect on these indicators, barely showing the improvement of 20% in both of the cases.

Overall, on an average, **the social capital has increased for 31,25% of respondents**.

3. Natural capital

The natural capital considers the indicators on productive change in the forest, awareness about environment, perception of natural resource usage, resources and wood collection from the forest as cooking fuel.

a. Environmental awareness and perception of natural resource use

According to interviews with experts, Administrative Office of Arstanbap-Ata Forest Management Division conducts campaigns on raising participant's awareness about importance of forests and agitates them to plant trees. And, the notion of JFM itself presumes that forest users would be more interested in protecting and maintaining their plots as they generate their income from forest products. The feeling of ownership also plays not less role in it. Here is the opinion of one of the forest users:

> *"Yes, now I care about the forest condition more than before. As I am leasing this forest plot, I am responsible for its maintenance. So, I try to take a proper care of it. I won't let anyone cut any trees or bring any harm to it".*

As a result, 41 respondents (51,25%) state that now they care about the environment more than before, and 39 respondents (48,75%) think that there has been no change in their apprehension.

In regard to the changes in their perception to use natural resources, the majority (53,75%) thinks that it has improved due to JFM, because they understand that if they use forest products in a rational way, they will continue to benefit from forests what is, in fact, equally good both for the environment and the forest users.

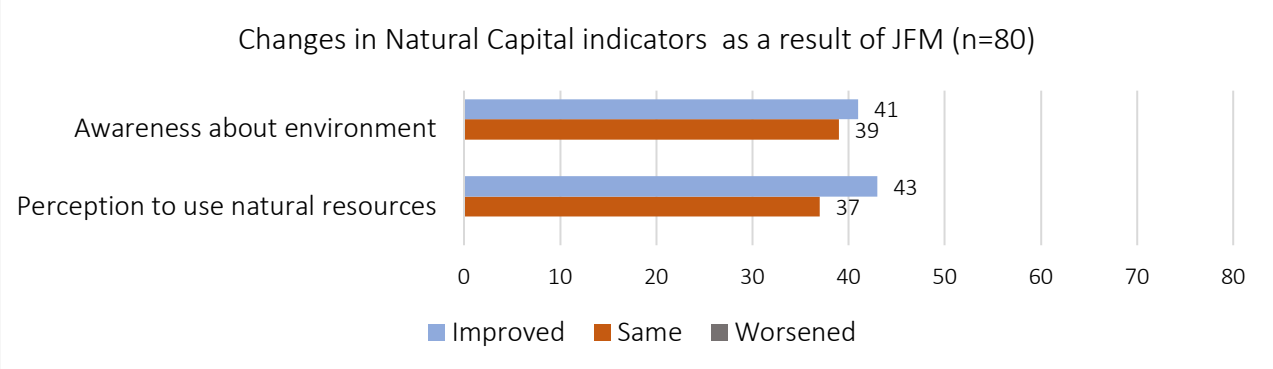


Figure 4.14. Changes in Natural Capital indicators

b. Productive change in the forest

One of the main aims of Joint Forest Management approach is not only saving and maintaining the initial forest coverage, but also increasing it by conducting afforestation activities. Consequently, forest users are expected to undertake appropriate environmental maintenance and improvements in their forest plots. However, despite their reported improved awareness, surprisingly, only one third

of respondents (31,25%) state that they were able to bring some positive productive changes in the forest, the remaining 68,75%- did not. It was mainly explained by the fact that they try to plant new cultivations, however, at the end nothing growths due to cattle grazing. One of the forest user's response:

> *"I planted nursery transplants in previous years, but unfortunately, they did not grow because they were all eaten by local livestock. My plot does not have any borders, and I cannot just stay there and control it all the time. So, I did not cultivate anything this year".*

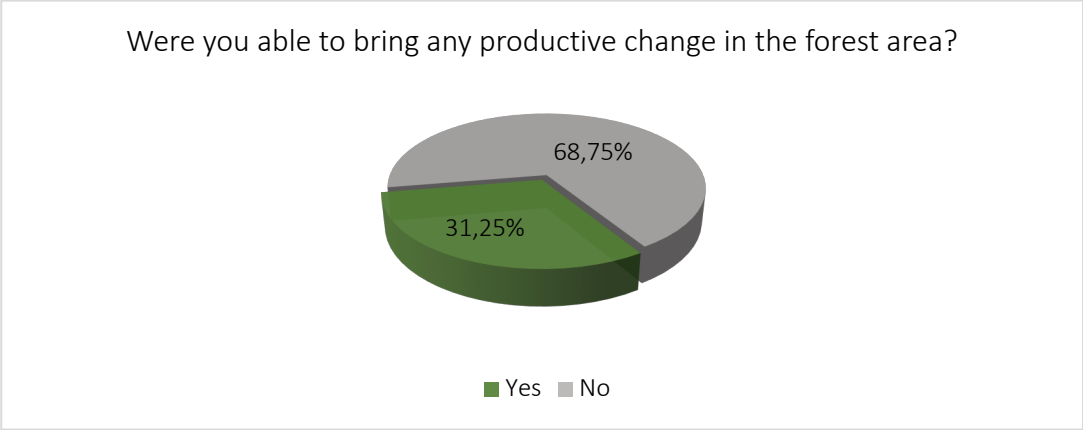


Figure 4.15 Productive change in the forest area

c. Collection of wood for cooking purposes

27 out of 80 respondents admit that they use wood collected from forests for cooking purposes, but mainly noting that they do not cut but trim the trees. Despite the fact that 100% of respondents have access to electricity (not necessarily as a result of JFM), they pointed out to the problem of affordability and absence of other alternatives of energy source, which is why they rely on forest woods especially during winter times when the need for energy rises immensely.

Overall, on an average, **the natural capital has increased for 25,62% of respondents**.

4. Financial capital

Financial capital comprises indicators on income level, ability to save, access to credit markets and creation of other income generating opportunities.

Predictably, as seen on Figure 4.16, the income level has increased for all 100% of respondents.

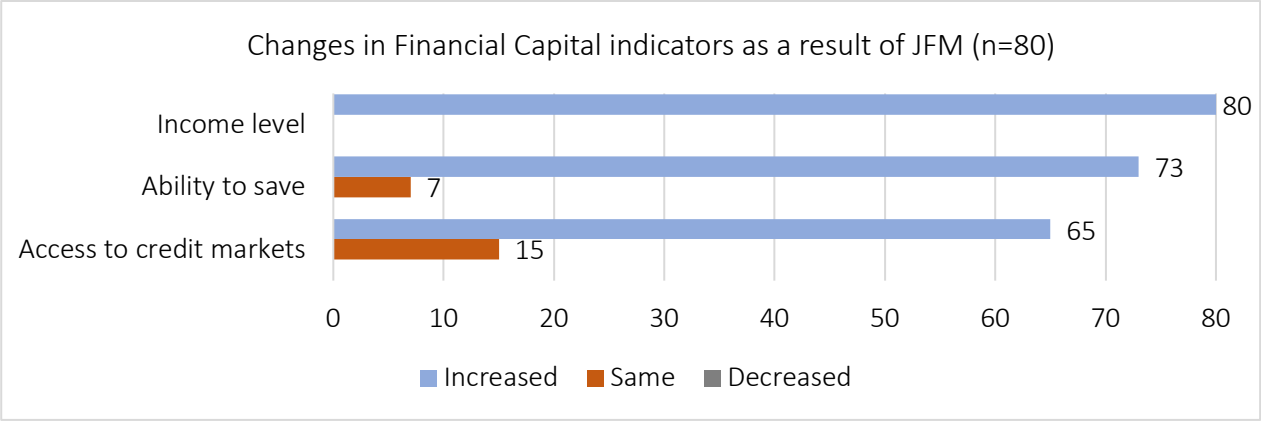


Figure 4.16 Changes in Financial Capital indicators

In the case of indicators on ability to save and access to credit markets, the respondents have also reported an increase of at least 65%.

Additionally, almost one fifth of respondents (18,75%) reported that thanks to JFM, they were able to get engaged in other income generating opportunities. And this is what one of the respondents commented on this matter:

> *"I attended specialized trainings on greenhouse construction last autumn. After its completion, on the basis of what I have learned so far, I built a conservatory where I grow tomatoes and cucumbers now. Since I have a big family, we mainly consume the vegetables ourselves, but sometimes we manage to sell the part of it and earn some money".*

Overall, on an average, **the financial capital has increased for 72,81% of respondents**.

5. Physical capital

Physical capital considers indicators on access to market, land ownership, disaster resilient housing, renovation of housing, access to information, access to safe drinking water, infrastructure facilities and access to sanitary latrines.

As seen from Figure 4.17, JFM did not affect much the respondent's ability to own a land and a disaster resilient housing, nevertheless, it had helped 97,5% respondents to carry out home renovation activities.

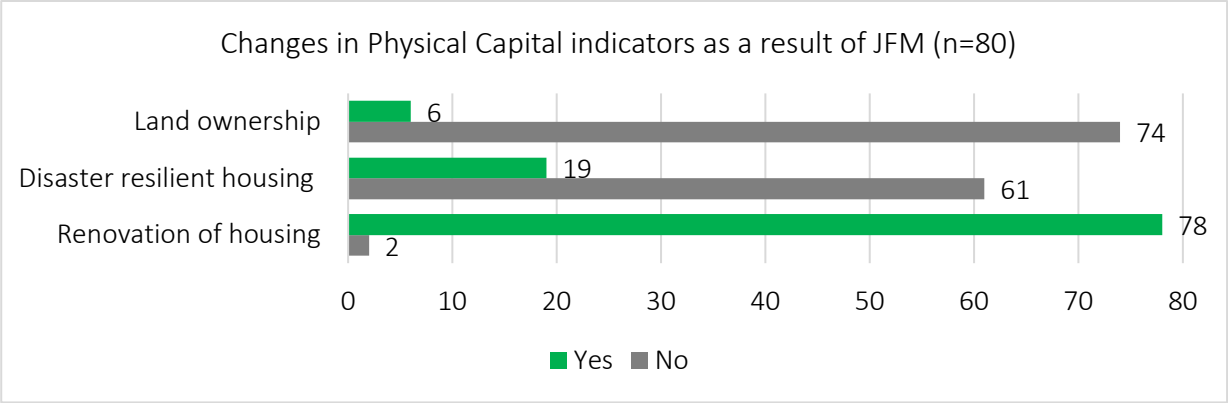


Figure 4.17. Changes in Physical capital indicators (land ownership, disaster resilient housing and renovation of housing)

In terms of other indicators such as the access to market and access to sanitary latrines, the majority of respondents did not see any improvements, but in the cases of access to information and safe drinking water, around 55% of respondents could see the positive changes. Albeit, the second highest level of improvement, besides renovation of housing, has been achieved in regard to the condition of infrastructure facilities, encompassing 67 out of 80 respondents (83,75%). Remarkably, within last two years, the participants of JFM program with the help of Administration of Forest Department and International Organizations have renovated 2 bridges and conducted road repairs in some areas.

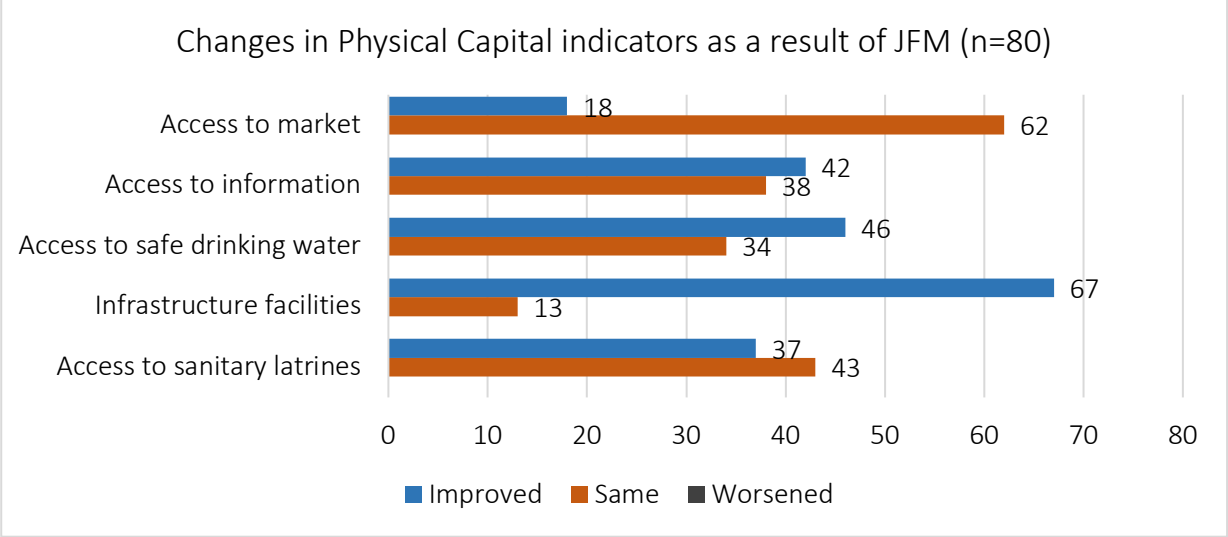


Figure 4.18 Changes in Physical capital indicators

Overall, on an average, **the physical capital has increased for 48,90% of respondents**.

Livelihood strategies

Besides the forestry, the livelihoods of Arstanbap-Ata Forest Management Division convey agricultural activities; however, the scale is much less than in any other places of Kyrgyzstan due to the shortage of land and mountainous specificity of soil which is not that suitable for crop production. Hence, the majority of people tend to diversify their income through livestock breeding. In cases,

when the working capacity in the household is high, and the access to farming is limited, some of the household members tend to work off-farm. The most common off-farm activity for men is house construction, for women- retail trading.

The other ways in which households get income is mainly through remittances, and then loan systems and subsidies. Notably, almost one third of participants have at least one family member working in the Russian Federation. Here is one of the common comments on this regard:

> *"Here, in our region, people either work in the forestry sector or go to Russia. Before there were factories where the majority of people used to work, but after the collapse of USSR everything got closed".*

Access to Joint Forest Management

Despite the fact that all 100% of respondents stated that thanks to the workers of Administration Office of Arstanbap-Ata Forest Management Division and public media sources they have received enough information about JFM program before joining JFM, unfortunately, as evidenced below, 38,75% of them faced various types of difficulties.

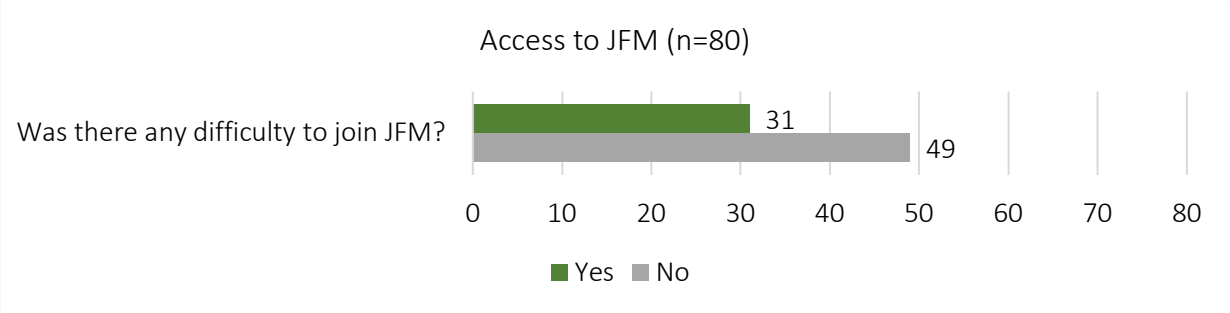


Figure 4.19 Access to JFM

Among 38,75% of respondents, the majority had difficulties with the cases of corruption and unfair allocation of forest plots.

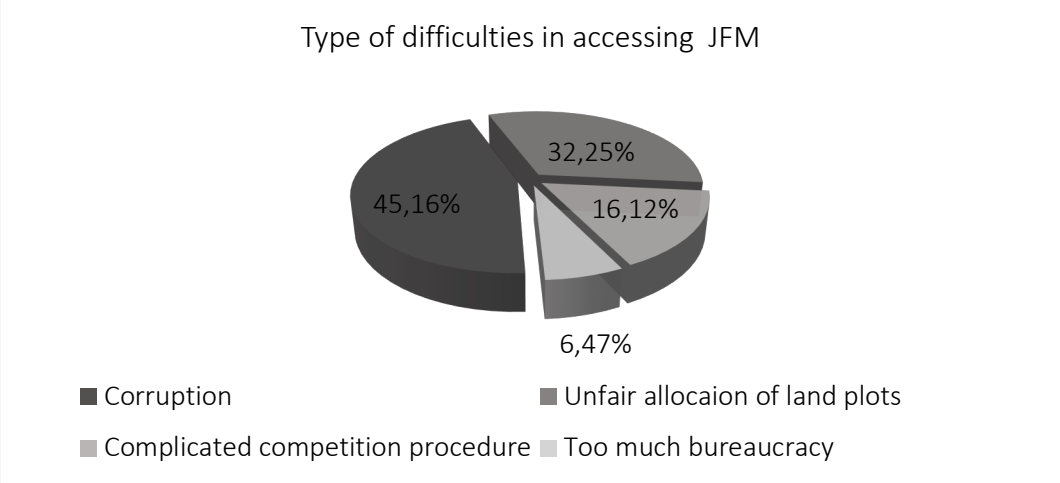


Figure 4.20 Distribution of responses by type of difficulties in accessing JFM

Part B. Changes observed in the forest coverage of Arstanbap-Ata Forest Management Division in the period from 2007 to 2017.

The changes of forest coverage have been assessed based on the inspection report provided by the Forestry Agency and the analysis of interviews with experts and participants of household surveys, focus group discussions and personal observation.

The State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic carried out the two inspections of walnut forest coverage of Arstanbap-Ata Forest Management Division (they conduct it once in 10 years): one in 2007 and another in 2017. The Table below presents the changes that occurred after 10 years of JFM introduction.

Table 4.1 Changes in the forest coverage (2007-2017) (in ha)

№	Wood species	2007	2017	Increased	Decreased
1	Juniper	57,8	93,7	35,9	
2	Ash-tree	3,7	19,8	16,1	
3	Ulmus (elm-tree)	13,8	8,9		4,9
4	Maple	285,3	375,8	90,5	
5	Black locust	1	0		1
6	Grey birch (Betula fontinalis)	50,4	33,1		17,3
7	Populus	11,2	18,0	6,8	
8	Pear tree	11,8	11,5		0,3
9	Hachberry (Celtis)	0,8	0		0,8
10	**Walnut-tree**	**2558,8**	**2491,2**		**67,6**
11	Apple-tree	897,9	602,8		295,1
12	Cockspur (Crataegus gen.)	381,4	657,7	276,3	
13	Honeyberry	2,9	0		2,9
14	Briar (Rosa canina)	61,5	70,8	9,3	
15	Currant (Ribes cynosbati)	3,5	0		3,5
16	Meadowsweet	26,3	13,4		12,9
17	Cotoneaster	72,4	94,0	21,6	
18	Barberry (Berberis vulgaris)	11,5	4,5		7,0
19	Abelia	2,3	0,7		1,6
20	Cherry plum (Prunus cerasifera)	14	9,0		5,0

21	Pearl bush (Exochorda)	173,3	77,4		95,9
22	Aflatunia ulmifolia	68,2	69,6	1,4	
	Total	**4709,8**	**4651,9**	**457,9**	**515,8**

Source: The State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic, 2017

As evidenced, from 2007 to 2017, in total, the forest coverage has decreased by 57,9 ha, and in the case of walnut-trees, there is a decline of 2,65% (67,6 ha).

When it comes to the respondent's opinion, the majority (71,25%) thinks that the condition of the forest in last 10 years has deteriorated.

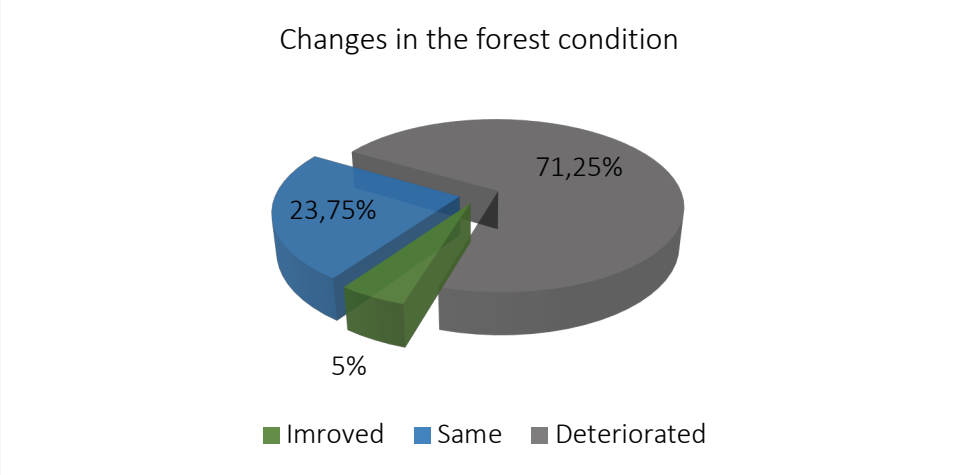


Figure 4.21 Changes in the forest condition

The experts also pointed to the worsening of the forest condition explaining it by several factors, such as the absence of alternative affordable energy sources (therefore, the high dependency on wood energy), livestock grazing, inefficient maintaining of tree records, weak laws and absence of strict control.

Some of the comments given by experts:

"Every forest user under JFM approach has a carnet of tree records. Suppose, it is written there that there are 40 walnut trees in your territory, and consequently, based on that, at the end of your leasing term the number of trees should not be less than 40. However, the problem is that when the plots were distributing, the forest workers did not really record all the trees the way it should be, but estimated everything by eyes. So, people who had much more trees, had cut them all of them up to the number which was registered officially. Although, today the reports are saying that the forest coverage declined just a bit, in reality, the forest density has shrunk a lot".

"Trees are getting older and no one is planting new ones. If we continue this way, I am afraid, we will lose our forest one day".

Additionally, the experts and participants expressed their concerns in regard to the increased number of landslides happening in recent years due to accelerated deforestation.

Image 4.1. Landslides in Arstanbap-Ata Forest Management Division


Source: Author

The Representatives of Administrative Office of Forest Division, in turn, shared with problems of underfinance, lack of professionals willing to work in rural areas and extremely law salaries (on an average, 5800 som/ 74.10 EUR per month).

Overall, the forest coverage of Arstanbap-Ata Forest Management Division has been decreasing. And if no actions are taken, it might not be sustainable in long run period.

Part C. SWOT Analysis of JFM approach

Based on the results of interviews with experts and participants of household surveys, focus group discussions and personal observation, the following SWOT analysis table has been built:

Strengths	**Weaknesses**
S1. Income generation and improved rural livelihoods S2. Feeling of ownership and increased level of interest to protect forest areas S3. Decentralized forest management S4. Reduction of forest management cost for the government	W1. Poor monitoring of JFM implementation W2. Poor records of forest resources W3. Lack of budget for forest management, especially for afforestation activities W4. Lack of forest specialist W5. Extremely small forest staff salaries

S5. Higher income level for the government S6. Protection of forests against external factors (f.e. fires) S7. Easier access to forest products S8. Community empowerment and improvement of local decision-making power S9. Increased social cohesion and collaboration within JFM participants S10. Improved infrastructure facilities	W6. Cases of unequal access to JFM and unfair distribution of forest plots W7. Non-compliance of forest users with terms and conditions of the contract W8. Unclearly defined rights and obligations
Opportunities	**Threats**
O1. Possibility of replicating this practice in other areas O2. Improved local level governance over natural resources O3. Further reduction of land degradation through allocation of separate pasture areas for cattle grazing/ installment of fences to protect the forest areas O4. Increased budget allocation for Administrative Forest Management Division O5. Increased forest coverage O6. Securing forest products for the future generation	T1. Decreased forest coverage T2. Loss of biodiversity T3. Use of forest plots for livestock grazing T4. Potential conflicts within and between communities T5. Potential conflicts between forest users and forest management staff T5. Absence of alternative affordable energy sources, and as a consequence, a high demand for wood energy especially in winter time T6. Limited decision-making power of forest management staff

CHAPTER V CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This thesis work set forth threefold objectives to assess the effectiveness of JFM approach on livelihoods of rural people, to detect the changes observed in the forest coverage, and identify JFM's strengths and weaknesses. The analysis has been based on the case study of Arstanbap-Ata Administrative Forest Management Division of Arslanbob Forest, Kyrgyzstan. The selection of such precise study area has several arguments. Preeminently, Arslanbob is the world's largest natural walnut forest which requires a special attention. Whilst, it has been one of the first areas where JFM has been officially first introduced in Kyrgyzstan, which presents a good base to study its effectiveness at the grass-root level. Among all six Administrative Forest Management Divisions of Arslanbob Forest Area, Arstanbap-Ata is of particular interest since comparatively to others it has trice more population number and much less forest area available for leasing, which all together allows to study JFM on its full capacity.

The study has assessed the effect of JFM based on Recall Analysis using qualitative methods through primary and secondary data collection. Though the analysis mainly has been carried out on the basis of household survey, focus group discussions, key informant interviews and personal observations. The research found out that, on an average, the JFM approach has increased the livelihood assets for almost half of the interviewed respondents (44,03%), with the highest improvement reported in financial (72,81%) and physical (48,90%) capitals. Scilicet, thanks to JFM, the majority of people were able to raise their income levels and improve their living standards. Moreover, the condition of infrastructure facilities has been elevated as evidenced mainly by the renovation of two bridges and road repairs in some areas undertaken by forest users themselves in collaboration with forest staff and representatives of international organizations. In the case of social, natural and human capitals, the enhancement has not been as high as two other assets.

The analysis of the report, provided by the State Forest Agency and the results of interviews with experts and personal observations, revealed that the forest coverage of Arstanbap-Ata Forest Management Division in 10 years period from 2007 to 2017 has been diminished in total by 57,9 ha mainly because of the following reasons: non-compliance of forest users with terms and conditions of the contract, especially in terms of tree planting and conducting afforestation activities; cattle grazing; high dependence of people on wood energy and absence of other affordable alternatives and poor control activities. Overall, this decline in forest coverage indicates that it might not be sustainable in long-term period.

When it comes to the strengths and weaknesses, the JFM approach has been mainly beneficial in providing people an opportunity to generate income, in giving them a feeling of ownership, which in turn, increased their level of interest to protect the forests, in managing the forest in a more decentralized way; and reducing the cost of management for the government. Despite its manifold good points, there are still shortfalls that could be corrected: poor monitoring of JFM implementation, poor records of forest resources, lack of specialists in forest husbandry, lack of budget allocated for management and afforestation purposes, cases of corruption and unfair distribution of land plots, and potential conflicts between forest users themselves, as well as, with forest management staff.

5.2 Recommendations

All in all, taking into consideration every feature of JFM approach in general and in particular its implementation status in Arstanbap-Ata Forest Management Division of Arslanbob Forest, it is recommended to conduct some reforms by putting an emphasis on positive aspects and components among actual stakeholders and within currently applied structures by boosting incentives and encouraging for sustainable forest management. In total, seven recommendations are offered to modify the present dynamics of forest management to allow silva and forest resources to be used with the maximum benefit and in the most sustainable way:

1. **Address the problem of poor incentives within Forestry Management Division by revising its current administrative and financing conditions**

   Central Forest Agency should provide higher level of operational authority and decision-making power in regard to certain things such as developing workplans, setting tree planting rates and the like.

   Current budget for administrative and management needs should be reconsidered and revised in an urgent way. The wages and other financial rewards of forest employees should be not be less than other public sector salaries. It is crucial in increasing and elevating working performance level up to the standards.

2. **Set a clear-cut separation of duties between stakeholders**

   Forest management staff and forest users should revise their responsibilities especially in regard to carrying out afforestation and reforestation activities, and protection of land plots from external negative effects such as livestock grazing.

3. **Ensure equal treatment in the competition process, and fair allocation of forest plots**

   One of the key determinants of successful joint forest management is compliance with core principles such as transparency, fairness and equality, which in turn, increases the trust in people and decreases the cases of potential conflicts.

4. **Put a greater focus on outreach and forest conservation awareness**

   It is necessary to increase the public awareness through conducting environmental campaigns to reduce threats to forest biodiversity. Additionally, families and schools should teach kids about ecology starting from the early ages to increase their consciousness and create lifelong caring habits.

5. **Increase education and skill levels of forests staff, especially technicians and engineers, in prevention, detection, monitoring and control programs.**

   One of the fundamental conditions to achieve prominent results in forestry sphere is to have well-educated personnel who would know all subtleties and problems, and the way how to deal with them in a professional way.

6. **Keep the documentation of all inspections and control activities in structured and organized way**

   Unfortunately, the cases of very cursory inspections are not rare. However, in order to monitor the condition of the forest effectively, it is necessary to have the documentation of all the carried-out procedures and activities in a proper, structured and organized manner.

7. **Minimize expansion of livestock breeding and promote sustainable grazing**

   To solve this problem, it is recommended to either fence the forest border or allocate a different pasture zone for livestock breeding.

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Annexure

CONSENT FORM

The effectiveness of Joint Forest Management on the sustainable livelihood of rural people living in rural areas: A case study from Kyrgyzstan

Researcher: Zhyldyz Toktorova
University: Palacky University Olomouc
Contact Information: +996 709 724850, +420 777 825624 (WhatsApp)

Dear Sir/Madam,
You are invited to participate in the survey on **"The effectiveness of Joint Forest Management on the sustainable livelihoods of rural people living in rural areas: A case study from Kyrgyzstan"** conducted by the student of Palacky University Olomouc. Above all, it is very important that you read and understand your rights and the conditions under which you will be surveyed. Please take your time to check out the following information carefully. In case of any ambiguity or questions, please ask the researcher for further clarification.

Survey procedure:
Participation in this study will approximately take 30-35 min.

Benefit:
Participation in this study will not give you any direct benefits. However, your contribution will be vital in better assessing the effectiveness of Joint Forest Management approach on the sustainable livelihoods of Arstanbap-Ata Forest Management Division.

Cost of Participation
Participation in this study is free of charge.

Compensation
The participation in this study will not provide you any monetary compensation.

Possible Risks and Inconveniences
Although there are no risks for participating in this study, it is possible that some of the questions might cause you discomfort. In case of inconvenience, you have the right to refuse to answer to any of the given questions.

Right to Withdraw
Participation in this survey is voluntary. It is solely up to you to agree or not to participate in this study. Should you decide to take part in, you still have the right to withdraw completely from the interview at any point of the survey process.

Right to Ask Questions and Report Concerns:
You are entitled to ask any questions about this research study before, during, and after the survey. In case of any further concerns or problems to be addressed in regard to this study, you are most welcomed to contact the researcher at any time by above-given telephone numbers.

Confidentiality
The records of this study will be used for research purposes only. The personal information in any report (such as the names and contact details of respondents) would be kept confidentially.

Consent

By putting your signature below, you are declaring that you voluntarily agreed to participate in this survey and that you have read and understood the information provided above.

Signature_____ Date _____

HOUSEHOLD QUESTIONNAIRE

Serial №:
Date: _____ Time: _____

Name of the respondent:
Address:
Telephone number:

Section A: General Information
A1. Name of village: Arslanbob Bel-Terek Gumkhana Jai-Terek Jaradar
A2. Age:
A3. Gender: Male Female Other
A4. Marital status: Single Married Divorced Widowed
A5. Ethnicity: Kyrgyz Uzbek Other_____
A6. Respondent's Education level:
No education Primary Secondary Tertiary Vocational Schooling
A7. Primary Occupation of respondent:
A8. Household Status: Male headed Female headed
A9. Number of household members:

Section A.1: Household Member Roster

No	Kinship	Age	Gender	Marital status	Education	Occupation
1						
2						
3						
4						
5						

Section B: JFM Activity
B1. Do you lease a land of plot under JFM approach in Arslanbob Walnut Forest? Yes/ No
If yes,
B2. How long have you been leasing a forest plot (in years)?
B3. What is the total forest plot holding size (in ha)?
B4. How much do you pay per year (in KGS)?
B5. Is it affordable for you? Yes/ No
B6. What is the main reason/ activity for you to lease the forest plot?
a) walnut collection b) fruit collection c) wood collection d) hay harvesting
e) berries collection f) mushroom collection g) other
B7 and B8:

Name of product/activity	B7. How much above-mentioned product do you collect per year?	B8. What is the approximate yearly income from the upper mentioned activity in KGS?
walnut collection (in kg)		
fruit collection (in kg)		
wood collection (in № of trees)		
hay harvesting (in centner)		
berries collection (in kg)		
mushroom collection (in kg)		
other		

B9. Except selling or earning, do you self-consume any product from the forest? Yes No
If yes,

B10 and B11:

B10. Which product?	B11. How much?

B12. Have you participated in any of the trainings organized by JFM Committee in partnership with International Organizations? Yes No

B13. If yes, which one(s)?

a) Water and soil conservation technologies
b) Construction of greenhouses
c) Improvement of livestock quality
d) Tree cultivation
e) Other

Section C. Effect of JFM on Livelihood Assets

What changes have you observed in your life as a result of JFM?

Asset	Effect of JFM	Response & Explanation
Human	H1. Did you gain any new knowledge as a result of trainings after joining JFM?	Yes/ No
	H2. Did you gain any new skills that helped you as a result of trainings after joining JFM?	Yes/ No
	H3. Has your access to health services changed due to joining JFM?	Improved/ Same/ Worsened
	H4. Has the education level of your child changed due to joining JFM?	Improved/ Same/ Worsened
Social	S1. Has the social harmony and social bonding changed in your community as a result of JFM?	Improved/ Same/ Worsened
	S2. Has your status changed in the society after joining JFM?	Improved/ Same/ Worsened
	S3. Has your level of mobility changed after joining JFM?	Improved/ Same/ Worsened
	S4. Did you see any change in your decision-making power in your family and society level?	Improved/ Same/ Worsened
	S5. How do you cope up in a failyear/ unfruitful season?	
Natural	N1. Were you able to bring any productive change in the forest?	Yes/ No
	N2. Has your awareness about the environment changed as a result of JFM?	Improved/ Same/ Worsened
	N3. Has your perception to use natural resource changed a result of JFM?	Improved/ Same/ Worsened
	N4. Do you have an access to any renewable energy source?	Yes/ No
	N5. Do you use any wood collected from the forest as a cooking fuel?	Yes/ No
Financial	F1. Did you get any other income opportunities as a result of joining JFM?	Yes/ No
	F2. Has your income level changed as a result of JFM?	Increased/ Same/ Decreased
	F3. Has your ability to save changed as a result of JFM?	Improved/ Same/ Worsened

	F4. Has your access to credit market changed as a result of joining JFM?	Improved/ Same/ Worsened
Physical	P1. Has your access to market to sell your products changed as a result of joining JFM?	Improved/ Same/ Worsened
	P2. Do you own land as a result of JFM?	Yes/ No
	P3. Do you own a disaster resilience house as a result of JFM?	Yes/ No
	P4. Did you renovate your house for the money earned from JFM?	Yes/ No
	P5. Has the access to safe drinking water changed due to JFM?	Improved/ Same/ Worsened
	P6. Has the access to information from Village Authorities changed as a result of JFM?	Improved/ Same/ Worsened
	P7. Has the condition of infrastructure facilities (roads, bridges etc.) changed as a result of JFM?	Improved/ Same/ Worsened
	P8. Has the access to sanitary latrines changed as a result of JFM?	Improved/ Same/ Worsened

Section D. Access to JFM and Overall Opinion of the Respondent

D1. From where did you get to know about JFM?

D2. Did you get enough information about JFM before joining it? Yes/ No

D3. Was there any difficulty for you to join JFM? Yes/ No

If yes,

D4. What was the most difficult thing for you?

D5. According to you, what are the strength and weaknesses of JFM?

Please specify your answer:

Strengths	Weaknesses

D6. After joining the JFM in which area of your life you see the change the most?

a) Human b) Social c) Natural d) Financial e) Physical

D7. Did you receive any help from stakeholders? Yes/ No

If yes,

D8. In which form did you receive the help?

a) Financial b) Advise c) Physical capital d) Time e) Others, please specify

D9. What kind of change JFM brought in your life? Positive/ Negative

D10. What kind of changes did you see in the forest coverage of Arstanbap-Ata Forest Management Division in last 10 years? Improved/ Same/ Deteriorated

D11. Could you please explain the changes in people's lives caused by JFM in general?

D12.What kind of recommendations would you give in order to make JFM more effective?

Final Remarks/ Comments:

Photographs from the Field Survey




Pictures taken during Household Surveys with JFM Participants




Pictures taken during Focus Group Discussions and Interviews with Experts

Household Roster (Section A)									
Personal ID	A1	A2	A3	A4	A5	A6	A7	A8	A9
1	1	49	1	2	2	2	1	1	8
2	1	41	1	2	2	4	1	1	5
3	1	44	2	4	2	2	2	2	2
4	1	53	1	2	2	2	1	1	7
5	1	38	1	3	2	2	1	1	4
6	1	40	1	2	2	2	6	1	7
7	1	35	1	2	2	2	1	1	3
8	1	52	1	2	2	2	1	1	4
9	1	32	2	2	2	2	1	1	4
10	1	34	1	2	2	4	3	1	5
11	1	53	1	2	2	2	2	1	6
12	1	51	2	4	2	4	1	2	3
13	1	37	1	2	2	2	1	1	5
14	1	42	1	2	2	2	3	1	6
15	1	51	2	3	2	3	4	2	4
16	1	38	1	2	2	2	1	1	6
17	1	31	1	2	2	2	6	1	3
18	1	62	1	2	2	3	1	1	9
19	1	57	1	2	2	4	1	1	7
20	1	55	1	2	2	2	3	1	10
21	1	47	1	2	2	2	3	1	5
22	1	50	1	2	2	2	1	1	6
23	1	29	1	3	2	4	1	1	4
24	1	43	1	2	2	2	1	1	6
25	1	52	1	2	2	2	5	1	6
26	1	51	1	2	2	4	1	1	7
27	1	48	1	2	2	3	4	1	2
28	1	46	1	2	2	2	2	1	5
29	1	33	1	2	2	2	1	1	6
30	1	64	1	4	2	2	1	1	5
31	1	58	1	2	2	2	5	1	6
32	1	36	1	2	2	4	1	1	8
33	1	41	1	2	2	2	1	1	5
34	1	47	2	3	2	3	4	2	3
35	1	50	1	2	2	2	1	1	7
36	1	43	1	2	2	2	1	1	3
37	1	36	1	2	2	3	1	1	4
38	1	41	1	2	2	2	6	1	6
39	1	46	1	2	2	2	1	1	5
40	1	35	1	2	2	2	6	1	6
41	2	48	1	2	1	4	1	1	5
42	2	52	1	2	1	2	3	1	7
43	2	68	2	3	1	2	1	2	1
44	2	45	1	2	1	2	1	1	6
45	2	55	1	2	1	2	3	1	3

46	2	62	1	2	1	3	1	1	4
47	3	51	1	2	1	2	1	1	5
48	3	35	1	3	1	2	2	1	5
49	3	47	1	2	1	3	1	1	6
50	3	41	1	2	1	2	1	1	6
51	3	28	1	2	1	2	1	1	5
52	3	45	1	2	1	2	1	1	4
53	3	50	1	2	1	2	3	1	6
54	3	39	1	2	1	4	1	1	5
55	3	38	1	2	1	2	1	1	4
56	3	44	1	2	1	2	2	1	3
57	3	36	1	2	1	4	2	1	5
58	3	27	1	2	1	2	1	1	6
59	3	43	1	2	1	2	1	1	5
60	4	52	1	2	1	2	1	1	3
61	4	35	1	3	1	2	1	1	6
62	4	42	1	2	1	2	3	1	4
63	4	49	1	2	1	2	1	1	5
64	4	33	1	2	1	2	1	1	4
65	4	61	1	2	1	3	1	1	6
66	4	45	2	2	1	2	1	2	6
67	4	37	1	2	1	4	7	1	3
68	4	45	1	2	1	2	1	1	5
69	4	57	1	2	1	2	1	1	6
70	4	48	1	2	1	2	3	1	4
71	4	40	1	2	1	2	1	1	3
72	4	31	1	2	1	2	1	1	4
73	4	49	1	2	1	2	6	1	6
74	4	53	1	2	1	2	1	1	5
75	4	41	1	2	1	4	1	1	3
76	4	36	1	2	1	2	1	1	4
77	5	54	1	2	1	2	3	1	8
78	5	46	1	2	1	4	1	1	3
79	5	39	1	2	1	4	1	1	4
80	5	41	1	2	1	2	1	1	5

A1. Name of village: 1=Arslanbob 2=Bel-Terek 3=Gumkhana 4=Jai-Terek 5=Jaradar

A2. Age

A3. Gender: 1=Male 2=Female

A4. Marital Status: 1=Single 2=Married 3=Devorced 4=Widowed

A5. Ethnicity: 1=Kyrgyz 2=Uzbek 3=Other

A6. Respondent's education level: 0=No education 1=Primary(1-4 classes) 2=Secondary(5-9 classes) 3=Tertiary 4=Vocational Schooling

A7. Occupation: 0=No occupation 1=Forest user 2=Agriculture worker 3=Livestock-breeder 4=Government employee 5=Entrepreneur 6=Constructor 7=Other

A8. HH Status: 1=Male headed 2=Female headed

A9. Number of HH member (excluding responent)

												JFM Activit
Personal ID	B1	B2	B3	B4	B5	B6			B7			B8.a
						B6.a	B6.b	B6.c	B7.a	B7.b	B7.c	
1	1	10	2	2000	1	1	2	4	1000	2000	20	70000
2	1	12	1,5	1000	1	1	5		600	30	**	42000
3	1	10	1	500	1	1	**		500	**		35000
4	1	11	1,5	500	1	1	2	4	800	3000	50	56000
5	1	11	1	300	1	1	4	**	400	30	**	28000
6	1	12	2	1500	1	1	2	**	1200	2000	**	84000
7	1	12	1,5	1500	1	1	4	5	800	40	100	56000
8	1	12	1	700	1	1	2	6	600	2000	20	42000
9	1	9	1,5	1000	1	1	2	**	800	1000	**	56000
10	1	10	1	500	1	1	2	5	500	1000	50	35000
11	1	11	1	500	1	1	2	4	500	1200	40	35000
12	1	12	1	500	1	1	2	**	300	1000	**	21000
13	1	12	2	2000	1	1	4	5	1400	200	30	98000
14	1	8	0,7	400	1	1	5	6	400	50	40	28000
15	1	11	1	500	1	1	**	**	400	**	**	28000
16	1	8	2	1500	1	1	2	4	1200	2000	40	84000
17	1	12	0,5	300	1	1	2	**	200	1000	**	14000
18	1	10	2,5	2000	1	1	2	5	1500	1000	30	105000
19	1	11	1	700	0	1	4	**	500	50	**	35000
20	1	10	3	3000	1	1	4	**	2000	30	**	140000
21	1	11	1,5	1000	1	1	4	**	500	40	**	35000
22	1	9	2	2000	1	1	2	6	1000	2500	20	70000
23	1	10	1	1000	1	1	2	4	400	1000	50	28000
24	1	12	2	1500	1	1	2	4	1000	200	50	70000
25	1	10	0,7	300	1	1	2	4	200	300	50	14000
26	1	12	1,5	1500	1	1	4	**	1000	50	**	70000
27	1	10	1	700	1	1	2	4	500	200	40	35000
28	1	10	1	700	1	1	2	5	400	200	50	28000
29	1	11	1	700	1	1	2	**	400	1000	**	28000
30	1	9	1,5	1000	1	1	2	5	800	2000	100	56000
31	1	10	0,8	500	1	1	2	**	300	200	**	21000
32	1	12	2	2000	1	1	2	4	1500	3000	20	105000
33	1	12	2,5	2000	1	1	5	4	1200	1500	30	84000
34	1	10	0,7	300	1	1	**		200	**		14000
35	1	12	2	2000	1	1	2	4	1200	4000	50	84000
36	1	10	1,2	1000	1	1	2	4	700	2000	30	49000
37	1	8	1,7	1500	1	1	2	**	1000	4000	**	70000
38	1	10	0,7	500	1	1	2	5	400	300	10	28000
39	1	11	1,5	700	1	1	2	4	500	200	40	35000
40	1	12	1,8	1500	1	1	2	**	1000	200	**	70000
41	1	10	1,5	1500	1	1	2	5	1000	2000	50	70000
42	1	11	0,8	500	1	1	2	**	300	500	**	21000
43	1	10	0,7	300	1	1	2	**	200	1000	**	14000
44	1	9	2	2000	1	1	2	5	1000	2000	50	70000
45	1	10	1	700	1	1	2	5	500	2000	20	35000

46	1	8	2	2000	1	1	**	**	1200	**	**	84000
47	1	12	1,5	1500	1	1	2	4	700	3000	60	49000
48	1	10	1	500	1	1	2	**	400	200	**	28000
49	1	8	2	1500	1	1	2	5	1400	2000	100	98000
50	1	12	1,5	1300	1	1	2	4	1000	2000	40	70000
51	1	9	1,5	1000	1	1	2	4	600	2000	60	70000
52	1	10	1	700	1	1	2	**	500	2000	**	42000
53	1	11	1,2	1000	1	1	**	**	400	**	**	28000
54	1	11	2	2000	1	1	2	4	800	3000	50	56000
55	1	12	2	1500	1	1	2	4	700	3000	50	49000
56	1	8	0,7	300	1	1	2	**	200	1000	**	14000
57	1	12	1,5	500	1	1	5	**	600	50	**	42000
58	1	8	2	1800	1	1	2	4	1000	2000	40	70000
59	1	12	1,5	1000	1	1	2	4	600	2500	50	42000
60	1	10	1,5	1000	1	1	2	4	500	2000	40	35000
61	1	9	2	2000	1	1	2	4	800	2000	20	56000
62	1	10	1,5	1000	1	1	2	5	500	1000	50	35000
63	1	8	1,7	1500	1	1	5	6	1000	50	60	70000
64	1	10	1,5	1000	0	1	2	5	500	1500	80	35000
65	1	10	1,5	1000	1	1	2	5	600	200	20	42000
66	1	12	2	2000	1	1	2	**	1000	1000	**	70000
67	1	8	0,8	500	1	1	2	4	500	1000	20	35000
68	1	10	1,5	1500	1	1	2	6	800	1000	30	56000
69	1	12	1,5	1500	1	1	2	4	500	300	40	35000
70	1	11	1	700	0	1	4	**	400	40	**	28000
71	1	10	1,5	1000	1	1	2	5	600	1000	20	42000
72	1	9	2	1500	1	1	4	5	900	30	30	63000
73	1	10	1,5	1000	1	1	2	4	500	1000	30	35000
74	1	9	3	2000	1	1	**	**	1300	**	**	91000
75	1	10	1,5	1000	1	1	2	4	600	1500	30	42000
76	1	8	1,2	1000	1	1	2	5	600	1000	50	42000
77	1	12	2,5	2500	1	1	2	4	1300	2000	40	91000
78	1	10	1,5	1500	1	1	2	**	700	2000	**	49000
79	1	9	2	2000	1	1	2	5	1200	1000	40	84000
80	1	10	1,8	1500	1	1	2	4	1000	1500	30	70000

B1. Do you lease a land under JFM approach in Arslanbob Walnut Forest? 1=Yes 0=No
B2. How long have you been leasing a forest plot? (in years)
B3. Total forest plot holding size (in ha)
B4. How much do you pay per year in KGS?
B5. Is it affordable for you? 1=Yes 0=No
B6. What is the reason/activity for you to lease the forest plot? 1=Walnut collection (in kg) 2=
B7. How much above mentioned product do you collect per year in kg (on an average)? Record
B8. What is the approximate yearly income from upper mentioned activity in KGS? Record up
B9. Except selling do you self-consume any product from the forest? 1=Yes 0=No
B10. If yes, which product(s)? 1=Walnut 2=Fruit 3=Wood 4=Hay 5=Berries 6=Mushroom 7=Ot
B11. How much in (kg/centner)? Record up to 3 responses based on reply to Question B10.
B12. Have you partcipated in any trainings organized by JFM Committee in partnership with In
B13. If yes, which one? 1=Water and soil conservation technologies 2=Construction of greenho

ty (Section B)

B8		B9	B10			B11			B12	B13		
B8.b	B8.c		B10.a	B10.b	B10.c	B11.a	B11.b	B11.c		B13.a	B13.b	B13.c
1000	3000	1	1	2	4	50	80	20	1	4	**	**
1500	**	1	1	4	**	70	30	**	1	3	**	**
**	**	1	1	**		50	**		0	**	**	**
15000	4500	1	1	2	4	70	150	20	1	1	4	**
3600	**	1	1	4	**	80	20	**	1	4	**	**
10000	**	1	1	2	**	60	100	**	1	4	**	**
3600	5000	1	1	4	5	50	40	20	0	**	**	**
10000	400	1	1	2	6	80	100	20	1	4	**	**
5000	**	1	1	**	**	50	**	**	1	4	**	**
5000	2500	1	1	2	5	70	100	20	1	1	3	**
7000	3600	1	1	2	4	100	120	40	1	4	5	**
10000	**	1	1	2	**	50	70	**	1	4	**	**
2000	1000	1	1	4	5	60	30	20	1	3	**	**
2500	400	1	1	5	6	100	20	30	1	4	**	**
**	**	1	1	**	**	40	**	**	0	**	**	**
10000	3600	1	1	2	4	50	100	40	1	1	**	**
5000	**	1	1	2	**	50	100	**	1	4	**	**
5000	1200	1	1	2	5	65	100	30	0	**	**	**
4500	**	1	1	4	**	50	50	**	0	**	**	**
2500	**	1	1	4	**	70	30	**	1	4	**	**
3600	**	1	1	4	**	100	40	**	1	4	**	**
14000	4000	1	1	2	**	70	150	**	0	**	**	**
8000	4500	1	1	2	4	50	100	50	1	4	**	**
1000	4500	1	1	2	4	60	200	50	1	4	**	**
3600	4000	1	1	2	4	50	100	50	1	4	**	**
4500	**	1	1	4	**	100	50	**	1	3	**	**
1000	3500	1	1	2	4	100	200	40	0	**	**	**
2400	5000	1	1	2	4	40	80	50	1	2	**	**
10000	**	1	1	2	**	80	100	**	1	3	4	**
10000	6000	1	1	2	4	50	100	50	1	4	**	**
1000	**	1	1	2	**	70	200	**	1	4	**	**
30000	1500	1	1	2	4	100	200	20	0	**	**	**
6000	2500	1	1	4	**	70	30	**	0	**	**	**
**	**	1	1	**		50	**		1	4	**	**
20000	4000	1	1	2	4	100	200	50	1	4	**	**
10000	2500	1	1	2	4	100	200	30	0	**	**	**
20000	**	1	1	2	**	80	120	**	1	2	**	**
5000	400	1	1	2	5	80	150	10	0	**	**	**
1000	3600	1	1	2	6	100	200	40	1	4	**	**
1000	**	1	1	2	**	90	200	**	1	4	**	**
10000	3500	1	1	2	5	80	200	30	1	2	**	**
10000	**	1	1	2	**	70	150	**	1	4	**	**
5000	**	1	1	2	**	20	120	**	0	**	**	**
10000	2500	1	1	4	5	100	40	50	1	3	4	**
10000	1000	1	1	5	6	100	20	30	1	4	**	**

**	**	1	1	**	**	80	**	**	1	4	**	**
20000	5000	1	1	2	4	100	200	60	1	1	**	**
1000	**	1	1	2	**	80	200	**	1	4	**	**
10000	1000	1	1	2	5	50	100	10	1	1	4	**
10000	35000	1	1	2	4	80	200	40	1	4	**	**
10000	5000	1	1	2	4	60	120	60	1	4	**	**
10000	**	1	1	2	**	50	300	**	0	**	**	**
**	**	1	1	2	**	70	150	**	1	4	**	**
15000	4500	1	1	2	4	80	150	50	0	**	**	**
15000	4500	1	1	2	4	60	200	50	1	1	4	**
10000	**	1	1	2	**	60	150	50	1	5	**	**
2500	**	1	1	5	**	50	10	**	1	1	2	4
10000	3500	1	1	2	4	100	200	40	1	4	**	**
7000	4000	1	1	2	4	60	150	50	1	2	**	**
10000	3500	1	1	2	4	50	100	40	1	1	3	4
10000	1500	1	1	2	4	70	100	20	1	1	2	**
5000	2000	1	1	4	5	80	40	50	1	4	**	**
2000	300	1	5	6	**	50	60	**	1	2	5	**
7000	3000	1	1	4	5	60	30	80	1	1	**	**
1000	500	1	1	2	5	100	200	20	1	4	**	**
7000	**	1	1	2	**	40	80	**	0	**	**	**
5000	1500	1	1	2	4	20	100	20	1	4	**	**
5000	1000	1	1	2	6	50	120	10	1	1	3	**
1500	3000	1	1	2	4	70	300	40	0	4	**	**
3000	**	1	1	4	**	50	40	**	1	1	4	**
7000	800	1	1	2	5	40	130	20	1	4	**	**
5000	1000	1	1	4	5	50	30	30	0	**	**	**
5000	2000	1	1	2	4	60	40	30	1	2	4	**
**	**	1	1	**	**	90	**	**	1	4	**	**
7000	3000	1	1	2	4	50	150	30	1	1	**	**
6000	4000	1	1	2	5	70	150	20	0	**	**	**
15000	5000	1	1	2	4	80	180	40	1	3	4	**
10000	**	1	1	2	**	40	90	**	1	4	**	**
5000	2000	1	1	2	5	20	100	20	1	1	3	4
6800	4000	1	1	2	4	40	120	30	1	3	**	**

:Fruit collection (in kg) 3=Wood collection (in number of trees) 4=Hay harvesting (jn centner)
l up to 3 responses based on previous answer to Question B6.
to 3 responses based on previous answer to Question B6.

her Record up to 3 products

ıternational Organizations recently? 1=Yes 0=No
ɔuses 3=Improvement of livestock quality 4=Tree cultivation 5=Other Record up to 3 trainings

Effect of JFM on Livelihood Assets (Section C)																										
Personal ID	Human				Social					Natural					Financial				Physical							
	H1	H2	H3	H4	S1	S2	S3	S4	S5	N1	N2	N3	N4	N5	F1	F2	F3	F4	P1	P2	P3	P4	P5	P6	P7	P8
1	1	1	1	1	0	0	1	0	1, 4	1	1	0	1	0	0	1	1	1	1	0	1	1	1	1	1	1
2	0	0	1	0	0	1	0	0	1, 3	1	0	1	1	0	0	1	1	1	0	0	0	1	1	1	1	0
3	0	0	0	0	0	1	0	1	3	0	1	0	1	0	0	1	0	0	0	0	0	1	0	0	1	0
4	1	1	1	1	1	0	0	0	2	0	1	0	1	-1	0	1	1	1	1	0	1	1	0	0	1	1
5	0	0	1	0	0	1	0	1	1, 2	0	1	1	1	-1	1	1	1	1	0	1	0	1	0	1	0	1
6	0	0	0	0	0	0	1	1	1	1	1	0	1	0	1	1	1	1	1	0	1	1	1	1	1	1
7	0	0	0	0	0	0	0	0	4	0	0	1	1	-1	0	1	1	1	0	0	0	1	0	0	0	0
8	1	1	1	0	1	0	0	1	1, 3	0	1	1	1	0	0	1	0	0	0	0	0	1	0	0	1	0
9	0	0	0	0	0	1	0	1	3	0	0	0	1	0	0	1	1	1	1	0	0	1	1	1	1	1
10	1	0	1	1	1	0	0	0	1	1	1	0	1	0	1	1	1	1	0	0	0	1	0	0	1	0
11	0	0	1	0	1	1	0	1	1, 5	0	1	0	1	0	0	1	1	0	0	0	0	1	1	1	0	0
12	0	0	0	1	0	0	0	1	4	1	1	0	1	-1	1	1	1	1	0	0	0	1	0	0	1	1
13	1	1	1	0	1	1	0	0	3,4	0	1	1	1	0	0	1	1	1	0	0	1	1	1	1	1	1
14	1	0	1	1	0	0	1	0	5	0	1	0	1	-1	0	1	1	1	0	0	1	1	1	1	1	1
15	0	0	0	1	1	1	0	1	1, 4, 5	0	0	0	1	-1	0	1	1	1	0	0	0	1	0	0	0	0
16	1	0	1	0	1	0	0	0	1, 3	1	1	1	1	0	0	1	1	0	1	0	1	1	1	0	1	1
17	0	0	1	0	0	1	0	1	5, 4	0	1	1	1	-1	1	1	1	1	0	0	0	1	0	1	0	1
18	0	0	1	1	0	1	0	0	4	1	1	1	1	-1	0	1	1	1	0	0	0	1	1	0	1	0
19	1	1	0	0	1	0	1	0	1, 4, 5	0	0	0	1	0	0	1	1	1	1	0	0	1	1	1	1	1
20	1	0	1	0	-1	1	0	0	1	1	1	1	1	-1	0	1	1	1	0	1	0	1	0	0	1	0
21	1	1	0	1	1	1	0	0	1, 5	0	0	0	1	0	0	1	1	0	0	0	0	1	0	1	1	1
22	0	0	0	0	1	1	0	0	3	0	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	0
23	0	0	0	0	1	1	0	0	1, 4, 5	0	0	0	1	-1	0	1	1	1	0	0	0	1	0	0	1	1
24	1	0	1	0	0	1	1	0	1,4,3	1	1	1	1	0	0	1	1	1	0	1	0	1	1	1	1	0
25	0	0	0	0	1	1	0	0	1, 4	0	0	0	1	-1	0	1	1	1	0	0	0	1	0	0	1	1
26	1	1	1	0	0	1	0	0	1, 4, 3	0	0	1	1	0	0	1	0	0	1	0	0	0	0	1	0	0
27	0	0	0	0	1	0	0	0	4, 5	0	0	0	1	0	1	1	1	1	0	0	0	1	1	0	1	1
28	1	0	1	1	1	1	1	0	5	1	1	1	1	-1	1	1	1	1	1	1	0	1	1	0	1	1

29	1	1	1	0	0	0	0	0	1, 3	0	1	1	1	-1	0	1	1	1	1	0	0	1	1	1	1	1
30	1	0	1	0	1	1	0	0	1, 3	1	1	1	1	0	0	1	1	1	0	0	1	1	0	0	0	0
31	0	0	1	0	0	0	0	0	1, 3, 5	0	0	0	1	0	0	1	0	1	0	0	1	1	1	1	1	0
32	0	0	0	0	0	1	1	0	1	0	1	1	1	0	0	1	1	1	0	1	0	1	0	1	1	1
33	0	0	1	0	1	0	0	0	1, 3	0	0	0	1	0	0	1	1	1	0	0	0	1	1	0	1	0
34	0	0	0	0	1	1	1	1	5	0	0	0	1	0	0	1	1	1	1	0	0	1	1	1	1	0
35	1	0	1	1	0	0	0	0	1, 3	1	1	1	1	-1	0	1	1	1	0	0	1	1	0	0	1	0
36	0	0	0	0	0	0	0	0	3	0	0	0	1	-1	1	1	1	1	0	0	0	1	1	1	1	1
37	1	1	1	0	1	1	1	0	1	0	1	1	1	0	0	1	1	1	0	0	1	1	1	0	1	1
38	1	0	0	1	0	0	0	0	1, 4, , 5	1	0	0	1	0	0	1	1	1	1	0	0	1	1	0	1	0
39	0	0	1	0	1	0	0	0	1	0	1	1	1	-1	0	1	0	0	0	0	0	1	1	1	1	1
40	0	0	0	1	0	1	1	0	1, 4	0	0	1	1	0	0	1	1	1	0	0	0	1	0	0	0	1
41	1	1	1	0	1	1	0	0	4	1	1	1	1	0	1	1	1	1	0	0	0	1	1	1	1	0
42	0	0	1	0	0	1	0	0	1, 4	0	1	1	1	-1	0	1	1	1	0	0	0	1	1	0	1	1
43	0	0	0	0	1	1	1	1	4	1	1	1	1	0	0	1	1	1	1	0	0	1	0	1	0	0
44	1	0	1	1	1	0	0	0	3, 4	1	1	1	1	0	0	1	1	1	0	0	1	1	1	1	1	1
45	0	0	0	0	-1	1	0	1	1, 4, 5	0	0	0	1	-1	1	1	0	1	0	0	1	1	1	1	1	0
46	0	0	1	1	0	0	0	0	1, 4	0	1	1	1	0	0	1	1	1	0	0	0	1	0	0	1	0
47	1	0	0	0	0	0	0	0	1, 3, 4	1	0	0	1	0	0	1	1	1	0	0	0	1	1	1	1	0
48	1	1	1	0	0	0	0	0	4, 5	0	1	1	1	-1	0	1	1	1	0	0	0	1	1	1	1	0
49	1	1	1	1	1	1	1	0	1, 4	1	1	1	1	0	0	1	1	1	0	1	0	1	0	0	1	0
50	1	0	0	0	0	0	0	0	1, 3, 4	0	0	0	1	0	1	1	1	0	1	0	0	1	1	1	1	1
51	1	0	1	1	0	1	0	0	4	0	1	1	1	0	0	1	1	0	0	0	1	1	0	0	0	0
52	0	0	0	0	1	0	0	1	1, 3	0	0	0	1	0	0	1	1	1	0	0	0	1	0	1	1	1
53	0	0	0	0	-1	0	0	0	1, 4, 5	0	0	1	1	-1	0	1	1	1	0	0	0	1	0	0	1	0
54	0	0	1	1	0	1	1	1	1	0	1	1	1	-1	0	1	1	1	0	0	0	1	1	1	1	0
55	1	0	1	0	0	1	0	0	1, 3	0	1	1	1	-1	0	1	1	0	1	0	1	1	1	0	1	0
56	0	0	0	0	0	0	0	0	1, 4, , 5	0	0	0	1	0	0	1	1	0	0	0	0	0	0	1	1	0
57	1	1	1	1	1	1	0	0	1, 5	1	1	1	1	0	1	1	1	1	0	0	0	1	1	1	1	1
58	1	0	0	1	-1	1	0	0	1, 3, 4	0	1	1	1	0	0	1	1	1	0	0	0	1	1	1	1	0
59	1	1	1	0	1	0	0	0	1, 3	0	1	1	1	0	0	1	1	1	0	0	0	1	1	0	1	1
60	1	1	0	1	1	0	0	0	1, 2	1	1	1	1	0	1	1	1	1	1	0	0	1	1	0	1	0

61	1	1	1	1	1	0	0	0	1, 3	0	0	0	1	0	1	1	1	1	1	0	0	1	0	0	1	1
62	1	0	1	0	0	1	0	0	1, 4	0	0	0	1	-1	0	1	1	1	0	0	0	1	0	0	0	0
63	1	1	1	0	1	0	0	1	1	1	1	1	1	0	0	1	1	1	0	0	1	1	1	1	1	1
64	1	1	0	0	1	0	0	0	3,4	0	0	0	1	-1	0	1	1	0	0	0	0	1	0	0	1	1
65	0	0	1	0	-1	1	0	0	1,4	1	0	1	1	0	0	1	1	1	0	0	0	1	0	0	1	0
66	0	0	1	1	0	0	0	1	2,3	0	0	0	1	-1	0	1	1	1	1	0	0	1	0	0	1	1
67	0	0	0	0	0	0	0	0	4, 5	0	0	0	1	0	0	1	0	0	0	0	0	1	1	1	1	0
68	0	0	1	1	1	0	0	1	1,4	0	0	1	1	0	1	1	1	1	0	0	0	1	0	1	1	1
69	0	0	1	1	0	1	0	0	3	0	0	1	1	0	0	1	1	1	0	0	0	1	0	0	0	0
70	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	1	1	0	0	0	1	1	1	1	0
71	0	0	1	0	0	0	0	0	4, 3	0	0	0	1	0	0	1	1	1	0	0	0	1	1	0	1	1
72	1	0	0	1	1	1	1	0	1	1	1	1	1	0	0	1	1	1	0	0	0	1	1	1	1	0
73	1	1	1	0	0	0	0	0	1, 4	0	0	0	1	-1	0	1	1	0	0	0	0	1	0	0	0	0
74	0	0	1	1	1	1	1	0	1	1	0	1	1	0	0	1	1	1	0	0	1	1	1	1	1	1
75	0	0	1	0	0	0	0	0	1, 2	0	0	1	1	0	0	1	1	1	0	0	1	1	1	1	1	0
76	0	0	0	1	-1	0	0	0	1, 3, 4	0	0	0	1	-1	0	1	1	0	0	0	0	1	1	1	1	1
77	0	0	0	0	0	1	1	0	1	1	0	0	1	0	0	1	1	1	0	0	0	1	1	0	1	0
78	0	0	1	0	0	1	0	0	1, 4	0	0	0	1	0	0	1	1	1	0	0	0	1	1	1	1	0
79	1	1	0	0	0	0	0	0	1	0	0	0	1	0	0	1	1	1	0	0	0	1	0	0	1	1
80	0	0	1	1	1	0	0	0	1, 4	0	1	1	1	0	0	1	1	1	0	0	1	1	1	1	1	0

H1. Did you gain any new knowledge as a result of trainings after joining JFM? 1=Yes 0=No

H2. Did you gain any new skills that helped you as a result of tranings after joining JFM? 1=Yes 0=No

H3. Has your access to health services changed due to joining JFM? In which way? 1=Improved 0=Same.-1=Worsened

H4. Has the education level of your child change due to joining JFM? In which way? 1=Improved 0=Same -1=Worsened

S1. Do you think JFM has changed the social harmony and social bonding in your community? 1=Improved 0=Same -1=Worsened

S2. Has your status changed in the society after joining JFM? 1=Improved 0=Same -1=Worsened

S3. Has your level of mobility changed after joining JFM? In which way? 1=Improved 0=Same -1=Worsened

S4. Did you see any change in your decision-making power in your family and society level as a result of JFM? In which way? 1=Improved 0=Same -1=Worsened

S5. How do you cope up in a failyear/unfruitful season? 1=Cattle selling 2=Internal migration 3=External migration (work seasonaly in Russia) 4=Taking loans 5=Other

N1. Were you able to bring any productive change in the forest? 1=Yes 0=No
N2. Has your awareness about the environment changed? 1=Improved 0=Same -1=Worsened
N3. Has your perception to use natural resource in a rational way changed? 1=Improved 0=Same -1=Worsened
N4. Do you have any access to any renewable energy source? 1=Yes 0=No
N5. Do you use any wood collected from the forest as a cooking fuel? -1=Yes 0=No
F1. Did you get any other income generating opportunities as a result of joining JFM? 1=Yes 0=No
F2. Has your income level changed as a result of the program? 1=Increased 0=Same -1=Decreased
F3. Has your ability to save changed as a result of JFM? 1=Improved 0=Same -1=Worsened
F4. Has your access to credit market changed as a result of JFM? 1=Improved 0=Same -1=Worsened
P1. Has your access to market to sell your products changed as result of joining JFM? 1=Improved 0=Same 1=Worsened
P2. Do you own land (as a result of JFM)? 1=Yes 0=No
P3. Do you own a disaster resilience house? 1=Yes 0=No
P4. Did you renovate your house for the money earned from JFM? 1=Yes 0=No
P5. Has the access to safe drinking water changed due to JFM? 1=Improved 0=Same -1=Worsened
P6. Has the access to information from Village Authorities changed (as a result of JFM)? 1=Improved 0=Same -1=Worsened
P7. Has the condition of infrastructure facilities (roads, bridges etc.) changed as a result of JFM? 1=Improved 0=Same -1=Worsened
P8. Has the to access to sanitary latrines chnaged as a result of JFM? 1=Improved 0=Same -1=Worsened

Access to JFM and Overall Opinion of the Re									
Personal ID	D1	D2	D3	D4	D5		D6	D7	D7.a
					strenghts	weaknesses			
1	1	1	0	**	feeling of owners	poor monitoring of fo	4	1	2
2	1	1	1	2	income generatior	poor monitoring of fo	4	1	4
3	1	1	0	**	each renter tries t	irresponsibilty of fore	5	0	**
4	3	1	1	1	income generatior	rules and regulations	4	0	**
5	1	1	1	2	income generatior	no weaknesses	4	0	**
6	1	1	0	**	income generatior	some of the renters (	4	1	2
7	1	1	1	1	income generatior	poor monitoring of fo	4	1	3
8	3	1	1	3	each renter tries t	non comliance with (	4	0	**
9	1	1	0	**	feeling of owners	lack of governance	4	0	**
10	1	1	0	**	income generatior	poor monitoring of fo	4	1	2
11	1	1	1	2	income generatior	poor monitoring of fo	4	1	2
12	1	1	0	**	income generatior	not everyone takes a	2	1	2
13	1	1	1	2	income generatior	non comliance with (	4	1	2
14	2	1	0	**	income generatior	poor monitoring of fo	4	1	2
15	1	1	0	**	each renter tries t	everything is good or	4	1	2
16	1	1	0	**	income generatior	not everyone takes a	4	1	3
17	1	1	0	**	income generatior	absence of strong reg	4	0	**
18	1	1	1	1	income generatior	lack of governance	4	1	3
19	1	1	0	**	income generatior	poor monitoring of fo	4	0	**
20	1	1	0	**	income generatior	poor monitoring of fo	4	1	2
21	2	1	1	1	income generatior	poor monitoring of fo	4	1	2
22	1	1	0	**	income generatior	everything is good or	4	1	2
23	3	1	1	1	income generatior	poor monitoring of fo	4	1	2
24	1	1	0	**	income generatior	forest committee is (	4	1	3
25	1	1	0	**	income generatior	poor monitoring of fo	4	0	**
26	1	1	0	**	income generatior	poor monitoring of fo	4	1	2
27	1	1	1	2	income generatior	poor monitoring of fo	5	1	2
28	1	1	0	**	income generatior	since laws do not wo	4	1	1
29	3	1	1	2	income generatior	forest committee is (	4	1	2
30	1	1	1	1	income generatior	poor monitoring of fo	4	1	2
31	1	1	0	**	income generatior	poor monitoring of fo	4	1	2
32	1	1	1	1	feeling of owners	poor monitoring of fo	4	1	2
33	1	1	1	2	income generatior	poor monitoring of fo	4	0	**
34	2	1	0	**	many people econ	Committess do not s	5	1	4
35	1	1	1	3	income for people	Not everyone is fullfi	4	0	**
36	1	1	0	**	income generatior	poor monitoring of fo	4	0	**
37	1	1	0	**	each renter tries t	not everyone follows	4	1	2
38	1	1	1	1	income generatior	lack of governance	4	1	2
39	3	1	0	**	forest stopped deg	Committess do not h	4	0	**
40	1	1	0	**	feeling of owners	lack of governance	4	0	**
41	1	1	0	**	income generatior	poor monitoring of fo	4	1	2
42	1	1	1	4	income generatior	poor monitoring of fo	4	0	**
43	1	1	0	**	income generatior	not everyone takes a	4	1	2
44	1	1	0	**	income generatior	poor monitoring	4	1	2
45	1	1	0	**	income generatior	poor monitoring of fo	4	1	2

46	1	1	0	**	each renter tries t	some renters do not	4	1	3
47	2	1	0	**	income generation	not everyone fullfills	4	1	3
48	1	1	1	3	income generation	absence of strong re	4	0	**
49	1	1	0	**	income generation	before implementati	4	1	3
50	1	1	1	1	income generation	poor monitoring of fo	4	0	**
51	1	1	0	**	income generation	poor monitoring of fo	4	1	2
52	1	1	1	2	income generation	poor monitoring of fo	4	1	2
53	1	1	0	**	income generation	non comliance with c	4	1	2
54	1	1	1	1	income generation	poor monitoring of fo	4	0	**
55	1	1	0	**	income generation	forest committee do	4	1	2
56	1	1	1	2	income generation	poor monitoring of fo	4	0	**
57	1	1	0	**	income generation	poor monitoring of fo	4	1	2
58	1	1	0	**	income generation	poor monitoring of fo	4	1	2
59	1	1	1	1	income generation	since laws do not wo	4	1	2
60	1	1	0	**	feeling of owners	forest committee is r	4	1	2
61	1	1	1	3	income generation	poor monitoring of fo	4	1	2
62	1	1	0	**	income generation	lack of resources for	4	1	2
63	1	1	0	**	income generation	lack of governance	4	1	1
64	1	1	0	**	income generation	poor monitoring of fo	4	1	2
65	1	1	0	**	income generation	poor monitoring of fo	4	0	**
66	1	1	1	4	income generation	nothing	4	1	4
67	1	1	1	1	income generation	poor governance of f	4	0	**
68	1	1	0	**	income generation	no strict rules clearly	4	1	2
69	2	1	0	**	income generation	no strict rules clearly	4	0	**
70	3	1	0	**	income generation	no weaknesses	4	1	2
71	1	1	1	1	income generation	absence of strong re	4	1	2
72	1	1	0	**	income generation	non comliance with c	4	1	2
73	1	1	1	2	income generation	poor monitoring	4	1	2
74	1	1	0	**	income generation	not everyone follows	4	1	2
75	1	1	0	**	income for people	since laws do not wo	4	0	**
76	1	1	1	3	income generation	non comliance with c	4	0	**
77	1	1	0	**	income generation	poor monitoring of fo	4	1	2
78	1	1	0	**	income generation	rules and regulations	4	1	2
79	1	1	1	1	income generation	since laws do not wo	4	1	2
80	1	1	0	**	income generation	absence of strong re	4	1	2

D1. From where did you get to know about JFM? 1=Forest Committee (Lezkhoz) 2=Public media 3

D2. Did you get enough information bout JFM before joining it? 1=Yes 0=No

D3. Was there any difficulty to join JFM? 1=Yes 0=No

D4.1 If yes, what was the most difficult thing for you? 1=Corruption 2=Unfair allocation of land plo

D5. According to you, what are the strenght and weaknesses of JFM?

D6. After joining the JFM, in which area of your life you see the change the most? 1=Human 2=Soc

D7. Did you receive any help from stakeholers? 1=Yes 0=No

D8. If "yes" to Question D6, in which form did you receive the help? 1=Financial 2=Advice 3=Physic

D9. What kind of change JFM brought in your life? 1=Positive 0=No change -1=Negative

D10. What kind of changes did you see in the forest coverage after JFM? 1=Improved 0=Same -1=

D11. Could you please explain the change in people's lives caused by JFM in general (key words)?

D12. Recommendations (key words)

spondent (Section D)					
D8 D7.b	D7.c	D9	D10	D11	D12
**	**	1	1	improved living stand	enforcement of laws, bu
**	**	1	0	improved living stand	strict control over walnu
**	**	1	-1	improved living stand	enforcement of laws
**	**	1	-1	improved living stand	strict control, creation o
**	**	1	0	improved living stand	offer alternatives to ene
	4	1	-1	people care more ab	bring some good profess
**	**	1	-1	improved living stand	enforcement of laws
**	**	1	0	improved living stand	strict control
**	**	1	-1	people earn money b	enforcement of laws
4	**	1	-1	Improved living stand	giving more authority to
**	**	1	1	improved living stand	strict control
**	**	1	-1	Improved living stand	enforcement of laws
**	**	1	-1	improved living stand	strict control
	**	1	-1	Improved living stand	bring some good profess
**	**	1	0	improved living stand	strict control
4	**	1	0	improved living stand	enforcement of laws, fo
**	**	1	-1	improved living stand	strict control
**	**	1	-1	improved living stand	give Forest Committee r
**	**	1	-1	improved living stand	creating job opportunitie
**	**	1	-1	improved living stand	strict control
**	**	1	-1	improved living stand	enforcement of laws
2	**	1	0	improved living stand	enforcement of laws, fo
**	**	1	-1	improved living stand	strict control
2	**	1	0	improved living stand	enforcement of laws
**	**	1	0	improved living stand	enforcement of laws
**	**	1	-1	nothing	creating job opportunitie
4	**	1	0	improved living stand	forest planting, strict co
2	3	1	-1	improved living stand	forest planting, strict co
4	**	1	1	improved living stand	impose strict rules
4	**	1	-1	improved living stand	strict control
3	4	1	-1	improved living stand	forest planting, strict co
**	**	1	-1	improved living stand	enforcement of laws, fo
**	**	1	-1	improved living stand	the approach itself is go
3	**	1	0	improved living stand	approach is good, but fir
**	**	1	-1	improved living stand	give much more authori
**	**	1	-1	improved living stand	strict control, protection
4	**	1	-1	people started to thi	we lack good profession
4	**	1	0	improved living stand	bring cheaper alternativ
**	**	1	-1	more income	strict control
**	**	1	-1	more income, better	enforcement of laws
4	**	1	0	Improved living stand	Forest Committees shou
**	**	1	-1	improved living stand	everyone should comply
**	**	1	-1	Improved living stand	enforcement of laws
3	4	1	-1	improved living stand	strict control
4	**	1	0	Improved living stand	bring some good profess

4	**	1	-1	improved living stand	bring professionals who
4	**	1	-1	people live better	forest planting, more str
**	**	1	0	improved living stand	strict control
**	**	1	-1	income coming from	bringing affordable alter
**	**	1	-1	improved living stand	creating job opportunitie
**	**	1	-1	improved living stand	strict control, forest plan
4	**	1	-1	improved living stand	forest planting, solve the
4	**	1	-1	improved living stand	those who do not plant t
**	**	1	-1	improved living stand	bring professionals who
4	**	1	-1	improved living stand	solve the problem of cat
**	**	1	1	improved living stand	strict control, creation of
4	**	1	-1	improved living stand	creating job opportunitie
4	**	1	-1	improved living stand	strict control, bring more
4	**	1	-1	improved living stand	forest planting, strict co
4	**	1	0	improved living stand	impose strict rules
4	**	1	-1	improved living stand	strict control
**	**	1	-1	improved living stand	forest planting, strict co
4	5	1	0	improved living stand	forest planting, solve the
**	**	1	-1	improved living stand	bring educated professio
**	**	1	-1	improved living stand	give Forest Committee r
**	**	1	-1	income coming from	Forest Committees shou
**	**	1	-1	improved living stand	solve the problem of cat
3	4	1	-1	improved living stand	bring cheaper alternativ
**	**	1	-1	improved living stand	strict control, bring more
4	**	1	0	better public infrustr	solve the problem of cat
**		1	-1	improved living stand	bring cheaper alternativ
1	**	1	-1	improved living stand	strict control, forest plan
**	**	1	-1	improved living stand	creating job opportunitie
4	**	1	0	improved living stand	strict control over walnu
**	**	1	-1	improved living stand	strict control, bring more
**	**	1	-1	improved living stand	enforcement of laws
4	**	1	-1	improved living stand	solve the problem of cat
**	**	1	0	improved living stand	strict control, forest plan
4	**	1	-1	improved living stand	impose strict rules
3	4	1	-1	improved living stand	strict control, forest plan

=Neighbourhood 3=Other

ots 3=Complicated competition procedure 4=Too much bureaucracy

cial 3=Natural 4=Financial 5=Physical

cal capital 4=Time 5=Other (insert up to 3 responses)

Deteriorated