Relocation and Resilience: A Case study from Sariska Tiger Reserve

A THESIS Submitted by

ABHISHEK

For the award of the Degree of

MASTER OF SCIENCE
IN HERITAGE CONSERVATION AND MANAGEMENT

Under the guidance of

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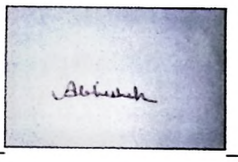
DECLARATION

I, **Abhishek**, hereby declare that the research work entitled "**Relocation and Resilience: A Case study from Sariska Tiger Reserve**", carried out in partial fulfilment of M.Sc. (Wildlife Science) degree of Saurashtra University, Rajkot is an original work. This work was carried out under the supervision of **Dr. Anju Baroth, Scientist – C** and co-supervision of **Dr. Visnupriya Kolipakam, Scientist- C, Prof. Qamar Qureshi, Scientist G**, at the Wildlife Institute of India from January 2021 to July 2021. I hereby declare that this work has not been submitted in any form for any other degree or diploma at any university or other institutions.



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CERTIFICATE

This is to certify that Mr. **Abhishek** has carried out an original piece of research in partial fulfilment of Master's Degree in Wildlife Science of the Saurashtra University, Rajkot, Gujarat. The topic of his dissertation was "**Relocation and Resilience: A Case Study from Sariska Tiger Reserve**". The study was carried out under our supervision from January to June. We hereby certify that this work has not been submitted for any degree to any university

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Abstract

India have set up more than 980 protected areas with the primary aim of conserving biodiversity. Human habitation and use of natural resources are forbidden within these protected areas. However, biomass extraction including grazing and fuelwood collection is common from communities residing inside or situated in periphery of the protected areas (Kothari *et al.,* 1989; Pande, 2005). Biomass extraction is observed as the most serious warning to biodiversity by forest authorities, therefore relocation has become a primary objective to create inviolate spaces for biodiversity conservation. Role of these inviolate spaces is considered significant in large forest habitats for nourishment of biodiversity and reduction of human-wildlife conflicts (Soule & Terborgh, 1995; Karanth, 2005).

Relocation of villages have implications on socioeconomic status of forest dependent people, however studies have often ignored the well-being of people after relocation. Sariska Tiger Reserve has undertaken relocation as one of its key programmes for biodiversity conservation. Sariska has a long relocation history, Karnkawas and Kraska were the first relocated programs in the reserve in 1977 (Johari, 2003). The recent project in Sariska comprised relocation of 493 households from villages of Umri, Deori, Kankwari, Haripura etc (Sahabuddin *et al.,* 2007). Relocation programs in Sariska are on anvil since 2000, after complete extinction of tigers in 2005, government felt the need for relocation and people were seen as the main reason for tiger loss due to hunting and poaching pressures.

In my study I took a field work of analysing the ground realities of relocation in Sariska Tiger Reserve. The objectives of the study suggest: (1) documenting the perception of forest department and communities towards relocation. (2) analysing the resilience of communities in "Relocated" and "To be Relocated" sites. My study includes the use of sociological survey techniques including questionnaire survey, semi-structured interviews, observatory analysis, focused group discussion etc. The study was conducted in two relocated sites (1) Rundh

Maujpur (2) Bardod Rundh and future projects villages for relocation Kankwari, Haripura, Lilunda and Kraska. 86 households were surveyed in relocated sites and 96 households were surveyed inside the core zone of Sariska. Results of Resilience have been quantified through abstract and non-abstract measurable.

The finding in the study shows that, the influence of local inhabitants on relocation process is very limited. Forest department and local authorities need to retrospect their notion of conservation and rethink their plan for relocation. Results for the resilience measurable in the study shows that relocation facilitation have improved educational accessibility, decreased natural resource dependency, increased adaptive livelihood options, development of basic infrastructural facilities and enhanced material assets in the relocated sites. The result also found that the involvement of local communities is still foreseen from organizational lens. Local knowledge and potential of communities in management of resources is underestimated in the relocation process at Sariska Tiger Reserve.

Based on my results I conclude that execution process of relocation is yet to be more community inclusive in Sarsika Tiger Reserve. My study reiterates that the relocation process should be more decentralised, it should involve NGOs and social organisations in proper implementation. Execution of propose plan in relocation needs more focus from forest authorities. The scope for improvement is present in community concerning issues for relocation, notifying the need of basic amenities. The relocation package proposes pre-planned meetings with community members which is missing in case of relocation of STR. Inclusion of the opinions of stakeholder community in relocation package needs more consideration and issues resulting with relocation needs instant actions. A success of any relocation project cannot be just determined by achieving ecological objectives, consideration of attaining social requirements is also equally significant.

Chapter 1 Introduction

1.1 Background

Biodiversity conservation is passing through a challenge when protected areas are not sharing equal cost and benefits, the subject of relocation is lying at the top of the problem. The issue of relocation and eviction of communities from the protected areas is undertaken all over the world since the pre-colonial period, however in the last couple of decades there has been a significant rise in the number of protected areas around the world. Therefore, conservation has put a continuous pressure on indigenous people who now perceives it as a main threat to their territories (Dowie, 2009). The Network of protected areas covers more than twelve percent of the total terrestrial surface excluding the ice-territory and is considered as the keystone for conservation (Brooks *et al.,* 2004). Millions of people in the past have been displaced to create habitats for wildlife (West Igoe & Brockington, 2006). Historical relocation in the past have resulted in mass displacement of human communities to the tune of 1 to 16 million people in Africa (Geisler & De Sousa, 2001) and 600,000 people in India (PRIA, 1993). Individual protected area management policies resulted in relocation and these mass movements were hardly documented.

After condemnation of these historical relocation movements, protected areas are improving their relocation policies globally (Agrawal & Redford, 2009; Lasgorceix & Kothari, 2009; West et al., 2006). But studies on landscape level impacts and wider effects beyond the protected area boundaries including the effect of relocation on people's well-being are very few (Cernea & Schmidt-Soltau, 2003; Harihar, Ghosh-harihar, & Macmillan, 2014; Milgroom, Giller, & Leeuwis, 2014). Poor documentation of relocation in the past and consideration of standalone policies of small sample sizes and no comparison across geographies or communities and struggle with measuring well-being of people.

The western concept of conservation considers biodiversity and forests as immaculate while indigenous communities are blamed for the decline. According to this notion relocation of such tribal people is the accurate solution to safeguard the environment (Dowie, 2009). Researchers' findings, on the other hand, imply that relocating people from protected regions is hazardous to both the protected areas and its biodiversity, as well as the communities that depend on natural resources. (Cernea & Schmidt- Soltau 2003).

Relocation has affected both people and conservation in human dominating landscapes. Despite the fact that conservation recognises the importance of human needs for natural resources in and around protected areas, local people have been compensated for losses due to conflicts with wildlife, and policies such as Joint Forest Management have been developed to provide livelihood opportunities to reduce human pressure on natural areas (Goswami & Paul, 2012; Oldekop, Holmes, Harris, & Evans, 2016). Nonetheless, these initiatives are largely ineffective, as they are focused on broad conservation aims rather than local needs for natural resources. (Barua, Bhagwat, & Jadhav, 2013; Kumar, 2002). The setting up of protected areas for biodiversity conservation and ecosystem is a treasure for those who benefit from their shared use. These benefit notifications, however, have come at a higher cost paid by the local communities living within these spaces, putting their resources, land, and other development opportunities at risk. (Kruege, 2009).

Communities in rural areas have remained dependent largely on the natural resources. This is still in continuation and millions of forest dwelling communities are using forests for their livelihood resources (Gibson *et al.,* 2000). Additionally, degradation of forests by livestock grazing shows the dependency of communities on forest products. Thus, the contest between grazing livestock and wildlife can result in a declining prey base which can further result into a decline in tiger numbers.

Conservation of Natural resources has long been on the agenda of institutions concerned with biodiversity. However, the country's current population is equivalent to more than 17 per cent of the global population, making us the second most populous country globally. (Worldometer, 2020). The local communities living dependent on forests constitutes around 20% of the total Indian population (Mcneely & Scherr, 2003).

Management in these protected areas centralises the power to bureaucracies, while the local communities and traditional knowledge is hardly taken into account (Kothari et al. 1995, Torri, 2011). Human habitation and natural resources are too restricted in most of the protected areas (Lasgorceix & Kothari, 2009). Therefore, local communities living inside the protected areas live in a deprived state, causing regular conflict with the protected area managers considering them responsible for the loss of wildlife (Karanth, 2005, Lasgorceix & Kothari, 2009). As a result, relocation of communities from protected areas is seen as a solution to these issues.

Earlier studies have shown that relocated populations and their living conditions have become worse (Gadgil *et al.*, 1993; Heltberg, 2001). Relocation of communities outside protected areas has remained constant and controversial, dividing the conservation communities (Wilkie *et al.* 2006; Brockington & Igoe, 2006). Those who are advocating the idea of wilderness believe that local communities' presence is very harmful (Oelschager, 1991). On the other hand, scholars challenge the philosophical and historical adequacy of the wilderness (Cronon, 1995; Brockington 2002; Schmidt-Soltau, 2003). Therefore, conservation of natural resources comprises aesthetics, ecology, and leisure time activities and includes another dimension of equality and social justice. Thus, understanding the process of relocation becomes significant to understand livelihood and resilience level of the communities' dependent on natural resources. It will provide an overview of whether relocation is doing justice to the communities in building their collective and individual strength.

1.2 History of Relocation

The first relocation drive started in India during pre-independence period in 1908 when two small villages were relocated from Kaziranga reserve in Assam. This later on was followed in Kashmir in Shikar reserve and Kanha National Park in Madhya Pradesh where Baigas were also relocated. After independence relocation cases are witnessed in Sariska Wildlife sanctuary, Rajasthan, in Gir Wildlife Sanctuary in Gujarat and many other protected areas (Lasgerscoix & Kothari, 2009). However, the customary practice of relocation from protected areas began in 1970s after the enactment of Wildlife Protection Act (WLPA) in 1972 and later launching of Project Tiger in 1973. WLPA prescribed the procedures for management of protected areas and regularizing of biodiversity conservation activities (Kothari, 2009). Regulations of WLPA had direct impact on thousands of tribal & forest dwellers, and their traditional practices and lifestyle was directly affected by the act, although hunting practices for elite sportsmen and tourism activities were allowed in the act (Dowie 2009). During this period there were about 67 National parks, 336 Wildlife Sanctuaries making up to 2.59% of the total Indian land cover, which has doubled up today. As per the most recent records, India currently holds 903 Protected areas (101 National Parks, 553 Wildlife sanctuaries, 86 Conservation reserves and 163 Community reserves) covering 21.54 % of the total geographic area (Wildlife Institute of India, 2020).

The question remains open whether relocation lessens the pressure from biodiversity important areas or shifts to other landscapes. Landscape wise process of relocation in protected areas give a complete picture of policies that can achieve: well-being of relocated people and landscape level conservation targets. Research studies indicate that proximity of anthropogenic activities around protected areas is rising (DeFries, Karanth, & Pareeth, 2010; Nagendra & Mondal, 2013). Increased demand for natural resources in protected areas is putting pressure on wildlife

and people in non-protected areas. The pressure of relocating the public from these protected areas is also increasing.

As parallel to the global lines, India too has a disputable history of conflicts and dispossessions from protected areas. These relocation processes were viewed as successes, but they were short-lived after reports of tiger population losses, including poaching from Panna Tiger Reserves in 2005 and from Sariska in 2004 began to circulate. Considering all these events, the current conservation plan is adding to improve efforts for tiger conservation in India. Conservation of Wildlife in developing countries including India is based on relocation of social groups, most of them belonging to economically poorer sections (Sahabuddin & Bhamidipati, 2014). The aim of this study is to understand how the government is currently implementing these relocation programmes and whether changes in policy have led to any betterment in the implementation. A study done earlier (Lascorgeix & Kothari, 2009) suggests that the number of people displaced or relocated outside the reserve forest have scaled to 100,000 between 1970s and 2008. These relocation projects are backed with the aim to integrate and expand the protected area network in the country.

India currently in its national plan for tiger conservation is following a systematic relocation policy to make inviolate zones. In this plan protected areas are managed for tigers and works as multipurpose zones identified as connecting corridors. Until 2006, there was no effective legal relocation policy and Beneficiary Oriented Tribal Development (BOTD) scheme was used for relocation (Sahabuddin & Bhamidipati, 2006). After questions were raised against relocation, Indian government introduced Scheduled Tribes and other Traditional Forest Dwellers Act known as the Forest Rights Act (FRA) in 2006. The Forest Rights Act (FRA) restores deprived forest rights in India, including community rights over common property resources and individual rights to cultivate land in forested areas. The FRA came into existence from the struggle of peasants for forest land rights, drawing attention to the need for greater

protection for indigenous communities. The World Parks Congress in Durban in 2003 highlighted its commitment to involve indigenous communities and nomadic people in the creation and management of protected areas. However, the idea of informed consent as a pre-requirement for management plan of the protected areas was recognized later by the Convention on Biological Diversity (CBD). Article 8(i) of the CBD states that "*the establishment, management and monitoring of protected areas should take place with the full and effective participation of, and full respect for the rights of indigenous and local communities consistent with national law and applicable international obligations*".

1.3 Role of NTCA

NTCA was established in 2005 by Ministry of Environment and Forest (MoEF back then) and notified under the WLPA to supervise the tiger reserves. Since then, NTCA has overseen the overall management as well as expansion of the tiger reserves. The expansion of tiger reserves accelerated after the NTCA's involvement; in fact, the area of tiger reserves increased from 25,551 sq. km in 2007 to 40,340 sq. km in 2018, nearly doubling the land mass in 2007. The numbers of tiger reserves also grew from 28 to 50 during this time (Fanari, 2019). The introduction of voluntary village relocation in core/critical tiger habitats of reserves in 2011 by National Tiger Conservation Authority (NTCA) was a game changer for relocation process as a whole. Conservation of Critical Tiger Habitat (CTH) was one of the main causes for relocation of these indigenous communities. In cases like Bilgiri Rangaswami Temple Wildlife Sanctuary in Karnataka, CTH was illegally notified and applied against the wish of Soliga indigenous community residing in the area (Madegowda, 2017). These displacements were made successful through NTCA funding which started in 2008 and has scaled from Rs. 30 Crores in 2007-08 to Rs. 114 crores in 2009-10 (Tiger Link, 2009). According to the NTCA an

amount of 435.46 crores was released between 2007-08 to 2011-12 for the relocation. In the year 2013-14 itself the amount equal to 49.6 crore was spent for relocation in Dampa Tiger Reserve in Mizoram, Ranthambore & Sariska Tiger reserve in Rajasthan and Tadoba Tiger reserve in Maharashtra. It consolidates the earlier revised NTCA guidelines introduced in 2008 which included relocation in core areas of tiger reserves. NTCA guidelines with its new paradigm of focusing on benefits of local people even shows the shift in international conservation discourse.

1.4 Relocation Package

The voluntary relocation owes to the Article 10 of United Nations Declaration on the Rights of Indigenous peoples (UNDRIP) adopted in 2007 in which India is a signatory. According to this article, no relocation should take place without the informed consent of the indigenous people and they are protected from forcible movement from their land and territories. Relocation can only take place after agreement on fair compensation and if possible, with the option of return (Sarma & Barpujari, 2020). As the name suggests, these guidelines direct the relocation based on the voluntariness of the people, showing a paradigm shift in the history of relocation. The ongoing relocation policy by National Tiger Conservation Authority (NTCA) gives an opportunity to study relocation providing records of the relocated households.

The revised guidelines of NTCA of 2008 provides a package with two options:

Option 1. Payment of 10 Lakhs Rs. per family (which in April 2021 has been increased to 15 Lakh Rs.), if family opts so, without any relocation process by the forest department. This process is monitored by the collector of the concerned area, to ensure that the person is rehabilitating by individual choice with the package money provided to them.

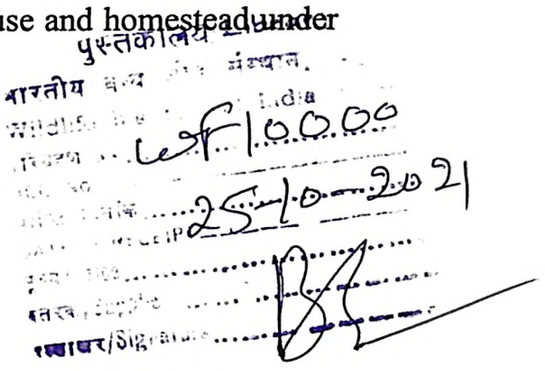
Option 2. Relocation of the village by the forest department. In this case the following options of the package are given:

Table 1.1 Details of Relocation Package, Source: NTCA, 2008.

Components of Option 2 Package	
Agricultural land procurement (2 ha) and development	35% of the total package
Settlement of Rights	30% of the total package
Homestead land and house construction	20% of the package
Incentive	5% of the package
Community facilities (access road, the irrigation, drinking water, sanitation, total package electricity, telecommunication, community centre, cremation ground	10% of the package

In this package the value of the assets (done by the collector) is comparatively higher than the amount given in the option A which is compensated through funding support from the state government. The eligible families for relocation have free choices between these two options but mostly procurement of land for relocation has been the favourite among the two. The procurement of land in option 2 appears to be the major constraint for forest department. There are limitations of standard practice of relocation in which eligible families are relocated in degraded forestland, but sooner these forest compartments are going to be transferred into the revenue department. Therefore, even when both the options are available, sometimes it may not be possible for forest department to go forward with option 2. In such case Option 1 seems to be an efficient solution, but it may not always be adequate to buy two hectares of land with the ongoing fluctuations in land prices. Definition of family is the epicentre of the relocation

package. The definition of family in the National Rehabilitation and Resettlement policy 2007, defines family as a person, his or her spouse, minor sons, minor brothers, unmarried daughters, unmarried sisters, mother, father and relatives living with him or her and dependent on him or her for their livelihood; nuclear family comprises of a person, his or her spouse and minor children. According to this definition a male above 18 years is eligible for the relocation package and will be provided with agricultural land, constructed house and homesteadunder the option 2.



1.5 Rationale for Relocation by Government

The major reason for the Indian government to relocate people was to protect the Tiger, a charismatic endangered animal species. National parks, tiger reserves, and wildlife sanctuaries are areas rich in prey for tigers that are linked to a healthy ecological system through habitat corridors. (Karanth & Stith, 1999). Also, these protected areas are surrounded by people for their traditional sources of livelihoods. But there are historical instances of conflicts including the decline in numbers of Bengal tiger due to poaching, habitat fragmentation and forest degradation (Rangrajan & Sahabuddin, 2006). The subject of conservation-based relocation give rise to extreme perceptions regarding the two: the conservation needs and the socio-economic impacts. Therefore, conservationists advocate for human free conservation areas to ensure for the viability of endangered Bengal Tiger, while the locals and social scientists oppose attempts to relocate people from their homes.

Secondly, conservation of natural green spaces is essential for ecology and effectiveness of the protected areas and is based on various components including avoiding poaching, hunting, forest cover loss, grazing and promoting non-timber forest harvesting, etc. (Nagendra *et al.*, 2010). These forest dynamics are frequently used to understand the effectiveness level of the

protected areas (DeFries *et al.,* 2005; Naughton-Treves *et al.,* 2005; Hayes 2006; Andam *et al.,* 2008; Nagendra 2008; Gaveau *et al.,* 2009). Loss of forest cover is not the ultimate test to check protected area effectiveness because several factors can affect the biodiversity (Mondal & Nagendra, 2011). However, integrated and continuous forest cover is a useful matrix for conservation evaluation, providing quality of the forest, wild herbivore distribution, forest composition etc. (Kuiijper *et al.,* 2009).

1.6 Scope and Objective of the Research

This study examines relocation of communities since 1971 from Sariska Tiger Reserve (STR), which is known for its conservation success stories in recent past. STR is located in the Rajasthan state of India holding a population of 20 tigers (Hindustan Times, 2020). This makes STR as the largest tiger holding population after Ranthambore Tiger reserve in the state. It was taken up in 1978 as a Tiger area under the Project Tiger establishment in 1973. STR is serving a pivotal role in maintaining tiger populations in Semi-arid landscapes of the Aravalli hills. Management standalone is not responsible for the conservation of tigers in protected areas. Study shows that healthy genetic population is necessary for tigers to disperse from one area to the other (Maldonado *et al.*, 2013; Yumnam *et al.*, 2014). Research shows that various paths have been used by tigers to navigate the human-dominated areas in protected areas (Dutta *et al.*, 2015; Thatte, Joshi, Vaidyanathan, Landguth, & Ramakrishnan, 2018).

The reserve also has rising tourism values supporting the local economy of the region (Wheeler, 2009). The communities residing inside the STR are mostly part of "Scheduled Tribes" and "Other backward classes". STR earlier was a mix of 18 castes, the dominant caste are the Meenas aho are farmers and Guujars dependent on livestock rearing. People traditionally were dependent on the land and natural resources for livelihood, however the protected area in STR

has changed the trend. Tourism whether direct or indirect started paying for 24% of the household in local economies (Wheeler, 2009).

The aim of this dissertation is

a) To study the relocation impacts on people's resilience and
b) Analyse the perspectives of forest department of Sariska Tiger Reserve.

This dissertation builds on the excellent documentation of post relocation patches of households by the Sariska Forest department and earlier knowledge of human-wildlife conflict in STR landscape (Karanth, 2006). Resilience of a community is seen as the ability to fight against a disaster of any kind. It is viewed as a positive response increasing the local capacity, resources and decreasing the risks and trauma. With mixed definition appearing in scientific world, 'Community Resilience' as a concept has not reached to its complete definition (Patel *et al.,* 2017).

This study is focused on the two class of measurable. First, is non-abstract measurable class which can be classified as quantified data of the research. Second, is abstract measurable including the qualitative analysis of the study. In order to understand the non-abstract resilience measurable, the research will focus on following variables:

i) Dependency of Community on Natural Resources,
ii) Adaptive Livelihood Options,
iii) Community Groups and committees for their Decision making,
iv) Education,
v) Material Assets and Accessibility to Infrastructure,
vi) Power Structure/Political and Social Structure of the society,
vii) Social trust and collective efficacy,
viii) Health care systems in the village.

Abstract values of the study will include

i) Traditional knowledge structure,

ii) Activity pattern and leisure time,

iii) Identity and perception, and

iv) Their relation with Nature.

For the second objective of the dissertation, I have analysed perceptions of the forest department and indigenous community. It is essential to understand the rational and aim behind the relocation process as a whole. By process of analysing the community perception it will give the understanding of the implementation process of the relocation. Whether communities had any say in their relocation choices and what was offered to them on what rational grounds. In order to assess the perceptions, I have done focused group discussions (FGD) and personal interviews with forest department officials and community locals.

Survey has been conducted in three sites, both relocated and future prospects for relocation have been taken into account. A total number of 180 surveys have been conducted involving the different caste and sex groups available in the region.

In the STR landscape, communities are living in agrarian livelihoods and use natural resource for consumption. In chapter 4, I will explore the resilience level of communities through defined measurables. I include comparisons with non-relocated population, this comparison will provide a useful baseline to assess the impacts of relocation on household levels with inferences to post-relocation interventions. To assess the conservation progress in STR it is significant to answer the question of relocation process. This study will try to answer the camouflaged uncertainties of how relocation is strengthening the communities economically and socially.

Chapter 2 Review of Literature

FRA in India entered into force in 2008 which allowed local users to resource rights and land in government protected areas. The issue of indigenous people's rights is very complex and involves millions of livelihoods. These narratives shape the indigenous people and implementation of tiger laws in the tiger reserves. Through Literature review in my thesis, I have tried to explain the significance of these narratives and discourses and have demonstrated how the narrative itself is a political ground.

In the second half of this chapter, I have tried to define the broad definition of community resilience. The concept of community resilience earlier is propagated for a disaster response approach. It is viewed as a positive attitude, showing the local capacity (Kennedy *et al.,* 2013; Dawes *et al.,* 2004; Dept. for Intl. Development, 2011), social support (Rodriguez *et al.,* 2013; Aldrich *et al.,* 2015), resources (Coles & Buckle, 2006) and reducing danger (Turnbull *et al.*, 2016). However, community resilience's core definition is not clearly defined in scientific studies and practice (Patel *et al.*, 2017). Recent studies on social resilience mainly focus on coupling, interdependence, and co-evolution of social and natural systems (Folke, 2006).

2.1 International Status

2.1.a Narrative

Narratives have a significant effect on decision making and environmental decisions are not far from narratives. This chapter covers existing International, national and regional literature on decision making of relocation and resilience. The popular conservation narrative shows indigenous people as ignorant and poor in India. Indigenous people are meant as destroyers of forest cover and poachers of animals. Indian government is seen as the environment friendly

mechanism who relocates these indigenous people and creates violate spaces for flora and fauna (Rice, 2012). However, these locals also have a unique knowledge of the environment and uses cultural essentialism. This makes them the legitimate claimer for the resource rights in protected areas. In past the human-free areas were unsuccessful in protecting forest and animals which has made legislation authorities realize the need for a community conservation approach. However, several countries are still struggling to get access for indigenous population in their forest conservation acts.

Paul Robbins in his book written in 2004 states that control over resources is not judged by declining biodiversity, overgrazing is happening in the landscape but by the environmental factors that are considered as true by competing interests, locals and policy makers. These narratives are held responsible for shaping the natural resource management decisions according to Robbins. Therefore, scholarly attention looks at the material conditions of an ecosystem. Narratives related to environment rely on assumptions about complex natural systems and interaction between human-environment (Menzies, 2007). People have only incomplete understanding about systems and narratives assist in environmental change. Roe describes those narratives are important for policymakers to make decisions in complex situations because it gives a concrete platform to base a policy (Roe, 1991). However, the uncertainty and complexity and the reality of half knowledge can lead to solutions not addressing the root causes for environmental problems (Fairhead & Leach, 1995). For example, nomadic pastoralists and small peasants were blamed for desertification in the Sahel & Sahara in Africa. Later when this story gained popularity among development practitioners in the 1980s, United Nations (UN) reports expressed issues about the scientific basis of the crisis (Forsyth, 2003).

The narratives criticized research on the causes of aridity which says that human actions have small impact on rainfall levels (Forsyth, 2003). UN later ignored these ambiguities, and

recommended that Sahel peasants and nomads change their land use patterns (Swift, 1996). However, reducing the size of livestock herds did nothing to increase the green cover or reduce aridity (Sullivan, 1996). This example of desertification shows importance of narratives, they give the idea upon which decisions are made by decision-makers about management and conservation of natural resources (Roe, 1991).

Narratives are part of regular negotiations of property rights including forest rights. Indigenous people have used narratives to argue for communal land rights from a long time (Fortmann, 1995). In India forest-dwelling people have used narratives about pre-colonial access to forest resources. Hegemonic narrative is most widely circulated story about an environmental change. It is a way through which cultural practices and values of the elite are spread in a way that it become unquestioned. However, hegemonic narratives are mostly dominative in catching the attention of the policymakers (Flint, 2009). Narratives regarding environment feed into large frameworks about society and nature. For instance, international NGOs and governments adopt a narrative and make programs, statements and allot money in accordance to that narrative (Hoben, 1995).

The hegemonic narrative in colonial nations is considered as reiteration of colonial narratives (Guha 1983). Native population using the forests in a destructive manner is where these narratives begin from. Due to lack of modernity and rise in the population, once known as sustainable practice is now seen as destructive. As a research (Menzies, 2007) says that intervention of outside institution is very necessary in saving indigenous people from these narratives. In India communally held-forests were managed by colonial government using the rational of ecological modernization.

The idea of "modern science" was seen as estimating sustained yield, work plans, and species plantation of marketable trees like teak for export (Guha, 1983). And even post-independence Indian Forest Department administering these pre-colonial laws using the name of

conservation. Gradually and slowly the tiger became a valuable asset for conservation of wildlife tourism, which before was feared and hunted nearly to extinction by the British.

By following the American model of human-free national parks, government owned forests were turned into protected areas. This model was adopted by several developed countries.

Stories about indigenous people as destroyer of protected areas remained hegemonic, but people residing in these conflict areas made counterarguments (Leach & Fairhead, 1995). Cultural essentialism was used by these locals to establish their ecological legality as ecological stewards (Pulido, 1996). Culture essentialism was of the idea that culture fixes anthropological definition as unitary and it determines people's collective and individual identity (Grillo, 2003). Essentialization on the other hand treats a trait as inherent to the culture and through extension to the collective and individual identities of a group. Both outsiders and insiders can essentialize a group. Cultural essentialism was used by British to justify their power. British declared Hindus to a weak and unmanly culture, they need protection just as a woman need from her husband (Mill, 1817; King, 2002). James Mill's popular literature "History of British India" tries to prove the effeminacy of Hindu culture in India. Cultural essentialism can give marginalized people power to fight existing hierarchies of power. Indigenous people argue that to claim legitimacy they need to react according to the rituals of their cultures. Indigenous people essentialize themselves as ecological heroes and believe that their cultures are inherently more sustainable from the mainstream culture (Paulido, 1996). For example, in New Mexico Hispanic grazers believed their grazing patterns as perpetrators of ecological destruction and essentialized it as inherently sustainable in nature. This practice was earlier viewed as incapable of managing natural resources by American state. Use of narrative here by Hispanic grazers helped them to increase management rights and a land trust (Paulido, 1996). Essentialism acclaim indigenous people with a special knowledge for the natural; environment (Karlsson, 2000).

Although it creates a political opportunity for essentialists, these claims of ecological legitimacy by essentialists are problematic. First, indigenous people are not sustainable (Damodaran, 2006; Baviskar, 2011). Various communities try to exploit the environment by claiming ecological legitimacy (Karlsson, 2000). Cultural essentialism also erases differences within a group, political ideology, ignoring gender, class or factors that are not cultural. It ignores differences in consumption of resources and access to them within an indigenous community. This assumption of considering every village of indigenous people as homogenous has led to conflicts in conservation programs on community across the world (Menzies, 2007). Also, cultural essentialism hides the variance within a group of indigenous people. For example, in Malaysia, Sarawak the native forest people deprived Penan indigenous community for their acclaim on the forest (Brosius, 1997). Western environmentalist values the environmental knowledge of Penan people as mystical wisdom which made them disservice. Brosius in his study describes how a couple of environmentalists took sago palm field research of Brosius and expanded it to use as a widespread reminiscent of western romanticism without giving attention to ideas relating with Penan (Brosius, 1997). These images create material problems for indigenous people and policymakers ignores the real.

In Indian scenario leftist activists and indigenous people claim that locals live in harmony with the nature, by counter narratives they also promote this narrative (Karlsson, 2005; Baviskar, 2011). Indigeneity discourse states that for the tribal forests, land and wildlife are not just subsistence resources, but also an aspect of living with nature which is sacred and should be treated with respect. Natural and social world relations are deeply rooted in an ethic, which is distributive and egalitarian in nature (Baviskar, 2011). Locals become the heroes of degradation stories by dispossessing the government using the natural resources against them. They impose external management which later leads to degradation. Hegemony gets undermined by these counter narratives because of power redistribution in protected areas. The

fact establishment that local indigenous people are the best possible land managers, allows them to regain the rights which earlier were closed on the name of ecological modernization of protected areas.

Indigenous people for resource control in India have used essentialism in their counter narrative successfully. In 1930s indigenous activists were struggling against the government of Bihar state under the banner of Adivasi. The term "Adivasi" helped them in successfully positioning as more sustainable users of forest against the government of Bihar. Later these Adivasi movements helped in formation of new state of Jharkhand (Damodaran, 2006). The narrative that indigenous use of forest is inherently sustainable was used later in 2006 by indigenous groups and their allied activists to put pressure on the government to adopt the Forest Rights Act. The story of ecological legitimacy can be seen in the preface of the act: "the recognition of forest rights was not consolidated properly by state forests on ancestral lands during colonial period as well as in independent India. This resulted in injustice to the traditional forest dwelling communities and scheduled tribes, who are integral to the sustainability and survival of the forest ecosystems" (Government of India 2007, section A, emphasis added).

Failures of Human-free conservation areas and proof that public respect laws more if they are part of the formulation, environmentalists and development practitioners championed local participation in conservation – "community conservation" (Agarwal & Gibson, 1999). Community conservation according to Adams & Hulme (2001) means planning & emphasizing the role of local people in the conservation & natural resources decision-making. Community conservation includes practices from 29 development programs in Africa and integrated conservation to the community resource management projects in protected areas (Newmark & Hough, 2000). It is also known as "community forestry" which has become popular in most of the world's forest in developing countries (Pagdee Kim & Daugherty, 2006). Nepal in 1970s

became the first country to have a nationwide community forestry program (Springate-Baginski *et al.,* 2007).

Community forestry programs across the world ranges widely in the legal foundation including deep involvement of community. FRA in India was preceded by Joint Forest Management (JFM). It promulgated the non-binding forest policy of 1988, it is a voluntary power-sharing arrangement with forest communities (Upadhyay, 2003). Unlike the FRA, JFM is not a statutory reform – it was unable to recognize the user rights or the rights on the land of the local people. In statutory reforms people get legal rights to own, use and/or manage forest resources. These statutory forest tenure reforms are becoming more popular worldwide (Larson, Barry & Dahal, 2010). Laws of these reforms are promoted by disparate groups using rationale narratives. These tenure reforms are seen as reparation for past government expropriation by various indigenous people's organizations (Karlsson 2000, Campaign for Survival and Dignity 2010). Claims are formed in these reforms for individual and communal rights around the indigeneity and ecological legitimacy. United States Agency for International Development (USAID) and World Bank promote these tenure reforms to increase individual ownership of the forest resources (World Bank 2006; USAID, 2011).

According to the tenure reforms narrative, forest owner gets a private ownership and incentive to use the forest sustainability and invest in the land. It is a part of ecological modernization discourse which blames clearly defined market property rights and lack of market for environmental degradation. Actors promoting this narrative considers statutory tenure reform with programs modernizing forestry and increasing people's access to the markets (World Bank, 2006). Actors adopt features of both narratives considering them fluid. Community forestry has become more common since 1980s and numerous laws, amendments and regulations hoping for better conservation outcomes (Barry *et al.*,2010). Governments from 1985 to 2002 have passed legally transferring laws on over 200 million hectares of land

affecting indigenous and community people in around 30 countries (White & Martin, 2002). An increase has been seen in the amount of forestland in 10 of the 30 most forested countries. Almost seven countries have experienced a rise in forestland owned directly by the local indigenous people (Sunderlin, Hatcher & Liddle, 2008). New laws in Africa, Asia & Latin America gives ownership rights to local communities varying with level of control over the forest (Larson *et al.,* 2010). However, it does not translate into reality and access for indigenous people. This shows that the law implementation by the governments is slowly ignored and laws reducing the access for people in forest becomes more powerful.

2.2 National Status

Protected area management is based on the principle of habitat preservation by creating people free and inviolate zones for the specie specific habitat. It is essential to minimize the human-animal conflict and to sustain the endangered wild fauna for a sustainable management of the area (Karanth, 2006). Conservationists believe that without exclusion of public from natural spaces, the current level of human-animal conflict and degradation of ecosystem in developing countries like India can lead to a loss of vulnerable faunas (Bagchi *et al.,* 2004; Sahabuddin, 2005). In India researchers have pointed out that faulty planning, compensation-payment delay, top-down relocation policy and centralized governance in making protected areas, is putting the livelihoods of families in jeopardy (Sharma, 2003; Kaushal 2003; Dasgupta, 2003). In case of Sariska Tiger Reserve, Shahabuddin et al. (2005) and Torri (2011) reported that local people were not taken into confidence and access to buffer areas and resource use was made limited. This later resulted in poaching of tigers by locals and caused resentment in Sariska.

In a country as diverse like India, population of almost 1 million is living in the large network of protected area comprising only five percent of the land area (Kothari *et al.,* 1995). So far only two detailed studies on relocation deprivation and benefits have been carried out (Kabra,

2009; Karanth, 2007). In India, relocation process requires complex regional polity, socio-economic disparity and ethnic diversity needs multi-level assessment of people-ecosystem, but currently is lacking an analytical base.

In a review of relocation issues of Sanctuaries and National Parks in India, Lasgorceix & Kothari, 2009 pointed that indigenous communities have unrecognised rights or unclear to park resources which situates them far from mainstream society making them already disadvantageous. It later contributed in their poverty and got worsened by the non-consultative relocation and caused conflict with protected area managers. However, relocation when it is participatory and consultative has a beneficial impact on forest dwellers and tribal people in case of Kanha National Park and Kuno Tiger Reserve in Madhya Pradesh (Panwar, 2003).

Relocation of local people outside protected areas is seen as an essential part of India's wildlife conservation. The previous decade (2010-2020) had many relocation projects aiming to expand and consolidate India's protected area system. Indian government has intensified relocating villages after finding the poaching, habitat fragmentation of endangered Bengal tiger (Sahabuddin, 2010). Resettlement related to conservation started to create more space for breeding the tiger (Rangrajan & Sahabuddin, 2006).

Lack of proper consultative process and independent monitoring requirement made it easy to resettle people poorly (Sahabuddin & Shah, 2003). Most people were not fully compensated for their tangible movable assets or on the ecosystem services (fuelwood, fodder, and food) which they were dependent earlier (Mehra *et al.*, 2004). Further, the land provided for agriculture was so low that it took many years of work before becoming productive. Other than this basic amenity such as road access, electricity, and irrigation were either insufficiently developed or absent from the new locations (Sharma & Kabra, 2007). Economic and facilitatory support was even missing during their occupation change, given the time taken to develop secure livelihoods in new locations (Sahabuddin & Shah, 2003).

However, resettlement being inadequate was the norm, some exceptions like Bhadra Tiger Reserve, where 457 families were relocated from 11 villages during 2001-02 (Karanth, 2005, Nagendra *et al.*, 2006). The majority of relocated households here obtained good quality of agricultural land in the excellent infrastructure area. These kinds of resettlement have resulted from higher levels of political awareness and improved support networks (Kabra, 2009). Other than Bhadra Tiger Reserve, success stories of Relocation are popular from Nagarhole National Park and Corbett Tiger reserve, giving better governance and coordination between villagers and forest department (Lasgorceix & Kothari, 2009). However, the location in the Melghat tiger reserve was very far from perfect, and locals didn't get an opportunity to provide their consent (Sekar, 2016). Conservationists acknowledge the success through ecological restoration, and various studies have shown that prey and predator populations have recovered in free human settlements areas in Tiger reserves (Harihar *et al., 2009*; Karanth *et al.*, 2006; Lamichhane *et al., 2018*; Panwar, 1978; MoEF 2005, 2006).

Relocation has been operational in many tiger reserves having its pros and cons (Kabra, 2009; Karanth, 2007; Sekar, 2016). However, recently it has provoked some negative responses among local communities leading to unfavourable condition for conservation. In Sariska itself relocation has emerged after an order by the state, dating back to 1966-67, when two of its villages namely Slopka and Kalighati were relocated outside the protected area (Gurjar & Bladwa, 2013). After that since 1977 relocation process began in Sariska in phases with Kiraska village being relocated in Phase-I. Bhagini and Umri villages were relocated later in 2008 and 2010-11 respectively, and Rotkela village was relocated in 2013. In addition, Kankwari and Deori villages were also partially relocated in 2011 (Meena, 2015) whereas Lilunda, Kundaka & Rekhamala villages are future projects for Relocation (Gupta *et al.*, 2018). Though Relocation and displacement are very widely discussed in achieving conservation objectives, these studies have not tried to understand the perceptions and resilience level of the

communities. The concept of Community resilience in context to relocation is yet to be explored.

2.3 Community Resilience

The concept of community resilience earlier is propagated for a disaster response approach. It is viewed as a positive attitude, showing the local capacity (Kennedy *et al.,* 2013; Dawes *et al.,* 2004; Dept. for Intl. Development, 2011), social support (Rodriguez *et al.,* 2013; Aldrich *et al.,* 2015), resources (Coles & Buckle, 2006) and reduced danger for the communities (Turnbull *et al.*, 2016). However, community resilience's core definition is not clearly defined in scientific studies and practice (Patel *et al.*, 2017). Recent studies on social resilience mainly focuses on coupling, interdependence, and co-evolution of social and natural systems (Folke, 2006).

In a study conducted by Patel *et al.*, 2017 three general definitions were classified in community resilience. First, in the "Process definition", community resilience is seen as an ongoing process and change. Second, "absence of adverse effects", where community resilience is seen as an ability to maintain stable functioning. Third, "range of attributes", considering community resilience as a broad collection of response-related abilities.

In the study of Lemyre *et al.* 2005, Resilience is "constructed as a process and fulfilment of positive outcomes at the community, family and individual level despite natural adversity such as natural disaster and terrorist attack"). Norris et al. (Norris *et al.,* 2008), in another study, defines community resilience "as a linking process of adaptive capacities to a positive path of functioning after a disaster" (Norris *et al.,* 2008). Castleden and colleagues define community resilience "as a capability of a community to adapt and maintain functioning in the time of disturbance" (Castleden *et al.,* 2011). Cox and Perry define community resilience "as a response to people's unique capacities to manage and adaptively respond to the demands of resources and disaster associated losses" (Cox & Perry, 2011).

In the 'absence of adverse effect' definitions, Bonanno examines resilience based on loss and trauma between adults and defines it "as an ability of adults to maintain stable health levels of psychological and physical functioning (Bonnano, 2004). In another paper Gibson says, "Resilience is not a process, it is not a management system standard, nor is it a consulting product. Resilience is an outcome of an organisation's capability to cope with uncertainty and change in an often-volatile environment. Resilience is thus a product of an organisation's capabilities interacting with its environment" (Gibson, 2010).

Community Resilience as an outcome was adopted by those who noted the significance of identifying and strengthening community abilities. In the 'range of positive attributes' definition, a report published by the UK Cabinet Office define community resilience as "communities and individuals controlling local resources and expertise to help themselves in an emergency, in a way that complements the response of the emergency services" (Cabinet Office, 2010). This report mainly focuses on local support being a significant factor in helping the community after an incident. Coles and Buckle define community resilience as "an attribute in its different forms contributing to various but equally important ways to disaster recovery." Ahmed et al. 2004 defined community resilience from the features of the community, such as household relationships, levels of education and literacy, social support networks, employment seeking behaviours, ability to seek support services, sense of communal safety and hope, and physical security measures.

Many definitions exist overlapping on one or more general definition types. Ostaghizadeh et al. describe community resilience as "an ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from a hazard including restoration of its essential basic structures and functions" (Ostadtaghizadeh *et al.,* 2015). This definition blended the general types of 'range of positive attribute' and 'absence of adverse effect' definition. Pfefferbaum and team defined resilience "as an ability, a process, or an outcome

associated with successful adaption to and recovery from adversity, and also it differs depending on context and purpose" (Pfefferbaum *et al.*, 2015).

Therefore, several research groups applied and defined the concept of Community Resilience as an unformed concept. It is applied according to the objectives of study and research. In my study, Community Resilience is seen as "a process of adaptation, presence of positive attributes, and absence of negative effects."

2.4 Local Status

Earlier studies investigated STR and local communities but they largely focused on the villagers' attitude and not looked at the impact of the tiger on the local economy. A study in 2003 was carried towards conservation and wildlife tourism around STR, the conclusion of the study show that the villagers' attitude is where the problem lay (Journal of Environmental Management, 2003). However, majority of the 11 villages inside the core of STR were not benefitting financially from the tourism there. During the time social composition of the local population was a mix of 18 social castes. The most dominant were the *Meenas* who are farmers and *Gujjars* mainly dependent on livestock rearing. Majority of the farmers were small and marginal farmers. Protected area of STR have changed the trend of people being dependent on the natural resources for livelihood. Income from other sources have started to begun in recent years including dairy and agricultural products catering to the tourists but tourism was only restricted to 24% of the household according to a survey in 2003 (Wheeler, 2009). A majority of the people (about76%) responded that they don't have any direct experience with the tourism and did not receive any benefits.

The prospect for local livelihood benefitting from the sustainable tourism should be positive given the nature forms a part of religion and culture of a majority of local communities. The locals are likely to support the conservation in STR despite the lack of participatory

governance. The local communities are situated within 2 km radius of the tourism zone at STR benefitting from the most of the tourism but the people located outside the 2 km radius benefits far less. A study carried out in 2005 showed that the population of the 11 villages inside the Core Zone – 1 in STR is 3000. Around 87.4% of these people belong to the *Gujjar* caste (occupationally buffalo-hearders), other castes were *Meenas, Bawarias, Meos* etc. The state of people living in these villages was severely deprived. Literacy rate was estimated around 31.6% and only 1% above the age of 6 had studied up to class 10. Sex ratio was also poor at735 females to 1000 males. Villagers were travelling 10 km by foot to the nearest market and 2-25 km for the nearest health services. The education access was limited to primary education and that of very poor quality.

Communities inside STR are traditionally grazing communities, most of their income comes from the milk derivatives and the sale of milk products such as *ghee* and *mawa.* Livestock rearing is the primary occupation of the villages inside STR. According to a study (Sahabuddin, 2005) average households owned 9 buffaloes, 1 cow and 12 goats. Livestock rearing was reduced according to the study because of the previous years of droughts from 2002-03. *Gujjar* people have knowledge of livestock rearing and they rarely require veterinary help. Grazing is extensive in reserve, fresh leaves in the dry summer and agricultural crop residue as well as commercially available nutritional supplements can be easily found inside the reserve. For feed, a wide range of forest trees, grasses, and shrubs are gathered extensively. Secondary occupations are reported to be of daily wage labour, agriculture, sale of livestock and pensions. In the same study average gross annual household income of 11 villages was estimated as 48,175 Rs. whereas disposable income after accounting for fodder was about 30,190 Rs. Expenditure on farm fodder and commercial fodder was 32% and 50% of the income was being used for food items. Families were seen indebted with an average amount of 20,000 Rs. in the year 2003-04. 19% households had land outside the STR Core area out of which 85.7% had

less than 5 bighas each. About 13.7% households reported loss of livestock to tigers and leopards in 2003-04 but none of them received compensation from forest department.

Livelihoods of locals also got affected by local conditions and natural disasters. A majority of respondents in the study have admitted that available economic opportunities have declined with deteriorating forest productivity. Daily wage activities have been closed by forest department and mortality of livestock was higher during the drought of 2002-03. A variety of livelihood options are available at STR and produce provision to drivers, handicrafts, institutions, cleaning, catering, serving and guides. Therefore, tiger's role can be very crucial in the local economy if an amount of revenue is invested in community development.

Indian Express in June, 2008 reported about 20 women mostly from the *Gujjar* village signed up to join daily tiger patrolling. The model was successful as according to the then ACF Mr. R.K Kherwa "*After extermination of tigers, we were looking for new solutions. We are also looking at more local co-operation and thus we went from village to village asking villagers to be a part of patrolling*" It was the first-time village women earned in the reserve receiving a wage of Rs.100/- per day which was welcomed by their community. Another forest staff, Mr. Satyanarayan Prajapti, a forest guard shared "*In some ways the Gujjars are better at guarding the forests than we are. They know animal sounds, tracks and, best of all, they can anticipate where the animal will go and his behaviour. I came here when there were no tigers. Now I hope we can keep our tigers*" (Sinha, 2008).

Another recent study (Azeez *et al.,* 2014) shows that considerable changes have occurred related to the day-to-day life of people. Availability, accessibility and resource utilization has changed significantly. More than 60% of the people are dependent on government bore wells after relocation. It shows the existence of common water resources available in the community. As it is difficult to fetch water from the government bore well, one-third of the population started owing a personal bore well. 90% of the people according to the study admitted that

accessibility to water has decreased. One positive aspect is electricity, which every household was having after being relocated from the original residence. There was no electricity earlier but now they have privilege of having electricity. Study shows that almost 60% of people didn't have agricultural land before relocation and now more than 95% avails agricultural land after relocation (Azeez *et al.,* 2014).

Hygiene is still an issue after the relocation and now none of them have a toilet facility and they resort to open defecation. All respondents had ration card, bank account and voter id before relocation. Almost 80% people were found using wood as their cooking source and relocation increased the use of LPG as medium for cooking. Respondents admitted that wood availability for cooking had been badly affected in the study. Also, relocation had rejuvenated access to public institutions including hospital, Anganwadi (child day care centres), schools, bank, post office etc. Study shows the positive indicators of the accessibility and utilization and 90% people believed that health services have improved after relocation (Azeez *et al.,* 2014).

Occupation changes saw a drastic change after relocation. People pre-relocation were engaged actively in livestock and dairy works with about 60% population engaged in agricultural practices. However, after the relocation livestock and dairy work almost vanished from the job list and the majority of people were dependent on the agriculture to the tune of 95%. This shift affected people negatively and income of people declined. According to the study relocation dwindled the annual income from Rs. 3.2 lakhs before relocation to Rs. 2.3 lakhs annually. This difference in income level after relocation was reported to be a result of the diminution of the livestock (Azeez *et al.,* 2014).

Deori and Umri villages were livestock dependent communities and also the environment for cattle rearing was suitable inside. Azeez *et al.,* 2014 also reports that relocation had affected the people in a way that it made cattle rearing a difficult proposition since there were no ponds

or pasture land available in the relocated places for cattle rearing. Many people had to sell their livestock after relocation due to lack of resources to feed them. Study shows that there was no incident of discrimination faced by villagers after relocation and it was easy for them to access the common properties and resources just like others. 80% of the respondents in the study had got same neighbourhood after relocation but they admitted that life had become more tough after relocation. 80% of the Villagers believed that their lifestyle had changed after increased exposure to travelling facilities, towns, and modernity. Social practices such as marriage, cultural festivals and religious did not change much however, it was complained that most of the people lost their common place of worship (Azeez *et al.,* 2014).

Chapter 3 Study Area

3.1 Location

The study area is known as "Sariska Tiger Reserve" and it is located in the Alwar district of Rajasthan state in the oldest mountain range of Aravalli which stretches from Mount Abu to the Delhi ridge. The Critical Tiger Habitat (CTH) lies at a distance of 200 km from Delhi, 36 km from Alwar and 110 km from Jaipur.

The Core Area of STR lies between

Latitude 270 05' 45.6" to 270 38' 54.9" North

Longitude 760 14' 30.1" to 760 32' 44.5" East

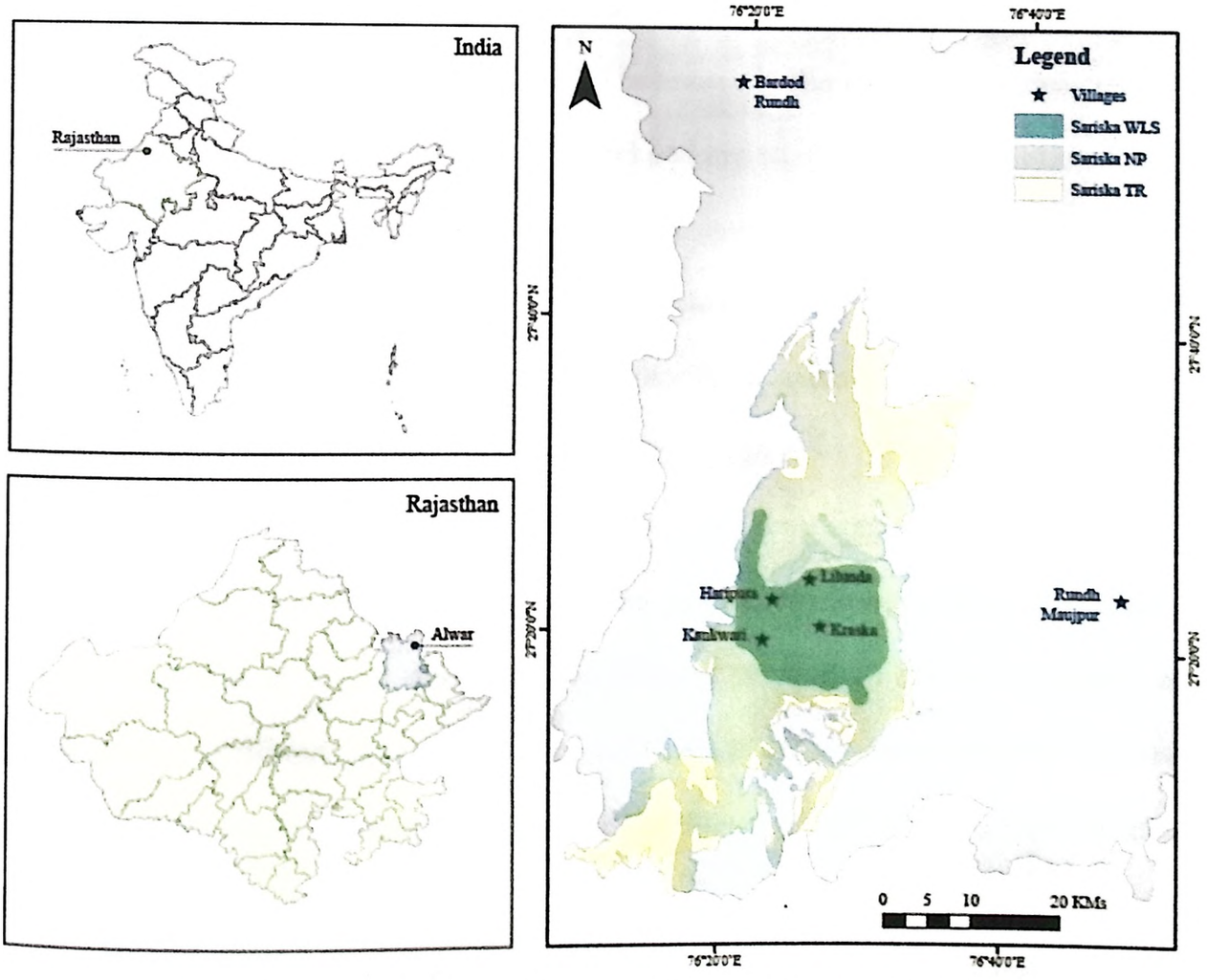


Figure 3.1 Map of Sariska Tiger Reserve with details of surveyed villages

STR is popular for its tiger population for several centuries. Alwar princely state protected this region for game reserves specifically for tiger hunting. The habitat of STR is isolated and the tiger population in the reserve is second to Ranthambore Tiger Reserve in Rajasthan state. It is known for its tiger sightings and is considered as a good habitat for wild cats including tigers. STR is also popular for its successful tiger re-introduction program that took place in 2008. STR has an important place in the natural history of north-western India and is a significant source for long term survival of tigers. Aravalli hills is one of the most significant habitats for the endangered great cat's conservation.

STR with dense Dhok (*Anogeisus pendula*) and Khair (*Accacia catechu*) forests is home for 420 species of plants. The diverse habitat and climatic conditions and varied topography provides habitat to a wide variety of wild animal species. The reserve is of high ecological value being the catchment of the river Ruparail. The reserve is also known for its rich cultural and historical heritage. The prime objective behind declaration of Sariska as a protected area (first as national park and then as tiger reserve) was "To protect, restore, manage and maintain representative biodiversity of Aravalli hill ranges along with ecological processes and conservation of wild gene pool with a focus on Tiger and to accommodate the viable population of tiger" (Meena, 2015).

STR also has its significance as an important bird area site for conservation of avian fauna. It provides habitat for residential as well as wintering ground for migratory birds. STR forest shows the intricacies of natural ecosystem and different pyramids of various ecosystem at different geological history, river orientation, wild habitat and producer-consumer chains. Besides the tiger reserve is home to a wide range of faunal species including Chowsingha, leopard and rusty spotted cat. The scenic beauty of dense forest and open meadows and picturesque beauty of historical monuments in STR provides a sense of the wilderness. STR

represents biological diversity of western landscape in India including the great medicinal, scientific and endangered flora of conservation values. This habitat and its resources are under tremendous human pressure both on core as well as buffer. CTH of STR inhabits two species of dog family, six species of cat, three species of mongoose and marsh crocodile (STR Management plan, 2014).

3.2 Geology, Rock and Soil

The majority of the STR is covered by rocks from the Aravalli comprising of quartzite's conglomerates, limestone, grits, granites, phyllites and schists. High ridges mostly comprise of quartzites, gits and conglomerates. The interlinking valleys have phyllites, limestone and schists. Lava conglomerates evidences can also be seen occasionally. Soil also differs depending on the underlying rock. Metamorphic rocks and ancient crystalline with schists and gneiss are covered by red sandy soils. The nitrogen content of red soil is low, and the phosphorus and humus contents are naturally alkaline. Plains and river valleys Have comparatively fertile and rich dark coloured soils. Weathering of schistose rocks vary from sandy to heavy loam depending on the quartzite amount in the parent rocks (Kumar & Sahabuddin, 2005).

3.3 Hydrology and Water resources

3.3.a Climate

The region of STR is characterized by sub-tropical climate with cold in November to February, hot from March to June and Rainy in July to September seasons. The lowest temperature could go up to 2° Celsius in December-January and highest above 47° Celsius in May-June. The

variation of temperature in STR is high. Droughts and frost are common in summers and winters respectively. Relative humidity on average is 30 to 34 percent. The monsoon blows mainly from south-westerly and westerly directions. Thunder storms and dust storms in summer are common and cold westerly waves from north-north-west direction blow during winter (Parmar, 1985).

Precipitation is from South west monsoon and occurs during the months of July to September. In winters rains from North-East are more common. Average rainfall is 621 mm in STR. June-September rainfall constitutes around 92% of the annual rainfall in the region though variation occurs yearly. In the summer months of March to June, the temperature rises on a continuous level. First half of June and the whole month of May being the hottest months of the year. Monsoon showers occurs in the second half of the June which brings down the temperature by 3 to 5 degrees Celsius. After the end of monsoon, days become hot in the second week of September. January is the coldest month during the winters mean temperature goes as low as 6.9° Celsius in this season (Parmar, 1985).

The temperature further drops down as the cold wave spells. In the core areas like Lahpur valley, it almost touches the freezing point. Relative humidity goes over 60% in the rainy days and becomes as low as 10 to 15 percent during summer months. Generally, the winds are light to moderate but during pre-monsoon period the north-westerly winds become strong with occasional dust storms. During winters these north-westerly winds are mild and in summer season hot winds locally known as 'loo' blow from south-west and north-west direction. From May to September period thunder storms occur and hail may also associate with it. Dust storms are also very common during hot seasons. Low pressure waves moving from the west, affect the region and creates the situation of cold waves in January. The minimum mean wind velocity in December is 1.5 km per hour and maximum is 6.5 km per hour in June (Parmar, 1985).

Ruparel river runs in the middle of the reserve in north-south direction. The drainage flows from the northern part of the reserve including the Bandipol stream flowing into the Ruparel river. The drainage of the southern part flows into the Mansarovar lake. Drought's occurrence is common in the region and drought period creates an acute shortage of fodder inside and outside the core as well as in the buffer areas. Water becomes a limiting factor when water holes dry up very early. It sometimes leads to conflicting situations between park authorities and villagers living inside the park. Water limitation also creates a havoc for the survival of wildlife. The water availability is not uniform throughout the year in the region of STR. Geology, terrain, topography plays an influential role in contributing towards the runoff and ground water recharging (Ibid, 1985).

3.4 Conservation History

Sariska Tiger Reserve was an important hunting reserve for the Maharaja of Alwar particularly for tigers since the early 20th century. These hunting was allowed only for the royalty and British officials. Wood cutting and grazing were controlled in some sections by 1909. Various parts of the valleys were open for forest produce and commercial sale by 1909 and simultaneously part of the valley was opened for charcoal production which contributed to the period of maharaja of Alwar (Johari, 2003). The villages in the STR valley were following the lambardaari system of revenue collection from forest products. Late after independence Sariska came under the purview of the Rajasthan Wild Animals and Birds Protection Act, 1951 with a notification of the state government in 1955 (Jain & Sajjad, 2016).

STR was declared a wildlife sanctuary with an area holding 492.29 sq. km. on September 18, 1958 with a notification under the Rajasthan Wild Animals and Birds Protection Act. The establishment of wildlife sanctuary under the Wildlife Protection Act in 1972 gave no rights to the local residents. As a result, the cattle camps and villages remained inside the sanctuary even

after notification. The seasonal cattle camps referred as "Guadas" by the forest authorities finally shifted between 1966 and 1967 from Kalighati and Slopka villages falling within STR. These village relocationswere more organised as compared to the relocation of Kiraska and Karakawas villages which took place during 1976-77. This attempt of relocating villages in 1976-77 was the first attempt to relocate villages full-fledged during the post-independence period. Sariska was declared as a project tiger reserve in 1979 and a total area of 866 sq. km was notified with core zone of 400.14 sq. km and buffer zone of 466 sq. km. This era was starting of increasing controls over forest and its resources by both locals and reserve management. Forest department stopped the commercial felling of trees and restrictions on agriculture and grazing inside the TR were enforced strictly (Sahabuddin *et al.,* 2007). Core zone – 1 of STR was notified as a national park on 27 August 1982 under section 35 of WLPA 1972. As a result of this, in 1987 forest department declared all villages inside the reserve as illegal.

Forest related activities were completely banned for locals and they were left with informal rights of forest use. Presently STR refers to the tiger reserve of 866 sq. km, including the reserved forest, wildlife sanctuary and protected forest in which villagers have not yet settled the dispute or been compensated due to legal procedures. In Core zone -1 villagers are informally allowed to collect forest produce and graze their livestock within an arbitrary area of 1-3 km radius surrounding their villages.

3.5 Tourism in Sariska Tiger Reserve

STR lying in the Alwar district of Rajasthan is larger in area than Ranthambore Tiger Reserve, although less commercial and fewer tigers than Ranthambore. STR between 2013-14 received more than 32,000 tourists and generated a revenue of around 72 lakh Rs. The close proximity to Delhi and Jaipur is an advantage for tourism in STR. Furthermore, the Alwar district

headquarters which hosts several agro-industrial businesses is only 37 km far. The main predators for tourist attraction in STR are the tiger (*Panthera tigris*) and the leopard (*Panthera pardus*). Although STR is a critical tiger habitat for tiger conservation, visitors mostly come to set eyes on the *Panthera tigris,* one of the rare and endangered species, including leopard, striped hyena, jungle cat, golden jackal, chital, sambhar, nilgai, chousingha, wild boar, hanuman langur, caracal and a rich variety of reptiles and birds (Sekhar, 2003).

STR holds several archaeological ruins in its boundary belonging to the 8th and 10th century AD. This tiger reserve is open to tourists throughout the year and does not close in the monsoon period. STR boundaries includes forts, palaces and temples increasing the attention of tourists. The Pandupol temple of Hanuman is a favourite pilgrimage route and also the temple of Bhartrihari at the south-eastern edge of the reserve is popular all over the state for its pilgrimage and fairs. STR is associated with the buildings of the kings of Alwar such as Sariska Palace, used as a hunting lodge by Maharaja Jai Singh earlier, which pulls a large number of tourists. Consisting of Rajasthan's rich heritage, STR comprises of rich culture and folklore with several sites of historical importance including the 17th century Kankawari fort, built by Jai Singh II which is located at the centre of the reserve. Landscape of STR offers attractive views at the hilltop plateaus (Wheeler, 2009).

Accommodation at STR is principally at Tiger's Den (RTDC) and the Sariska Palace. Recently various new properties have come up at the nearest town Thana Ghazi, called Tiger Heaven. Siliserh Palace at the northern edge property managed under state. Tourists in STR are mostly day tourists taking wildlife safaris organised by the forest department. The tourism trend is increasing in recent years and attracting numbers of wildlife tourists.

3.6 Livelihood Opportunities

Livelihood opportunities are of central importance to understand the role of STR in local economy. This factor is critical in influencing the future of human-tiger relationships in tiger conservation in India. India's 30% rural population remains in poverty and more than 300 million people are still living below poverty line (Development Plan, 2007-12). This poverty affects tribal people in forest areas and loss of entitlement to resources has made them even poorer. The local communities sharing the tiger's habitat have been forest dependent through grazing cattle inside the parkor doing agricultural activities. The potential role of tiger in the local economy is huge. The national minimum floor wage has increased to 80 Rs. per day from the earlier 66 Rs. for all scheduled employments. The minimum wage is fixed in the state guaranteeing 100 Rs. per day for unskilled work and 107 rupees for semi-skilled and 115 rupees for the skilled workers (Minimum wages in India, Ministry of labour & employment).

National Rural Employment Guarantee Act, 2005 (NREGA) was not successfully implemented in the STR which could have strengthened the livelihood security of the local households and local economy. Total of 26 villages are situated inside the STR and another 310 within a 5 km belt all around the reserve. Population of these villages together hold a cattle population of around 4,70,000 which is partially or wholly dependent on the reserve for grazing. This puts a tremendous pressure on the natural resources of the reserve. An annual human population growth around the reserve is 1.5%, however, the livestock density in and around the reserve is twice of the average for Rajasthan. Around 55% of the livestock dependency is on the reserve's grazing, creating a competition for wildlife for grass and water. Conflict between communities and forest department is also very common phenomenon. In 1998, 74% of the villages around Sariska reported crop damage by wild animals as an issue (Sekhar, 1998).

Presence of people and livestock makes the reserve open to forest fires, poaching and pressures of tourists. The undisturbed vegetation and degraded vegetation due to over-grazing is stark and pervasive at STR. Settlement rights and concessions were mostly granted in STR around

hundred years ago. The process of deforestation is fuelled by the demands for milk and fuelwood. Locals living in the forest cut trees and become law breakers. The population (as does of their livestock) continues to increase in the poverty condition. As a result of this grazing once understood as very profitable is now filled with misery and poverty. Communities dependent on forest are mostly denied rights when the changes are brought by the authorities for the development of the surrounding areas. These communities remain trapped in the cycle of ecological degradation and poverty. Tiger tourism has the potential to create a wide livelihood opportunity for these indigenous communities in STR. However, before this the cycle of dependence and exclusionist policies needs to be managed.

Relocation programs earlier were unsuccessful in creating better livelihood opportunities for the relocated villages. Villagers in STR are caught in an increasingly sustainable lifestyle and cannot break it on their own. However, they are not intentional culprits in collection of firewood and overgrazing. These people have welcomed government inputs but their perception for relocation varies. It is difficult to identify if relocation is the only answer for securing the livelihoods of the local communities. The conservation enhancement will support the long-term development of Alwar district. List of long-term benefits can be job opportunities, water flow in summer, wildlife tourism, provision of fodder from the buffer in lean periods, insular villages, participatory and voluntary relocation of neglected and eco-development projects focusing on livestock and fuel (Sahabuddin & Bhamidipati, 2007).

3.7 Socio – Economic Profile of Villages

Villages in STR are totally dependent on forest for their livelihood. The villagers of Kiraska, Kankwari, Lilunda and Kundalka are totally dependent on animal husbandry whereas Haripura, Sukola, Dabli also work as a daily wage labourer in adjoining areas. 80% the income of average households is dependent on the milk, mawa, ghee sale while 20% comes from the secondary

occupations like drivers, daily labourers, farmers etc. Villages like Deori, Dabli and Raikamala situated on the boundary of the reserve revenue villages have some agricultural land in core area. They mainly grow corn, wheat, oat, mustard and gram. In the monsoon period milk production is highest and people desire to save money for the whole year and for the repayment of existing loans. They sell milk to a local dealer from their own village later he sells it to the real market at Tehla, Alwar, Thanaghazi & Bharathari tiraha. Middlemen also makes good profit connecting the local villagers to the larger market. From Kankwari the milk is transported through jeep and in villages like Dabli, Kiraska Raikamala, Lilunda and Sukola largely sell *ghee* and *mawa* due to lack of roads and vehicles for transport. Good cost of the product is only obtained by those who go to Alwar otherwise they get a low price paid by the local dealer.

The price of *mawa* and *ghee* varies per kg in these villages. Bhagani which is now relocated was reporting highest milk sale in the market because of a greater number of cattle per household and a smaller number of houses. Livestock is taken out daily from the villages for grazing and the maximum distance covered by the livestock is 7.8 km and minimum are 3.6 km. Instances of grass cutting, wood cutting, lopping and non-wood forest products can also be seen. Kankwari, Bhagani, Lilunda, Raikamala has reported grass cutting and 100% lopping. Haripura and Kiraska reported 79% lopping and grass cutting. According to forest department Kankwari observed 41.5% and lowest in Haripura around 17%. NWFP collection was reported highest from Lilunda (85%) and lowest in Haripura (37%). *Anogeissus Pendula* is the most preferred tree species cut for fuel wood by all people in all villages. *Apluda Mutica* is the grass specie collected by people for stall feeding the buffaloes. This grass specie grows on hill slopes and people travel long from their villages for collecting the same (Dular, 2003).

Anogeissus pendula, Zizyphus mauritiana, Butea monosperma are lopped for feeding the goats and buffaloes in and around all villages. *Zizyphus mauritiana* is a significant fodder plant of wild ungulates and is not allowed to fruit and flower close to Kankwari and Kiraska. Forest

department in their management plan of 2014 have created a table of anthropogenic pressure based on questionnaire survey from highest to lowest: Lilunda> Raikamala> Kankwari> Umri> Sukola> Kundalka> Deori> Dabli> Kiraska> Haripura. Land holdings in these villages is poor resulting in poor economy of the people in common. Economy of these villages is totally dependent on forest. There is no industrial set up in the area and other option is mining on natural resources. Land patterns indicates that the area available for agriculture is less, owing to the water availability, soil conditions and the terrain (Sariska Management Plan, 2014).

Poor harvest forces people to take other occupations like mining, animal husbandry and labour to support their economy. Activities like small timber, collection of fire wood, building material and NWFP during the time when people are free from their agricultural works and occupations can be seen. Locals have a large number of goats, cattle and sheep and other animals and cannot survive only with their resources of agricultural land. Heavy pressure of browsing and grazing have resulted in degradation of land and cannot sustain the large number of animals. In Alwar district nearly 1300 animals per thousand hectares of land and heavy pressure of grazing in the areas peripheral to CTH and recovery is difficult due to continuous pressure of people (Sariska Management Plan, 2014).

In rainy season a large number of cattle enter inside the Core Zone of STR, specifically in Kankwari valley, Malakhodka, Umri valley, Raika-Panidhal and Kalikhol areas for grazing. Lack of regeneration, loss of habitat an unavailability of the area for wild animals is putting pressure leads to degradation of the area. These factors together lead to loss of habitat and shortage of food and cover to wild animals. The ratio of cultivated and irrigated land is small which cannot sustain the cattle population and human throughout the year. Cropping pattern of people leave them free for six months in a year and during this period of unemployment grazing of the cattle, people indulge in labour, collection of small timber and fuelwood and other activities increases the pressure on CTH. According to forest department Biotic disturbance

and degradation of habitat and removal of biomass from CTH increase the tendency of people to encroach on suitable lands of the forest area which depletes the actual area for wildlife (Sariska Management Plan, 2014).

Mining is also a significant biotic factor affecting the well-being of CTH. In the buffer area of STR, mining is carried out for excavation of masonry stone, marble and limestone. Mines are mostly non-functional now except a few around Tehla and Pratapgarh area. These two mines create a lot of disturbance in terms of transportation of material, blasting, disposal of mining waste, accumulation of stone dust and presence of human area. Generally, wild animals don't go near to mining disturbed areas and this leads to reduction and degradation of habitat area available for wildlife. Various large and small temple sites are also located inside the CTH to which people have rights to visit. People's religious visit to these temples create disturbance and is detrimental to wildlife. Instances of littering and other waste damages pose threat to health of the wild animals. These temples are situated in the pristine sites which is very significant for the wildlife in this zone.

Inadequate and delayed compensation for cattle killing, crop damage and injuries to humans by wildlife are a concern of long-term survival of species like tiger. Wild boars and nilgai often raid crops which leads to poaching of wild animals. Leopards and tigers go out of CTH in search of food and water and incidents of livestock killing by leopards are very common in the peripheral areas. Compensation is paid by the forest department depending on the condition, type and age of the animal. The amount given is very meagre and sometimes take a long time which is unpopular among the villagers. Therefore, owners of livestock are tempted to kill wild animals by any mean. Compensation factor is significant in mitigating the damage caused to the crop or livestock. It helps in securing the CTH and some satisfactory system needed to work out or reduce the negative impacts of such incidences (Sariska Management Plan, 2014).

Chapter 4 Methodology

4.1 Survey of the Study Area

Preliminary survey of the area was done during January 2021 to study its climate, demographic pattern and demarcate the area into different region *viz.* "*Relocated*" and "*To be Relocated*" respectively with corresponding geographic levels. Relocated site consist of villages Umri and Deori, relocated from STR in the Rundh Maujpur region. Another relocated site consists of villages Kankwari, Haripura, Peelapani, Karath, relocated to Bardod Rundh region. Villages inside Core zone-1 of STR are Haripura, Lilunda, Kankwari and Kraska, from the Core zone of STR.

Table 4.1 Number of Households surveyed and percent sampling achieved at all three sites.

Village	Range	Beat	Total Population	Total Households	Surveyed households	% Of households surveyed
Kankwari (Inside STR)	Saiska	Kankwari	180	64	53	86
Haripura (Inside STR)	Sariska	Haripura	200	23	12	52
Lilunda (Inside STR)	Sariska	Bhartari	80	21	14	67
Kraska (Inside STR)	Sariska	Kraksa	250	48	17	44
Rundh Maujpur			350	85	31	36
Bardod Rundh			550	110	55	49

4.2 Scope of the Study

The outcomes of relocation for human resilience are addressed both quantitatively and qualitatively using measurables related to the day to day lives of communities in and around STR. We have explored patterns of resilience pre-relocation and post-relocation associating it with the timeline of the relocation. Our research compares the households inside (pre-relocation) the TR with those who have moved outside (post-relocation) of the STR. Policy for relocation by NTCA is clear that livelihoods within protected area is no longer viable and forest department has put various restrictions on resource use. Revision of the policy is unlikely, suggesting that research can most usefully contribute through improved understanding of the impacts post-relocation. We focus our analyses on household resilience providing information on wide features underpinning the resilience– for example dependency on natural resources, relation with the nature, perception of communities and forest department towards relocation.

4.3 Data Analyses

Data collection was done in two relocated settlements from the STR known as Rundh Maujpur in the Lakshmangarh tehsil of Alwar district. It holds the village population of Umri (relocated in 2010), and Deori (partially relocated in 2011) from STR. Second settlement was Bardod Rundh in the Behror tehsil of Alwar district. It also holds population of Kankwari village (partially relocated in 2011), Haripura (partially relocated in 2016), Peelapani and Karath from STR. Further, data from inside Core zone of STR was collected mainly from remaining villages namely Haripura, Lilunda, Kankwari and Kraska which are going to be relocated in future.

A pilot survey was conducted before carrying out a large-scale qualitative and quantitative research in relocated settlements in the Alwar district from Sariska. Some insights of the study can be referred to the studies done earlier in the region (Sahabuddin, 2007; Azeez *et al.*, 2014).

Based on the preliminary research and pilot survey a semi-structured questionnaire schedule was prepared. Owing to language and other social barriers, the survey was conducted by interviewing respondents with a questionnaire schedule and noting down the responses with respect to every question in printed sheets of the questionnaire schedule (Appendices 1). The questionnaire schedule comprises of contingent questions enquiring abouta) demographic information about the household, b) natural resource dependency, c) adaptive livelihood options, d) material assets and infrastructure, e) subjective questions on abstract measurables. In our study we did visual inspection of all measured variables to ensure that the samples collected from households provided a comparative baseline for surveyed relocated houses. We used the following variables:

1. Dependency on natural resources.
2. Adaptive livelihood options.
3. Community Groups and committees for their decision making.
4. Education.
5. Material Assets and Accessibility to Infrastructure.
6. Power structure/political and social structure of the society.
7. Social trust and collective efficacy.
8. Health care systems in the village.

Abstract values will include

9. Traditional knowledge structure.
10. Activity pattern and leisure time.
11. Identity and perception,
12. Relation with Nature.

All variables used in analyses were verified by visual inspection of the distributions of the relocated and non-relocated households.

In STR, we asked respondents about consumption of forest foods, produce from forest and in relocated households we measured local food baskets and supplementary sources. Data collection on dependency of natural resources was done with the help of questionnaire developed for the study (check in Appendices 1). Information was noted and oral interview was recorded. A total of 50% households were surveyed from the total household numbers in the village. To get the results of adaptive livelihood options, we score livelihood options from 1 to 5 (most favoured to least favoured). Community groups and decision-making data is collected from participatory rural appraisal techniques, semi-structured interviews and questionnaire. Similarly, to assess education, power structure, social trust, health care system in the villages, accessibility to infrastructure is done with questionnaire survey.

4.4 Sampling Design

We surveyed households in the relocated villages, located at Rundh Maujpur and Bardod Rundh now. In order to assess the resilience of people, household was considered as the unit of sampling. We used the established social science method of stratified random sampling method, using a coin toss to change direction. This method was flexible in villages of different size and shapes. The number of such selected relocated households in each village follows the distribution across the survey villages. In case of two or three relocated households in a village we survey three or five non-resettled households to ensure a sensible baseline. In the case of household members not being available for survey, we omitted the household from our survey if it was a relocated household and sampled another household if the survey household was for our non-relocated location specific baseline.

We survey approximately surveyed 32 households from relocated site of Rundh Maujpur and 54 households from Bardod Rundh, and about 96 households from Inside Core zone of STR. In total we conducted 182 sample surveys from February to April in all three sites. The data of

relocated villages was taken from STR forest department to locate the relocated households at their new settlement locations across three tehsils (Behror, Tijara, Lakshmangarh) in the Alwar district.

We carried out surveys mainly in February-April period in 2021. To measure the remoteness of survey locations we calculated forest cover per available capita, built-up area, highway, closest market, river and the core forest of Sariska Tiger Reserve. We conducted questionnaire survey comprising both open ended and close ended questions, at each survey household, to collect data on resilience of communities. We did semi-structured interviews with forest department and communities to analyse their perception on relocation. We did semantic analyses and observatory analyses to understand their relation with forest. To conduct this survey effort, I employed two field assistants (Babulal and Balwant) for approximately three to four weeks each.

4.5 Socio-economic Information

Although, caste and tribal affiliation is a relevant aspect of assessing social status, this data was not used for analyses since any major tribal or caste discrepancy was not observed in the field. In terms of housing status, respondents with house that were built of concrete and gravel blocks and had galvanized iron roofing sheets were considered as depicting better economic affordability and the housing status was computed as ordinal data where better status was given a score of 1 and others 0. Similarly, those who had any kind of sanitation facility available (in the study area toilet is always priority in comparison to bathrooms) a score of 1 was given if not both toilet and bathroom facility was available and a score of 0 others. Educational qualification of every member of the household was classified according to primary, intermediate, higher secondary, senior Secondary school. It is considered as the number of people in family first in higher education there by indicting the ability to bear the expenses of

higher education for which one has to stay away from home. Adaptive livelihood of persons is computed by summing up the various sources of income for each household. This comprises of occupations such as farming, selling milk products, private or government jobs, small scale business, wage labour.

Basic socio-economic data was collected from every household. Furthermore, the educational qualifications of every member, whether staying at home or away from home to pursue education, employment. Nature of job and location of placement was documented, availability of sanitation and water facility was noted with the help of their status on ration card demarcated as above poverty line (APL) or below poverty line (BPL). Moreover, data about land, livestock, small scale business owned and also if any liabilities incurred was noted.

4.6 Analytical Methods

T-test was done to analyse the per-household variance in the livestock number, income and expenses from livestock. Content analysis was done to analyse the perception of communities. To get the activity pattern and leisure time, relation with nature, content analysis was done.

4.7 Rationale for Resilience

The concept of community resilience was found amorphous and applied differently by different research groups. It can comprise of existence of a variety of positive attitudes, absence of negative effects, continuing process of adaptation. Three general types of definition were found across the studies:

(i) Process Definition (reflects the ongoing process of adaptation and change)

(ii) Absence of Adverse Effect Definition (Reflecting the ability of communities to maintain a stable functioning.

(iii) Range of Attributes Definition (Reflecting on the wide accumulation of response-related activities).

In our study we used a mix of the all three broad definitions and defined Community Resilience as "associated with Capacity, social support, resource availability, decreasing risks, collective efficacy, preparedness, social trust" (Patel *et al.*, 2017).

We categorize main elements of Community Resilience in two areas. These two describe the main elements based on the concept of community resilience defined by authors. The first category consists of non-abstract values of community resilience. These non-abstract values are quantitative values including Dependency on natural resources, adaptive livelihood options, Community Groups and committees for their decision making, Education, Material Assets and Accessibility to Infrastructure, power Structure/Political and Social Structure of the society, social trust and collective efficacy, health care systems in the village. Abstract values will include Traditional knowledge structure, Activity pattern and leisure time, Identity and perception, their relation with Nature.

4.8 Dependency on Natural Resources

Forest has played a key component in the livelihoods of people for centuries. Role of forest is significant in local community's livelihood and this role has built a mutual dependence between community and forest. They help communities both socially and economically. Dependency of communities on forest is a multifaceted phenomenon providing communities a diverse type of benefits. Fodder and fuelwood are extracted regularly on a daily basis in the rural areas of STR. Communities depend on natural resources for non-timber, timber products, water, biodiversity, protection from soil erosion, carbon sequestration and various other ecological

services. In developing countries like India, conservation of protected areas has challenging and complex problems. Dependency of communities is also higher in developing nations and similar in case of STR.

In STR, villages inside the Core zone are still dependent on the natural resources such as fuelwood and small timber. There are multiple reasons for their dependence but primary is the unavailability of required tree species outside the Core zone. Areas outside the CTH does not have suitable tree species for small timber resources and they are degraded and even if it is available, it is not sufficient in quantity. Plantation of timber trees in agricultural areas outside is not that common in this region which exerts a great pressure on the woody areas of CTH. The demand for fuel in town is high and supports the income of fuelwood collectors in the area. The agricultural waste is unable to meet the demand and this is one of the major causes provoking the communities to collect fuelwood from the CTH.

Furthermore, STR shelters a large number of cattle inside the CTH specifically in Kankwari valley, Umri valley, Malajhodka, Raika-Panidhal and Kalikhol. Due to continuous pressure these areas suffer a lot, which later leads to lack of regeneration, habitat degradation etc. Also, wild animals hesitate to enter in the area due to presence of cattle. This results into food shortages for wild animals and poor wildlife density is observed in these affected areas. Furthermore, livestock also pose a constant threat of disease transmission, the cattle share the water holes in summers made for wild animals. Wild animals suffer from the water shortage due to competition with livestock, it affects their health in summers. Grazing of livestock in rainy season creates issues for law and order in the CTH of STR. In our study we are looking at the non-timber forest products collected by the communities in STR. The study will also compate resource dependency of communities in pre and post relocation context. Furthermore, the study will try to analyse the number of livestock in each household (pre and post relocation).

4.9 Adaptive Livelihood Options

Communities in STR depend mostly on forest for their livelihood options. *Mawa* and *Ghee* is the main source of income for the pastoralist community and except a few villages (Kiraska and Kankwari) and all people follow this as their primary occupation. Apart from this daily wage labour is the second most popular livelihood opportunity available in STR (Sahabuddin *et al.*, 2007). Villages situated on the boundary of the reserve like Deori, Dabli and Raikamala also have some agricultural land in the Core Zone -1. People in these villages grow corn, oat, wheat, gram and mustard. A few families have property in the buffer area and on the outskirts of the reserve.

Income sources have changed over time and people in search of employment have started moving out. People go out mainly to nearby cities of Jaipur, Alwar, Bharatpur, Bhiwadi and Delhi. Adaptive livelihood options in this context becomes important as it helps communities to respond in case, they lose one livelihood opportunity. Adaptive livelihood options show the willingness and available opportunity for the communities in the region. Our study is analysing how relocation has impacted the adaptive livelihood opportunities in the region.

4.10 Community Groups and committees for Decision making

Community groups are local institutions of people made by an authoritative individual or group and is recognized and legitimate to make decisions for the community. Community decisions is a choice of action by a person within the community groups or an authoritative group. Decisions of community can be resulted actions of the conscious individuals and their organisations to transform the status quo of the community. The decisions related to communities can be associated with the local government, formal social structure of the community, public-system and political issues. In these decisions, issue involves the groups

and persons to which they ultimately are referred. Basic approach of community groups and their decisions are associated with the decision makers attempting to relate personal and social variances to the kinds of decision made. In case of STR, forest departments and policy maker authorities like NTCA and MOEFCC sits at the position of decision makers.

Community decisions are also a resulting action of communities to the decisions of decision makers. Furthermore, it includes the understanding of the choices of decision makers as outcomes involves complex processes. STR primarily holds two communities: *Gujjar* (86.1%) and *Meena* (7.6%) in the Core zone. These community groups may be functioning at community level, village level or family level as well. Displacement of communities is directly affecting the economic base of these communities, in these circumstances decisions made at community groups can play a major role becoming a voice of the community. In our study we try to understand the role of community groups or decisions in the social resilience of communities at STR.

4.11 Education

Over the past few years, education has received a considerable attention from nations around the world. Developing countries like India is primarily focusing on providing education for all. Educating indigenous forest dwelling communities is also a part of the bigger structure. Development of schools and education centres will lead to a healthier sustainable future for the kids. Education will play a key role in building capacity and knowledge structure of the rural populace and will improve their social and economic situation. Education will make communities more informed about their decisions preventing them from misinformation. It will help the local people to get better outcomes in their livelihood sources. Locals through education will improve their ability to understand rights, duties, legislation, government schemes, available benefits and protection laws etc. Education standards of communities in

STR is very low and very hardly kids go for education after 10th standard. It is essential to understand the importance of quality education in these areas. Those who do want to go for higher education have to move to cities that involves additional cost.

Providing quality education to these communities can enhance quality of their life for upcoming generations. It is essential for the overall development of the people and the communities in STR. Education has a critical role to play in rural development in developing the overall structure of the region. If quality education is given access to these community, it will improve their social and economic resilience. Our study is aimed at understanding the accessibility of public education institutions in STR. If the public education institutions are located far from the community residence, it becomes difficult for the kids to travel in forest. Therefore, they tend to avoid the education and as a result most of the community people remain uneducated. Our study will check whether the public education institutes have become more accessible to community people after relocation.

4.12 Material Assets and Accessibility to Infrastructure

Material assets and accessibility to infrastructure is an indicator of quantitative data of community level infrastructure and life-style. In studies done earlier social status and wealth is identified through examination of relative wealth and material style of life of households (Pollnac & Crawford, 2000; Cinner & Pollnac, 2004). Material assets by measuring wealth is a way to check the absence or presence of household structure or possessions. In our study we developed a list of indicators like possession of radio, LPG, mobile phone, vehicle, land, television, electricity etc. and presence of these items was recorded during the surveys done at households.

Information associated with infrastructure such as hospitals, railway station, internet services, agricultural credit cooperative society, MSP based government procurement centre, post office,

Public Distribution system, food markets, electric services, pharmacies, banking facilities was collected. Furthermore, liabilities are significant factors in analysing the wealth system of the household in community. In our study we are analysing how much indebted communities are pre and post relocation.

4.13 Power Structure of the Community

Community power structures is found at the upper levels of the occupational hierarchy to inhabit important power positions. Even in heavily working-class managers and professional men play essential role. Commonly some members play prominent part than other members and these people are found to be in some type of inner circle. The power structure is seen commonly varying in power share among the number of decision makers. Communities vary in their power structure in various platforms. In STR communities are highly dominated by men and power structure also lies in the male section of the community. Power structure incorporates social and political structure of the society. Political influence of the community can play a prominent role in their positioning at the society. The consequences of actions related to community will have larger complications if the community holds a stronger political structure in the society.

Social structure on the other hand shows the inter-relations of people between communities. These social structures can be strengthened by social gatherings and participation at festivals, social events, marriages and ceremonies. These social relations make communities stronger in times of disaster. In our study we intend to analyse the power structure present in the villages at STR. Furthermore, the study will analyse how much socially interactive communities are living in the STR and how their social structure has changed after relocation outside.

4.14 Social trust and Collective Efficacy of Community

Social trust in a community is defined by the linkages within the community. This trust is created though social relationships or connectedness among community members. Community is more cohesive if these links are strong and vice versa. Social trust of communities holds them together in building the community resilience (Kadetz, 2018). The elements purported collective efficacy and social structure reacts in dynamic ways leading to other factors. Social togetherness makes community mentally strong and resistant to the external factors. If a community is organised collectively, they suffer less in any crisis situation. Factors of strength in community can be determined by sharing values, including trust and their collectiveness. Social networks and their cohesion are a significant aspect of social capital focusing on bridging, linking and on bonding.

Collective efficacy of a community is a shared belief of a community to overcome potential hardships. Collective efficacy involves civic responsibility of people, personal and community preparedness, self and community reliance. In our study at STR, we are measuring the social trust and collective efficacy of community members through structured questionnaire survey. These questions are pointed to understand the social bonding of people living in close proximity to each other.

4.15 Health

Health of a community depends on medical care focusing on the mental and physical well-being of the community people. Health factors and delivery of health services of a community are essential in structuring community resilience. Vulnerabilities in health structure at community level will not help in maintaining a strong resilience. Physical and mental health issues are identified as essential elements in delivering quality health. Community health is

associated to wellness of individual and healthy people in a community is a sign of good community health. Health of a community can have far reaching impacts on education, safety and crime, achievement, people's ability to work, economic health, happiness, life expectancy and many more. Health of a community can affect the desire of people to participate in social activities and leisure activities.

Health in community can reduce the inequality among residents and health gaps caused due to gaps in ethnicity, income, location, race, social status etc. Lack in community health leads to a complex set of issues which are difficult to address. For instance, negative health outcome is linked to rise in crime and violence which becomes a perpetuating cycle if not taken care quickly. Overall suffering of a community can led to chronic diseases of diabetes and heart related problems. Life expectancy is also affected due to chronic diseases and affects the overall growth of an individual. Generally, life expectancy is lower in areas where proper health services are not provided. Traditional knowledge of medical practices is another major aspect related to communities living in protected areas. These traditional methods are used with the available resources in forest and communities. In North-east and Himalayan region of the country, people tend to prefer these traditional methods of healing than modern healthcare system. In our study at STR we look at the health system of villages in STR and the preferred healing system by the community. Has health improved post-relocation and if yes, why? The study will also analyse the use of traditional healing method by people.

4.16 Traditional knowledge Structure

Traditional knowledge is a reliable and rational knowledge developed through generations of intimate relations by native people with their land having equal status with scientific knowledge. Traditional knowledge of indigenous communities has a significant role in the biodiversity management of forest. The value of traditional knowledge is recognized by policy-

makers, managers, scientists. It is constantly evolving in the national and international law system (Ananya, 1996). Arguments in favour of traditional knowledge emphasize on economic and intellectual benefits to non-indigenous societies by leading to agricultural innovation, drug discovery and raw materials for bio technology. Indigenous communities in forests have wise stewards of forests and most of the world's biodiversity hotspots and primary forests are situated with a vast diversity of traditional knowledge and indigenous cultures. Preservation and protection of cultural heritage and traditional forest knowledge is a battle for many societies. Rising socio-economic pressure and exploitation of available forest resources is a particular challenge in the forest policies.

Communities have used traditional knowledge in building their relationship with the environment throughout generations. Traditional knowledge comprises of legends, paintings, songs, stories, methods and practices preserved in artefacts passed from generation to generation. Generally, there is no difference in sacred and secular knowledge in the traditional knowledge system. In our study we are analysing the traditional knowledge structure of the community at STR and how it is helping them in building resilience to outside factors. The information is gathered through semi-structured interviews and observatory analysis of communities in STR.

4.17 Activity Pattern and Leisure time

Leisure and activity pattern is a significant factor in maintain a psychological health of a community. Communities often suffer from stress being controlled by the outsiders and it effects their wellbeing. Leisure is a positive response to stress using perspective based on resilience. With this approach focus can be enabled on the strengths and competencies in stress-leisure-coping process. Studies shows that leisure facilitates preventive functions and a sense of resilience (Denovan & Macaskill, 2017). Leisure activities offer a positive way of coping in

day-to-day life. Leisure offers escapism from regular life, promotes positive mood and encourages belonging via shared activities.

Leisure facilitates balance in work performance, positive emotion, life and relationships among professionals. Resilience of an individual or group can be built through creation of psychological resources as leisure. In our study we are looking at activity pattern and leisure time activities in STR. This will give us idea about activity pattern of people inside STR and what do they consider as leisure time. To understand the activity pattern and leisure time, observatory analysis and questionnaire survey was conducted.

4.18 Identity and perception

Communities provide a wealth of deep-rooted organized knowledge and every community has its particular norms, values and traditions. The knowledge of community is built on the countless interactions with various socio-cultural, socio-economic, socio-political attributes occurred over a period. Identity and structures are shaped by this knowledge gathered over a long time. Various communities have emerged and has provided opportunity for people to gain diverse amount of knowledge by getting membership in these communities. Interaction of identities on an individual level by different communities shape the thinking, learning and perceptual environment forming the nature of value preferences, experiences, and knowledge arrangements. Identity of a person is shaped by this complex and intricate system of socialization. Individual personalities are shaped depending on the nature of the organized knowledge and socio-cultural traditions.

Study of an individual and its affiliations with the community shows the role of community specific knowledge in making an identity. Subsequently community memberships help us in understanding the identity dynamics of a person. Examination of knowledge of community can give more information about the social interaction process within the community. Identity and

perception of a community are two significant constructs which need considerable attention to understand the relationship between community and an individual. In our study we are analysing the interaction of communities with the forest of Sariska and how much role does it have in their lives. The study is conducted through semi-structured interviews about their individual and communal identity. To understand how relocation have made any significant change in their identity and perception.

4.19 Relation with Nature

Nature and man are in the relationship since the dawn of history. It has taken attention of various fields including behavioural science, geographical science and social science. Communities are taking part in conservation of nature from generations. However, it is now that it's gaining growing concern in global conservation. With increasing numbers of protected areas all over the world, conflicts between local people and conservation authorities becoming more prominent. Approaches appropriate for sustainable biodiversity and natural heritage with culture maintenance and need for basic livelihood are under discussion of practitioners around the world. Developing countries like India and China is seeking ways to coordinate conservation and community livelihood under its process of listing protected area networks. Socio-ecological systems are inter-related because socio-economic development is based on the available natural resources.

Communities living in close proximity to nature interact with nature through resource management. Communities' knowledge and their relationship with nature is protecting natural resources and the indigenous culture. In our study we are doing observatory analysis and interviews with communities' relation with nature at STR and how this relationship is transformed after relocation outside.

Chapter 5 Results

The proposed objectives of the study would be:

1. **To understand the perception of Communities and Forest department towards Relocation.**

Research Questions (Under Objective 1):

1) **What is the perception of forest authorities towards Relocation?**

In interview with forest officials,

Forest officials believe and have records that after relocation, the area occupied by the villages before have shown good growth in vegetation and even tiger movement has been observed. According to forest department employees, relocation is necessary not only for the survival of biodiversity and reducing habitat degradation but also helps the communities with better facilities and resources outside. But the issue mainly arises in the selection process of relocation package, the survey done by local revenue department in 2008 is considered as the time-period which will be considered for the relocation package. Those who were availing the package, having age of more than 18 men were considered for the relocation package. However, people did not move in that time and now they demand the relocation package from a new survey according with the present time. But state forest department has denied the package from a new survey and 2011 is considered as the final timeline, those who are 18 by 2011 will be eligible for the relocation package.

Forest officials said people first agreed to move to places like Kanpura Lojh and Tijara Rundh and later when forest department invested the money preparing the land for them, they denied to go to Kanpura Lojh. But earlier villagers have themselves given permission to go to Kanpura Lojh. Road connectivity and water are the main criteria used for allocation of relocation land.

Also, community people are prioritized to their similar surroundings, if *Meenas* are planned to be relocated it is first seen whether relocation site has *meena* population living in the surroundings. According to forest officials one person is sent from each family for the site seeing of the proposed relocation site. Consent is first taken from the villagers with all the paperwork. Forest department takes the decision of selection of relocation site in the area and assistance is also taken from the state revenue department. Forest department had a goal for first phase for 2017, relocating 10 villages but it is still undergoing and yet to achieve. NGOs are not taken any help but state's social welfare department is given some responsibilities for the work. Survey committee for each village is made by local revenue department with the help of Patwari, Tehsildar and a forest official. Survey date is considered as the final date for relocation and if 75% of villagers give their consent in written for relocation then the request is made to district collector.

When asked about the eligibility of relocation package, daughters are not considered for the relocation package but widows are considered for the package. 1 ha is the minimum land given to an eligible individual, if he or she has land inside the core zone, they will be given the package of original land holding + 1 ha of allocated land. For instance, if an individual already has 10 bigha of land inside the reserve. In relocation package he will get 10 bigha + 1 ha (4 bighas) land in total but the individual will have to give their original land before relocation.

2) How do communities perceive the process of Relocation?

When interviews were done to the communities their response was almost opposite of the forest officials. Respondents said relocation process is not done properly and the new selected site of Kanpura Lojh is a complete barren land and no facilities available. In our field visit we also visited the Kanpura Lojh site, the relocation was taking place in a barren land. Only two to three houses were relocated by that time and there was no proper road facility in the area.

Similarly, water facilities were also not started and the land was not ready for cultivation in an uneven level. Schools and health facilities were also far from the relocation site. People inside STR are now demanding proper facilities to be given if they are relocated to Kanpura Lojh and according to the present situation they believe the site is not suitable for living. Villagers have agreed and submitted the paper work for relocation but due to the improper facilities provided by forest department they are unwilling to shift.

In questionnaire survey when asked to households about their perception on relocation, about 59% of people have agreed to move out if proper facilities are provided in relocated area. However, 11% completely disagree for any relocation, and about 30% are willing to relocate in the present circumstances. Fig 5.1 below shows the data in pie chart.

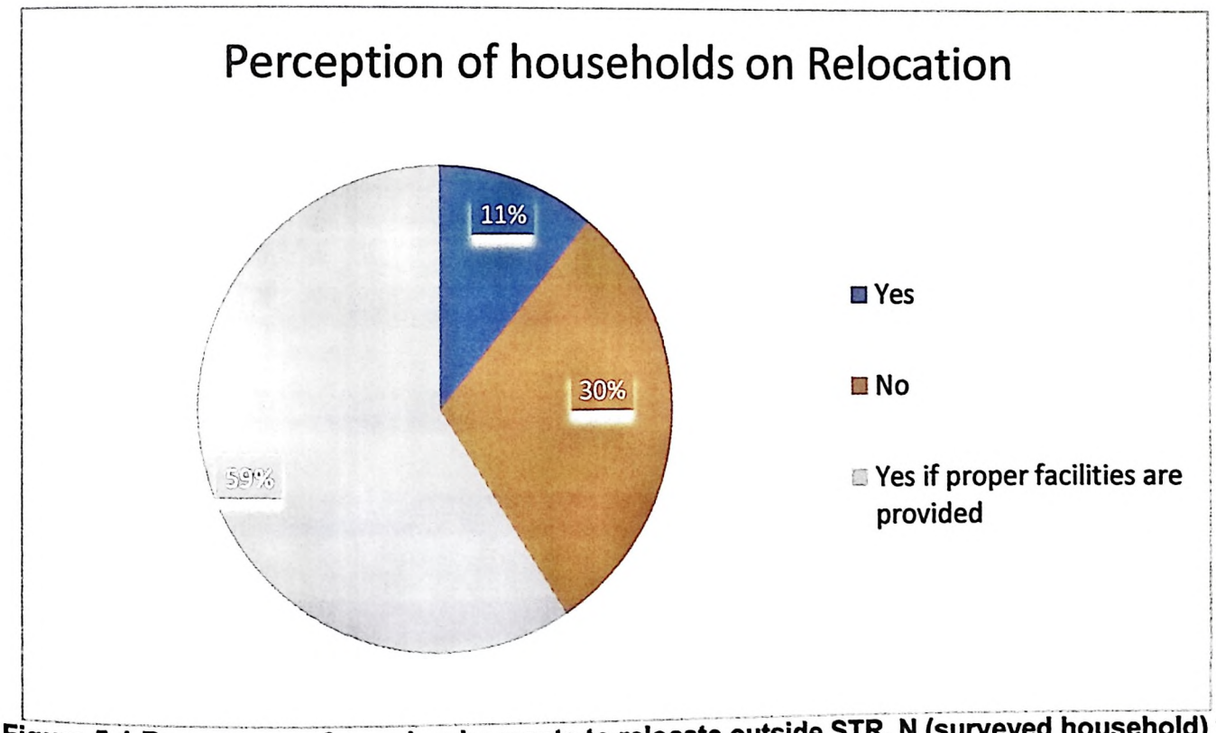


Figure 5.1 Percentage of people who wants to relocate outside STR, N (surveyed household) = 96.

The finalisation of the site selection is done by forest department and people are not asked for any views. According to the respondents only a few people go for the inspection of the site and forest department does not involve social organisations and NGOs in relocation. Respondents said if forest department does the relocation properly, we all will move outside but there is a

lot of corruption happening. Those who have good connections with forest officials get more and better land than the remaining one. This creates an issue in village people's mind and their trust within the community is also getting affected due to this. Therefore, community people are demanding relocation with proper given facilities as shown in the records. Until this happens in reality there will always be an issue amongst the relocators and the relocated.

People inside STR have raised concerns, necessary requirements for their relocation which can be seen in Fig 5.2. Education and infrastructure facilities are the main concerns raised by villagers with a result of 31.39% and 20.64%. Transportation, electricity, and roads were the other main concerns 10.32%, 13.22% and 18.94% respectively.

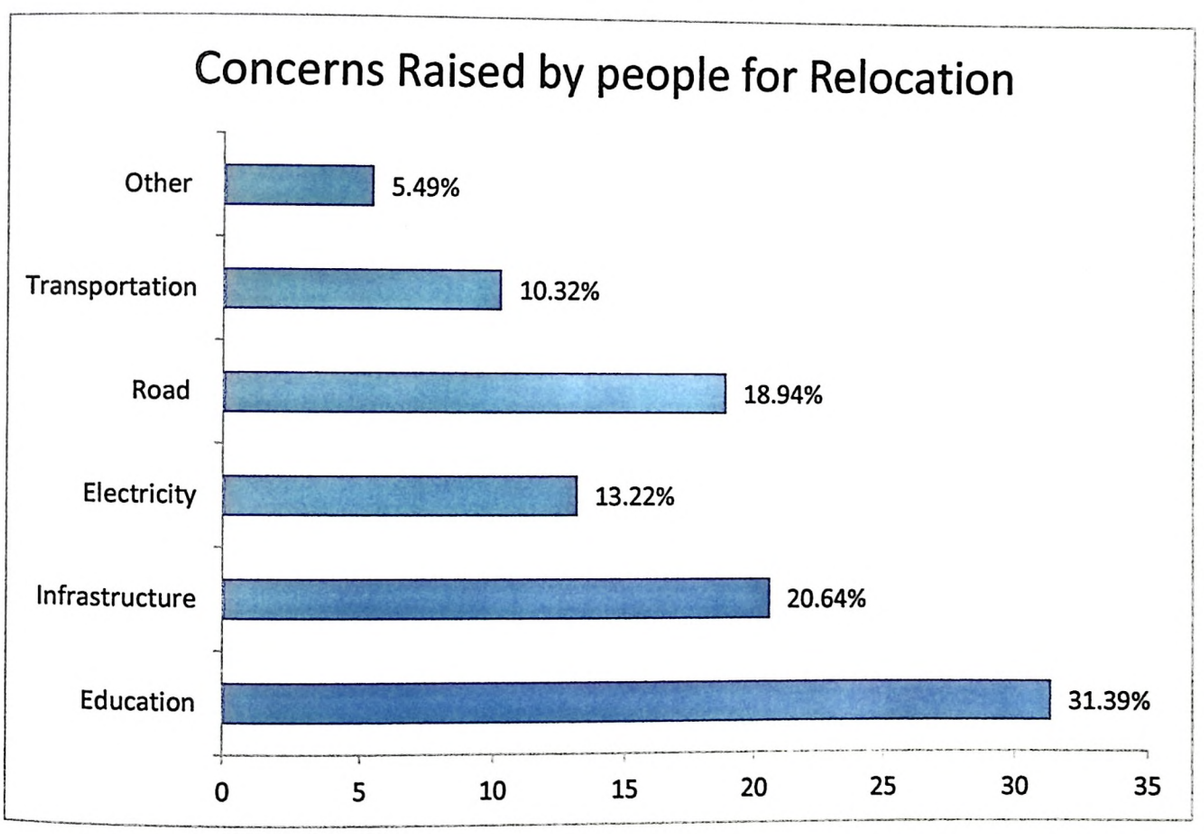


Figure 5.2 Concerns raised by percentage of households for relocation package in villages inside STR; N=96.

Objective 2: To understand community resilience in the context of the Relocation.

Research Questions (Under Objective 2):

1) How Resilient are the communities to the effect of Relocation?

5.1 Natural Resource Dependency

Natural resource dependency was estimated by documenting fuel wood, fodder requirement per household on a regular basis. It was estimated in two settlements outside (Rundh Maujpur, Bardod Rundh) and three settlements inside the STR (Lilunda, Kraksa, Haripura). In Rundh Maujpur settlement, data was collected from Umri and Deori villagers relocated in 2008 and 2011 respectively. The total household surveyed was 31 of total 85 in the area including 13 households on *Meena* caste and rest of them *Gujjar*. As per the response from respondents, villagers were mainly dependent on natural resources for fuel wood and fodder requirement for livestock. However, after their relocation outside the average number of livestock currently has declined from 20-25 livestock to 6.25 livestock per household. According to respondents almost all the population before relocation was engaged in livestock rearing and milk production was their main occupation but currently around 90-95% is dependent on agricultural production as their primary source of income.

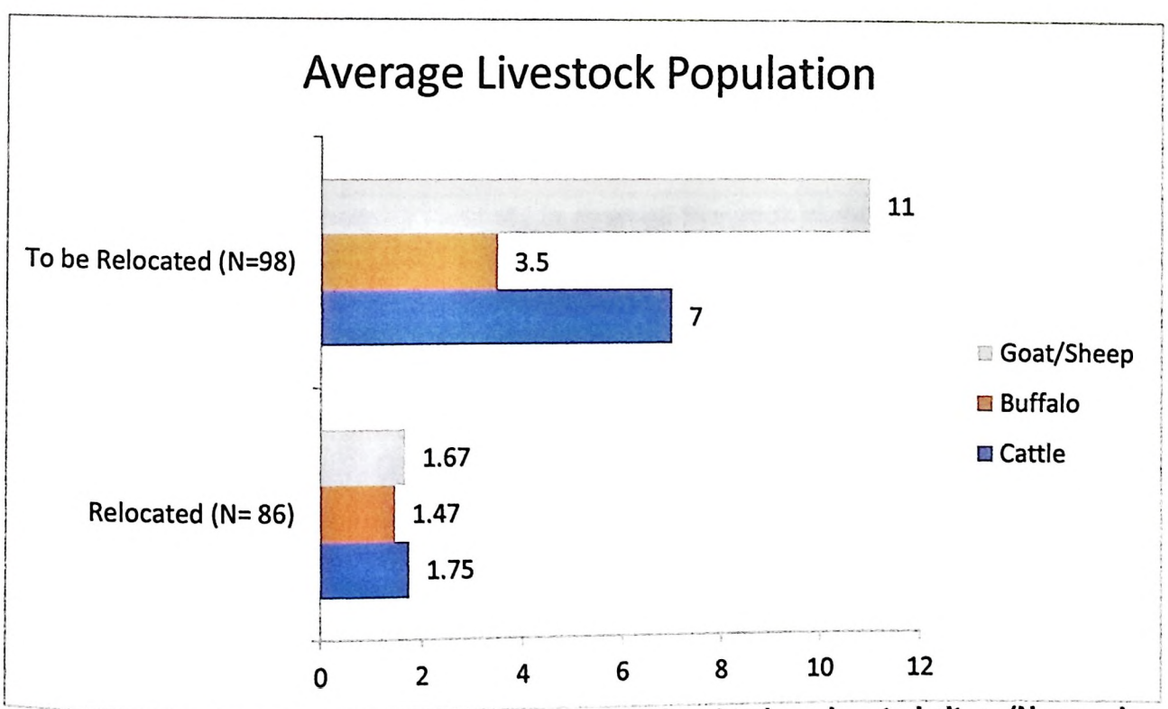


Figure 5.3 Average Livestock Population in relocated and to be relocated sites. (N= number of surveyed households).

Livestock population was varying in all three populations and results in Fig 5.3 shows the number of goats, cattle and sheep count in relocated and to be relocated sites including standard deviation. Furthermore, box plot in Fig 5.4, shows the average variance in number of livestock in relocated and to be relocated sites. T value of 9.2469 shows the difference in data in relocated and to be relocated sites, p value of 6.42E-17 in the table 5.1 shows the significance of variance here.

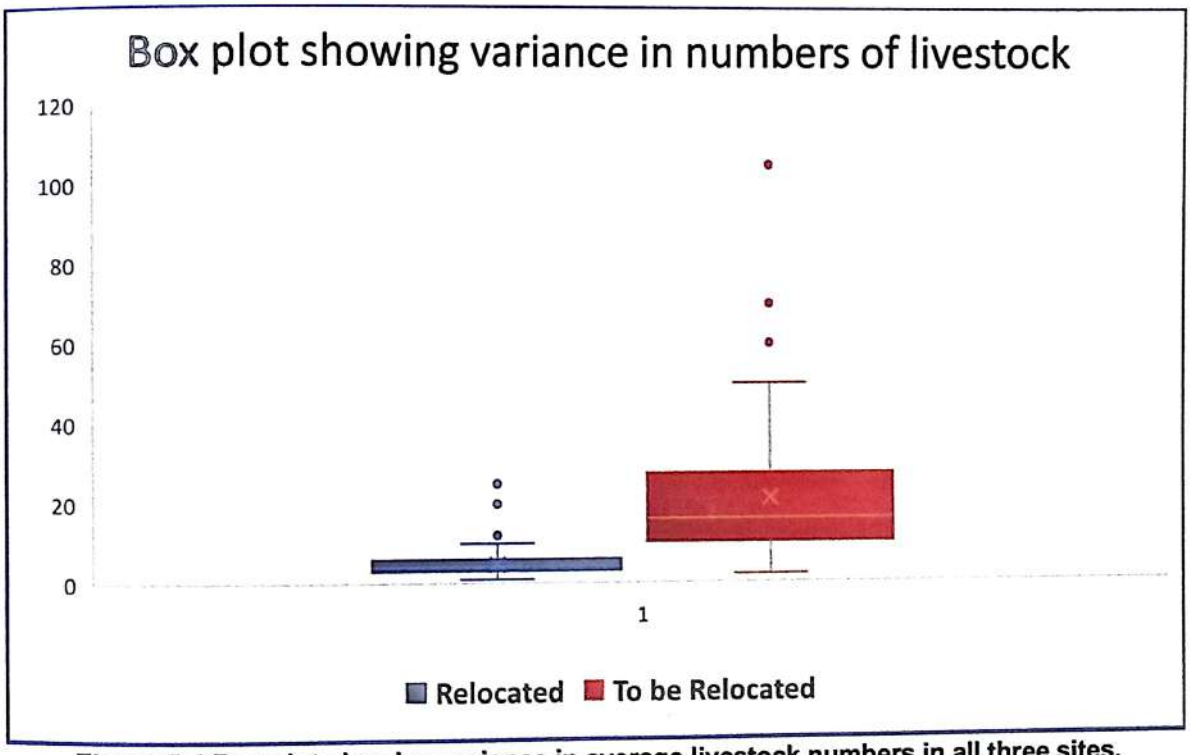


Figure 5.4 Box plot showing variance in average livestock numbers in all three sites.

Another main cause for decline in natural resource dependency of people in Rundh Maujpur is due to unavailability of natural resources around them. Though a few houses have reported collection of Dhonk (*AnogeissusPendula*), Ber (*ZizyphusMauritiana*) from the available sources. But respondents agreed that collection of these species is not easy as they have to walk several kilometres for it. Resulting to this resource dependency has decreased in Umri and Deori villages after relocation in Rundh Maujpur. People now in the area prefer to buy fodder grass from market or they grow in their land for surfable household consumption.

Fig 5.5 and Fig 5.6 shows the percentage number of households collecting species from forested area in relocated and to be relocated sites. *Anogeissus pendula* and *Butea monosperma* were the two main species collected inside core zone of STR with a result of 43.21%, 26.12% respectively. In relocated sites agricultural fuelwood is the main source of fuelwood accounting for 60.32%. Buying fuelwood is another option people follow with a result of 28.28%.

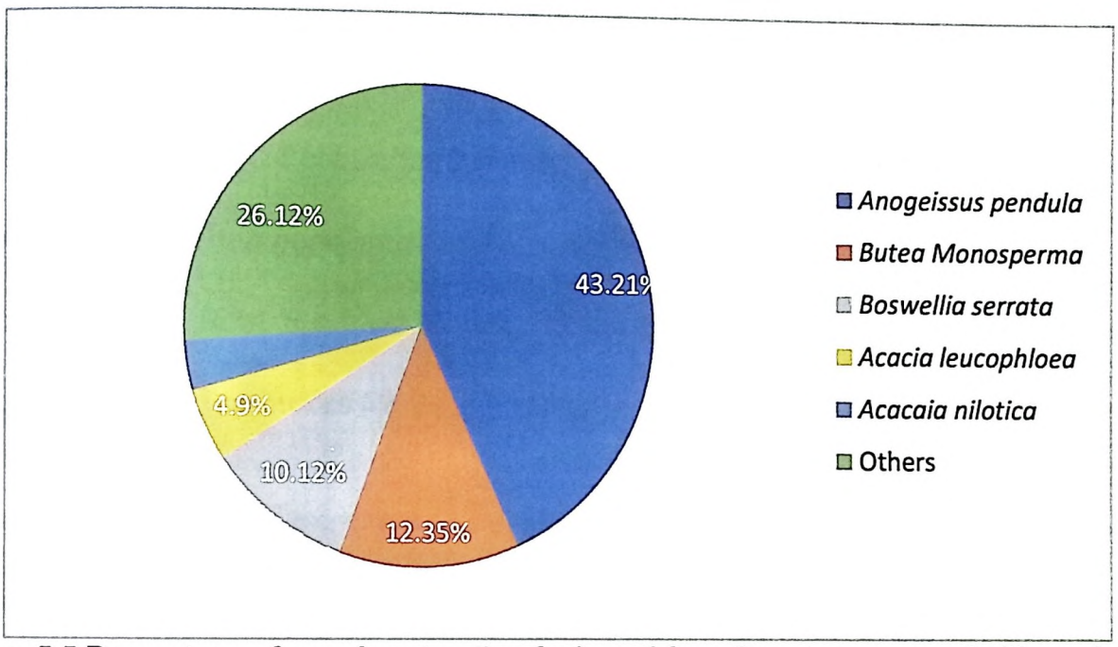


Figure 5.5 Percentage of people extracting fuelwood from forest at surveyed villages inside Sariska tiger reserve (Number of Surveyed households= 96).

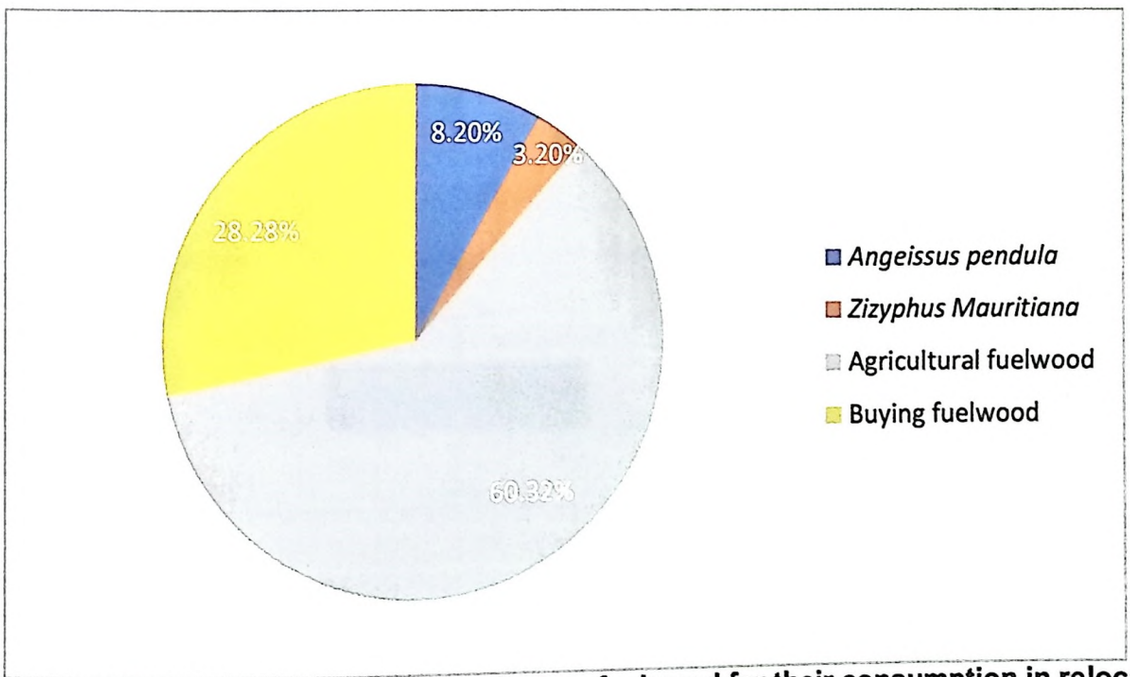


Figure 5.6 Percentage of people dependent on fuelwood for their consumption in relocated villages, N (number of surveyed households) =86.

In Bardod Rundh settlement, partial relocation has been done from villages including Kankwari, Haripura, Peelapani and Karath. The settlement is located 4 km away from Behror tehsil of Alwar district on Alwar-Behror highway. A total number of 60 households were surveyed from the settlement with a household representing all given villages. In terms of Natural resource dependency, people in the area is completely depended on farming as their primary source of income. Due to its geographic location, settled in agricultural landscape, there is no availability of fuel wood and fodder grass for household and livestock consumption. People either grow crop of cotton for fuelwood consumption and grow fodder in their farming land. About 90% of the population cultivate fodder grass in their farmland and 10% of the household buys it from the local farmer. Therefore, in Bardod Rundh, villagers are not dependent on natural resources for their livelihood.

According to respondents' expenses on livelihood has increased after relocation and to analyse the results T-test was done which can be seen in Fig:5.7. T value of 19.18 P value of 7.27E-31 in the table 5.2, shows the significance of variance here.

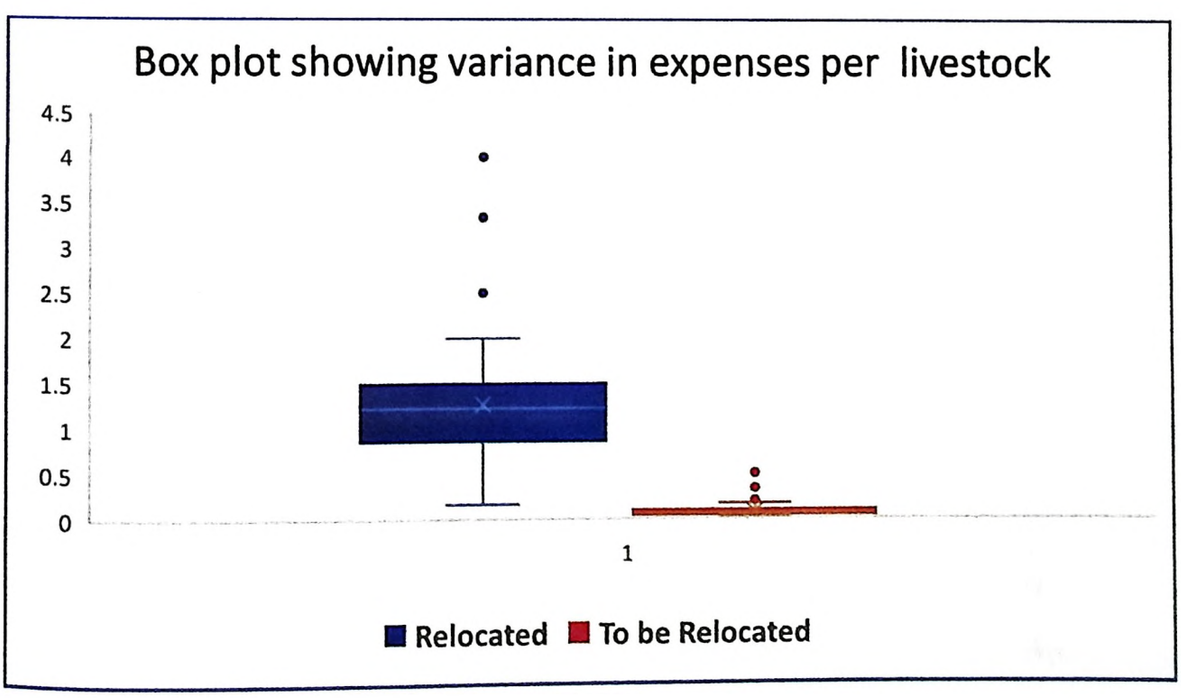


Figure 5.7 Box plot showing the variance in average monthly expenses on livestock by villagers in relocated and to be relocated sites.

Fig 5.8, shows the analyzation of the income variance from livestock in relocated and to be relocated sites. T-value of 3.69 shows the variance in data and p value of 0.00028 in the table 5.3, shows the significance of variance per livestock income in both the sites.

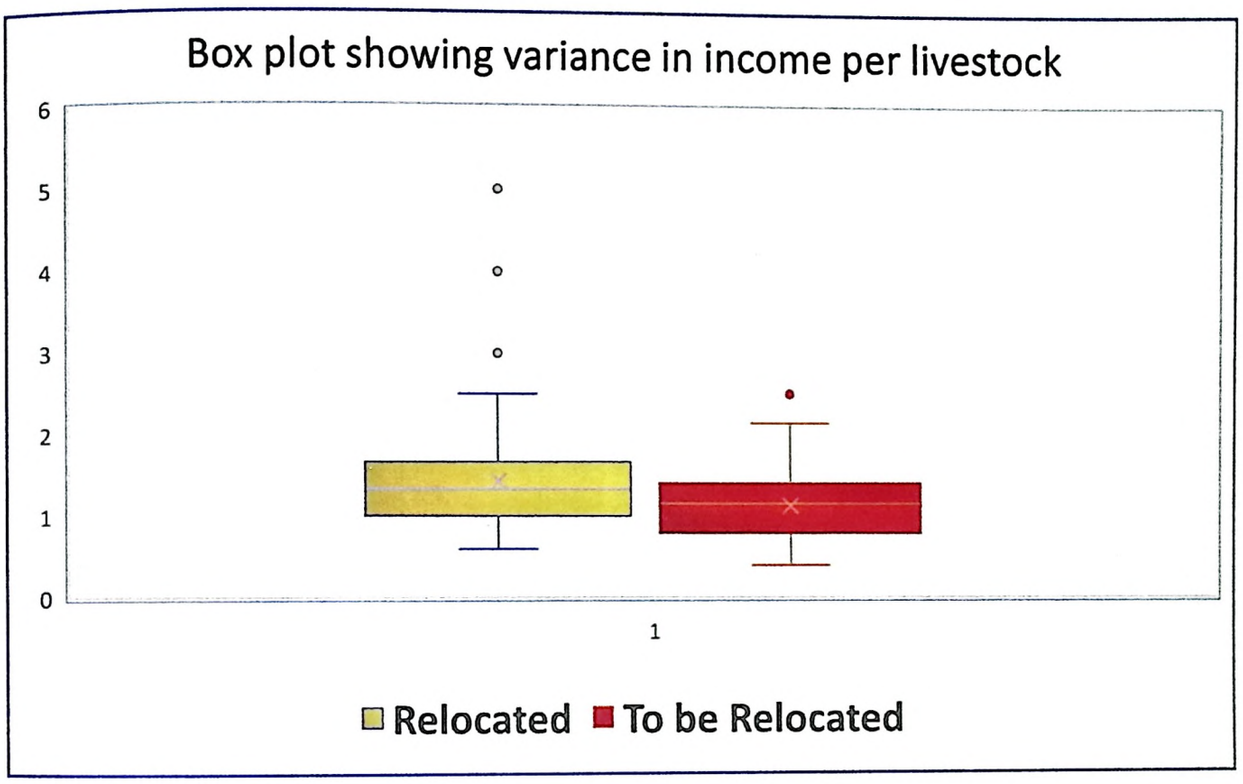


Figure 5.8 Box plot showing variance in average monthly income from livestock in relocated and to be relocated sites.

Inside STR we conducted questionnaire survey in Lilunda, Kankwari, Haripura and Kraska villages. Average household in these villages have 14 cattle/buffalo with average 11 goats. Their main source of livelihood is selling of milk products to local market. Every household inside STR is dependent on forest resourced for their fuelwood and fodder collection. Livestock grazing is also very common inside and respondents said that livestock moves freely inside the Core zone of STR for grazing. People take their livestock for grazing and drinking water during day time. The fuelwood is generally collected every day by both men and women for cooking. The species collected from forest for fuelwood are mainly *Butea monosperma* (Palas), *Acacia leucophloea* (Rijva), *Anogeissus pendula* (Dhok), *Boswellia Serrata, Grewia flavescenes,*

Acacia Nilotica(Babul), *Capparis decidua* (Kair), *Pithecellobium dulce* (Jungle Jalebi), *Prosopis cineraria* (Khejari), *Haldina cordifolia Roxb.* (Haldu), *DiospyrousmeloxylonRoxb.* (Timbru).

5.2 Adaptive Livelihood Options

Data for livelihood options was collected from households in Rundh Maujpur and Bardod Rundh region and from inside Core zone of Sariska Tiger Reserve. The table below shows the main livelihood options prevalent in the region.

Table 5.1 Livelihood sources available in STR landscape.

1. Peasant (Own land)	2. Selling Milk Products
3. Wage Labour	4. Business (small size)
5. Service (Government)	6. Service (Private)
7. Driver	8. MNREGA
9. Peasant (sharecropper)	10. Others

The study reveals that majority of the households (more than 90%) in Rundh Maujpur and Bardod Rundh region depend upon income from agriculture followed by sale of milk products (60%). Figure 5.9 below shows the main livelihood options preferred by relocated villagers in all surveyed villages.

In Fig 5.9, population of households' percentage can be seen adopting the available occupations in relocated and to be relocated sites. In results almost all the households primarily depend upon sale of milk products inside the core zone of STR. However, agriculture is the main source

of income in relocated villages. Apart from sale of milk products, wage labour is another primary source of income.

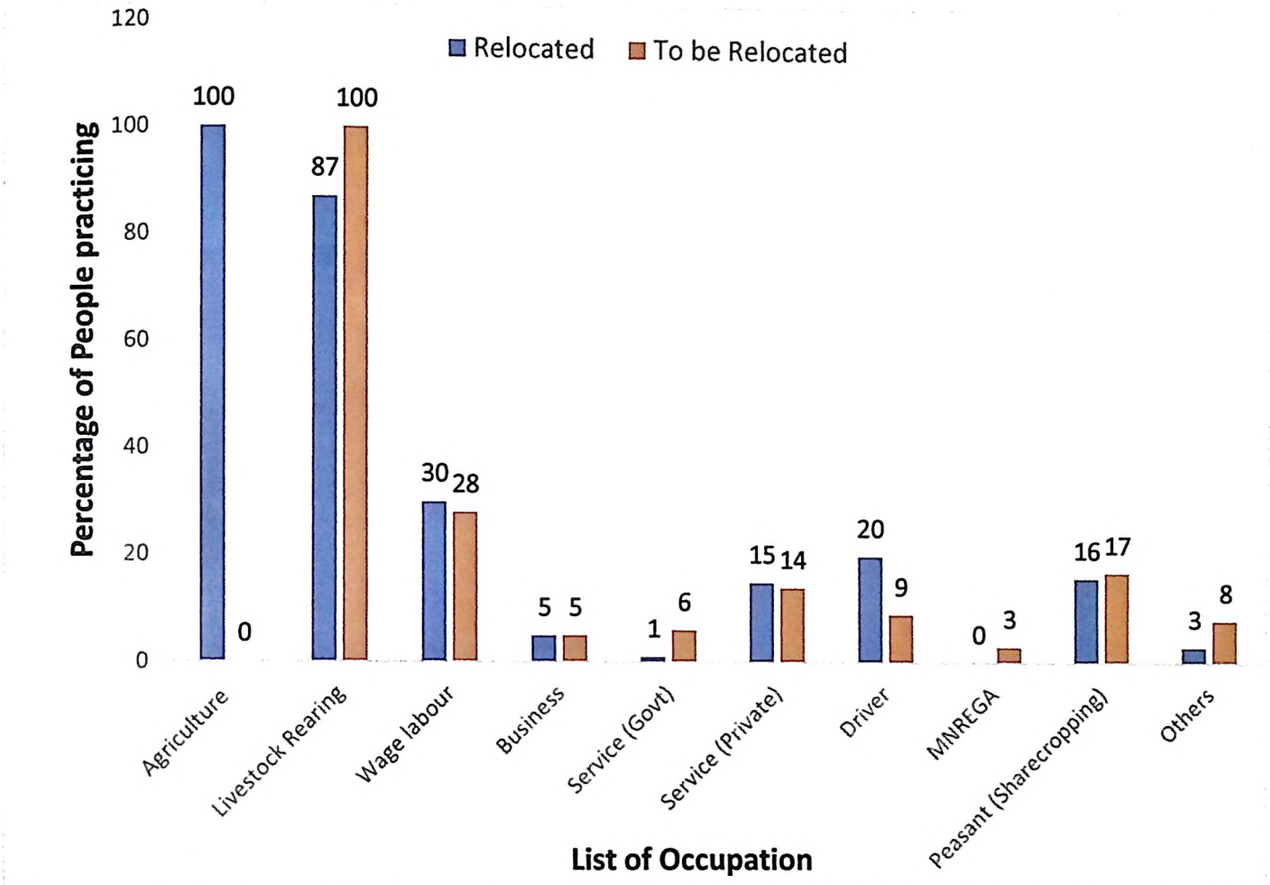


Figure 5.9 Percentage of people engaged in occupations in "relocated villages" and "villages to be relocated"; N1 (relocated) = 86, N2 (to be relocated) = 96.

Wage labour is mostly done in agricultural sector during the time of crop cutting in the area. Respondents also said that people migrate in the summer season during March-April to buffer areas of STR with their livestock. They graze their livestock in the agricultural fields after crop cutting and in return the land owner gets organic compost of animals. The landholders provide them shelter for one season and they return back to their village after monsoon season arrives in August-September month.

A few household members in the landscape were working in nearby cities of Alwar, Thanaghazi and Tehla as a temporary worker. Mahatma Gandhi National Rural Employment

Guarantee Act (MNREGA) is not benefitting the local currently, however in past a few households benefitted from it.

These available livelihood options show that people in relocated and to be relocated sites have more than ten livelihood sources, the most adapted livelihood sources apart from farming and selling milk products are wage labour, private jobs, farming with sharecropping in all surveyed villages. Subsequently, Fig 5.10 is showing the options chosen by households in relocated and to be relocated sites.

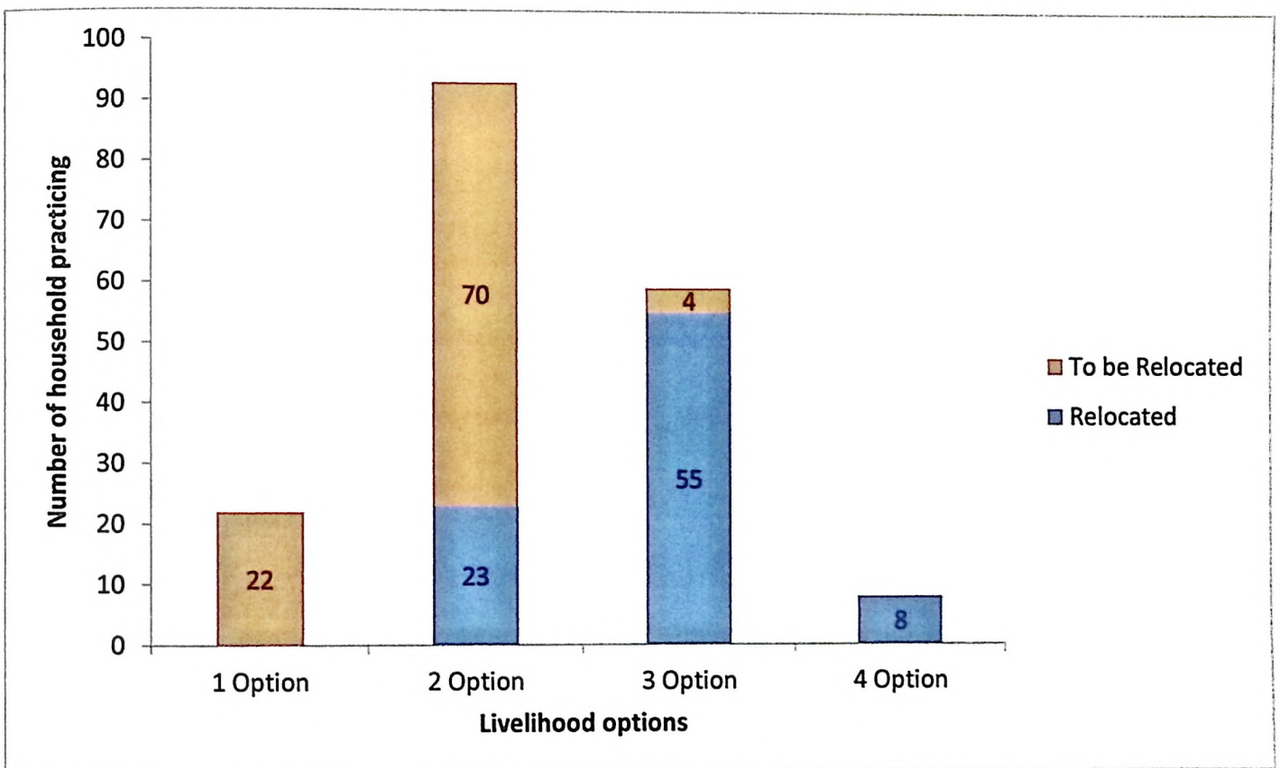


Figure 5.10 Number of households practicing the livelihood options at "relocated" and "to be relocated"; N1 (relocated) = 86, N2 (to be relocated= 96).

Chi-square test was run in relocated villages and to be relocated villages to analyse the significance of association between livelihood options. The result shows Df= 4, $\chi^2 = 55.841$, P (no. assoc.) = 2.1648E-11.

5.3 Community Groups and Committees for Decision Making

To assess the community groups and decision making, we undertook questionnaire survey and semi-structured interview of households in all three sites. The questions were both objective and subjective divided on two levels: community and family. After doing questionnaire survey and interviews with people. The results show that there is no existence of community groups in the relocated villages and households are solely dependent for the decision making at community level. For conflict resolution, respondents said they talk with their senior members of the family. As most of the families are associated in blood relations, their senior members take collective decisions of the community. Similarly, *Gujjars* and *Meena* both does not have any collective decision-making group and they take advices from their senior close relatives. Households inside Core zone of STR, do not have existing community groups and they are completely independent. When asked about need for community groups a respondent replied "*We never felt need of any community groups and households if required do take help from their close relatives but mostly we decide on our own. Forest department has nominated one member of the collective households for relocation but final decision is taken by each individual where and when he wants to go*". At family level decisions are taken by male members of the society and females do give their opinions but ultimate decision is taken by men. People voice their decisions individually or if the issue is collective, they go collectively.

5.4 Education

To analyse the Education level of communities, questionnaire survey was done at each site. Education standards generally are lower in the region and in Rundh Maujpur (relocated village) about 50% of the household members are uneducated and haven't got any formal education. Remaining population is mostly educated up to primary education and only about 5-6% people are educated up to secondary or higher secondary. Education after 12^{th} is very rare and about 2-3% go to college for education. Furthermore, the number of people who have gone through

any skill development training is also negligible. However, community is now concerned about the education of their kids and one of the primary motivations for people to move outside was to improve the education standards of their kids. Table 5.5 below compares the distance of primary, secondary and higher study education centres from the relocated site at Rundh Maujpur.

Table 5.2 Access to Education infrastructure pre and post relocation in relocated site of Rundh Maujpur. Distance in Kilometres.

Institution	Before		After
	Umri	Deori	
Anganwadi	0	0	4
Primary School	0	0	0
Middle School	3	0	0
Secondary School	25	16	4
Sr. Secondary School	25	16	4
College/University	25	16	11
Training Institutions	25	16	11

In Bardod Rundh (relocated site) similar trends were seen and education in households was poorly low. Though kids in more than 90% of the households were going to school for education. About 20-30% households were sending their kids to private schools. However, only about 5% people have gone for higher education and kids mostly drop out after completing secondary education. The reason for dropout is lack of money to support their higher education, unavailability of jobs and lack of quality education nearby. Table 5.6 below shows the education infrastructure availability at Bardod Rundh.

Table 5.3 Access to Education infrastructure pre and post relocation in relocated site of Bardod Rundh; Distance in Kilometres.

Institution	Before Relocation				After Relocation
	Kankwari	Haripura	Bhagani	Peelapani	
Anganwadi	0	0	2	0	0
Primary School	0	0	2	0	0
Middle School	9	10	6	12	0
Secondary School	15	10	6	12	4
Sr. Secondary School	15	10	6	12	4
College/University	15	10	15	12	4
Training Institutions	15	10	15	12	4

Inside the Core zone of STR average education level is below than the average education level of households in relocated villages. More than 90% of the population above 25 is uneducated and kids after completing the secondary education rarely chooses for higher education. Many households were unable to send their kids in schools due to the distance of schools being very far from their village. People are considering as very important factor for the development of their children's future. Several households have claimed this as one of the main rational for accepting the offer of relocation. Table 5.7 shows the accessibility of education infrastructure in surveyed villages inside STR.

Table 5.4 Access to Education infrastructure in surveyed villages inside the reserve; (Distance in Kilometres).

Institution	Kankwari	Haripura	Lilunda	Kraksa
Anganwadi	15	10	6	0
Primary School	15	10	6	0
Middle School	15	10	6	12
Secondary School	15	10	6	12

Sr. Secondary School	15	10	6	12
College/University	15	10	12	12

Fig: 5.12 further shows the numbers of kids going to school going children in their households. Numbers clearly shows that relocated sites have more number of children going to school as compared to the to be relocated sites.

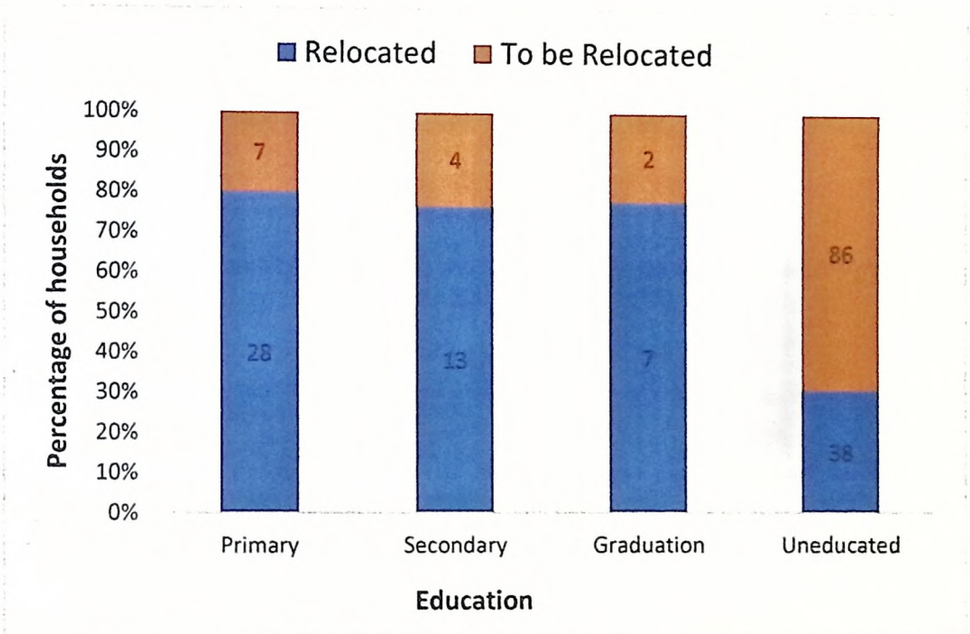


Figure 5.11 Education Percentage of surveyed people in "relocated" and "to be relocated" villages; N1 (relocated) = 86, N2 (to be relocated= 96).

5.5 Material Assets and Accessibility to Infrastructure

Information on material assets and infrastructure accessibility was collected through questionnaire survey. The table of material assets included list like TV, Radio, Mobile phone, Sewing machine, solar battery, motorbike etc. Fig 5.13 shows the list of primary assets available in the surveyed households at all three sites.

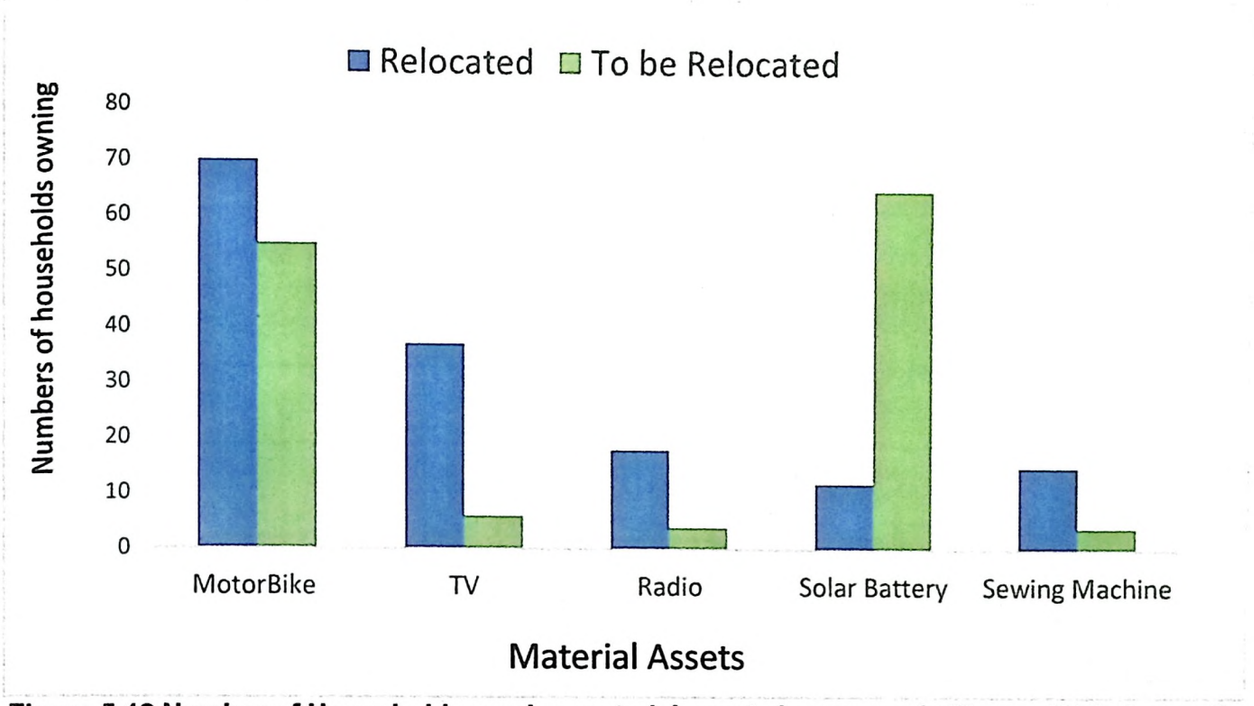


Figure 5.12 Number of Households owning material assets in surveyed villages, N1 (relocated) = 86, N2 (to be relocated= 96).

Similarly, a list of infrastructural assets was prepared and asked to the households and response were recorded. Table 5.8 shows the list of Infrastructural accessibility of all three sites.

Table 5.5 Distance of Infrastructural facilities in surveyed sites, Distance in Kilometres

Infrastructure facilities/ Services	Rundh Maujpur (relocated)	Bardod Rundh (relocated)	To be Relocated			
			Kankwari	Haripura	Kraksa	Lilunda
Agriculture Society	11	4	15	11	10	13
MSP based Centre	11	4	15	11	10	13
Milk Dairy	3	4	15	11	10	5
Veterinary care	11	4	15	11	10	13
Post Office	11	4	15	11	10	13
Ayurveda centre	11	4	15	11	10	13
E-sevakendra	3	3	15	11	10	5
Bus-stop	3	0	8	2	10	3

Infrastructure facilities/ Services	Rundh Maujpur (relocated)	Bardod Rundh (relocated)	To be Relocated			
			Kankwari	Haripura	Kraksa	Lilunda
Railway station	11	4	15	11	10	13
Library	3	4	15	11	10	13
Hospital	11	4	15	11	10	13
Electric services	3	4	15	11	10	13
Food Market	3	3	15	11	10	5
Pharmacies	3	3	15	11	10	13
Hotels/Guest House	3	2	15	11	10	13
Restaurant	3	2	15	11	10	5
Water dept.	11	4	15	11	10	13

5.6 Power Structure of the Society

A questionnaire was prepared comprising questions to understand the political role of these villages in the region. Results shows that in all three sites people did not had any of their family member involved in politics at all levels (Gram Panchayat, Tehsil, District and State). In relocated sites, villages were merged into the Gram Panchayats of Maujpur and Kankar Daupa respectively. The relocation was done on the land available on the outskirts of these villages, about 3 to 4 km far from the main village. Role of the people in the Gram panchayat of their village is very limited according to the respondents.

According to the responses we got through people most of them told that "*village's value is limited to the election time. The candidates who compete for the Gram Panchayat elections visits during election period and we hardly get to see him after the election is over*". For instance, people in Bardod Rund (relocate village) did not had concrete road facility, and street

lights in their village, they have been posing this issue since a long time to the local Sarpanch (head of Gram Panchayat) but till now there is no solution to the problem. In core zone of STR, households are also limited in their political powers and not from a single household have any representative in the local Gram Panchayat. According to the respondents the reason for them to not being a part of the local politics is lack of economic resources. According to the popular narrative of the respondents "*We don't have enough money to compete for the elections. Fighting elections is rich people's job, we are just getting used in their politics, who cares about poor and weak people. We just support them and ask for our demands but there's hardly anything they can do for us*".

5.7 Social Trust and Collective Efficacy

In Rundh Maujpur (relocated village), a total of about 85 households have been relocated and 85% of all household belongs to *Gujjar* community with remaining 15% to *Meenas*. In Rundh Maujpur According to the 85% responses, people are willing to help their neighbours and villagers and can be strongly trusted in any consequence. However, out of 85% the households, 60% trust their blood relatives in the village and in need of any social and economic help they go to them. However, the social trust has now become weaker after they are relocated. Respondents said that "*the whole village use to celebrate their festivals together but now after displacement the households are only limited to their close relatives. Before relocation we use to celebrate Gangaur, Teej* and *Holi* together". In Bardod Rundh about 72% people trust their neighbours and fellow villagers. Similarly, out of 72%, 58% trust their blood relatives in the village.

According to the interviews, one primary reason behind the reducing social togetherness of people is the distance of their households being very far. According to a female respondent "*we hardly go to meet our fellow villagers in the village now, which was very common earlier*

due to our houses being next to each other. Now we meet them in family functions and festivals sometime, otherwise we women do not really go to any houses apart from our families". Family functions including marriages, kids' birth etc. are the most common invitation points where households invite the fellow villagers. According to the respondents most of the village people invite their fellow villagers in these family functions. Respondents have also told that people after coming out have become more conscious and greedier for money, and those who have more money do not want to maintain their relations with the poor households. Therefore, the relationships and collective efficacy have become weaker than what it was before relocation. Inside villages in STR, people are still intact in terms of their social relations and they participate collectively in all social activities. Almost 90-95% people trust their fellow villagers in terms of any emergency situation. Almost 42% agreed that they trust their blood relatives in these situations. Trust among household is comparatively stronger than outside. There are no economic and social differences observed among village people. According to the answers of respondents the social bond of people inside Core zone is still strong and they trust their villagers far more than those who have been relocated. People also take financial helps from their co-villagers in need of money which is not seen common in relocated sites. Households inside STR people believes that people after relocating outside have lost trust in each other.

5.8 Health Care system

Health care system is a key factor in building resilience of a community in any consequences. In our study we have interviewed people on the followed health methods in need. The idea was to understand whether communities in STR follows any traditional healing system which makes them more resilient in vulnerable conditions. Results in relocated villages shows that people do not follow any traditional medicine making practices and the preferred health care system is the modern allopathy healthcare system. People when they get sick goes to local

healthcare system both government and private hospitals. However, the accessibility to this health care institution is more important and in Rundh Maujpur, nearest health care institution was about 6 km, in Bardod Rundh and villages inside STR it was 4 and 12 km (average) respectively.

The results show that accessibility to healthcare services have improved after relocation but the traditional medicinal values are not observed in any of the households at all three sites. Also, the most preferred mode of healthcare system was the allopathy system. People are also not getting a lot of health benefits in the villages from Government's health schemes. There is not even a single household benefitted from the Aayushman Bharat Yojana of the central government.

5.9 Traditional Knowledge Structure

The results show that households in relocated sites primarily do not sell any art and craft commodities and their main source of earning is agriculture. Only about 5% households are practicing tailoring which is also not the primary source of earning.

A few households inside the STR makes tokari (basket) of grass and they sell it outside, but it is not practiced throughout the year by households and they able to generate a very minimal amount from the work. Women generally practice the work when there is free time available. Similarly, festivals celebrated in the area is common Hindu festivals practiced in Rajasthan. Gangaur, Teej, Holi and Deepawali are the main festivals celebrated. Apart from these fairs of Bhartiari Baba, Pandupole temple is the common most celebrated events. There was no sign of association of people with natural elements and no traditional conservation practices are followed by people in the landscape.

5.10 Activity Pattern and Leisure time

Activity pattern was assessed in the study to analyse the psychological practices followed by people in the region. Results show that people throughout the year are invested in the household activities. Farming consumes most of the time of male section in relocated sites. Women spends most of their time in household chores and livestock rearing. According to the responses people do not feel like taking leave from their works. In leisure time men and women both just spends a little time of the day together with their close relatives or friends. They do not go to any touristic adventures in the leisure time and leisure time is considered as spending time with their loved ones.

Households with access to TV also prefers watching it. Small trips to local temples and fairs for example going to Bharithari baba fair and Pandupole temple can be done once or twice a year. Other than these activities most of the male members spends time in the neighbourhood during tea time in evening and sometimes morning. Tea with Hukka (smoking pot) is the most preferrable leisure time by the local men. Women during free time either watches TV if they have or they consider talking to their relatives in the village itself. In villages inside STR, both men and women are busy with livestock grazing and household works during day time. They get some free time in the evening where they have tea and hukka with their fellow villagers. Subsequently, women spend time with their close friends in the village.

5.11 Identity and Perception

Identity and perception play a major role in structuring the collectiveness and strengths. In our study we did questionnaire survey and content analysis of the responses. Identity can either be Individual, family or community, people after getting displaced may have developed a change in their identity and perception. In relocated sites, almost all the households have their identity

as a family and their aspirations are only associated to their families. Though their relationship with other members of the village was also friendly except a few households due to some personal issues. However, about 80% people thought they were attached with the place inside Core zone of STR and life has changed after relocation. It took them two to three years to settle down here completely and they still miss their old settlements inside STR.

There was no particular traditional belief attached with the place inside the STR. No changes have occurred to their identity after relocation. About 50 to 60% people are still willing to go back to their pre relocation village if they are given a choice. Respondents believe their identity of pastoralist community is certainly getting a shape of farming communities. Now they don't have enough resources to keep a large population of livestock. Fodder is not available here and they can't afford to have more than 10 livestock per family. Respondents believe they have lost their collectiveness also because of moving outside and now people are only limited to their family. However, earlier they were more collective in any decision making and preparedness. Households inside Core zone of STR, people also believe that going outside will change their perception and identity. Here inside they are more socially connected and going outside will bring changes in people's perception. Settling in the new place will also be not comfortable according to them and it may take years to get used to of the place.

5.12 Relation with Nature

Households in all three sites agreed that conservation of nature is necessary mainly for protection of wildlife and biodiversity, controlling pollution, providing resources for livelihood consumption. Though, the primary rationale for conservation of forest was benefit-related. People believe conserving forest will provide them goods including fodder, wood, other resources etc. People in all three sites believed that relocation will certainly change the future of their children and now they will not feel any attachment to the forest. But this was considered

on a positive note considering their children will have a better future with much more resources and options to grow.

There is no religious belief of people associated with the natural elements inside the STR and the most missed entity outside is water resources. According to a respondent "*Water is less here and we don't get enough outputs in our agriculture practices. Inside we had enough water availability due to natural streams and the lakes maintained by forest department. It was enough for our livestock as well as household consumption, we never felt short of water there*". Other respondents said we are facing water crisis here from a long time, and even after doing three to four borings we haven't got water. People inside STR also do not associate with any natural environment around them. They believe after relocation they will feel the same pressure, faced by people in relocated sites.

Chapter 6 Discussion

6.1 Perception of Forest Department

Forest officials have mentioned relocation as one of the key factors responsible for the conservation of the ecological elements. According to their suggestion relocation has benefitted both protected areas and communities in their survival. It helps them in improving social and economic capital with by obtaining better facilities outside. Relocation decreases the pressure on natural resources and wildlife movement. Areas of Umri and Deori after relocation, have seen growth in biodiversity and movement of wild animals have also been recorded. Studies (Sekhar, 1998; Sankar *et al,* 2010; Doubleday, 2018) have shown the relation of human dimensions of rewilding the Sariska Tiger Reserve.

The perception attached with residing communities inside the reserve is gloomy and absence of infrastructure facilities and social services are not the concerning subject for authorities. Presence of communities have remained an issue for forest department and forest officials believes the relocating people outside will provide them life of dignity with inclusion of basic services. Education is not the only concerning factor of communities for relocation, water facilities, land registration, levelling of land, new census of relocation package are considered necessary requirements for relocation. However, results in the study shows that affluence assets including motorbike, Television, sewing machine, radio etc. have shown ameliorate changes in relocated sites.

6.2 Community Perception

Relocation is ensured to provide the necessary apparatus for the community giving them sustainable income options for advancement. Success of any relocation can be observed with

enhanced livelihood of relocated communities. Objective of the relocation package is to decrease dependency of communities on natural resources, sustainable income options, assuring education and health facilities, infrastructural upgrade. However, the process of relocation can weaken the social bond and collective efficacy of a community group, their relationship with nature, conflicts among social group, influence in collective and individual identity.

In Sariska communities are willing to move outside if they get all the proposed facilities. However, the results show conflicting issues between forest authorities and community members for water level in relocated site. Regular concerns have been raised by relocated villages regarding decreasing water level in the agricultural land. This certainly has created fear amongst community members for relocation, haunting them about similar consequences in future. Exclusion of household members reaching adulthood after 2011 have become conflicting issue between locals and forest department in Sariska. Disagreement to relocation package in number of households in the villages is associated with this overarching issue.

Villagers are demanding a fair relocation process; in the relocation package itself planned meetings and inclusion of NGOs in the relocation process is proposed. In STR, Study (Sahabuddin *et al.*, 2007) shows that forest department did not plan meetings or done prior to the submission of the relocation plan for approval to the central government or after in the first phase from four villages where relocation was planned. Forest guards were the main source of information about relocation for villagers and some villagers were knowing about the proposed relocation from the word of mouth from other people. Half of the village population was unaware of the relocation package given to them (Sahabuddin *et al.*, 2007).

Involvement of NGO in development of relocation plan was also not followed and name of Tarun Bharat Singh (TBS) was given to get people to agree for the relocation. However, TBS denied any involvement in studies and they were traditionally against the relocation. Main

focus of TBS was to rather focus on the development works to harmonies local livelihood with the ecosystem (Bhatia, 2000). No rural development schemes were implemented for relocated out sees to assure a smoother transition in livelihood for people. Study done earlier shows that both local division officer and district magistrate had any idea about the problems to allocation of previous relocations and land rights from STR.

Talking about a collective issue, around 13 families in Bradod Rundh (relocated village) are facing issue related with their land allocation. Land allocated to 112 families in 2010-11 in Bardod Rundh later became an issue for thirteen families as the land was already registered with Indian Oil company in 1962. When Indian Oil Corporation started digging the land to lay the pipeline, the issue became known to the families. Later when these families collectively went to forest department regarding the issue, they were given assurance for the land compensation. However, till now villagers who lost their land between 0.5 to 1.5 Bigha has not received any solution from forest department and the revenue department. These villagers are now threatening to shift back to STR if the issue is not resolved soon. Respondents said only affected family is involved in fighting the issue and they are not receiving any help from other household families and the Gram Panchayat of Kankar Daupa. This shows that lack of any authoritative community groups in the village is making people vulnerable to such issues. Their voice is hardly recognized individually by government authorities and people are struggling to find a solution for the same.

6.3 Community Resilience

Increasing natural resource dependency of people on forest was one of primary rationale for relocation of households outside. In my study it shows that people after relocating outside have shifted from their main livelihood income source of selling milk products to agriculture. This

shift of occupation in relocated sites is associated with the decreasing number of livestock in relocated sites.

People after moving outside are unable to afford the expenses for livestock due to unavailability of fodder in nearby areas. They cannot take their animals for grazing nearby and buying fodder is expensive for a greater number of livestock. Another basis for their shift is associated to their landholding outside, before relocation people did not landholdings inside the reserve. Shifting to agriculture was one of the primary motivations of relocation package to make the communities self-sustainable. Furthermore, this has also reduced the dependency of communities on natural resources as now they have a smaller number of livestock and selling milk is not the primary source of income as the results shows in the study.

In relocated sites it is visible that the number of livelihood strategies are comparatively more than villages inside STR. The rationale for this is the less livelihood expenses and stable income source by selling milk products inside the reserve, where people are unwilling to shift from this permanent source of income. However, in relocated site rise in livelihood expenses and unstable income in agriculture have forced them to shift to more than one livelihood options.

Education is a crucial factor in strengthening social and economic resilience of communities. In relocated sites, improvement in accessibility to education and improvement in their education numbers. Lack of education infrastructure at villages inside core zone is due to unavailability of roads and schools inside the core zone. Forest department is against the idea of opening schools inside the reserve. People have told in village inside STR that going to school for children is difficult to areas far from their village due to lack of roads and networks. Going to schools by walking is also not possible due to surrounding wild areas, having danger of tiger and leopards in nearby areas. Material assets and infrastructure facilities are nearby in relocated sites as compared to villages inside STR. Similarly, roads and networks re are the primary reason for better availability of these facilities.

Lack of political representation was due to the lower economic status of the community, all the households surveyed in three sites were belonging to Below Poverty Line (BPL) class. To have a position at any political level needs economic resources which was lacking at all three sites. Health facilities when analysed in all three sites shows household do not follow any traditional healing method for health. The preferred health care is modern allopathy system. However, relocated sites showed better accessibility than villages inside STR due to better connectivity outside. Furthermore, households at all three sites did not get any health scheme benefits of government. This primarily has happened due to lack of awareness about the government schemes among people.

Traditional knowledge of all surveyed villages was analysed and results shows that people do not sell handicraft products apart from a few households inside the park. Three households were found practicing Tokari (basket) making from grass but the earnings from the work is very less. It is only practiced by women in their free time. Sacred sites are Bhartari and Pandupole temple common for all three sites. People follow the traditional festivals of Rajasthan state including Gangaur and Teej. I did not get data for folklores as people were not aware about any specific folklores to their community. There was no traditional method followed by people for conservation.

Male members of the household are invested in the agriculture in relocated sites and women does all the household work. Men in their free time spends smoking hukka and having talk with their neighbours. Families do watch TV and once and sometimes twice a year goes to the Pandupole and Bhartari temple. People inside were involved in the same activities during free time. However, the pressure of livestock rearing is lesser than agriculture according to the respondents. One of the interviewees said "*Here we are free most of the time even when we take out our livestock for grazing*".

At family level, the head of the family in almost every case male member of the family takes all the decisions. Women's condition is marginal and they hardly take part in decision making. There is no record of any women groups in the society, and respondents said there was hardly any need for one. Women mostly do not participate in the collective decisions of the house and they are taken by male members. Even before relocation there was no existence of community groups and people lived on their own. According to a respondent, "*Forest department nominated one person as the leader of the relocation houses from each village but his role was limited to relocation and after displacement, we never had a meeting*".

Villages when moved outside did not face any identity issue with social and economic character. However, they feel moving out was very difficult for them to completely change their lifestyle. Old age population still wants to go back to their pre-relocation site, they believe they have spent all their life inside and now it is difficult to live outside. The relationship with nature was not present in all three sites and people were dependent on nature only for the benefits extraction. There were a few cases of hunting were also observed in last two years. However, people inside are mostly vegetarian and do not hunt, but still a few cases of hunting has happened in past. People in relocated sites believe their kids childhood will be better because of better facilities and education.

Chapter 7 Conclusion

The top-down, incumbent approach for management of protected areas has generates socio-cultural disruption. It may lead to failure in sustainable management and conservation of biodiversity. For the relocation process, a non-magisterial and inclusive orientation of government and forest department is necessary to safeguard the cultural heritage and local livelihood from bifurcation. However, the finding shows that, the influence of local inhabitants on relocation process is very limited. Forest department and local authorities need to retrospect their notion of conservation and rethink their plan for resettlement.

A shift from traditional conservation paradigm towards more collaborative-community oriented criterion can possibly satisfy the needs of communities and conservation. Relocation plan needs to be more sensitive; conservation objectives, community participation, handsome incentives, consideration of cultural ethos should be the priority of forest department. Relocation plan needs further broadening and region oriented; a common plan for the entire Sariska Tiger Reserve fails to accommodate the village level issues before and after relocation.

Forest authorities need to move from 'fencing' for conservation to 'favouring' conservation. This will also contribute in improving and enhancing the resilience of communities. Developing a joint management plan with community consultation, viable agreements, capacity building programs, sustainable welfare arrangements, and formalization of fundamental responsibilities for local community and forest department will make the communities more resilient to relocation. It will ensure mobilization of skills, local perspective, devotion and respect for the management of natural resources. However, comparatively the results of study have shown that relocation facilitated improved educational accessibility, decreased natural resource dependency, increased livelihood options, development of basic infrastructural facilities and enhanced material assets.

The study advocates changing the perceptions attached with people within parks – essentially not as predators or catalyst of degradation but as delegates with ample potential for both negatively and positively impacting the landscape, depending upon the way they are understood and approached.

The promotion of a participatory approach between forest authorities and local communities requires a wider process of reorienting institutional policies, procedures and development practices. The study summarizes the elements required for strengthening the resilience of relocated communities at Sariska Tiger Reserve. The core components of natural resource dependency, adaptive livelihood options, education, material assets and infrastructural facilities, health and education are extensively studied and compared at villages inside and relocated villages outside the Sariska Tiger Reserve.

My study opens up more questions for research in relocation and its significance to the stakeholder community. Relocation is emerging as a very significant issue in conservation and requires close attention from social studies. Forest authorities needs more sensitivity to the cultural and socio-economic requirements of people. Similarly, social scientists need to understand the ecological need of protected areas. Coordinated engagement of managers, biologist and social scientists is necessary to answer the relocation question of why, how and where. A participatory approach between communities and forest department needs broader understanding of institutional procedures, policies and development practices.

Though a plethora of work was done earlier, this study adds a critical insight to the factors crucial for building community resilience during the relocation process. There are few research gaps as the previous literature disproportionately depends upon theoretical and conceptual analyses for relocation and resilience of communities. This study follows an empirical and field based approach which fills the vacuum. Previous studies (Karanth, 2007; Sahabuddin *et al.*,

2007) have assessed relocation and resilience as separate entities working in isolation, whereas, the present study involves in-depth comparative studies and not only retrospective in approach. This research adds critical component of resilience to relocation and forestry studies. Further analysis is needed to test and identify activities necessary for strengthening community resilience during process of resettlement and relocation from their native surrounding.

Field Pictures

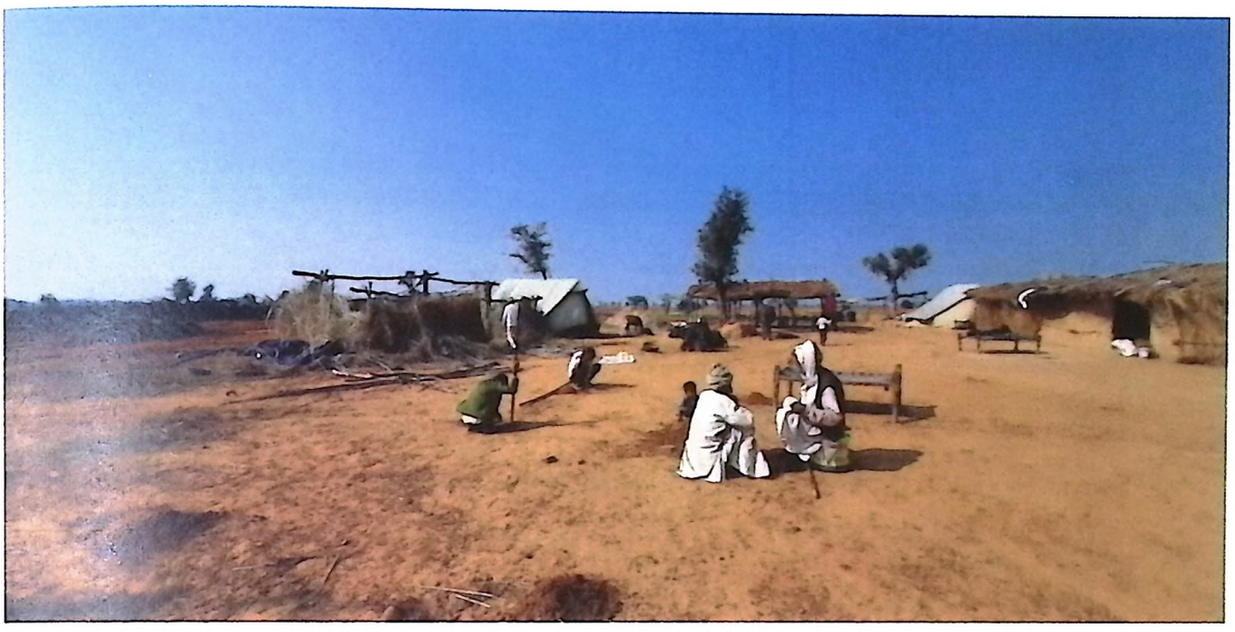


Figure 0.1 A scene from the ongoing relocation site of Tijara Rundh.

Figure 0.2 A house at relocated site of Bardod Rundh.

Figure 0.3 Relocated house at Kanpura Lojh.

Figure 0.4 Questionnaire survey at relocated site of Bardod Rundh.

Figure 0.5 Fields of households at relocated site of Bardod Rundh.

Figure 0.6 Picture of households inside Sariska Tiger Reserve

Questionnaire Survey

Date:

Village: ..... Gram Panchayat: ..... Ward No. .....

Block: ..... District: .....

State: ..... LS Constituency: .....

Categories	Population Distribution
SC	
ST	
OBC	
General	
Total	

Categories	Population Distribution
Religion	
Hindu	
Muslim	

I. Demographic Details

1. *Personal Information*

a.

S.No.	Name	Sex 1=male 2=female	Age[1] (year) *Write '0'*	Religion[2]	Caste[3]	Relationship to household head[4]	Education[5]	Marital Status[6]	Main Occupation[7]	Monthly salary/ Daily wages

[1] 1= 18 years and below, 2= 18-35 years, 3= 36-50 years, 4= 51-70 years, 5=70 years and above

[2] 1= Hindu, 2= Muslim, 3= Other (Please specify)

[3] 1 = Gujjar, 2= Meena, 3= Mew, 4= Bawaria, 5= Other (Please specify)

[4] 1=Head, 2=Spouse, 3=Son/daughter-in-law, 4=Stepchild, 5=Parent, 6=Sibling, 7=Grandchild, 8=Niece/Nephew, 9=Son/daughter-in-law, 10=Brother/Sister-in-law, 11=Parent-in-law, 12=Other

[5] 1 – Illiterate 2 - Literate without formal schooling 3 - Less than primary 4 – Primary 5 – Middle 6 – Matriculate 7 – Intermediate 8 - B.A./ B.Sc. and more 9 - Professional degree 10 – Diploma

[6] 1 – Married 2 – Unmarried 3 – Widowed 4 - Separated

[7] 1.Own-farm agriculture 2. Off-farm hired agriculture labour 3. Self-owned small business 4. Salaried in private enterprise 5. Salaried in govt enterprise 6. Student 7. Old/ Handicapped 8. Unemployed 9. Collection of forest products 10. Livestock maintenance 11. Family work

			if less than one year							

b. Details of persons who send remittances (for those not living in the house)

Where does this person work?		Number of years since left home	How much money did (s)he send last year
Season 1	Season 2		

2. *Income Information*

What is your income level?

(i) Below Poverty Line

(ii) Above Poverty Line

Which of the following occupations are you and your household involved in for livelihood?

a. Agriculture: (i) Yes (ii) No

If yes,

What are the most common crops grown in the village?

Season 1	
Season 2	

(1- Most of it is good, 2- Half of it is good/poor, 3- Most of it is poor)

Among these, how many were cropped last year?

(i) How has your income from forest increased after relocation?

If yes

What factors contribute most to the increase?

a. Traders come to village often

b. Greater availability of products

c. Value-addition through local cooperatives
d. Govt/ NGO assistance in marketing
e. Forest employment through FD

(ii) What is the reason for this change?

(iii) And how have you dealt with this income shift?

(iv) Your expenditure outside vs inside, how it has changed?

(v) Have you compensated the loss of relocation in your income now?

(vi) Has there been any change in your cultivation pattern of crops after relocation?

If Yes,

What has been the change?

b. Poultry farming: (i) Yes (ii) No
What year did you start poultry farming? .....
If yes, which types, for what purposes, and average sale:

Types	Purposes	Average Annual Sale
	(i) For household consumption only (ii) For selling to market only (iii) For both household consumption and market selling	*Sale in* ₹.....

c. Livestock rearing: (i) Yes (ii) No

Types	Purposes	Average Annual Sale

1. Dependency on Natural Resources

a. NTFP collection: (i) Yes (ii) No
b. Where do you source fodder for livestock from? .....
What type of NTFP does your family collect? .....

Name of Item	Use of Item 1 - fodder 2 - food 3 - construction 4 - for sale 5 - medicinal 6 - ritual	Who mainly collects the item? 1 - head of household 2 - other adult males 3 - spouse of household head 4 - Other adult female 5 - sons 6 - daughters 7 - hired labour	How many days is the item collected in a month in which season?		How much is collected in a day each season? 1- Kg 2- Bundles 3- Other		What other products are collected on such a day?	Time taken (in minutes) to collect these products
			Days	Season	Amount	Code		

Purpose of NTFP collection and average sale:

Purposes		Average Annual Sale
(i)	For household consumption only	Sale in ₹ .....
(ii)	For selling to market only	
(iii)	For both household consumption and market selling	

c. Fuelwood for Cooking/Heating: (i) Yes (ii) No

If YES,

Species Collected	Collection Period[8]	Collected from[9]:	Time and Distance

[8] 1= Monsoon, 2= Summer, 3= Winter

[9] 1= Reserve Forest, 2= Panchayat, 3= Private Land, 4= Civil Land, 5= Other areas

If NO, what other sources do you use for cooking/heating?

(i) LPG (Gas)
(ii) Solar cooker
(iii) Induction
(iv) Others (please specify) .....

d. Wildlife Hunting: (i) Yes (ii) No

What type of wildlife does your family collect? .....

Purpose of wildlife hunting and average sale:

Purposes	Average Annual Sale
(i) For household consumption only (ii) For selling to market only (iii) For both household consumption and market selling	Sale in ₹ .....

e. Food

Do you consume meat? (i) Yes (ii) No

If YES,

How frequently do you consume meat?	What meat do you consume?	Where do you source the meat from?	Are there particular seasons of meat consumption?

Do you procure fruits, vegetables, and spices from places other than the market?	What do you procure?	How often do you procure them from places other than the market?	Are there particular seasons of procurement? (i) Yes (ii) No	If YES, are there any particular items procured in particular seasons?

f. Drinking Water

a. What is your main source of drinking water: [1] Public well [2] Tube well [3] Handpump [4] Tap [5] Private well [6] Surface water [7] Rainwater harvesting [8] Buying water [9] Corporation water
b. If buying, how much did you pay for drinking water last year? (In Rupees)
c. How far is the water source? (in minutes)
d. How many households share this source?
e. Do you treat the water before drinking?
   If yes,
   f. Do you face water scarcity: [1] Yes [2] No
g. Who in the household collects water: [1] Male [2] Female
h. How frequently is water collected
   ..... times/day
   ..... times/week

g. Medicines

Do you use herbs or animal parts for medicinal purposes? (i) Yes (ii) No

If YES,

What plant parts do you use?			What animal parts do you use?	
Species Name	Part Name	Procured from:	Species Name	Part Name

h. Timber products

Home Production item	Did you produce any of the product this year	How much did you produce?	How much did you sell?	How did you obtain the Timber to make this product?

	(past 12 months)?	Number	Unit	Number	Unit	Price Per Unit	1 - purchased 2 - collected from community forest 3 - collected from private lot

12. What did you invest this additional income in?
(a - agriculture b - education c - health d - home improvement e – business)
13. What factors contribute most to the decrease?
a. No market for forest products
b. Lesser availability of products
c. Local cooperatives are dysfunctional
d. No Govt/ NGO assistance in marketing
e. Fall in jobs provided by the FD

2. Adaptive Livelihood Options:

a. What are your alternative livelihood options?
(Please tick multiple options, if exists, on a scale of 1 to 5; 1 = most preferred and 5 = least preferred)

Occupation List	Occupation Before Relocation	Current Occupation	Adaptive livelihood Options (Before 1978/2008/2013)	Adaptive Livelihood Options (After)
Jobless				
Peasant (own land)				
Sharecropper peasant				
Peasant (own land & sharecropper)				
Homemaker				
Livestock rearing				
Day labour (in agriculture sector)				

Day labour (other sectors)				
Fisherman				
Housekeeper				
Skilled labour (blacksmith, fuller, shoemaker, weaver, carpenter, mason, Tailor)				
Businessperson (small size)				
Businessperson (medium and large size)				
Selling Milk Products				
Rickshaw puller/van puller/boatman				
Bus/motorbike/auto/three-wheeler driver/helper				
School teacher				
Student				
Cattle Grazing				
Forest dependent				
Service (Government)				
Service (Private)				
Others (please specify)				

b. Would your current livelihood option be affected after relocation (Q for Villages inside)?
   (i) Yes
   (ii) No

c. Which livelihood option would be more affected (Q for villages inside)? (Please select from the list above)
d. Do you think livelihood options have increased after relocation? [1] Yes [2] No [3] Don't know

3. Community Groups and Committees for Decision Making

Family Level

a. Do you take part in decisions in your household? [1] Yes [2] No
   If NO, who takes decisions at your household? .....
b. Does your opinion matter during decision-making? [1] Yes [2] No
c. What collective decisions are taken in the household?
   .....

d. Describe about your Informal power structure?

e. What is the composition of local committees in terms of communities' representation and decision making?

Community Level

f. Do you take part in decisions in your community?
[1] Yes [2] No

g. Do you have a conflict resolution committee in your village?
[1] Yes [2] No [3] Do not know
If yes,
How was it established? (1- local initiative 2- Forest dept insistence 3- initiative from NGO 4- other)
Is every household a member of the committee: [1] Yes [2] No

h. Who are excluded from the committee & why are they excluded?

i. Are women part of these committees? How important their opinions: [1] Yes [2] No

j. Do you have elections to decide on the committee: [1] Yes [2] No

k. How many Committee meetings did you have last year?

l. Has the group dealt with any conflicts over the last 2 years?
[1] Yes [2] No [3] Do not know

m. What are the ways through which members of the village voice their opinions or provide feedback about village decisions?
[1] Village meetings/panchayat
[2] Meeting with village leader(s)
[3] Indirectly to village leaders through others (e.g., elders, religious leaders, etc.)
[4] No ability to provide opinion/feedback
[5] Others (please specify)
[6] Do not know

n. What are the rules that your committee have devised and are currently implementing?
(1- prevent non-members from forest extraction 2- rules governing extraction of certain products 3- rules for sale of certain products 4- monitoring and policing)

o. Are there separate decision-making groups or committees for different genders at the community level?
[1] Yes [2] No [3] Do not know
If YES, please name them and the decisions taken by them:

p. What activities are these organisations for?
(1- credit 2- irrigation 3- festival 4- agriculture 5- others)
.....

4. **Education/Awareness**

a. Do you receive general information from a formal source (from the government) (e.g., price of crops, government schemes, announcements, news)? [1] Yes [2] No
    a. Do you receive general information from an informal source (e.g., relatives, neighbours)? [1] Yes [2] No
b. How would you rate the importance of education in your life?
    [1] Extremely important
    [2] Somewhat important
    [3] Important
    [4] Not at all important
c. Do you practice any traditional livelihood options?

d. Have you undergone any skill development training?

e. Do you feel traditional livelihoods are better?
    [1] Yes [2] No [3] Do not know
    a. How do you dispose household waste: [1] In plastic [2] Paper bags [3] Recycled containers [4] Dump them [5] Burn them
    b. Where do you dispose household waste: [1] Outside the house [2] Designated place in the village close to house [3] Designated place in village far from house

Formal Education

Service	**How far is the facility from the village**	**When was is established**	**Please rank how useful is the facility to you** 1. **Very useful** 2. **Moderately useful** 3. **No use**
Anganwadi			
Primary school			
Middle school			
Secondary School			
Sr. Secondary School			
College			
Training Institutes			

(To be collected from Gram Panchayat/School)

Gram Panchayat/School	Male	Female	Total
Drop-out Rates			
Enrollment Rates			
Reason for dropout (if the rate is higher)			

5. Material Assets and Accessibility to Infrastructure

Does the household have:

c. Electricity: [1] Yes [2] No
d. Tap water: [1] Yes [2] No
e. Access to latrine or toilets: [1] Yes [2] No
f. Who collects the garbage: [1] Local authority [2] Arrangement among neighbors [3] No one [4] Others
g. What is the frequency of garbage collection and disposal: [1] Daily once a week [2] Less frequent than once a week

Immovable Assets

h. Ownership of land where house is built: [1] Yes [2] No
i. Ownership of land in other areas: [1] Yes [2] No
If YES,

No. of Bighas	Cultivated/ Uncultivated	Irrigated/ Unirrigated	On lease	Share cropping	Fallow

Movable assets

Yes (Y)/No (N)		Expected current selling price
Television		
Radio		
Gas (LPG)		
Electrical Generators		
Mobile Phone		
Sewing Machine		
Solar battery		
Pump set		
Watch		
Vehicle		

Others		

Assets that you own collectively with family or friends

Item	Your share
Land	
Tractor	
Pump set	
Thresher	
Livestock	

Liabilities

j. Do you or does your family borrow money from others? (i) Yes (ii) No
If YES, who/what is the lender?
(i) Bank
(ii) Local money lender
(iii) Cooperative society
(iv) Friends and relative
(v) SHGs
(vi) Others (please specify) .....

k. What are the purposes of borrowing money?
(i) Buy food
(ii) Medical treatment
(iii) Agricultural production
(iv) Household consumption needs (except food)
(v) Marriage/Funeral services
(vi) Purchase of modern facilities (i.e., bike, TV, etc.)
(vii) Others (please specify) .....

l. Do you have any debt to repay?
(i) Yes
(ii) No

If YES, how much.....to whom.....interest

Is it difficult to repay the debt? (i) Yes (ii) No

Infrastructure Facilities and Services

m. Does the household have access to the following?

Infrastructure Facilities/Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
Agriculture Credit Cooperative Society		
Nearest Agro Service Centre		
MSP based Government Procurement Centre		
Milk Cooperative /Collection Centre		
Veterinary Care Centre		
Ayurveda Centre		
Internet Services		
E – Seva Kendra		
Bus Stop		
Railway Station		
Library		
Hospitals/Medical clinics		
Electric service		
Telephone services		
Food Markets		
Pharmacies		
Hotels/Guest house		
Restaurant		
Common Service Centre		
Water Facility		

6. **Power Structure/Political and Social Structure of the society**

a. Do you have any family member involved in politics?
Yes/No

If YES, what level does he/she represent?

(i) Gram Panchayat
(ii) Tehsil
(iii) District
(iv) State/Centre

b. Does the representation help the family or the community in any manner?
Yes/No

If Yes, how does it help?

c. Are the festivals in the community celebrated together?
Yes/No

If No, why?

d. Do you get invitation in the ceremonies of other communities?
Yes/No

If yes/no, why?

e. Do you have a separate cremation/burial ground: [1] Yes [2] No
If yes/no, why?

7. Social Trust and Collective Efficacy of Community

Do you agree or disagree with the following statements?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
People around here are willing to help their neighbours/community					
People in the neighbour/community can be trusted					
People in this community help each other.					
People in this community work together to improve the community.					
I get information/communication through this community to					

help with my home and work life.					
People come together celebrate the festivals					
People in neighbourhood/community get long with each other					
In this village/neighbourhood, people generally do not trust each other in matters of lending and borrowing money.					

a. Generally speaking, would you say that most people can be trusted, or that you can't be too careful in your dealings with other people: [1] Most people can be trusted [2] You can't be too careful
b. About how many *close* friends do you have these days? These are people you feel at ease with, can talk to about private matters, or call on for help.

c. If you suddenly needed a small amount of money, how many people beyond your immediate household could you turn to who would be willing to provide this money: [1] No one [2] One or two people [3] Three or four people [4] Five or more people
d. [IF NOT ZERO] Of those people, how many do you think are currently able to provide this money?
.....
e. If you suddenly had to go away for a day or two, could you count on your neighbours to take care of your children: [1] Definitely [2] [3] Probably [4] Probably not [5] Definitely not
f. If you suddenly faced a long-term emergency such as the death of a breadwinner or, how many people beyond your immediate

g. household could you turn to who would be willing to assist you: [1] No one [2] One or two people [3] Three or four people [4] Five or more people
h. [IF NOT ZERO] Of those people, how many do you think are currently able to assist you?

i. If a community project does not directly benefit you, but has benefits for many others in the village/neighbourhood, would you contribute time or money to the project:
[A] Time [B] Money
[1] Will not contribute time [2] Will not contribute money
[3] Will contribute time [4] Will contribute money
.....

j. Do you think that after the relocation, level of trust in this village/neighbourhood has gotten better, worse, or stayed about the same: [1] Gotten better [2] Gotten worse [3] Stayed about the same?

8. Health Care System in the Village

a. Are you aware of any traditional healing medicinal practices?
Yes/No

b. Do you practice any traditional healing methods?
(i) Yes
(ii) No

If YES, please describe them in detail:

If No, what is the reason?

c. What is your preferred healthcare system and why?

d. Where do you go to seek medical help?

e. How far is this medical help from your location?

f. Are you aware about Govt. Health schemes?
Yes/No
If Yes, what is the scheme and what benefit are you getting from it?

g. How the accessibility to health facilities have changed after you moved out?

9. Traditional knowledge Structure

a. Do you make any handicraft products?
Yes/No

If yes, what are they?

b. Do you sell these handicraft products?
Yes/No

If yes, where do you sell these products?

c. What are the traditional festivals you celebrate?

d. How integral is the locality for these traditional rituals?

e. Is there any sacred site in the village?

f. Are you aware of oral history, folklores, grandma tales, etc. regarding...? Traditional knowledge?
g. What will you lose after you move out or after you have moved out?

h. Do you have any traditional practices for conserving natural resources?
Yes/No

If yes, what are they?

10. Activity Pattern and Leisure time

a. How much you are invested in your daily activities?

b. Don't you feel taking leave from your work for some days?

c. What is leisure time according to you?

d. What activities you do when you are stressed?

e. How much time do you spend on extra activities for e.g., family time, watching TV., etc.?

f. Leisure time of the day: Morning [1] Evening [2] After noon [3] Night [4]
g. What do you do when you are free?

11. Identity and Perception

a. How would you describe your identity?
b. What do you feel about your identity here?
[1] Individual
[2] Family
[3] Community

c. What are your aspirations:
   [1] Individual
   [2] Family level
   [3] Community level
d. What are your priorities:
   [1] Individual
   [2] Family level
   [3] Community level
e. How important is your relationships with people?
   [1] Family
   [2] Community
f. How is your relationship within the neighbourhood and community?

g. Will you feel the same if you will be moved from here?

h. Does your identity play any part in adopting an occupation?

i. How your identity is related with your lifestyle in the village?

j. How much you are attached with the place you are living in?

k. Is there any change you have faced in your traditional practices?

l. Similarly, did you face any change in religious or social beliefs?

m. Do you feel moving out from here will have effects on your culture?

n. Do you feel you can take pride in it even after moving away from the PA?

o. How comfortably you settled in the new place?

p. Have you faced any problems because of the new place?

12. Relation with Nature

a. How does forest help the [ ] members of this village?

(1- Provides firewood and wood for furniture and equipment 2- Protects the local watersheds, rivers and streams 3- Reduces soil erosion 4- Protects bio-diversity and wildlife habitat 5- Provides NTFP 6- Reduces pollution / provides clean air / improves air circulation 7- other)

b. Have there been any changes in the following conditions of the forest and your relation with it in the last 10 years?
(1 - increased 2- decreased 3 - same)

The distance of forest from the village	
The size of trees in the forest	
The number of species found in the forest	
Amount of timber collected for sale	
Amount of timber collected for household use	
Amount of NTFP collected for sale	
Amount of NTFP collected for consumption	

c. How would you describe your childhood?

d. Do you think your childhood and your child's childhood are same?
Yes/No

If yes, what is the change?

Whose childhood do you think is better and happier?

e. How integral was the natural environment to your childhood?

f. What will you miss the most if you are shifted outside?

g. Any belief associated with any particular area in surrounding?

h. How you make use of mountains, forests, and rivers nearby in daily life?

i. What activities involve your relation with nature for e.g., religious, daily routine, occupational, festivals, folklores, sacred groves, natural spirits?

j. What would be an ideal replacement place for your relocation and why?

k. Anything or any story or song that your elders always repeat related to natural resources?

l. Has the natural environment played an important part in your life?
Yes/No

If yes, what kind of a role was it?

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