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# Agriculture in Tribal Areas (Scheduled Areas) of Madhya Pradesh: A Socio-Economic Analysis

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# Agriculture in Tribal Areas (Scheduled Areas) of Madhya Pradesh: A Socio-Economic Analysis

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## Abstract

The growth oriented changes in Indian agriculture were very obvious in north western regions of India. The farming systems of eastern, central and western regions particularly the tribal areas were subsistence-oriented and remained more or less independent of these major changes in Indian agriculture. In Madhya Pradesh(M.P) state, agricultural sector contributes around 46% to the state's economy. M.P has a population of 72.6 millions (2011 Census) and schedule tribe population of 15.3 millions(highest in the country). Schedule tribes constitute 21.1% of the total population of M.P (India-8.6%). The present paper looks into the socio-economic conditions of tribal farmers in the scheduled areas of M.P and also tries to understand the process of changes occurring in the socio-economic life of tribal households in these regions. The study is largely drawn both from the primary and secondary data sources. A total of 20 villages were selected in the Jhabua, Mandla and Sidhi districts of M.P. A total sample of 400 households were selected for the study with twenty households in each village. Focused group discussions (FGDs) were also done with the tribal communities in Jhabua, Mandla and Sidhi districts of M.P. Findings of the study revealed that predominant livelihoods of the study villages of all three districts include farming, livestock rearing, wage work, migration and NTFP collection. Sampled households of study districts belonged to tribes/sub-tribes such as Bhils, Baiga, Gonds, Pradhan, Chowrasi, Ahir and Banjara. Across all size classes in both plain and interior villages, farming was the main occupation followed by non-agriculture labour such as MGNREGA labour, road works and construction works. Traditional millet crop diversity with the presence of kodo, kutki, maize, jowar and bajra could be seen in all the study villages of three districts. The population of cows and bullocks has come down in all the sampled villages. FGDs revealed that even now bullocks play a crucial role in agricultural operations and there are negligible number of tractors in the study villages. It is a disheartening sign that public sector banks are not able to cater to the credit needs of the farmers. Empirical data revealed that the per acre cost of cultivation of sampled households was slightly higher in the plain area villages as compared with interior villages of the study districts. During the recent times, due to less rains the crops don't reach maturity stage and hence people are sowing lesser area and are preferring to go for migration, seeking it as an important livelihood option. Due share must be given in socio-economic progress for tribal people and their habitations, including facilities like health, education, livelihood, drinking water, sanitation, roads, electricity and sustainable income.

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Author

## 1. Introduction

India's agriculture sector has undergone various changes since the introduction of five year plans. With the planners focusing on the development of irrigation projects, introduction of land reforms, promotion of scientific technologies, institutions and development of rural infrastructure an overall growth of the agricultural sector. The country also, apart from encouraging the adoption of high yielding varieties of seeds, adopted various measures as part of achieving the twin objective of raising food production and improving food availability to consumers. These included, among others, agricultural research and extension, minimum support price system, maintaining buffer stock, public distribution system, liberal agricultural credit etc. The resultant growth in agriculture during the green revolution period came to be considered a great success story of agriculture-led growth (Bhalla *et al*, 1992), although it generated various second generation problems later such as productivity decline, high level exploitation of water resources and degradation of land resources. In the recent times, government of India initiated several steps towards addressing the issue of sustainability of agriculture such as improving soil fertility through soil health card scheme; providing an improved access to irrigation and enhancing water use efficiency through Pradhanmantri Gram Sinchai Yojana and supporting organic farming through Paramparagat Krishi Vikas Yojana (GOI, 2016). The growth oriented changes in Indian agriculture were more visible in north western regions of India. While the farming systems of eastern, central and western regions, particularly the tribal areas remained subsistence-oriented besides being deprived of these major changes in Indian agriculture. Further the investment gone into these regions was relatively small in size during the green revolution period. Presently, we are in a situation where nobody seems accountable to the tribal development programmes (Nayak,2015). The recent measures aimed at improving rainfed farming with an increased focus on dryland farming also remain constrained by lack of water resources and other agricultural inputs. It seems there is a regional imbalance with respect to tribal areas when it comes to investments on agriculture.

India's population stands at 121.06 crores out of which the tribal population of the country (Census 2011) constitutes 8.6 percent(i.e, 10.43 crores). Out of this, 89.97% of them live in rural areas and 10.03% in urban areas (GOI, 2013). Despite special provisions, tribal communities continue to remain among the poorest and most marginalised sections of the society. During the year 2004-05, 37.7 percent of India's population lived below the poverty line, whereas, during the same period, 60.0 percent of the tribal people were living below the poverty line, almost 22 percent more than the

rest of the country. The scenario was similar in education and health spheres. Census (2011) indicates that the literacy rate among tribals is 59 percent as against the national average of 74 percent. As per the national health survey 2005-06, the infant mortality rate is 62.1 per 1000 live births among tribes, and under five the mortality is as high as 95.7 per 1000 live births. However, the situation with respect to sex ratio is found encouraging- 990 females for 1000 males as against the national sex ratio of 943.

Tribal communities live, in various ecological and geo-climatic conditions ranging from plains and forest to hills to inaccessible areas with significant concentrations of tribes being found in the Himalayan stretches, Western Ghats, Andaman and Nicobar islands. Central Indian states are home to the country's largest tribes and taken as a whole, 72.80 percent (GOI, 2013) of the total tribal population lives in this region, although it accounts for around 10 percent of the region's total population. In addition, major concentrations of tribal population are found in Gujarat, Maharashtra, Odisha and West Bengal. Further, tribal groups are at different stages of social, economic and educational development. The tribal communities of the east, central and western regions of India are mainly dependent on forest resources and agriculture. Also, for their survival, they practise hunting, gathering, agriculture and labour works for their livelihoods. There are certain scheduled tribes (known as PVTGs) which remain characterized by a pre-agriculture level of technology, stagnant or declining population, extremely low literacy and subsistence level of economy (GOI, 2013).

Agricultural practices followed by tribal communities are rooted in shifting cultivation. They practise traditional methods which are integrated with animal husbandry. A recent study notes that primitive tribal communities like the Chuktia Bhunjias living in Maharashtra, Chhattisgarh and Odisha continue to practise shifting cultivation (Sabar, 2010). A rough estimate shows that 4.47 million hectares of land is still under shifting cultivation, a method involving clearing of a field by slash-and-burn, for cultivation for a number of seasons before leaving it fallow for a long period. This practice of shifting cultivation has brought about various changes in the local ecology in terms of soil erosion, loss of flora and fauna depending upon the cycle of cultivation. The practice of shifting cultivation is found unsustainable in the context of Odisha as it exerts a substantial pressure on the fragile ecosystems (Sahu and Sarangi, 2005). It is also observed that shifting cultivation has become unsustainable primarily due to an increase in the population and the resultant increased demand for food grains (Tripathi and Barik, 2010). However, the practice is found to be slowly changing towards settled agriculture in many tribal parts of India.

Secondly, certain tribal communities are practicing settled agriculture, mostly in plains. The Bhil tribes of Gujarat and Madhya Pradesh are found to be more willing to adopt scientific method of cultivation (Hiremath and Patel 2004). It seems agriculture in tribal area is in a transition phase particularly in hilly areas and settled agriculture in plains due to various changes in markets, institutions technological extension, and environmental conservation policies. It is a transition from traditional subsistence based shifting cultivation to more scientific settled agriculture with differential impacts on well being and ecosystem sustainability. Against this back drop a study was conducted in the state of Madhya Pradesh with an objective of understanding the agricultural practices of tribal areas (scheduled areas) particularly in the context of a transition from traditional subsistence based (e.g., shifting cultivation) to modern settled agriculture. However the objective of the present paper is to look into the socio-economic conditions of tribal farmers in the scheduled areas of Madhya Pradesh and also understand the process of changes occurring in the socio-economic life of tribal households in these regions.

## **2. Socio-Economic and Demographic profile of Madhya Pradesh**

Madhya Pradesh State has a population of 72.6 millions (2011 Census) and schedule tribe population of 15.3 millions(highest in the country). Schedule tribes constitute 21.1% of the total population of M.P (India-8.6%). Madhya Pradesh ranks 20th in Human Development Index in India(2008-09) and has a literacy rate of 70.6(as against India's 74.02%). Similarly, ST literacy rate in Madhya pradesh state is 50.6 percent as against all India ST literacy rate of 58.96 percent. The total geographical area of the state is 307.56 lakh hectares. Recorded forest area is 95,221 Sq km constituting 31% of geographical area of the state and 12.44% forest area of the country. Madhya Pradesh state has 50 districts out of which 21 are tribal districts. Jhabua, Dhar and Mandla districts have more than 50% tribal Population. In Kharghone, Seoni and Chindwara, Sidhi and Shadol districts 30 to 50 percent population is of tribes. There are 46 tribes inhabiting Madhya Pradesh out of which six tribes Bhils, Gonds, Kol, Korku, Sahariya and Baiga constitute 92.2% of the state ST population. Twelve tribes have population below 1000 and three of them are special primitive tribes. Bhil is the most populous tribe (2011 census) with a population of 4,618,068 constituting 37.7% followed by 35.6% of Gonds. In last ten years tribal population has increased by 3.1 millions. Major livelihoods of tribals are farming, livestock rearing, casual labourers, collection of forest produce such as tendu leaves, fodder collection, fuel wood collection and migration(see box 1).

**Box 1 : Major Livelihoods of the study districts of Madhya Pradesh**

2015	1995
Farming ( <i>Kheti</i> ), MGNREGA, migration ( <i>Palayan</i> ), wage labour ( <i>Majdhoori</i> ), fuel wood selling, timber selling, tendu leaf collection ( <i>tendu patta</i> ), mohua fruit and flower collection, livestock rearing ( <i>maveshi palan</i> ), gold smiths, employees ( <i>naukiri</i> ), baja bajantri ( <i>doliyas</i> ), pig rearing.	Farming, <i>maveshi charana</i> . wage labour, tendu leave collection, fuel wood collection, Mohua fruit and flower collection, timber selling and pig rearing.

Source; Focused Group Discussions

### 3. Review of Literature

The Scheduled Tribes are the most disadvantaged in respect to land, which largely accounts for their perpetual poverty and makes them vulnerable to injustice and exploitation. There are a large number of process through which tribals have lost their access to land and forests essential for their survival and livelihoods in India. These not only include alienation of land which is legally owned by the tribals through debt mortgaging and sale, but also loss of access to land through reservation of forests, loss of traditional shifting cultivation land through survey and settlement, displacement, unsuitable and unimplemented land reform law etc. Over a period of time, all these processes have led to loss of control and access to livelihood support systems vital to existence, marginalising and destitution of tribal communities. Influx of non-tribals since the last two centuries, many of whom are more capable of negotiating state enforced legal and tenure systems, have pushed tribal communities to the bottom of the local power hierarchies, even in areas where they are in majorities. In area where tribals are in minorities, their conditions, along with that of Scheduled Caste (SC) or dalits, are even more miserable and powerless. Lack of ownership and claim over land and other factors of production is the basic constraint of agricultural production in tribal areas and one of the fundamental reasons behind their poverty.

A study conducted by Purushothaman (2005) in a tribal belt located around Anaikaty, near Coimbatore city and bordering Kerala and Tamilnadu in southern India reveals that Land alienation, Soil-degradation, wild animal attacks and declining access to forests have debilitated the livelihoods base of the tribal community. Similarly a study conducted by Sabar (2010) on the tribal agricultural practices of a primitive tribal group (Chuktya Bhunjia) in Odisha finds that these groups still practices the shifting cultivation and traditional- agriculture using bio-cultural resources and still remain poor despite these economical and soil-protecting practices. The small landholdings and exploitation by "outsiders" creates problems in the tribal area.

A study from Andhra Pradesh shows that the implementation of Land Transfer Regulation Acts (LTR) has neither been effective in arresting land transactions between tribes to non-tribes nor resulted in restoration of lands to tribal communities (Rao *et al*, 1998). There have been shifts and changes in land use pattern due to pressure on forest making way for emigrants as well as commercial cultivating castes posing threat to tribal land rights. The Land Committee Report has noted the grave situation with regard to dispossession of tribal lands 'non-tribal population holds as much as 48 percent of tribal lands, every year more and more lands are passing into the hands of non-tribals and if not checked tribals may not have lands at all' (Land Committee Report, 2006). Further tribal lands are alienated through 'benami transactions' in the form of lease, purchase, mortgage in general and through tribal women. This phenomenon is mostly prevalent among the Koya community in the districts of Khammam in Andhra Pradesh. This phenomenon indicates effective control and use of land resource is not vested with the tribal communities. The non-tribal communities enter into contracts with tribal people to gain access to tribal lands. These studies reveal the basic issues with respect to land ownership among tribal communities.

Although living in these forests for generations, given poor documentation of customary rights, most tribals find it difficult to convert their de facto access to forest land and resources to de jure ownership. Legislation to prevent sale of ST land to non-tribals too has been largely ineffective as witnessed in the large number of cases involving land grabbing by non STs through marriage or through fraud. Non-STs getting ST certificates and usurping ST lands and other advantage is now a serious political issue in Odisha and Jharkhand. Tribal indebtedness is another important reason for lands being handed over to moneylenders (UNDP, 2008).

Studies estimate that more than 50 per cent of tribal land in Odisha has been lost to non-tribals over a period of 25-30 years through indebtedness, mortgage and forcible possession. Worse, the process of tribal alienation, i.e. STs gradually losing their access to traditional commons has accelerated in recent years. While studies vary with regard to the impact of displacement in Odisha & Jharkhand, mostly on account of setting up of mineral-based industries, all agree that of those displaced a disproportionate number are tribals. These states also have a controversial track record of resettlement and rehabilitation<sup>1</sup>. Most activists and academics working on tribal issues think that it is alienation from these communal resources which forms the fulcrum of tribal angst and revolt.

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<sup>1</sup> See for instance, Mishra, I. 2007. "Heat and Dust of Highway at Kalinganagar." Economic and Political Weekly, March 10, pp 822-25. Also see, Actionaid 2007. Vedanta Cares? Busting the myths about Vedanta's operation in Lanjigarh, India.



Alienation together with reduced income from NTFPs, stagnant agriculture and limited opportunities for non-farm self-employment, push tribal households into a cycle of high interest debt from private moneylenders resulting in food insecurity and forced migration. The cycle is usually linked to the agricultural season, with most tribals migrating in the months of March-April after harvest to repay the loans taken during monsoons (Kabra, 2004). A majority end up working as manual labour employed in construction sites or as domestic workers.

Data from a primary survey of more than 800 tribal and nontribal farmers undertaken by a development programme of non-governmental organisations (Verma, Nair and Sharma 2004; Verma, Dasgupta and Singh 2004)<sup>2</sup> as well as data from 10 district studies undertaken in central India reveals that: (i) tribal farmers derive much less income from their lands than their non-tribal brothers even in the tribal-dominated blocks of tribal districts; (ii) their net returns from agriculture are also much lower; (iii) they make much smaller investments (in absolute rupee terms) in agricultural assets as compared to the non-tribals while the proportion of their capital investments devoted to agriculture is much higher indicating their desire and willingness to increase the productivity of their agriculture; (iv) they have much weaker access to agricultural technology and inputs from the state or private sector machinery; and (v) the dependence of tribal people on income from seasonal migration, often under duress, is twice as high as that for non-tribal people from the same districts.

The tribal economies are mostly subsistence economies whose survival is closely linked to land and natural resources. Estimates for Odisha & Jharkhand indicate that over 30 per cent of land in these states comprises of commons such as forests and one half to over one-fifth of annual income of tribal households comes from Non-Timber Forest Products (NTFPs). More so in Odisha & Jharkhand, tribal areas are coterminous with mineral deposits and have thus attracted considerable attention by the private sector in recent years, both for extraction and industrial development. All this together with the increasing threat of naxalite violence in these areas has made focus on tribal development a policy imperative (GoI 2008)<sup>3</sup>.

Historically, tribals in Odisha & Jharkhand have always been far removed from the economic mainstream, some argue by default not design. De Haan (2004) and De

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<sup>2</sup> It was part of a collaborative research programme between the International Water Management Institute (IWMI); Sir Ratan Tata Trust (SRTT), Mumbai; Professional Assistance for Development Action (PRADAN), New Delhi and the NM Sadguru Water and Development Foundation (NMWSDF), Dahod in seven tribal districts across seven states.

<sup>3</sup> See in particular the Planning Commission's report on development challenges in extremist affected areas (Government of India, 2008).

Haan & Dubey (2005) suggest that the institutions that emerged at the time, particularly in the time of the British, were driven by a priority of maximising state revenue. Current state policies in Odisha, De Haan argues, are still reflective of the same objective. Even though the state like Odisha has devolved the procurement and marketing of 68 NTFPs to gram sabhas, the government retains control over high revenue earning products (e.g. tendu leaves) which are prone to commercial exploitation. Further, the lack of capacity of gram sabhas (village assemblies) in these areas has meant that even for NTFPs over which communities have supposed control, middlemen benefit more than tribal people. Tribals who do sell on their own, sell in a buyers' market with no control over prices (Saxena, 1999). On the other hand deforestation continues unabated. It is estimated that Odisha has lost more than a quarter of its forests in the last 25 years resulting in considerable decline in the proportion of tribal income contributed to by NTFPs. In the context of losing income from common property resources, it is important to strengthen land based productive employment for their survival.

There are several policies in place to secure the rights of tribals to their land, natural resources and livelihoods; but there is a slip between the cup and the lip. One of the most important pieces of legislation in the last decade has been PESA. It is unique in being in consonance with customary laws, focusing more on tribal hamlets based on culture rather than revenue villages. Several steps have been taken to operationalise PESA- state amendments and rules have been passed and monitoring is underway. However field studies in Odisha reveal that many people on the ground are not even aware of the legislation (Upadhyay, 2007). Similarly, the Forest Rights Act is a significant step in the direction towards recognising the pre-eminent rights of tribals on forest land, but in most cases it doesn't yet harmonise well with forestry/ wild life/environmental laws. As a result the tribals, formerly communal owners, end up as 'encroachers' on protected forests, dependent on the mercy of rent-seeking revenue inspectors. Inclusive growth programming is about building such alternate paths both for their intrinsic and instrumental worth - intrinsic, because exclusion is in a manner, denial of basic rights and instrumental since exclusion leads to poverty and creates obstacles for the achievement of the Millennium Development Goals (MDGs). As part of developing an alternate path, it is important to strengthen agriculture in tribal area where this study focuses.

Review of literature relevant to Madhya Pradesh state indicated that More than 70% of the bhil tribes are unable to meet their food requirements for more than 6 months and there is heavy dependence on CPRs for fodder, fuel, fruits and other products (David Mosse and etal, 2010). Singh (2008) has reported that market forces influence in promoting cash crops cultivation in tribal areas has seriously constrained food production and food availability. In tribal areas, extensive agricultural practices have impacted the

forest and grazing land depletion and increased environmental and natural ecological unsustainability of agricultural practices (Singh and Singh, 2009). According to Brodt(2001), indigenous knowledge is best conserved insitu. Introduction of a universal knowledge systems such as International Federation of Organic Agricultural Movement (IFOAM) in tribal areas would be counter productive in the development of contextually appropriate and workable sustainable land management (Ernstman and Wals, 2009).

Watershed development and irrigation strategy has been the neglect of relatively wetter areas and the tribal people living there. Investing small scale interventions for improved water control can produce a dramatic impact on the productivity and dependability of tribal livelihood systems (IWMI, 2007 and Edmonds and *et al*, 2006). In tribal areas there is a limited access to institutional credit which means that borrowing is largely at higher interest from private money lenders. The study conducted by David Mosse etal(2010) concluded that deficit induced budget gives rise to the mortgage and sale of assets among poorer families. Tribals are pledging their fixed assets like land, mahua and tamarind trees and mobile articles for meeting their daily expenses and occasional functions (SRRA,2010).

Sah(2007) reported that tribal and forested areas of M.P are among the 15 pockets of chronic poverty in India. As a result migration has become an important livelihood activity (Virgo etal, 2003 and Mosse etal, 1997). Public investments in infrastructure and development of credit input and output markets decrease risk of chronic poverty for a large section of tribal society(Sah and etal, 2008). Deshingkar and Akter (2009) reported that landlessness, nominal and unproductive land holdings and the inability to invest in farming is a major issue in tribal areas. Study done by SAMARTHAN (2011) indicated that there is considerable scope to file the claims under Forest Right Act(FRA) for user rights to forest resources already under use such as land to collect NTFPs, markets, pasture land etc.

Given the present challenges of climate change, the study by Arvindakshan and Sherif(2010) pointed that creating incentives for the conservation of agro-biodiversity especially the onfarm diversity of under utilised crops such as minor millets is essential to combat climate change. Similarly, in tribal areas integrated resource use policy for efficient utilization of resources and planned diversified cropping pattern with agro-forestry and horticulture is required to be promoted and interlinked to the agro-processing activities and market linkages (Singh, 2008).

#### **4. Methodology, Data and Plan of Activities**

The study is largely drawn both from the primary and secondary data sources besides using number of Government documents and reports supplied by the various

departments. Along with secondary data Focused group discussions were also done with the tribal communities in Jhabua, Mandla and Sidhi districts of Madhya Pradesh. The first criteria adopted for the selection of the district was the notification as scheduled area. The second important criteria adopted was presence of tribes which constitute/represent major tribal population of the state so that the study findings would be relevant to them. Hence the district/part of district coming under scheduled areas of Madhya Pradesh which are inhabited by tribes such as Bhils, Gonds, Baigas, Kol were selected for the study. Jhabua (87% of STs and is dominated by Bhil tribe) Mandla (57.9% of STs and is dominated by Gonds) and Sidhi(29,89% of STs and Kusumi block of the district where Baigas and Gonds are predominant is selected).

In each block four villages were selected. Two villages which were interiorly placed and geographically distant were selected. The other two villages were those tribal villages which are undergoing transition in agriculture or which were near to plain areas with the presence of few households of non-tribals who are adopting modern agricultural practices. A total of 8 villages each were selected in Jhabua and Mandla districts and four villages in Sidhi district (as it is the only block in scheduled area). A total of 20 villages were selected for the study and twenty households were selected in each village. Hence, a total sample of 400 households were selected for the study of Agriculture in Tribal areas of Madhya Pradesh (see table 1). Focused group discussions were conducted with men and women in the study villages. Size class wise and analysis between plain and interior villages was done.

#### **4.1 Methods of Data collection**

Secondary data on rainfall, net irrigated area and demographic features of the villages were collected from block development office and village panchayat records. A thorough review of past and current trends in agricultural policies was conducted through a study of secondary sources. Structured questionnaire was used to collect the data from the selected sample households of selected villages. The interview schedule, comprising the measurement of variables was prepared in consultation with experts, keeping in view the objectives of the study. The interview schedule was pre-tested in one of the village in an identical village outside the present study. In the light of the experience gained in the pre-testing, suitable modifications were made before finalizing the interview schedule. Enumerators were used for collecting the information through individual questionnaire. In the beginning enumerators were given one week of training on how to canvas the questionnaire and aiding them in understanding general issues of agriculture in tribal areas. Field work was carried out during the year 2013-14

**Table 1: Sample Villages selected from Madhya Pradesh state.**

Name of the District	Block Name	Village Name
Jhabua	Jhabua	Hadmathia(Interior village)
		Bagore (village near to plain area)
		Jaida (village near to plain area)
		Koythariya (Interior village)
	Petlabad	Bada saloniya (Interior village)
		Barvet (village near to plain area)
		Bed dha(Interior village)
		Ramghad (village near to plain area)
Mandla	Gughri	Salwah (village near to plain area)
		Kusumi (Interior Village)
		Kamthara (Interior Village)
		Dobahat (village near to plain area)
	Beejahandi	Pindrimal (Interior Village)
		Beejahandi (village near to plain area)
		Chourai (Interior)
		Udaipur (village near to plain area)
Sidhi	Kusumi	Pondi (Interior villages)
		Pankhaira (Interior villages)
		Thadipattar (Interior villages)
		Duhari kalan (Interior villages)

The questionnaire was divided into 24 blocks covering demographic particulars, household characteristics, access to basic amenities, migration details, land particulars, inputs used per acre, credit details of household hold, transition in agriculture, issues on shifting cultivation, religious practices in agriculture, marketing of crop/forest product by the households, livestock particulars, indebtedness, consumption expenditure, land acquisition and issues on Forest Rights Act 2006. Village basic information was obtained using a questionnaire administered to the village panchayat secretary of the selected villages and the block revenue office of the respective blocks.

#### **4.2 Focused Group Discussions (FGDs)**

FGDs were done with both men and women farmers of each study village. The objective of these discussions was to have general idea on agriculture in tribal areas and related issues irrespective of farm size. FGDs helped to understand the livelihoods, ecological

and economic dimensions of agriculture in tribal villages and their advantages and disadvantages. This helps to bring out the perspectives of various categories of people with reference to issues in farming in interior as well as tribal villages near to plain areas with the presence of non-tribals.

### 4.3 Methods used for data analysis

Both quantitative and qualitative information on the details of crop cultivation and its determinants was gathered. The analysis was basically done in two ways. One is comparing between the interior and plain villages and the other analysis was done comparing between the various size-classes. The results of the study are discussed at two levels one at the household level and the other is at the plot level. The data gathered was analysed using different statistical tools. Averages, frequency and percentages were used to analyse the various information related to agricultural practices in tribal villages.

## 5. Key features of Agriculture in Madhya Pradesh

Madhya Pradesh is heavily dependent on the agriculture sector. The economy of M.P depends on agricultural sector as more than 80% of the people of the state depend on this sector for their livelihood. Cultivable area in M.P is 49%. The agricultural sector contributes around 46% to the state's economy. Average rainfall of the state is 1370mm. Madhya Pradesh has a sub-tropical climate. Like of most of north India, it has a hot dry summer (April-June) followed by monsoon rains (July-Sept) and a cool and relatively dry winter. M.P State is divided into 11 agro-climatic zones (see figure 1). Madhya Pradesh is richly endowed in natural resources. Soil types in Madhya Pradesh include black soils (predominantly in Malwa region), red and yellow soil (in Bundhle khand region), alluvial soils( northern Madhya Pradesh), laterite soil (in high land areas and mixed soil (in parts of Gwalior and Chambal region).

Black soils cover about 47.6% of the total area of the state followed by red and yellow soils about 36.5 percent. Similarly, table 2 indicates that in the study districts of Jhabua(54.64%) and Mandla(55.7%) predominantly shallow soils were prevalent and in Sidhi it was deep soils(46.2%).

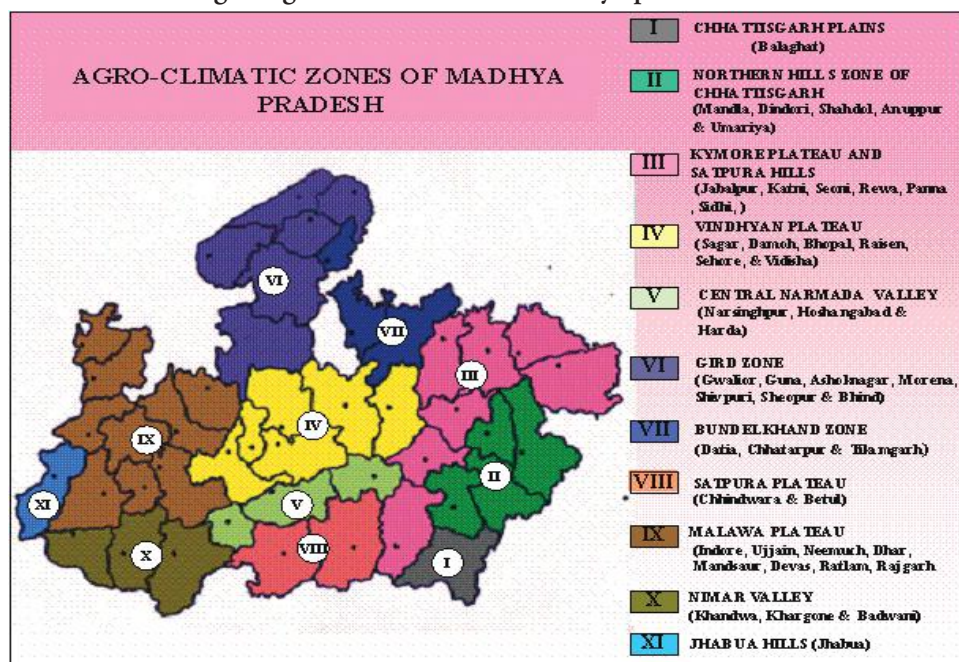
**Table 2 : Soil types of the Study districts in Madhya pradesh**

S. No	Major Soils	Jhabua		Mandla		Sidhi	
		Area in '000 Hectares	Percent(%) of the total	Area in '000 Hectares	Percent(%) of the total	Area in '000 Hectares	Percent(%) of the total
1	Deep soils	124	18.32	-	22.9	486.2	46.2
2	Medium Deep soils	183	27.04	-	21.3	211.4	20.1
3	Shallow soils	370	54.64	-	55.7	353.6	33.6

Source: NBSS & LUP Nagpur



Fig 1. Agro-climatic Zones of Madhya Pradesh State



Around 61% of total land holdings belong to small and marginal farmers. The net sown area is 151.30 lakh hectares. The gross cropped area is 202.16 lakh hectares out of which 27.7% (56.68 lakh hectares) is the irrigated area. Introduction of soybean in 1980s' replaced low value cereal crops their by decline in the area. M.P has stood first in the country by achieving about 18% agricultural growth rate during 2011-12. It has won Krishi Karman award during 2011-12, 2012-13 and 2014-15. Today, M.P stands first in the country in the production of pulses, gram, oilseeds and soya bean. Infact, the state contributes 22.54% of the total pulses in the country. The total production of food grains in 2014-15 is 320.43 lakh metric tones. The various kinds of crops grown in the M.P are rice, pulses, wheat, oil seeds, grams, soya bean and maize. State has good support infrastructure with 4500 Primary Agricultural Cooperatives (PACs), 240 Mandis, 2 SAUs, 11 Agricultural colleges. It also has a strong extension network.

Agriculture in Madhya Pradesh is dominated by the marginal farmers who account for 67.10% of total farmers(see table 3) with 22.50% of total land holding. Small farmers constitute 17.91% with a 22.08% land holding. Medium and large farmers comprise 4.25% and 0.70% with a land holding of 21.20 and 10.60 respectively.

**Table 3: Land Holding position in the Madhya Pradesh State  
(Area in 000' ha and Number in)000')**

Sl.No	Operational Holdings	No.	%	Area	%
1	Marginal (0.5 to 1.0 ha.)	92826	67.10	35908	22.50
2	Small (1.0 to 2.0 ha.)	24779	17.91	35244	22.08
3	Semi Medium (2.0 to 4.0)	13896	10.04	37705	23.62
4	Medium (4.0 to 10.0)	5875	4.25	33828	21.20
5	Large (and over Hundred)	973	0.70	16907	10.60
<b>Total</b>		<b>138348</b>	<b>100.00</b>	<b>159592</b>	<b>100.00</b>

*Source:* Madhya Pradesh at a Glance 2011.

The total geographical area of Madhya Pradesh is 328726 thousand hectares. Out of total geographical area forests constitute 21.30 per cent in Madhya Pradesh (see table 4). In Madhya Pradesh, the net sown area is 140974 thousand hectares (42.88% of total geographical area).

**Table 4: Land Use Pattern of Madhya Pradesh State in 2011 (000'ha.)**

Particulars	Madhya Pradesh
1. Geographical area	328726 (100)
2. Forests	70035 (21.30)
3. Land not available for cultivation	26309 (8.00)
4. Culturable fallow & Un-culturable land	17217 (5.24)
A. Permanent pastures & other grazing lands	10311 (3.14)
B. Land under misc. tree crops & groves Cultivable waste Land	3167 (0.96)
5. Land available for cultivation	26117 (7.94)
6. Fallow Land	26208 (7.97)
A. Current fallows	14515 (4.41)
B. Land other than current fallow	10664 (3.24)
7. Net area sown	140974 (42.88)
8. Area sown more than once	54658 (16.62)
9. Gross Cropped Area	195632 (59.51)
10. Cropping intensity %	138.8

*Source:* Madhya Pradesh at a glance 2011.

Table 5 gives us an idea about the land use pattern of study districts in Madhya Pradesh. Mandla has the highest percentage of forest area followed by Sidhi and Jhabua. Current fallows were more in Sidhi and Mandla. Net sown area was highest in Jhabua (53.20%) followed by Sidhi(34.03%) and Mandla (22.19%).



**Table 5: Land Use Classification of study districts in Madhya Pradesh (in 000'Hectares)**

S.No	Land use	Jhabua	Mandla	Sidhi
1	Geographical area	675.7	965.6	1039.2
2	Forest	131.7(19.5)	593.2(61.4)	434.8(41.8)
3	Land put to non-agricultural uses	57.3 (8.48)	42.4 (4.39)	83.1 (8)
4	Barren and Uncultivable land	83.4(12.34)	10.6 (1.09)	16.6(1.6)
5	Permanent pastures and other grazing land	8.7(1.3)	19.9 (2.06)	14.5 (1.4)
6	Land under Misc.Trees, crops and groves	0.0 (0)	0.1(0.01)	0.0 (0)
7	Cultivable waste land	25.8(3.8)	21.5(2.2)	65.7(6.3)
8	Current Fallows	4.7 (0.7)	31.4(3.25)	42.9 (4.13)
9	Permanent fallows	4.6 (0.68)	32.2 (3.33)	28.0 (2.69)
10	Net Sown Area	359.5 (53.20)	214.3(22.19)	353.6(34.03)
11	Cropping Intensity (%)	119	130	136

Source: Commissioner of Land records (2011), Gwalior, M.P.

Note: Figures in parentheses indicate the percentage share.

**Table 6: Agricultural Households by Major source of Income in Madhya Pradesh in 2012-13(%)**

Source	Madhya Pradesh			All India		
	Scheduled Tribe Households	All Other Households	All Households	Scheduled Tribe Households	All Other Households	All Households
Cultivation	79.8	73.4	75.3	69.8	62.5	63.5
Livestock	0.1	3.5	2.5	1.8	4.0	3.7
Other Agriculture	0.1	0.1	0.1	0.8	1.1	1.1
Non-agriculture	0	0.8	0.6	1.7	5.1	4.7
Wages	19.8	20.7	20.4	24.3	21.7	22
Others	0.1	1.5	1.1	1.6	5.6	5.1
All	100.0	100.0	100.0	100.0	100.0	100.0

Source: NSS Report No.569: Some Characteristics of Agricultural Households in India, 2012-13

In Madhya Pradesh state (see table 6) for nearly 80% of the scheduled tribe households, major source of income is through cultivation followed by wages (19.8 %). Whereas, at all India level only 69.8% of the ST households get income from agriculture. The income from livestock for ST households in Madhya Pradesh was negligible with 0.1 % as against 3.5 % for all other households of the state. At all India level, 1.8% of ST households get their income from livestock. Due to poor status of agriculture in tribal areas, poor households depend on other sources of income to meet their food security and survival needs (CMS, 2009).

Major crops grown in the states of Madhya Pradesh are rice, wheat, maize, pulses, groundnut, rape seed and soya bean. Table 7 indicates that as compared with all India average, the productivity of all the major crops is lesser in Madhya Pradesh.

**Table 7: Productivity comparison of important crops in Madhya Pradesh during 2013-14.**

CROP	Madhya Pradesh (Kg/Ha)	All India (Kg/Ha)
Paddy	2228	2424
Wheat	2946	3075
Maize	2361	2583
Pulses	662	764
Groundnut	1274	1750
Rapeseed	851	1188
Soyabean	836	983

*Source:* Directorate of Economics and Statistics, Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India.

## **6. Socio-Economics of Sample Farmers**

In this section an attempt is made to understand the socio-economic profile of the sample villages and sample farmers of study villages of Jhabua, Mandla and Sidhi. The demographic features of the sample villages and livelihood patterns seen in the selected villages are discussed in section-I. The socio-economic features, age group, literacy level, livestock population, market distance, farming experience, social participation, caste composition, land holding, net income and borrowings are some of the important issues discussed in the latter part of this section. This analysis is expected to provide information about the representativeness of the sample villages.

### *6.1. Profile of the Sample Villages*

The study is based on twenty villages out of which study villages of Jhabua district are having considerable amount of net irrigated area with the highest area in Barvet village of Petlawad tehsil is having highest net irrigated area. Whereas, in Mandla there is no irrigated area in the study villages. In study villages of sidhi district there is negligible area under irrigation. Predominant livelihoods of the study villages of all districts include farming, livestock rearing, wage work, migration and NTFP collection (see table 8). Across all size classes in both plain and interior villages, farming was the main occupation followed by non-agriculture labour such as MGNREGA labour, road works and construction works. Similarly across all size classes firewood was the main fuel wood. Between 20-30 percent sampled households were women headed in Jhabua and Mandla while only 2.5% of hhs were women headed in Sidhi.

Bijahandi of Bijahandi tehsil of Mandla district is the village with the maximum number of households (515) having a population of 2282 and Pankhora of Kusumi tehsil of Sidhi district is the village with the minimum number of households (54) having a population of 235. Majority villages are having mixed social composition but are dominated in numbers by scheduled tribes. In both interior and plain villages of study

districts, majority of sample hhs were in the category of 30-40 years followed by 41-50 years age group. Out of the total sample farmers age group between 20-30 years ranged between 7.5% to 18.75% in various study districts.

The basic features of the villages such as land use pattern, wage rates and crops grown in kharif and Rabi in the sample villages are presented in tables 10 and 11 respectively. Agriculture, agricultural labour and animal husbandry are the main features of the sample villages. Study villages of Mandla and Sidhi districts with no/least access to irrigation have hosted higher crop diversity with food crops occupying a major place. On the contrary in the study villages of Jhabua which had better access to irrigation cultivation of commercial crops such as cotton, soyabean, chillies, onions could be seen. Most of these villages even cultivated vegetables crops such as tomato and Bhendi for the market. Traditional millet crop diversity could be seen in all of the study villages of three districts. kodo, kutki, maize, jowar and bajra are being cultivated. Along with maize, minor millets kodo and kutki were predominantly grown in each village in each under a considerable area in Mandla and Sidhi districts. Whereas, jowar and bajra were popular in sample villages of Jhabua district. Diverse soil types could be seen in the study area (table 10).

**Table 8: Livelihoods of the sampled hhs in the Study districts of M.P during 2013-14**

Livelihoods		
Jhabua	Mandla	Sidhi
Farming ( <i>kheti</i> ), MGNREGA, migration( <i>palayan</i> ),wage labour ( <i>majdhoori</i> ), fuel wood selling, tendu leaf collection ( <i>tendu patta</i> ), mohua flower and fruits collection, Livestock rearing ( <i>maveshi Palan</i> ), Gold smiths, employees ( <i>naukiri</i> ).	Farming (kheti), MGNREGA, migration( <i>palayan</i> ),wage labour ( <i>majdhoori</i> ), fuel wood selling, tendu leaf collection ( <i>tendu patta</i> ), livestock rearing ( <i>maveshi palan</i> ), gold smiths, mohua flower and fruits collection, employees (naukiri), baja bjantri (doliya).	Farming, MGNREGA, migration( <i>palayan</i> ), wage labour, fuel wood selling, tendu leaf collection ( <i>tendu patta</i> ) and livestock rearing ( <i>maveshi palan</i> ) and mohua flower and fruits collection,

These include black soil, red soils, red stony soils, gravel, red gravel, stony gravel, sandy soils, alkaline soil and lateritic soils. In Jhabua both plain and interior villages, red soil was predominant followed by gravel soils. Table 9 indicates that plain villages of Jhabua had more (20.93%) fertile black soils as compared with interior villages (9.52%). Similarly infertile soil was quite high(19.05%) with the farmers in interior villages of Jhabua. Red soil was predominant in plain villages followed by black soils. As seen in Jhabua, in Mandla too, the black soils were less in interior villages. In interior villages of Mandla, red gravel(31.39%) was predominant followed by red soils(27.91%). Soils of marginal fertility were more in interior villages. Contrary to other two study districts, in Sidhi, Black soils were predominant(32.0%) followed by sandy soils (30.55). It was interesting to notice 8.33% of lateritic soils in Sidhi which are present in only very few pockets of India.

Table 9 : Acreage of crops across size classes in both plain and interior villages of study districts of Jhabua, Mandla and Sidhi in M.P during 2013-14.

	Soil Type	Plain Village	Interior village
JHABUA	Black soil	20.93(18)	9.52(10)
	Red	43.02(37)	41.90(44)
	Gravel	24.42(21)	29.52(31)
	Stony gravel	9.30(8)	19.05(20)
	Alkaline soils (Jalot/Chavudu)	2.33(2)	0.0(0)
	<b>Total</b>	<b>100.0(86)</b>	<b>100.0(105)</b>
MANDLA	Black soil	36.54(57)	22.67(39)
	Red	44.23(69)	27.91(48)
	Red stony soils	2.56(4)	8.14(14)
	Red gravel	0.0(0)	31.39(54)
	Gravel	12.82(20)	8.14(14)
	Stony gravel	3.85(6)	1.74(3)
	<b>Total</b>	<b>100.0 (156)</b>	<b>100.0 (172)</b>
SIDHI	Black soil	0.0(0)	32.00(24)
	Red	0.0(0)	13.33(10)
	Gravel	0.0(0)	18.52(20)
	Lateritic soil	0.0(0)	8.33(9)
	Others	0.0(0)	11.11(12)
	Sandy soils	0.0(0)	30.55(33)
	<b>Total</b>	<b>0.0(0)</b>	<b>100.0(108)</b>

Note: Figures in the parenthesis are actual acres under that particular category.

Table 12 gives an indication of the agro-biodiversity of the study villages and the predominant area occupied by kodo and kutki crops in the study villages. It is evident from table 12 that in Udaipur village of Bijahandi tehsil of Mandla district, 34.33 and 8.48 percent of the cropped area in the village is under kodo millet and kutki respectively. Similarly in Pindrahimal village, kodo millet and kutki were grown in an area of 14.56 and 10.02 percent respectively. This indicates the importance of millets in the food and farming systems of tribal villages. Creating incentives for the conservation of agrobiodiversity, especially the onfarm diversity of underutilized crops such as minor millets is essential to combat climate change (Arvindakshan and Sherief, 2010). Crop genetic diversity is an essential dimension of agricultural production in low-input farming systems, a reduction in diversity often leaves small cultivators more vulnerable (Cleveland *et al.*, 1994). The predominant source of irrigation in the sample villages has been open well irrigation followed by canal irrigation. Until early 2000's Shifting cultivation was prevalent in some of the hhs, but now it is not seen except with 5-6 hhs in Pindrahimal village of Bijahandi tehsil, Mandla district.

Table 10. Key Features of Sampled Villages and Households in Jhabua District of Madhya Pradesh during the year 2013-14.

Features	Jhabual							
	Jhabua Tehsil			Petlawad Tehsil				
Village Name	Koya Dhariya	Jaida	Bhagor	Hadmatiya	Barvet	Beddha Saloniya	Bade	Ram garh
No of Households(HHs)	171	275	357	226	317	269	176	382
Total Population	969	1245	1914	1373	1371	1577	862	1887
wage rate/day (in Rs)								
1) Women	150	200	150	150	150	150	100-150	200
2) Men	150	200	150	150-170	150	150	100-150	200
Permanent pastures (Ha.)	8.3	5.6	4.2	3.8	7.2	10.4	28.2	12.5
Net Area Sown(Ha.)	193.6	241.5	226.7	187.4	227.9	363.5	240.8	608.5
Irrigated Area(Ha.)	6.5	24.5	63.3	19.7	203.2	50.1	45.2	278.6
Unirrigated Area(Ha.)	187.1	217	163.4	167.7	24.7	313.4	195.5	329.9
Major Kharif crops	Cotton, Maize, Soya, Paddy, BG, G.Nut, RG, Sesame, and GG	Maize, Cotton, Soya, Paddy, BG, G.Nut, RG, Sesame, GG,	Maize, BG, GG, Soyabean, GNut, RG, Cotton, Paddy, Sesame, Bajra, Jowar and Hibiscus.	Maize, Cotton, Soya, Paddy, BG, G.Nut, RG, Sesame, GG	Soya bean, Maize, Tomato, Chillies, Cotton, paddy, RG, Jowar Giner and Garlic	Soya bean, Maize, paddy, Tomato, Chillies, Cotton, RG, Jowar	Cotton, Soya, Maize, Chillies, Tomato, BG, GG, RG and Paddy	Cotton, Soya, Maize, Chillies, Tomato, BG GG, RG and Linseed.
Major Rabi Crops	Maize, Chick pea, wheat, Peas, Lentils, Onion, Chillies, and Tomato	Chick pea, Wheat, Maize, Peas, Onion Bhendi, Chillies, Tomato and Pedda chikkudu.	Wheat, Chick pea, Peas, Maize, Potato, Onion and Garlic.	Maize, Chick pea, wheat, peas onion, Chillies, Tomato	Chick pea, wheat, mutter, Onion.	Chick pea, wheat, mutter, Onion and Lentil	Chick pea, Dollar Chick pea, Wheat and Maize	Maize, Chick pea, Wheat, peas, Onion Chillies, Tomato and Linseed.

Source: Village records and Field survey, District Census Hand Book (2011) of Jhabua, Directorate of Census Operations, Madhya Pradesh.

Note: RG= Redgram, BG= Black gram, GG= Green gram

Table 11 Key Features of Sample Villages and Households of Mandla and Sidhi District of Madhya Pradesh during the year 2013-14.

Features	Mandla District					Sidhi District						
	Bijadandi Tehsil			Gughri Tehsil		Kusumi Tehsil			Thadipattar		Dubari Kalan	
Village Name	Udaipur	Bijahaandi	Chourai	Pindrahimal	Khamtara	Kusumi	Salwah	Dhobabor	Pondi	Pankhora	Thadipattar	Dubari Kalan
No of Households(HHs)	230	515	100	137	162	223	513	142	274	54	480	215
Total Population	939	2282	464	536	757	804	1873	515	1229	235	2059	831
wage rate/day (in Rs)												
1) Women	60-75	50	50	100	150-200	50	50	50	50	50	50	50-60
2) Men	65-80	50	50	100	150-200	50	50	50	0	50	50	60-70
Permanent pastures (Ha.)	9	7.7	13.4	12.2	64.9	2.9	22.4	7.5	15	5	9	8
Net Area Sown(Ha.)	150.7	117.9	18.5	176.2	227.5	263.6	439.4	189.6	351	28	198	114
Irrigated Area(Ha.)	0	0	0	0	0	0	0	0	16	1.5	15	4
Unirrigated Area(Ha.)	150.7	117.9	18.5	176.2	227.5	263.6	439.4	189.6	335	26.5	183	110
Major Kharif crops	Paddy, Maize Kodo, Kurki, BG, RG, Sesame.	Paddy, Kodo, Kurki, RG	Paddy RG, Kodo, Kurki	Maize, Kodo Paddy, Kurki RG, Niger, BG, Sesame.	Paddy,Kodo, RG, Maize, BG, Sesame Niger, Cow pea Niger	Paddy Kodo, Kurki, RG, Maize, BG, Sesame Feild pea Jagni	Paddy Kodo Kurki RG, Maize, BG, sesame	Kurki, Paddy, Kodo, RG and Maize.	Paddy, Kodo, RG, BG	Paddy, Maize, RG, Sesame, Kodo, Kurki and Jowar	Paddy, RG, Maize, BG, Kodo and Kurki	Maize, RG, Paddy, Kodo Sesame, Kurki, Jowar and Mizri.
Major Rabi Crops	Wheat, Chickpea, Rapeseed.	Chick pea, Wheat Linseed and Lentils.	Wheat Linseed and Chick pea.	Wheat, Chick pea, Linseed, Lentils and Peas	Peas, Linseed and Lentils	Wheat, Chickpea, Peas, Linseed	Wheat, Peas, Chick pea and Lentils	Wheat, Black Gram, Peas, Linseed	Wheat, Chick pea and Peas.	Chick pea, Wheat and Peas.	Chick pea, Wheat and Lentils	Chick pea, Wheat and Peas.

Source: Village records and Field survey; District Census Hand Book (2011) of Mandla and Sidhi, Directorate of Census Operations, Madhya Pradesh.

Note: RG= Redgram, GG= Green gram; MG= Black gram; BG= Black gram, GG= Green gram

Table 12 : Agro-biodiversity and the millet crop predominance in the study villages of Mandla district during the year 2013-14.

S.No	Udaipur		Pindrahimall	
	Particulars	Area in hectares	Particulars	Area in hectares
	<b>KHARIF</b>		<b>KHARIF</b>	
	Net Area Sown	141.40	Net Area Sown	101.61
	Paddy (dry sown)	42.30 (29.92)	Paddy (dry sown)	32.01
	Maize	22.0 (15.56)	Maize	12.46
	Kodo millet	30.20 (21.36)	Kodo millet	14.80 (14.56)
	Kutki	12.00 (8.48)	Kutki	10.18 (10.02)
	Kodo intercropped with other crops	18.34 (12.97)	Red gram	8.60 (
	Redgram	6.0	Blackgram	6.60
	Blackgram	3.10	Til	2.40
	Til	2.50	Ramtil	4.20
	Ramtil	5.0	Jowar	0.46
	<b>RABI</b>		<b>RABI</b>	
	Net Area Sown	62.60	Net Area Sown	96.21
	Wheat	20.60	Wheat	56.05
	Chick pea	7.50	Chick pea +wheat	21.01
	Peas	5.10	Chick pea	2.40
	Lentils	6.20	Peas	1.95
	Linseed	16.50	Lentils	2.10
	Safflower + Chick pea	2	Linseed	0.90
	Rai	4.70	Rai	11.80

Source: Village records and Department of Agriculture

## 6.2 Findings of the Study

### 6.2.1 Size-Class

The analysis of the total sampled households of the study revealed that, 68.50 percent of the sampled households were marginal farmers (see table 13) followed by small farmers (21.75%). There were no large farmers size class in the sampled households of Mandla district and where as in Sidhi there were no medium and large farmers category in the sampled households.

Table 13: Size-class wise distribution of sampled farmers in study districts of Madhya Pradesh State

District	Type of Villages	Type of Farmer				Total
		Marginal	Small	Medium	Large	
Jhabua	Plain	38 (47.50)	29 (36.25)	9 (11.25)	4 (5.0)	80 (100.0)
	Interior	36 (45.0)	28 (35.0)	13 (16.25)	3 (3.75)	80 (100.0)
Mandla	Plain	64 (80.0)	11 (13.75)	5 (6.25)	0 (0.0)	80 (100.0)
	Interior	62 (77.5)	13 (16.25)	5 (6.25)	0 (0.0)	80 (100.0)
Seedhi	Interior	74 (92.50)	6 (7.5)	0 (0.0)	0 (0.0)	80 (100.0)
<b>Total</b>		<b>274</b> <b>(68.50)</b>	<b>87</b> <b>(21.75)</b>	<b>44</b> <b>(8.0)</b>	<b>7</b> <b>(1.75)</b>	<b>400</b> <b>(100.0)</b>

Source: Primary Survey

Note: In Sidhi district Kusumi block was the only scheduled area and all the villages were located in quite interior places and no villages in the plain area category.

### 6.2.2 Tribe/Subtribe

In order to understand the social and economic dynamics of sample villages, one has to look into the social system, which largely determines people's perceptions, values and knowledge. Even today 'tribe' continues to be an important marker of identity and mode of political articulation among several communities in India (GOI, 2014). Indian tribes have been officially defined, since atleast the 1960s, as having five key features: primitive traits, distinctive culture, geographical isolation, shyness of contact with outsiders and backwardness (Guha, 2015) The size-class wise tribe composition of sample households is presented in the table 14. It is evident from the table that the sampled households of three study districts belonged to tribes/sub-tribes such as Bhils, Baiga, Gonda, Pradhan, Chowrasi, Ahir and Banjara. Baigas were the only particularly vulnerable tribal groups (PVTGs) that were found in the sampled households of the study area. Bhils are the predominant tribe in both plain and interior villages of Jhabua (See table 14) across all size-classes. Within Bhils there are three major tribes Bhil, Bhilala and Patlia and they are further divided into several sub-tribes(see table 15). The identity of subtribes play a key role when entering in to marriage relationship. In Mandla district, Gonds are the predominant tribe. In Sidhi, Baiga(64.90%) were predominant in marginal size-class categories and Gonds (66.70%) were predominant in small farmers' category.



Table14 : Distribution of sampled hhs according to their Tribe/sub-tribe in the study districts of Madhya Pradesh (Percent).

Type of Villages	Tribe/sub-tribe	Type of Farmer			
		Marginal	Small	Medium	Large
Plain	<b>JHABUA</b>				
	Bhil	76.30(29)	96.60(28)	100.0(9)	100.0(4)
	Baiga	7.90(3)	0.0 (0)	0.0 (0)	0.0 (0)
	Gond	2.60(1)	3.40(1)	0.0 (0)	0.0 (0)
	Laxman	5.30(2)	0.0 (0)	0.0 (0)	0.0 (0)
	Patelima	7.90(3)	0.0 (0)	0.0 (0)	0.0 (0)
	Total	100.0(38)	100.0(29)	100.0(9)	100.0(4)
Interior	Bhil	97.20(35)	100.0(28)	100.0(13)	0.0 (0)
	Patelima	1.20(1)	0.0 (0)	0.0 (0)	0.0 (0)
	Pradhan	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
	Total	100.0(36)	100.0(28)	100.0(13)	100.0(3)
Plain	<b>MANDLA</b>				
	Baiga	9.60(6)	0.0 (0)	0.0 (0)	0.0 (0)
	Gond	67.20(43)	72.70(8)	100.0(5)	0.0 (0)
	Ahir	3.20(2)	9.10(1)	0.0 (0)	0.0 (0)
	Banjara	6.20(4)	18.20(2)	0.0 (0)	0.0 (0)
	Chowrasi	4.68(3)	0.0 (0)	0.0 (0)	0.0 (0)
	Laxman	9.40(6)	0.0 (0)	0.0 (0)	0.0 (0)
	Total	100.0 (64)	100.0(11)	100.0(5)	0.0(0)
Interior	Baiga	3.20(2)	0.0 (0)	0.0 (0)	0.0 (0)
	Gond	85.50(53)	92.30(12)	80.0(4)	0.0 (0)
	Ahir	8.1(5)	0.0 (0)	0.0 (0)	0.0 (0)
	Pradhan	3.20(2)	7.70(1)	20.0(1)	0.0 (0)
	Total	100.0(62)	100.0(13)	100.0(5)	0.0(0)
Interior	<b>SIDHI</b>				
	Bhil	4.10(3)	0.0 (0)	0.0 (0)	0.0 (0)
	Baiga	64.90(48)	33.30(2)	0.0 (0)	0.0 (0)
	Gond	31.10(23)	66.70(4)	0.0 (0)	0.0 (0)
	Total	100.0(74)	100.0(6)	0.0(0)	0.0(0)

Source: Primary Survey

Table 15: Major Tribe/Sub-tribes of Bhil tribal community in the Jhabua district of Madhya pradesh

Bhil	Bhilala	Patlia
Solanki, Devda, Meda, Ninama, Damor, Bhilwal, Dindor and Vosari	Mujardha, Rawat, Bagel, Chauhan, Kanesh, Tomar, Kattara, Bahmniya, Davor and Changode	Babore, Dakia, Palia and Chauhan.

### 6.2.3 Land Tenure :

Land is considered to be the main asset in rural areas and it normally indicates the status and the level of living of a household. This variable was assessed so as to understand their situation with respect to access to own, leased in, shared in lands and community lands for cultivation of crops. It can be found from table 16 that more number of small and marginal farmers cultivated community land. Total land cultivated was slightly higher than the total land owned. Land leased in and land shared in was more in the case of small and marginal farmers. The total land owned by the 160 sampled households of Jhabua amounted to 678 acres where as in Mandla, 160 households owned 314 acres. However 80 households of Sidhi owned 113 acres.

**Table16.: Distribution of respondents according to their land tenure in the Study districts of M.P during 2013-14**

Village Type	Farmer type	Community Land in acres	Total Own land in acres	Leased-in land in acres	Leased -out Land in acres	Land shared-in in acres	Land shared-out in acres	Total land Cultivated in acres
Plain Areas (Jhabua)	Marginal	17(9)	105(38)	24(13)	24(12)	24(12)	20(10)	109(38)
	Small	35(13)	104(29)	34(16)	32(16)	32(16)	32(16)	104(29)
	Medium	4(2)	66(9)	16(5)	13(4)	8(4)	8(4)	69(9)
	Large	2(1)	50(4)	2(1)	4(2)	2(1)	2(1)	50(4)
	<b>Total</b>	<b>58(25)</b>	<b>324(80)</b>	<b>76(35)</b>	<b>73(34)</b>	<b>66(33)</b>	<b>62(31)</b>	<b>332(71)</b>
Interior Area (Jhabua)	Marginal	26(12)	98(36)	47(22)	41(21)	40(20)	40(20)	104(36)
	Small	48(13)	117(28)	26(13)	26(13)	24(12)	22(11)	119(28)
	Medium	6(3)	97(13)	14(8)	12(6)	10(5)	12(6)	97(13)
	Large	0 (0)	42(3)	0 (0)	0 (0)	0 (0)	0 (0)	42(3)
	<b>Total</b>	<b>80 (28)</b>	<b>354 (80)</b>	<b>87(43)</b>	<b>79 (40)</b>	<b>74 (37)</b>	<b>74 (37)</b>	<b>362 (80)</b>
Plain Area (Mandla)	Marginal	15(6)	72(64)	19(10)	6(3)	12(6)	8(4)	89(64)
	Small	0 (0)	40(11)	4(2)	6(1)	4(2)	0 (0)	42(11)
	Medium	0 (0)	22(5)	0 (0)	0 (0)	0 (0)	0 (0)	22(5)
	<b>Total</b>	<b>15(6)</b>	<b>134(80)</b>	<b>23(12)</b>	<b>8(4)</b>	<b>16(8)</b>	<b>8(4)</b>	<b>153(80)</b>
Interior Area (Mandla)	Marginal	9(6)	98(62)	25(12)	8(4)	22(11)	8(4)	129(62)
	Small	3(1)	44(10)	0 (0)	0 (0)	2(1)	0 (0)	46(13)
	Medium	0 (0)	38(5)	0 (0)	0 (0)	0 (0)	0 (0)	38(5)
	<b>Total</b>	<b>12(7)</b>	<b>180(66)</b>	<b>25(12)</b>	<b>8(4)</b>	<b>24(12)</b>	<b>8(4)</b>	<b>213(80)</b>
Interior area (Sidhi)	Marginal	2(1)	89(74)	6(3)	0 (0)	0 (0)	0 (0)	95(74)
	Small	0 (0)	24(6)	0 (0)	0 (0)	0 (0)	0 (0)	24(6)
	<b>Total</b>	<b>2(1)</b>	<b>113(80)</b>	<b>6(3)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>119(28)</b>

Source: Primary Survey

Note: Figures in the bracket are actual number of hhs (households).

#### 6.2.4 Education:

Education was operationalised as the number of years of formal schooling attended by the sample farmer. For the purpose of distribution of farmers six categories were evolved as not literate, below primary, primary, middle school, secondary, intermediate, graduation and above. It is presumed that if a farmer is educated he can be made aware of agricultural technologies and marketing issues involved so that he can take advantage of the situation. More importantly, it might be relatively easier to communicate the message by the extension agencies on recent advances in improved farming methods while conserving the natural resources to a literate farmer. An attempt has been made to enquire into the educational background of the respondents. Analysis was done by calculating the percentage of farmers in various educational levels in the respective size class of both interior and plain villages and also total sample households. The analysis of the variable education indicated that in Jhabua and Sidhi interior villages the percentage of literacy was less as compared with plain areas of the district. In the case of Mandla it is vice-versa. In Jhabua more than 73 percent of households across all size-classes were below primary level of education (see table 17). In Mandla district interior villages were having better literacy due to the efforts of both state and central governments in these areas with a focus on infrastructure development, increasing the enrollment and effective implementation of mid-day meal scheme. In Sidhi district more than 93% of the sampled households have literacy level upto only primary level. Tribal areas of M.P have very low educational attainment levels which show the very poor status of human development in the tribal areas(CMS 2009).

#### 6.2.5 Housing and Amenities:

This variable was studied to understand the situation of sampled households with respect to their housing and other basic amenities such as availability of kitchen garden, access to electricity and toilet. Majority of the households have kutchra house across all size classes except in case of large farmers in Jhabua. No kitchen gardening is seen except with small and marginal farmers of Mandla district. Access to electricity was a big problem in Jhabua district and interior villages of Mandla. Majority of the households in both plain and interior villages of study districts, sampled households were not having access to toilets. This could have serious health implications for the family members of sampled hhs affecting their physical fitness to participate in farm production activities. However, in Mandla plain areas, better access to toilets was seen due to government schemes to eradicate open defecation (table 18).

Table 17 : Distribution of Sampled respondents according to the education level of in the study districts of Madhya pradesh.

Type of Villages	Level of Education	Type of Farmer				Total
		Marginal	Small	Medium	Large	
Plain	<b>JHABUA</b>					
	Not literate	65.8(25)	75.9(22)	88.9(8)	50.0(2)	71.2(57)
	Below Primary	7.9(3)	6.9(2)	0.0(0)	25.0(1)	7.5(6)
	Primary	15.8(6)	3.4(1)	11.1(1)	25.0(1)	11.2(9)
	Middle	7.9(3)	13.8(4)	0.0(0)	0.0(0)	8.8(7)
	Secondary	2.6(1)	0.0(0)	0.0(0)	0.0(0)	1.2(1)
	Intermediate	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	Graduation and above	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	<b>Total</b>	<b>38 (100.0)</b>	<b>29(100.0)</b>	<b>9(100.0)</b>	<b>4(100.0)</b>	<b>100.0(80)</b>
Interior	Not literate	52.8(19)	53.6(15)	38.5(5)	33.3(1)	50.0(40)
	Below Primary	2.8(1)	0.0(0)	7.7(1)	0.0(0)	2.5(2)
	Primary	19.4(2)	28.6(8)	15.4(2)	33.3(1)	22.5(18)
	Middle	5.6(2)	7.1(2)	15.4(2)	33.3(1)	8.8(7)
	Secondary	11.1(4)	7.1(2)	7.7(1)	0.0(0)	8.8(7)
	Intermediate	5.6(2)	0.0(0)	7.7(1)	0.0(0)	3.8(3)
	Graduation and above	2.8(1)	3.6(1)	7.7(1)	0.0(0)	3.8(3)
		<b>Total</b>	<b>100.0 (36)</b>	<b>100.0(28)</b>	<b>100.0(13)</b>	<b>100.0 (3)</b>
Plain	<b>MANDLA</b>					
	Not literate	29.7(19)	45.5(5)	40.0(2)	0.0(0)	32.5(26)
	Below Primary	6.2(4)	0.0(0)	20.0(1)	0.0(0)	6.2(5)
	Primary	31.2(20)	18.2(2)	0.0(0)	0.0(0)	27.5(22)
	Middle	23.4(15)	18.2(2)	20.0(1)	0.0(0)	22.5(18)
	Secondary	6.2(4)	9.1(1)	20.0(1)	0.0(0)	7.5(6)
	Intermediate	1.6(1)	0.0(0)	0.0(0)	0.0(0)	1.2(1)
	Graduation and above	1.6(1)	9.1(1)	0.0(0)	0.0(0)	2.5(2)
	<b>Total</b>	<b>100.0(64)</b>	<b>100.0(11)</b>	<b>100.0(5)</b>	<b>0.0(0)</b>	<b>100.0(80)</b>
Interior	Not literate	41.9(26)	53.8(7)	40.0(2)	0.0(0)	43.8(35)
	Below Primary	22.6(14)	23.1(3)	0.0(0)	0.0(0)	21.2(17)
	Primary	9.7(6)	15.4(2)	0.0(0)	0.0(0)	10.0(8)
	Middle	14.5(9)	7.7(1)	20.0(1)	0.0(0)	13.8(11)
	Secondary	4.8(3)	0.0(0)	20.0(1)	0.0(0)	5.0(4)
	Intermediate	3.2(2)	0.0(0)	0.0(0)	0.0(0)	3.8(3)
	Graduation and above	3.2(2)	0.0(0)	0.0(0)	0.0(0)	2.5(2)
		<b>Total</b>	<b>100.0(62)</b>	<b>100.0(13)</b>	<b>100.0(5)</b>	<b>0(0.0)</b>
Interior	<b>SIDHI</b>					
	Not literate	77.0(57)	66.7(4)	0.0(0)	0.0(0)	76.2(61)
	Below Primary	2.7(2)	0.0(0)	0.0(0)	0.0(0)	2.5(2)
	Primary	12.2(9)	33.3(2)	0.0(0)	0.0(0)	13.8(11)
	Middle	6.8(5)	0.0(0)	0.0(0)	0.0(0)	6.2(5)
	Secondary	1.4 (1)	0.0(0)	0.0(0)	0.0(0)	1.2(1)
	Intermediate	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	Graduation and above	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	<b>Total</b>	<b>74(100.0)</b>	<b>6(100.0)</b>	<b>0.0(0)</b>	<b>0.0(0)</b>	<b>0.0(0)</b>

Source: Primary Survey

Table 18: Distribution of respondents according to their access to housing amenities in the study districts of M.P.

Type of Villages	Migration Particulars		Type of Farmer				Total
			Marginal	Small	Medium	Large	
			JHABUA				
Plain	Ownership of House	Kutchha	89.5(34)	89.7(26)	88.9(8)	50.0(2)	87.5(70)
		Pucca	10.5(4)	10.3(3)	11.1(1)	50.0(2)	12.5(10)
	Kitchen Gardening	Yes	2.6(1)	0.0(0)	0.0(0)	0.0(0)	1.2(1)
		No	97.4(37)	100.0 (29)	100.0 (9)	100.0 (4)	98.8(79)
	Electricity Access	Yes	76.3(29)	72.4(21)	77.8(7)	25.0(1)	72.5(58)
		No	23.7(9)	27.6(8)	22.2(2)	75.0(3)	27.5(22)
	Access to toilet facility	Yes	0.0(0)	3.45(1)	0.0 (0)	0.0 (0)	1.25(1)
		No	100.0 (38)	96.55(28)	100.0(9)	100.0(4)	98.75(79)
		<b>Total</b>	<b>100.0(38)</b>	<b>100.0(29)</b>	<b>100.0(9)</b>	<b>100.0(4)</b>	<b>100.0(80)</b>
	Interior	Ownership of House	Kutchha	91.7(33)	89.3(25)	92.3(12)	33.3(1)
Pucca			10.5(4)	10.7(3)	7.7(1)	66.7(2)	11.2(9)
Kitchen Gardening		Yes	0.0(0)	0.0(0)	0.0(0)	66.7(2)	2.5(2)
		No	100.0(36)	100.0(28)	100.0(13)	33.3(1)	97.5(78)
Electricity Access		Yes	72.2(26)	64.3(18)	46.2(6)	66.27(2)	65.0(52)
		No	27.8(10)	35.7(10)	53.8(7)	33.3(1)	35.0(28)
Access to toilet facility		Yes	5.56(2)	3.57(1)	15.38(2)	33.33(1)	7.50(6)
		No	94.44(34)	96.43(27)	84.62(11)	66.67(2)	92.50(74)
		<b>Total</b>	<b>100.0(36)</b>	<b>100.0(28)</b>	<b>100.0(13)</b>	<b>100.0(3)</b>	<b>100.0(80)</b>
MANDLA							
Plain	Ownership of House	Kutchha	82.8(53)	54.5(6)	80.0(4)	0.0(0)	78.8(63)
		Pucca	17.2(11)	45.5(5)	20.0(1)	0.0(0)	21.2(17)
	Kitchen Gardening	Yes	7.8(5)	9.1(1)	0.0(0)	0.0(0)	7.5(6)
		No	92.2(59)	90.9(10)	100.0(5)	0.0(0)	92.5(74)
	Electricity Access	Yes	93.8(60)	81.8(9)	100.0(5)	0.0(0)	92.5(74)
		No	6.2(4)	18.2(2)	0.0(0)	0.0(0)	7.5(6)
	Access to toilet facility	Yes	31.25(20)	9.09(1)	40.0(2)	0.0(0)	28.75(23)
		No	68.75(44)	90.91(10)	60.0(3)	0.0(0)	71.25(57)
		<b>Total</b>	<b>100.0 (64)</b>	<b>100.0 (11)</b>	<b>100.0 (5)</b>	<b>0.0(0)</b>	<b>100.0 (80)</b>
	Interior	Ownership of House	Kutchha	74.2(46)	84.6(11)	80.0(4)	0.0(0)
Pucca			25.8(16)	15.4(2)	20.0(1)	0.0(0)	23.8(19)
Kitchen Gadrening		Yes	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)
		No	100.0(62)	100.0(13)	100.0(5)	0.0(0)	100.0(80)
Electricity Access		Yes	72.6(45)	69.2(9)	80.0(4)	0.0(0)	72.5(58)
		No	27.4(17)	30.8(4)	20.0(1)	0.0(0)	27.5(22)
Access to toilet facility		Yes	11.29(7)	15.38(2)	0.0(0)	0.0(0)	11.25(9)
		No	88.71(55)	84.62(11)	100.0(5)	0.0(0)	88.75(71)
		<b>Total</b>	<b>100.0 (62)</b>	<b>100.0 (13)</b>	<b>100.0 (5)</b>	<b>0.0(0)</b>	<b>100.0 (80)</b>
SIDHI							
Interior	Ownership of House	Kutchha	100.0(74)	100.0(6)	0.0(0)	0.0(0)	100.0(80)
		Pucca	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	Kitchen Gadrening	Yes	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)
		No	100.0(74)	100.0(6)	0.0(0)	0.0(0)	100.0(80)
	Electricity Access	Yes	86.5(64)	100.0(6)	0.0(0)	0.0(0)	87.5(70)
		No	13.5(10)	0.0(0)	0.0(0)	0.0(0)	12.5(10)
	Access to toilet facility	Yes	0.0(0)	16.67(1)	0.0(0)	0.0(0)	1.25(1)
		No	100.0(74)	83.33(5)	0.0(0)	0.0(0)	98.75(79)
		<b>Total</b>	<b>100.0(74)</b>	<b>100.0(6)</b>	<b>0.0(0)</b>	<b>0.0(0)</b>	<b>100.0(80)</b>

Source: Primary Survey

### 6.2.6 Source of Drinking water

Access to drinking water is another important basic amenity which every human being should have and it is more important in remote tribal areas. Water being the life line of every individual, access to safe and clean water is crucial for health and well being of sampled households. Tube well and hand pump is the main source for drinking water in Jhabua (see table 19). In Mandla plain areas tap water and tubewell/handpump was the main source where as in Mandla interior tapwater, handpump and well unprotected were the major sources of drinking water. In sidhi too hand pump and well protected is the main source of drinking water. Women in tribal areas travel approximately 1-1.5 kms for fetching water(ASA, 2003).

### 6.2.7 MGNREGA

MGNERGA is the flag ship programme of government of India for providing the employment to rural families, especially during the lean season. Its proper implementation was of immense importance to tribal households in the scheduled areas who are migrating to distant places in search of employment. The empirical evidence of the study indicated that the Majority of the sampled households had Job cards(see table 20) and only small number of hhs does not have job cards. In general 25-35% of the hhs were having two job cards in the family. Average days of employment was better in Mandla and Sidhi. Table 20 indicates that average wage being obtained by households was more than Rs100.Despiting having Job cards of MGNREGA job cards only 50-70% of the card holders were employed in the works of MGNREGA. More than 100rupees/day is the average wage obtained by each person.

### 6.2.8 Migration

Migration was an important livelihood option for the majority of the sampled hhs in the study districts. In general most of the households migrated during the summer period when there is no employment in the villages. During the years when monsoon failure occurs they migrate much earlier. once the agricultural operations cease. With increasing population and decreasing carrying capacity of agriculture, the tribes are migrating to the other relatively agriculturally developed region (Singh, 2008). Empirical evidence from table 21 indicates that migration was high in interior villages of Jhabua and Mandla districts. As per CMS study(2009), 77 percent of the households reported migration in Jhabua district. In Kusumi block of Sidhi district, percent of migrating households was less but average days of migration is as high as 256 days and it was less in Jhabua and Mandla. Kusumi block is very interior in Sidhi district and when once people go out of village in search of employment, they do not return soon due to high travel charges. Hence the high average days of migration in Sidhi district. Migration has serious negative implication on health, education and tribal culture(ASA, 2003).

Table 19. Distribution of respondents according to their use of drinking water source in the study districts of Madhya Pradesh (Percent) during the year 2013-14

Type of Villages	Source of Irrigation (in acres)	Type of Farmer			
		Marginal	Small	Medium	Large
<b>JHABUA</b>					
Plain	Bottled water	15.8(6)	0.0(0)	0.0(0)	0.0(0)
	Tap water	5.3(2)	17.2(5)	11.1(1)	0.0(0)
	Tubewell/Handpump	60.05(23)	69.0(20)	55.6(5)	75.0(3)
	Well- Protected	5.3(2)	10.3(3)	22.2(2)	25.0(1)
	Well -Unprotected	10.5(4)	0.0(0)	11.1(1)	0.0(0)
	Tank	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	River	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	Spring	2.6(1)	3.4(1)	0.0(0)	0.0(0)
	<b>Total</b>	<b>100.0(38)</b>	<b>100.0(29)</b>	<b>100.0(9)</b>	<b>100.0(4)</b>
Interior	Bottled water	5.6(2)	7.1(2)	7.7(1)	0.0(0)
	Tap water	8.3(3)	7.1(2)	7.7(1)	0.0(0)
	Tubewell/Handpump	75.0(27)	64.3(18)	76.9(10)	66.7(2)
	Well- Protected	2.8(1)	14.3(4)	0.0(0)	0.0(0)
	Well -Unprotected	8.3(3)	0.0(0)	0.0(0)	0.0(0)
	Tank	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	River	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	Spring	0.0(0)	7.1(2)	7.7(1)	33.3(1)
	<b>Total</b>	<b>100.0(36)</b>	<b>100.0(28)</b>	<b>100.0(13)</b>	<b>100.0(3)</b>
<b>MANDLA</b>					
Plain	Bottled water	1.6(1)	9.1(1)	0.0(0)	0.0(0)
	Tap water	37.5(24)	9.1(1)	0.0(0)	0.0(0)
	Tubewell/Handpump	31.2(20)	63.6(7)	60.0(3)	0.0(0)
	Well- Protected	9.4(6)	0.0(0)	40.0(2)	0.0(0)
	Well -Unprotected	20.3(13)	9.1(1)	0.0(0)	0.0(0)
	Tank	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	River	0.0(0)	9.1(1)	0.0(0)	0.0(0)
	Spring	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	<b>Total</b>	<b>100.0(64)</b>	<b>100.0(11)</b>	<b>100.0(5)</b>	<b>0.0(0)</b>
Interior	Bottled water	1.6(1)	0.0(0)	0.0(0)	0.0(0)
	Tap water	25.8(16)	23.1(3)	20.0(1)	0.0(0)
	Tubewell/Handpump	33.9(21)	30.8(4)	20.0(1)	0.0(0)
	Well- Protected	3.2(2)	7.7(1)	0.0(0)	0.0(0)
	Well -Unprotected	35.5(22)	38.5(5)	60.0(3)	0.0(0)
	Tank	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	River	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	Spring	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	<b>Total</b>	<b>100.0(62)</b>	<b>100.0(13)</b>	<b>100.0(5)</b>	<b>100.0(3)</b>
<b>SIDHI</b>					
Interior	Bottled water	4.1(3)	0.0(0)	0.0(0)	0.0(0)
	Tap water	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	Tubewell/Handpump	35.1(26)	0.0(0)	0.0(0)	0.0(0)
	Well- Protected	35.1(26)	100.0(6)	0.0(0)	0.0(0)
	Well -Unprotected	13.5(10)	0.0(0)	0.0(0)	0.0(0)
	Tank	1.4(1)	0.0(0)	0.0(0)	0.0(0)
	River	2.7(2)	0.0(0)	0.0(0)	0.0(0)
	Spring	8.1(6)	0.0(0)	0.0(0)	0.0(0)
	<b>Total</b>	<b>100.0(74)</b>	<b>100.0(6)</b>	<b>0.0(0)</b>	<b>0.0(0)</b>

Source: Primary Survey

Table 20 :Distribution of Sampled respondents according to their access to MGNREGS in the study districts of M.P.

Type of Villages	Migration Particulars		Type of Farmer				Total
			Marginal	Small	Medium	Large	
			JHABUA				
Plain	Ownership of Job cards	Yes	76.30(29)	89.7(26)	88.9(8)	100.0(4)	83.8(67)
		No	23.70(9)	10.3(3)	11.1(1)	0.0(0)	16.2(13)
		<b>Total</b>	<b>100.0(38)</b>	<b>100.0(29)</b>	<b>100.0(9)</b>	<b>100.0(4)</b>	<b>100.0(80)</b>
	Job cards in the Family	1 card	68.97(20)	65.38(17)	62.50(5)	50.0(2)	65.67 (44)
		2 Cards	31.03(9)	34.62(9)	37.50(3)	50.0(2)	34.33(23)
	Job card owning hhs who were employed in MNREGA (%)		51.72(15)	42.30(11)	62.5(5)	75.0(3)	50.74(34)
	Mean days of employment		32.9(15)	37.86(11)	27.5(5)	35(3)	34.24(34)
Average wage per day (Rs.)		120.75	133.31	125.17	143.25	129.77	
Interior	Ownership of Job cards	Yes	94.4(34)	89.3(25)	76.9(10)	100.0(3)	90.0(72)
		No	5.6(2)	10.7(3)	23.1(3)	0.0	10.0(8)
		<b>Total</b>	<b>100.0(36)</b>	<b>100.0(28)</b>	<b>100.0(13)</b>	<b>100.0(3)</b>	<b>100.0(80)</b>
	Job cards in the family	1 card	67.65(23)	60.0(15)	60.0(6)	66.67(2)	63.89(46)
		2 Cards	32.35(11)	40.0(10)	40.0(4)	33.33(1)	36.12(26)
	Job card owning hhs who were employed in MNREGA (%)		44.12(15)	56.0(14)	40.0 (4)	33.3(1)	47.22(34)
	Mean days of employment		33.11	65.28	20.8	5	45.49
Average wage per day(Rs.)		111.5	123.94	156.6	150	128.38	
MANDLA							
Plain	Ownership of Job cards	Yes	96.9(62)	90.9(10)	100.0 (5)	0.0 (0)	96.25(77)
		No	3.1(2)	9.1(1)	0.0 (0)	0.0 (0)	3.75(3)
		<b>Total</b>	<b>100.0 (64)</b>	<b>100.0 (11)</b>	<b>100.0 (5)</b>	<b>0.0 (0)</b>	<b>100.0 (80)</b>
	Job cards in the family	1 card	54.84(34)	60.0(6)	80.0 (4)	0.0 (0)	57.14(44)
		2 Cards	45.16(28)	40.0(4)	20.0 (1)	0.0 (0)	42.86(33)
	Job card owning hhs who were employed in MNREGA (%)		75.80(47)	70.0(7)	80.0 (4)	0.0 (0)	75.32(58)
	Mean days of employment		72.94	58.25	75.83	0.0(0)	68.25
Average wage per day Rs.)		111.61	127.19	105.83	0.0(0)	114.56	
Interior	Ownership of Job cards	Yes	96.8(60)	100.0(13)	80.0(4)	0.0(0)	96.2(77)
		No	3.2(2)	0.0(0)	20.0(1)	0.0(0)	3.8(3)
		<b>Total</b>	<b>100.0 (62)</b>	<b>100.0 (13)</b>	<b>100.0 (5)</b>	<b>0.0(0)</b>	<b>100.0 (80)</b>
	Job cards in the family	1 card	43.33(26)	69.23(9)	75.0(3)	0.0(0)	49.35(38)
		2 Cards	56.67(34)	30.76(4)	25.0(1)	0.0(0)	50.64(39)
	Job card owning hhs who were employed in MNREGA (%)		66.67(40)	69.23(9)	100.0(4)	0.0(0)	68.83(53)
	Mean days of employment		61.59	75.64	46.4	0.0(0)	61.89
Average wage per day (Rs)		116.17	113.08	110	0.0(0)	114.30	
SIDHI							
Interior	Ownership of Job cards	Yes	93.24(69)	66.67(4)	0.0(0)	0.0(0)	91.25(73)
		No	6.76(5)	33.33(2)	0.0(0)	0.0(0)	8.75(7)
		<b>Total</b>	<b>100.0(74)</b>	<b>100.0(6)</b>	<b>0.0(0)</b>	<b>0.0(0)</b>	<b>100.0(80)</b>
	Job cards in the family	1 card	34.78(24)	75.0(1)	0.0(0)	0.0(0)	34.25(25)
		2 Cards	65.22(45)	25.0(3)	0.0(0)	0.0(0)	65.75(48)
	Job card owning hhs who were employed in MNREGA (%)		86.95(60)	100.0(4)	0.0(0)	0.0(0)	87.67(64)
	Mean days of employment		70.19	60	77.5	85	67.83
Average wage per day Rs.)		116.78	105.56	0.0(0)	0.0(0)	113.37	

Source: Primary Survey



Particularly women and minor children are affected most. Enforced migration has also led to an increasing number of scheduled tribes working as contract labourers in the construction industry and as domestic workers in major cities(GOI, 2014). The main reason for migration includes poverty, lack of food, lack of profits in farming, unemployment, lesser wage rate and lack of MGNERGA work in the villages (see table 22). High productivity agricultural areas continue to be important destinations, but rural urban migration is the fastest growing type of migration as more migrants choose to work in better paying non-farm occupations in urban areas and industrial zones(Deshingkar and Akther, 2009).

Table 21. Distribution of Sampled respondents according to their migration in the study districts of Madhya Pradesh during the year 2013-14.

Type of Villages	Migration Particulars	Type of Farmer				Total
		Marginal	Small	Medium	Large	
		JHABUA				
Plain	Migrating hhs (%)	47.36	78.57	77.77	75.0	62.50
	Average days of migration	84.06	131.45	111.71	73.33	108.14
	Permanent	5.6(1)	22.7(5)	0.0(0)	0.0(0)	12.0(6)
	Seasonal	94.4(17)	77.3(17)	100.0(7)	100.0(3)	88.0(44)
	Temporary	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	<b>Total Migrating hh</b>	<b>18 (100.0)</b>	<b>22(100.0)</b>	<b>7(100.0)</b>	<b>3(100.0)</b>	<b>100.0(50)</b>
Interior	Migrating hhs (%)	58.33	60.71	100.0	33.33	65.0
	Average days of migration	109.10	145.0	116.54	0.0	122.96
	Permanent	14.3(3)	5.9(1)	0.0(0)	100.0(1)	9.6(5)
	Seasonal	85.7(18)	94.1(16)	100.0(13)	0.0(0)	90.4(47)
	Temporary	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	<b>Total</b>	<b>100.0 (21)</b>	<b>100.0 (17)</b>	<b>100.0(13)</b>	<b>100.0 (1)</b>	<b>100.0(52)</b>
		MANDLA				
Plain	Migrating hhs (%)	46.87	54.54	40.0	0.0(0)	47.5
	Average days of migration	91.93	54.50	145.0	0.0	88.82
	Permanent	20.0(6)	0.0(0)	0.0(0)	0.0(0)	15.8(6)
	Seasonal	70.0(21)	100.0(6)	100.(2)	0.0(0)	76.3(29)
	Temporary	10.0(3)	0.0(0)	0.0(0)	0.0(0)	7.9(3)
	<b>Total</b>	<b>100.0 (30)</b>	<b>100.0 (6)</b>	<b>100.0 (2)</b>	<b>0.0(0)</b>	<b>100.0 (38)</b>
Interior	Migrating hhs (%)	50.0	61.53	40.0	0.0(0)	51.25
	Average days of migration	76.58	67.75	86.50	0.0(0)	81.82
	Permanent	9.7(3)	25.0(2)	0.0(0)	0.0(0)	12.2(5)
	Seasonal	90.3(28)	75.0(6)	100.0(2)	0.0(0)	87.8(36)
	Temporary	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	<b>Total</b>	<b>100.0 (31)</b>	<b>100.0 (8)</b>	<b>100.0 (2)</b>	<b>0(0.0)</b>	<b>100.0 (41)</b>
		SIDHI				
Interior	Migrating hhs (%)	20.27	0.0(0)	0.0(0)	0.0(0)	18.75
	Average days of migration	256.67	0.0(0)	0.0(0)	0.0(0)	256.67
	Permanent	33.3(5)	0.0(0)	0.0(0)	0.0(0)	33.3(5)
	Seasonal	66.7(10)	0.0(0)	0.0(0)	0.0(0)	66.7(10)
	Temporary	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)
	<b>Total</b>	<b>100.0(15)</b>	<b>0.0(0)</b>	<b>0.0(0)</b>	<b>0.0(0)</b>	<b>100.0(15)</b>

Source: Primary Survey

Table 22 : Migration details of the study villages in Mandla and Sidhi districts of Madhya Pradesh during the year 2013-14.

SIDHI						
Village	Number of Households Migrating	Type of work involved during migration	Place of out migration (Urban=1 Rural=2)	Age groups involved (15-25 years=1 26-50 years=2 Over 50 years=3)	Nature of out migration (Seasonal/ Temporary=1 Permanent=2)	Reasons for Migration
Dubari Kalan	30	Factories, Sugar cane Harvesting, watchman duty for building	1	1 and 2	1	Poverty and lack of profits in farming
Pondi	100	Sugarcane Cutting(Gujrat), Wheat harvesting(Meerut) and textile mills (Bombay and Surat).	1	1 and 2	1	Lack of employment in village, lack of food due to landlessness.
Pankhora	Nil	-	-	-	-	-
MANDLA						
Thadipattar	8	Factories(Meerut) and Building construction work (Punjab)	1	1	1	-
Pindraimall	25	Construction work, Canal works and porters in Railway station	1	1 and 2	1 (5-6 months)	1. No employment in the village 2. Wage rate is less in village.
Chourai	10-15	Building construction work and as labour on Borewell drilling machine.	1	2	1	
Udaipur	20-25	Building Construction (Jabalpur)	1	1	1 (3-4 months)	1. Less Agriculture 2. No factories and market. 3. No market 4. No timely work in NREGA 5. Less wage rate
Kamtara	15-20	Building construction and Paper mills.	1	2	1 (2 to 2.5 months)	

Source: FGDs in Mandla and Sidhi.

### 6.2.9 Access to Irrigation

Majority of the respondents land was under rainfed cultivation and in interior areas of study districts the land under rainfed cultivation was more as compared with plain areas (see table 23). Plain areas were having better access to canal and dug well irrigation and whereas interior villages had better access through tank irrigation. In plain areas very few acres of land was irrigated by the sampled hhs by purchasing water from other sources. Change in the fully irrigated area of tribal areas of M.P during the period 2002-07 indicates decline of 10% among small and marginal farmers, while it remained same for the medium farmers and for large farmers it increased by 2%(CMS, 2009).

**Table 23: Distribution of respondents according to Source of irrigation land in acres**

Source of irrigation	Jhabua		Mandla		Sidhi
	Plain areas	Interior areas	Plain areas	Interior areas	Interior areas
Rain fed	58.13(193)	78.18(283)	53.14(169)	67.69(176)	84.10(127)
Canal	10.84(36)	2.21(8)	11.63(37)	3.07(8)	0.0(0)
Bore well	4.22(14)	3.31(12)	0.0(0)	0.0(0)	0.0(0)
Dug well	9.94(33)	3.87(14)	10.38(33)	10.77(28)	7.95(12)
Tank	5.42(18)	12.43(45)	7.55(24)	17.69(46)	0.0(0)
Streams	0.0(0)	0.0(0)	1.57(5)	0.0(0)	0.0(0)
Purchasing water	1.80(6)	0.0(0)	1.88(6)	0.0(0)	0.0(0)
Lift from canal/ tank/river/others	9.64(32)	7.46(27)	13.84(44)	0.77(2)	7.95(12)
Total	100.0(332)	100.0(362)	100.0(318)	100.0(260)	100.0(151)

*Source:* Primary Survey

*Note:* Figures in the paranthesis indicate the actual number of acres

### 6.2.10 Crop Diversity

Despite the constant encouragement for monocropping by the agricultural extension agencies, private seed and pesticide and fertiliser companies from past three decades, farmers still follow huge crop diversity realizing its merit. Villagers in the tribal areas have adopted inter and mixed cropping practice as a coping strategy to counter the impact of environmental degradation(ASA, 2003).Table 24 indicates that maize and cotton were predominantly cultivated in villages located in both interior and plain areas followed by soyabean cotton. In Mandla district crop diversity was high with pulses and millets in farming system. Crop genetic diversity is an essential dimension of agricultural production in low-input farming systems; a reduction in diversity often leaves small cultivators more vulnerable (Poinetti and Reddy 2002; Reddy 2009). Dry sown paddy was occupying highest acreage in plain villages followed by kodo millet and maize respectively. Whereas in villages located in interior areas, dry sown paddy was predominant followed by maize. Surprisingly soyabean is not cultivated by the sampled households in

Mandla. Marginal farmers of Mandla have predominantly grown traditional food crops such as maize, fox tail millet, kodo millet and jowar. In Sidhi district, interior villages have mainly cultivated dry sown paddy followed by kodo millet, redgram and maize respectively. Adoption of crop diversity has positive influence on the soil fertility (Reddy, 2011). Minor millet diversity is very crucial for the vulnerable and geographically isolated tribal people with regards to food security and climate combat mechanism (Aravindakshan and Sherief, 2010).

Table 24: Acreage of crops across size classes of sampled households in both plain and interior villages of study districts of Jhabua, Mandla and Sidhi in M.P during 2013-14

JHABUA											
S.No	Crop	Marginal Farmer		Small Farmer		Medium Farmer		Large Farmer		Total	
		P V	I V	P V	I V	P V	I V	P V	I V	P V	I V
1	Paddy(Irrig.)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	2(2)	0(0)	3(3)	0(0)
2	Maize	18(15)	19(19)	18(16)	26(15)	5(4)	5(5)	1(1)	5(1)	42(36)	55(40)
3	Cotton	5(5)	14(10)	4(2)	4(4)	1(1)	0(0)	0(0)	5(1)	10(8)	23(15)
4	Vegetables	10(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	10(1)	0(0)
5	Soyabean	16(9)	6(6)	12(6)	9(5)	6(6)	7(7)	2(2)	0(0)	36(23)	22(18)
6	Ground nut	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	5(1)	0(0)	5(1)
7	Total	50(31)	39(35)	34(24)	39(24)	12(11)	12(12)	5(5)	15(3)	101(71)	105(74)
MANDLA											
1	Rainfed Paddy	71(34)	58 (34)	16(4)	21(9)	9(3)	24(5)	0(0)	0(0)	96(41)	104(48)
2	Jowar	0.5(1)	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	1(2)	0(0)
3	Maize	8(11)	60 (10)	3(2)	1(1)	0.5(1)	2(1)	0(0)	0(0)	12(14)	63(12)
4	Fox tail millet	5(1)	1 (1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	5(1)	1(1)
5	Kodo millet	20(2)	2 (2)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	20(2)	2(2)
6	Redgram	0.5(1)	0(0)	1(1)	2(1)	0.5(1)	0(0)	0(0)	0(0)	2(3)	2(1)
7	Blackgram	1(1)	1 (1)	0(0)	0(0)	0(0)	3(1)	0(0)	0(0)	1(1)	4(2)
8	Cotton	0(0)	0(0)	0(0)	0(0)	0(0)	1(1)	0(0)	0(0)	0(0)	1(1)
	Total	106 (51)	123 (48)	21(8)	24(11)	10(5)	30(8)	0(0)	0(0)	136(64)	177(67)
SIDHI											
1	Rainfed Paddy	0(0)	81(40)	0(0)	7(6)	0(0)	0(0)	0(0)	0(0)	0(0)	88(71)
2	Jowar	0(0)	0.5(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0.5(1)
3	Maize	0(0)	11(7)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	11(17)
4	Fox tail millet	0(0)	5(2)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	5(1)
5	Kodo millet	0(0)	23(14)	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	24(7)
6	Redgram	0(0)	18(9)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	18(10)
7	Total	0(0)	139(73)	0(0)	8(7)	0(0)	0(0)	0(0)	0(0)	0(0)	147(80)

Source : Field Survey 2013-14

Note : PV= Plain area villages; IV =Interior area villages. Figures in the parenthesis indicate the number of households

It is clearly evident from table 25 that there was almost negligible access of crop inputs loan to all size class farmers of both plain and interior villages in study area. This has huge implications for cultivation. As a result of this poor tribal households have to depend on private sources for credit who inturn exploiting them charging high interest rates.

**Table 25. Distribution of sampled hhs according to their access to crop inputs loan in the study districts of Madhya Pradesh (Percent).**

Type of Villages	Access to Crop Input Loan	Type of Farmer				Total
		Marginal	Small	Medium	Large	
<b>JHABUA</b>						
Plain	Yes	0.0(0)	0.0(0)	11.11(1)	0.0(0)	1.25(1)
	No	100.0(38)	100.0(29)	88.89(8)	100.0(4)	98.75(79)
	Total	100.0(38)	100.0(29)	100.0(9)	100.0(4)	100.0(80)
Interior	Yes	2.78(1)	10.71(3)	0.0(0)	0.0(0)	5.0(4)
	No	97.22(35)	89.29(25)	100.0(13)	100.0(3)	95.0(76)
	Total	100.0(36)	100.0(28)	100.0(13)	100.0(3)	100.0(80)
<b>MANDLA</b>						
Plain	Yes	4.69(3)	0.0(0)	0.0(0)	0.0(0)	3.75(3)
	No	95.31(61)	100.0(11)	100.0(5)	0.0(0)	96.25(77)
	Total	100.0(64)	100.0(11)	100.0(5)	0.0(0)	100.0(80)
Interior	Yes	1.61(1)	7.69(1)	0.0(0) (0)	0.0(0)	2.5(2)
	No	98.39(61)	92.31(12)	100.0(5)	0.0(0)	97.5(78)
	Total	100.0(62)	100.0(13)	100.0(5)	0.0(0)	100.0(80)
<b>SIDHI</b>						
Interior	Yes	2.70(2)	0.0(0)	0.0(0)	0.0(0)	2.50(2)
	No	97.30(72)	100.0(6)	0.0(0)	0.0(0)	97.50(78)
	Total	100.0(74)	100.0(6)	0.0(0)	0.0(0)	100.0(80)

*Source:* Primary Survey

### 6.2.11 Livestock

This is most crucial aspect influencing the agricultural practice of sampled households of both plain and interior villages. Quantity and quality of livestock influences the soil fertility management both directly and indirectly. Higher the livestock number, more is the access to organic manures which will inturn makes soils healthy giving resistance to plants for with standing pest and diseases. The livestock component of the farming system is crucial to help maintain soil fertility, supply of draft power and food for the family (Reddy 2001, Reddy 2011).

Table 26: Mean Distribution of sampled hhs according to their ownership of livestock in the study districts of Madhya Pradesh (Percent)

Type of Villages	Livestock category	Type of Farmer				Total
		Marginal	Small	Medium	Large	
			JHABUA			
Plain	Cows	1.42	1.07	1.0	1.50	1.25
	Bullocks	1.67	2.06	1.71	2.0	1.85
	Buffaloes	1.40	1.38	1.40	6.0	1.63
	Small Ruminants	3.81	1.80	1.75	2.67	2.85
	Pigs	0	1.0	0	0	1.0
	Poultry	2.40	2.0	2.0	10.0	2.71
Interior	Cows	1.19	1.62	1.11	1.0	1.32
	Bullocks	1.57	1.72	1.78	1.0	1.64
	Buffaloes	1.38	1.55	1.0	1.50	1.37
	Small Ruminants	1.88	2.22	2.70	0	2.20
	Pigs	0	0	0	0	0
	Poultry	3.88	4.43	3.57	0	3.75
			MANDLA			
Plain	Cows	1.52	1.0	1.0	0	1.41
	Bullocks	2.14	2.25	3.60	0	2.30
	Buffaloes	3.80	2.0	0	0	3.64
	Small Ruminants	4.33	0	2.50	0	3.60
	Pigs	1.67	1.0	1.0	0	1.40
	Poultry	3.09	2.0	1.0	0	2.79
Interior	Cows	1.73	2.0	2.0	0	1.79
	Bullocks	1.98	2.20	2.25	0	2.03
	Buffaloes	1.60	1.67	4.0	0	1.89
	Small Ruminants	1.29	0	0	0	1.29
	Pigs	2.50	0	0	0	2.50
	Poultry	2.82	1.67	0	0	2.65
			SIDHI			
Interior	Cows	1.34	1.0	0	0	1.32
	Bullocks	2.18	2.3	0	0	2.19
	Buffaloes	1.0	0	0	0	1.0
	Small Ruminants	3.18	0	0	0	3.18
	Pigs	-	0	0	0	0
	Poultry	2.23	3.0	0	0	2.31

Source: Primary Survey

The population of cows and bullocks has come down in all sample villages. FGDs revealed that even now bullocks play a crucial role in agricultural operations and there are negligible number of tractors in the study villages. "Bina bail ka Gujaran nahi", says, Gorelal Baigha of Pondi village (without livestock there is no existence). Some mechanization could be

seen in Jhabua district where in use of tractors and harvesting machines were used. Earlier each hh used to have atleast one pair of bullocks. Very few hhs used to have cows. Due to poverty sampled hhs could not buy buffaloes. During the FGD Baburam Markans of Kamthara says "*Baail tho jaroori hai*"(as bullocks are essential we, keep it). Table 26 indicates the mean livestock owned by different size class farmers in plain and interior villages. It can be seen that in all the study districts both in villages near to plain areas and in the interior villages, mean size of bullocks was more except in the plain villages of Mandla. This highlights that hitherto, In general most of the study villages used to keep more livestock as they used to get fodder in forest and also in the village. Discussion in the FGDs Revealed that now the access to forest is restricted by the department and the lands available have been improved and are distributed to people. All these things influenced the reduction in livestock population. Livestock population has reduced due to the fodder and drinking water shortages because of recurring drought (ASA, 2003 and Ranjitha 2004). Pigs were prominently seen in villages of Mandla district. Among small ruminants, goats were predominant and in majority of the study villages sheep was not present. Village wise and livestock category wise details of Kusumi block of Sidhi district gives a glimpse of this scenario (see table 27)

**Table 27: Live stock population in the study villages of Sidhi district in Madhya Pradesh during the year 2013-14**

District	Block	Village	Buffaloes	Cows	Bullocks	Sheep	Goats	Other
Sidhi	Kusumi	Duhari	10	160	190	-	22	100(Poultry)
		Podi	10	500	100	-	110	400(poultry)and 6 (Pigs)
		Pankhaira	-	12	25	-	10	-
		Thadipattar	8	320	250	-	300	

Source: Village records.

### 6.2.12 Sources of Credit

The present study tried to assess the credit sources of sampled households. Table 28 reveals that more than 95 percent of the sample farmers did not have access to any loans. There is not much difference between plain and interior villages with respect to access to loans. Only 2 percent of the sampled households had availed loans from cooperative banks. However, the credit facilities extended by the cooperative agencies in view of rising cost of cultivation are inadequate and hardly benefit small farmers (Mohanty, 1999). Commercial banks gave loans to negligible (0.5 percent) number of sampled households. It is a disheartening sign that public sector banks are not able to cater to the credit needs of the farmers. The formal credit agencies provide low cost credit, facilities of repayment in installments and the possibility of postponement of repayment in case of crop failure (Mohanty and Shroff, 2004). Hence, the credit disbursement of these

banks has to be increased for reducing dependency on private money lenders who charge exorbitant interest charges. Rural credit plays an important role in meeting the financial requirements of the resource poor (Adolph and Butterworth, 2002). Interestingly, the dependence on fertiliser and pesticide dealers is not seen in the study districts which is contrary to the scenario in other rural parts of India.

**Table 28 : Distribution of households reported source loans in the study area**

District name	Type of village	No Loans	Employer/SHG Landlord	Commercial	Co-operative Bank	Bank	Total
Jhabuva	Plain	100.0 (80)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	100.0 (80)
	Interior	88.8 (71)	0.0(0)	1.2 (1)	0.0(0)	10.0 (8)	100.0 (80)
	Total	94.4 (151)	0.0(0)	.6 (1)	0.0(0)	5.0 (8)	100.0 (160)
Mandla	Plain	97.5 (78)	1.2 (1)	.0 (0)	1.2 (1)	0.0(0)	100.0 (80)
	Interior	96.2 (77)	1.2 (1)	1.2(1)	1.2 (1)	0.0(0)	100.0 (80)
	Total	96.9 (155)	1.2 (2)	.6 (1)	1.2 (2)	0.0(0)	100.0 (160)
Sidhi	Interior	100.0 (80)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	100.0 (80)
	Total	100.0 (80)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	100.0 (80)
	Grand total	96.5 (386)	0.5 (2)	0.5(2)	0.5 (2)	2.0(8)	100 (400)

Source : Based on primary survey

Size class wise analysis (see table 29) with regards to source of credit indicated that a couple of marginal farmers have access credit from Self Help Groups and small farmers depended on cooperative banks. SHGs or other community based forum has not evolved to the desired extent which made access to formal banking system very weak in tribal areas for agriculture sector(CMS, 2009). Micro-finance through SHGs and network of SHGs can play an important role in meeting the credit needs of farmers in the tribal regions(ASA, 2003).

**Table 29 : Size class wise distribution of sampled households with respect to source of loans in the study area during the year 2013-14**

Source of Credit	Size-Class		
	MF	SF	MDF and LF
<b>Villages in Plain Areas</b>			
Did not take any loan	98.0 (100)	100.0 (40)	100.0 (18)
Land lord	1.0 (1)	0.0 (0)	0.0 (0)
SHG	0.0 (0)	0.0 (0)	0.0 (0)
Commercial Bank	1.0 (1)	0.0 (0)	0.0 (0)
Cooperative	0.0 (0)	0.0(0)	0.0(0)
<b>Villages in interior Areas</b>			
Did not take any loan	98.9 (170)	85.1(40)	85.7(18)
Land lord	0.0(0)	2.1(1)	0.0(0)
SHG	1.2(2)	0.0(0)	0.0(0)
Commercial Bank	0.0 (0)	0.0(0)	4.8(1)
Cooperative	0.0 (0)	12.8(6)	9.5 (2)

Note: MF=Marginal Farmers; SF= Small Farmers; MDF & LF= Medium and Large Farmers



### 6.2.13 Cost of Cultivation

The farmers of the sample villages cultivated diverse crops in different soil types. The per acre cost of cultivation of sampled households for the year 2013-14 was calculated taking into consideration expenses of bullock power, machine power, farm yard manure, fertilisers, pesticides, agricultural implements, irrigation expenses and human labour.

Table 30: Per acre cost of inputs used by sampled households in the study area of Madhya Pradesh during the year 2013-14.

Variables Village Type	Jhabuva		Mandla		Sidhi
	Plain	Interior	Plain	Interior	Interior
Bullock power	825	715	699	938	769
Tractor power	620	647	680	692	722
Seed	780	759	962	787	188
Farm Yard Manure	1237	1270	1037	951	1063
Fertiliser	1390	1254	1331	1107	1118
Pesticide	345	225	378	125	83
Agricultural Implements repaired/purchased	1020	1082	651	595	722
Human labour	943	902	1039	1266	828
Irrigation charges(Human labour/diesel/ electricitycharges)	1651	1558	1085	939	834
Total cost of all inputs	8811	8412	7862	7400	6327

Source: Based on Primary Survey.

Empirical evidence from the field for the year 2013-14 reveals that, per acre cost of cultivation of sampled households was slightly higher in the plain area villages as compared with interior villages(see table 30). In sidhi, all the villages were interior and the cost of cultivation was much lesser (Rs.6327/acre). Expenses on fertilizer were lesser in interior villages. Similarly, very less expenditure was seen on pesticides and that it was spent for only commercial crops such as cotton and soya bean. Further analysis was done so as to look at the cost of cultivation of major crops cultivated by the sampled households and the net incomes from these crops. This was calculated by subtracting cost of crop production from gross income of crop produce. As per the table 31, the cost of cultivation of cotton and soya crop was more both in plain area villages and interior villages of Jhabua district. Study done by Catalytic Management Services in M.P (2009) found that among the major crops highest proportion of increase on cost of production is noticed in cotton followed by maize and cotton. As compared with Jhabua, the per acre cultivation expenses of cotton and soya were lesser in Mandla and Sidhi district (see table 31). Cultivation expenses of traditional food crops (paddy, maize and millets) were much lesser.

The farmers in tribal areas recognize the benefits of using manure and hence use farm yard manure worth of more than thousand rupees for majority of the crops and with the relatively high costs of mineral fertilisers, manuring could play a greater role in maintaining soil fertility (Powell and Williams, 1995). It can be seen from table 31, that, there was no pesticide spraying on food crops paddy and millets. Similarly, there was no chemical fertilizer use in case of millet crops. Focused group discussions revealed that the cultivation of maize, kodo and kutki millet cultivation was prominent in the study districts.

Table 31 : Cultivation expenses of major crops grown in the study villages of Jhabua, Mandla and Sidhi districts of Madhya Pradesh during the year 2013-14(Per acre).

Village Type	Crop name	Bulls power	Tractor power	Seed value	FYM	Fertilizer	Pesticide	Human labour	Total
<b>Jhabua</b>									
Plain	Paddy	772	552	866	1161	804	0.00	610	4765
	Maize	846	761	570	1107	1011	243	750	5288
	Cotton	950	333	875	2500	3653	1975	900	11186
	Soya	883	533	1430	1741	1516	916	1050	8069
Interior	Paddy	613	494	562	828	571	0.00	590	3658
	Maize	736	663	511	1359	1238	210	723	5440
	Cotton	943	1057	1153	2350	2743	1278	880	10404
	Soya	820	625	1325	1684	1863	891	1020	8228
<b>Mandla</b>									
Plain	Paddy	432	725	838	720	343	0.00	605	3663
	Maize	781	588	693	900	1016	387	670	5035
	Little millets	800	0.00	50	1750	0.0	0.00	315	2915
	Red gram	937	600	152	1243	0.00	0.00	540	3472
	Cotton	1000	700	1000	950	1325	1075	870	6920
	Soya	746	725	1242	1290	1433	649	1010	7095
Interior	Paddy	1203	550	804	702	1044	0.00	580	4883
	Maize	883	691	781	962	1131	710	650	5808
	Red gram	770	600	203	1010	500	0.00	503	3583
	Cotton	975	762	737	1333	1518	1005	845	7175
	Soya	755	705	946	1036	968	573	980	6926
<b>Sidhi</b>									
Interior	Paddy	799	543	651	1041	859	0.00	450	4343
	Maize	584	633	363	900	613	350	603	4046
	Little millets	700	500	66	556	0.00	0.00	289	2111
	Cotton	860	991	937	993	2031	652	834	7298
	Soya	790	888	1220	1247	1271	913	807	7136

Source: Based on primary survey.

Analysis of the table 32 revealed that the net incomes varied for different crops in study villages. Net incomes were more for cotton, paddy and soya bean in Jhabua, Mandla and Sidhi districts respectively. Except, cotton and soya crops, net incomes of other crops were below or around 4500 rupees. In Jhabua plain areas and sidhi interior areas, paddy gave negative incomes. This could be due to low rainfall during the crop maturity stage which affected crop yields. Same was the case with soyabean in Jhabua. Noticably, in Sidhi district, little millet gave an income of Rs.4359 per acre.

**Table 32: Net income of major crops cultivated by sampled households in the study area of Madhya Pradesh state during the year 2013-14.**

Name of the District	Village Type	Crop name	Grain yield in Kgs	Grain income in Rs	Fodder income in Rs	Gross income in Rs	Total cultivation expenses	Net income
				Jhabuva				
Jhabuva	Plain	Paddy	450	3450	325	3775	4765	-990
		Maize	305	3483	2402	5885	5288	597
		Cotton	491	16366	662	17028	11186	5622
		Soya	371	7706	1239	8945	8069	635
	Interear	Maize	352	3800	2307	6107	5440	667
		Cotton	416	11580	650	12230	10404	1826
Soya		443	9044	1200	10244	8228	1750	
Mandla	Plain	Paddy	429	6039	754	6793	3663	2585
		Maize	308	2146	3914	6060	5035	1025
		Little millets	362	3625	500	4125	2915	1210
		Red gram	75	5250	1000	6250	3472	2778
	Interear	Paddy	391	8367	730	9097	4883	4214
		Maize	225	1697	4375	6072	5808	264
Red gram		203	2700	350	3050	3583	-530	
Sidhi	Interear	Paddy	237	3240	432	3672	4343	-671
		Maize	201	2408	4000	6408	4046	2362
		Little millets	234	5845	625	6470	2111	4359
		Soya	516	13500	1516	15016	7136	7880

Source: Based on primary survey.

## 7. Process of Changes in Socio-economic life of tribals :

The present study has tried to understand the changes taking place in the socio-economic spheres of tribal families in the study districts of Jhabua, Mandla and Sidhi of Madhya pradesh. Focused group discussions were conducted with men and women farmers in each and every study villages. Comparison was made between the situation in the year 2015 and the scenario during 10-15 years back in early 2000. These changes were assessed with respect to poverty, education, health, food habits, farming situation, crops grown,

Table 33: Process of Changes in Tribal Socio-economic life in Study districts of Madhya Pradesh

S.No	Particulars	Now in 2015	Hitherto 10-15 years back
1	Poverty	<p>Now employment has improved, especially through MGNREGA and other works. Works such as <i>Medbandh</i> (bundling), <i>Khet Talab</i> (farm ponds) are done in agricultural fields. Households are earning 85-Rs100/day. In Tadipatar village of Sidhi district nearly 75% of households(hhs) don't have land on their name and still they are not considered under BPL families. Only their parents have few acres. If divided, each person gets less than 1-1.5 acres. They are deprived of benefits which BPL families can get. In general, MGNREGA Job card gave employment from 1 week to 50 days. However, in certain villages, payment is received only after 3-4 months. The measurement is being done wrongly and hence in some villages people are getting around Rs50 per day. Sanjay Marku of Kamtara village, says, "<i>Officer moolyankan me kaahi natak banathe</i>" (while taking measurement of our work, they do all kinds of dramas to deceive us) . "<i>Job card rahkar bhi mathlab nahi, bus show piece hai, bolne ke liye tho saav dhin ka kaam bolthe</i>", says, Kubudas of Kusumi village (there is no meaning of possessing the Job card, it is like a show piece, only for name sake they say 100 days employment". When there is no work people just migrate with a bag.</p>	<p>Lot of poverty. Earlier, paddy was not cultivated. "<i>Naukar Chakar</i>" (free bonded labour) was prevalent until 15 years ago. Earlier, unless and until they had gone for wage, the hhs could not afford to eat a meal on that particular day. People used to plan things properly to migrate.</p>
2	Education	<p>Children of all the hhs go to the school. Earlier few girls used to go to school where as now all girls go to the school. More enrolment of children is seen in schools. However, all the schools have less permanent teachers and more temporary teachers. Children also attend school for the sake of mid-day meal and as a result get some education.</p>	<p>We used to study upto a maximum 3-5th class. That too hardly 15-20 students in a village. It was not the same case earlier</p>
3	Health	<p>Now more health problems due to consumption of rice. "<i>Pahale jangal ki Dawah se teek ho jatha tha! Ab tho kahi injection lene par bhi teek nahi ho re</i>" says Shankar lala baigha of Bubari kalan village in Sidhi district. Now headache, weakness and all kinds of body pains. However access to treatment has improved. Medical facilities and medical shops have improved. Vehicles are available in emergency. Now all kinds of diseases are attacking. Now lot of paralysis attack could be seen. Only some villages have tapped water supply. Though the access to food has improved, the health is getting affected due to consumption of food grown using agro-chemicals.</p>	<p>Due to chemical free food and consumption of kodo kutki, one used to be healthy. Earlier mainly cold and headache incidence was seen. Earlier we used to die in the village itself. Malaria used to be predominant. Tapped water supply was not there to any household. Earlier due to more physical work, women used to have normal delivery but now they get operated.</p>

Table 33 contd...

S.No	Particulars	Now in 2015	Hitherto 10-15 years back
4	Agriculture	<p>Presently very less rains are received.</p> <p><i>Seeds:</i> Now some Government seed is used in case of Paddy, Maize and Redgram.</p> <p>Now Chemical fertilizer (Shasan ka khad) is being used. If it is not used for one season, yields are reducing. If excess is used, it results in Scorching. In certain crops some farmers use a bit of Pesticide. Crops are more or less same but area under crops such as Kodo Kutki has come down. Now farming area has come down and people are preferring to do labour work and migrate for work. Modern varieties need more fertilizer and pesticides and when not used in required quantities, the yields are going down these days.</p> <p>Now machinery is being used in farming including harvesting of crops.</p>	<p>Hitherto we received good rains.</p> <p>Earlier we used to save our own seed (<i>ghar ka bheej</i>). Farm yard manure (<i>desi Khad</i>) was used</p> <p>No pesticides were used. People used to do farming in bigger area.</p>
5	Major Crops	<p>Kharif: Cotton (<i>Kapas</i>), Soybean, Rice (<i>Dhan</i>), Kodo (<i>Kodo millet</i>), Kutki (<i>barnyard millet</i>) Maize (<i>Mecca</i>), Redgram (<i>Thuvvar/Rahar</i>) Black gram (<i>Urad</i>), Sesame (<i>Tili</i>), Niger (<i>Ramthil/Jagni</i>), Pea (<i>Field bean</i>), Barbatti, Tomato and Chillies.</p> <p>Rabi: Peas (<i>Batra/Mutter</i>), Linseed (<i>Alsi</i>), Lentils (<i>Masoor</i>), Wheat, Chick pea (<i>Chana</i>), Sarson (<i>Rai</i>). And Balor (<i>big beans</i>). Now maize is cultivated even in rabi.</p>	<p>Kharif: Kodo, Kutki, fox tail millet, finger millet, paddy (<i>Dhan</i>), Jowar, Bajra, Ground nut, Redgram (<i>Arhar</i>), Black gram, Green gram, Til, Niger and cow pea (<i>Chowle long</i>)</p> <p>Rabi: Peas (<i>Batra/Mutter</i>), Linseed (<i>Alsi</i>), Lentils (<i>Masoor</i>), Wheat, Chick pea (<i>Chana</i>), Sarson (<i>Rai</i>)</p>
6	Livestock	<p>Now livestock population has come down due to lack of grazing land, restriction to forest areas, distribution of land by government to poor and cultivation in larger area. For maintaining a pair of livestock a person has to stay the whole year in the village with migrating for search of employment and hence are not showing interest to keep livestock. In general all categories of livestock are reduced in number, but in Jhabua district study villages cow population has increased due to increasing demand for cow milk. Even in majority of the villages goat population has increased. Now in Forest areas instead of fodder grass, parthenium (congress grass) and ipomea (<i>besheram</i>) is growing. Now the cost of a pair of bullocks has gone up. Now in study villages of Jhabua, tractor is being used for ploughing the land.</p>	<p>Earlier each household used to maintain atleast 1 pair of bullocks. Very few hhs used to have cows. Buffaloes were not present (could not afford due to poverty)</p> <p>More livestock was maintained due to access fodder from forest and also from within village.</p>
7	Agricultural Wage	<p>50/day</p> <p>60-75 (female) and 65-70 (male)</p>	<p>10-15/day and 25/day</p> <p>20/day (women)</p> <p>15/day (women)</p>

Table 33 contd...

S.No	Particulars	Now in 2015	Hitherto 10-15 years back
8	Other Wage labour	1.Rs200-300 2. Rs150/day	50-70/day 25-30/day
9	Food Habits	Meccai ki Kichdi, Meccai ki roti, Meccai ki bath, kodo ki bath, rice and wheat. Consumption of Kodo Kutki has reduced now. The taste of food has gone down. Now, we purchase vegetables once in a week. The quantum of food consumed is good now. We do eat earlier food types but in lesser quantities. Now the hhs get Rice and wheat through PDS. " <i>Ab dal chaval, kuch accheheech kathe</i> " says Delan Maravi of Kusumi village of Mandla district (now we eat rice and dal which is much better than hitherto).	Baaji, Meccai ki roti, Besan and Dal, Meccai ki Kichdi, Meccai ki, Bajra and Jowar roti bath and kodo ki bath. Earlier food used to be tasty (" <i>Pahela khana meeti meeti laghthi thi</i> "). Earlier once in 15-20 days we used to buy vegetables from market. Earlier, to fill the stomach we used to eat roasted Mohua flower, meccai ki pathla kichdi and Chekonda Bhaji. Earlier, we used to eat mostly forest based foods.
10	Alcohol Consumption	Scenario is same, but the quantity of liquor consumption has come down. Now some people have stopped as it is affecting their health and livelihood. Earlier, Mohua liquor was consumed by people mixing with water and it used to be good for health.	Earlier alcohol consumption used to be more.
11	Shifting cultivation	Now it is not present in every village and was stopped by Forest Department. However <i>Katni/Dahiya Dokha/Khuter</i> (shifting cultivation) is still prevalent with Baiga community of Pindrahimal village, Mandla district. In Dobabor Village of Mandla district, 8-10 hhs do Katni in 8 acres and one hh has applied for land title under FRA.	Those hhs with little or no land used to practice shifting cultivation.
12	Communi- Cation	Road <i>Dambarikaran</i> under PM sadak Yojana-From last 3-4 years the roads have improved. Now, some of us use motorcycle to go to the market.	Earlier no Pucca Road, used to go to market by walk. Market used to be at a distant place.
13	Access to information	Few hhs have Radio. Television has come into village 8-10 yrs back. Presently, in most villages, around 5% of hhs have T.V. Majority of the hhs are purchasing a Cell phone spending Rs 1000-3000. In some study villages, nearly 75% of the hhs are having mobiles. " <i>Mobile me chal gayi gaane, radiyonke mahathv bee chal gayi</i> " (As the songs are being played in mobile, the radio has lost its importance), says a youth. Reliance and BSNL Phones are predominant.	Earlier majority hhs in all the study villages used to have Radio.

Table 33 contd...

S.No	Particulars	Now in 2015	Hitherto 10-15 years back
14	Marketing of crop produce	Now we sell the crop produce in the nearby market. Earlier we used to sell to only Baniya(dalal). Number of shops have increased now and this increased the option of selling to those who offer good price. Now even other communities such as Rathods are entering into areas such as procurement of agricultural produce.	Hitherto, dalal (middle men) used to come and buy the produce from the village paying us less price.
15	Government Programmes	Now PDS Scheme, Housing, Mid-day meal programme for students, Anganwadi, financial assistance for marriage under Lad-Laxmi yojana for girls completing 12th standard, MGNREGA, Agricultural schemes such as Well digging ( <i>Khooha</i> ), bunding ( <i>medbandhi</i> ), Pisciculture ( <i>Machli palan</i> ) and Irrigation provision ( <i>khet talab</i> ).	buffaloes, bullock and bullock cart were given.
16	Income	MGNREGA Job card gave employment from 1 week to 50 days. However, in certain cases, payment is received only after 3-4 months only. The measurement is being done wrongly and hence in some villages people get not more than Rs.50 per day. One of the farmers said " <i>Officer moolyankan me kaahi natak banathe</i> "( while taking measurement of our work, they do all kinds of dramas to deceive us). " <i>Job card rahkar bhi mathlab nahi, bus show piece hai, bolne ke liye tho sauv dhin ka kaam bolthe</i> "(there is no meaning of possessing the Job card, it is like a show piece, only for name sake they say 100 days employment". " <i>Log thaila utathe, palayan ke liye jathe</i> ". Works such as <i>Medbandh</i> (bunding), <i>Khet Talab</i> (farm ponds) are done in agricultural fields.	Very low income

Source: Focused group discussions in Jhabua, Mandla and Sidhi districts of Madhya Pradesh

livestock, agricultural and other wage rates, food habits, alcohol consumption, communication, access to information, access to market, implementation of government programmes and income. Table 33 Presents the various changes happening with regards to the above mentioned important variables in concise manner based on the inputs from men and women FGDs conducted in the study districts.

## 8. Conclusion

There are multiple agricultural challenges in tribals areas and low crop productivity being one of the forefront of these problems. There is lot of gap between the all India productivity and the productivity of Madhya Pradesh with respect to the yields of major crops. As compared to 10-15 years back, there is not much change in the cropping pattern of the study districts. However, the area under millets has reduced considerable and Soybean has been a new addition to their cropping pattern. During the recent times, due to less rains the crops don't reach maturity stage and hence people are sowing lesser area and are preferring to go to labour work/migration seeking it as important livelihood option. Enrolment in schools has improved and the electricity is more regular

now. There was no discrimination towards girl child education in the tribal villages. Access to Irrigation is a major problem in all the study villages. Farmers who are having access to irrigation are growing wheat in rabi. During the focused group discussions, in most of the villages farmers felt that, the yields have come down in major crops, but in few cases they also improved. The reasons for low yields are lesser and untimely rains, declining soil fertility, failure of high yielding seeds in low input system of agriculture. The cost of cultivation has also increased. Accessing Credit through Kisan Credit card is a problem due to lack of title deeds in the name of progeny who are cultivating the land. Empirical evidence clearly revealed that MGNREGA does not provide employment for 100 days as intended. Added to this measurement of work done by households MGNREGA is manipulated depriving the money to hard working tribals. Most of the time payment is delayed and one has to make several trips to post office to access the MGNREGA amount.

The process of changes in tribal socio-economic life revealed that major changes were happening in the last 10-15 years. There was positive development with regards to education, health, wage rate, communication, access to information, access to market and implementation of government programmes and income. Though quantum of food being consumed has increased, the diversity and quality of food consumed by tribal households has gone down. Alcohol consumption which was taking heavy toll on health and economic well being of tribals has come down drastically. Reduction in livestock population is affecting the agricultural practices, soil health and crop yield. Describing the life of tribals in a nut shell, one of the woman farmer, Tiharu Bhai Maravu of Kamtara village said "*Jhopdi tho bahar se accha hai, andhar se Khokla hai*" (our huts look good from outside but it is hollow inside). To protect children and women from rain, winter and summer we construct our houses well and maintain them well. Even now, majority of the tribal households do not have enough food to eat and they have to struggle every day to access food. Hence, due share must be given to the socio-economic progress of tribal people and their habitations, including facilities like health, education, livelihood, drinking water, sanitation, roads, electricity, agricultural extension and sustainable income (GOI 2014/HLC).



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