Dynamics of Livelihoods along foothills of Arunachal Pradesh

Lijum Nochi
August 2019

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Department of Economics
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PREFACE

The Centre for Development Studies (CDS) was set up as a research adjunct at the Department of Economics, Rajiv Gandhi University (RGU), Itanagar, Arunachal Pradesh, with a generous grant from the Ministry of Finance (Department of Economic Affairs), Government of India. The objectives of the Centre include the creation of high-quality research infrastructure for students and researchers and faculty members, in addition to sponsoring and coordinating research on various developmental issues having policy implications both at the regional and national level. Publishing working/policy papers on the research outcome of the Centre, monographs and edited volumes areamong the key activities of the Centre. The present working paper by Dr. LijumNochi, titled, '*Dynamics of Livelihoods along foothills of Arunachal Pradesh*', is the research outcome of a project funded by the CDS. It is the *first* in the series of working paper being published by the Centre for Development Studies.

The Working paper focusses on the dynamics of Livelihoods along the foot hills of the State of Arunachal Pradesh. It deals with the various facets of livelihood activities and accesses. It ranges from occupational paradigm to land use pattern, from the household assets to farm practices, from dependence on natural resources to socio-institutional access. Based on the livelihood approach, the study has designed household livelihoods portfolio. It emphasis that the existing structures and processes do influence and shape the outcomeof the livelihoods portfolio. The households in securing their livelihoods are faced with the problems of trading off and substitution of strategies and practices, giving rise to multiple least cost livelihood portfolios.In addition to farm activity, there are also set of allied farm activities in the portfolio of the households.The poor households are dependent upon nature-based livelihood activities such as fishing, hunting and trapping, in addition to gathering and extraction which constitutes an important part of their livelihoods portfolio. The study emphasises that the need of the hour is the right kind of interventions in the form of physical assets and technology at a lower cost for livelihood diversification.

This working paper, with its focus on the dynamics of Livelihoods in the hilly regions of the State, will be interest and use to policy planners, academics, researchers and students. I congratulate the author for the excellent time bound work.

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SUMMARY

Based on the livelihood approach, the study designed household livelihood portfolio. In fact, the existing structures and processes do influence and shape the outcome, of the livelihood portfolio. The livelihood outcome as a portfolio of activities in securing a living is a hierarchal ladder process. The ladder points proceed from bottom upwards i.e. from mere *survival*, *tocoping*, *adaptation*, and finally to *accumulation*. Any income-consumption shocks actually pushes the households backward to a lower ladder point in the reverse hierarchical order. In other words, households by engaging the resources and assets either maintains a particular livelihood level, or invests in assets to improve it, or accumulate assets to provisions for moving into different or newer activities. For all these to happen, the households requires capitals or assets in the form of human, natural, physical, social, and financial. The access to capital, therefore, has an important bearing in the making of the household's livelihood.

Drawing on from the analysis of the socio-demographic profile, it is understandable that the poverty-stricken households with big family size have high dependents and are labour deficit. These have two contradicting implications. First, households have to intensify the limited amount of household labour in securing livelihoods. Second, to cope up with the joneses, household have to strategise alternative options that are remunerating but involve least cost, measured in terms of either capital or labour used.

The households in securing their livelihood are faced with the problems of trading off and substitution of strategies and practices, giving rise to multitude of least cost livelihood portfolios. Analysis of the farm and allied practices of the household points to this direction. As is found in the livelihood activities of the households, their activity portfolio is diverse, ranging from gathering and extraction to fishing, and hunting, from rearing of animals to cultivation and plantations. However, the usual practice of cultivation of the rural gentry is in the form of either shifting cultivation or plantations. The labour deficit households' trades off and substitutes for alternative option of sharecropping in case of wet paddy cultivation, which constitutes their basic staple. The arrangement, although seemingly discarded in theory as inefficient, is the best rescue. By entering into this arrangement, households only share a part of the cost of production, thereby, enabling them to unleash the limited labour time to raise other portfolio in securing their livelihoods i.e.

households engage in avenues that cushion off income-consumption shock or are incentivising enough to meet their transaction requirements.

In addition to the livelihood portfolio based on farm activity, there are also set of allied farm activities in the portfolio of the households. Households indulge in gardening around homestead, which is sanctuary for diverse crops. In fact, adhering to the least cost principle, households are seen putting up nursery for own plantation, in addition to market disposal. Such nurseries are usually the plantation crops like, rubber, tea, orange, and betel nuts. Another important allied activity that was an important constituent of livelihood portfolio is that of the backyard poultry and piggery. Fisheries, although not as significant as other portfolio, do have its presence in securing livelihoods.

Thus, the households of the study area, trades off or substitutes sharecropping institution in raising the livelihood portfolio for staples, while they are engaged in pursuits other than wet paddy cultivation to raise the diverse portfolio in securing their livelihood. In this regard the nature-based livelihood activities such as fishing, hunting and trapping, in addition to gathering and extraction also constitutes important part of the livelihood portfolio.

Households raise their livelihood portfolio adhering to the least cost principle, measured either in terms of labour or capitals used. Though the value of imputed cost or the opportunity cost seems high in the realisation of the output, households have their own calculus to juxtapose the cost efficiency. To them, it is not the output generated per unit of investments in terms of labour, but of securing a living. Hence, they impute the value of life and living as cost element rather than book accounting. Taken together, the rural gentry views the present cost as gradually vanishing as time proceeds.

The poor households are also dependent upon nature-based resources. In fact, in one or other way, households are dependent upon the access to natural capital not only to even out the consumption requirements but also the income shocks. In addition to access to it, few households also depend upon it to make livings or securing livelihood. Thus, access to natural capital plays a crucial role in the determination of the livelihood portfolio, its exploitation is in the rise due to emerging commercialisation and absence of alternatives.

Thus, the study has dealt with the various facets of livelihood activities and accesses. It ranged from occupational paradigm to land use pattern, from the household assets to farm practices, from dependence on natural resources to socio-institutional access. The calibration and analysis of the various facets to categorical variables in

accordance with the methodology stipulated. The categorical variables were, then put under the appropriate heads of respective capitals.

To conclude, the need of the hour is the right kind of interventions to make available the physical assets and technology at a lower cost. It may rapid-up the pace of induction so that poor households with labour deficit can judiciously diversify their livelihood portfolio. Further, intervention schemes require systematic convergence, calibration, and integration with the diverse livelihood options of the rural gentry on a sustainable basis. Lest, income-consumption shocks at the backdrop of rising aspirations will result into falling back on a greater scale upon natural or environmental resources, which will have drastic consequences.

CONTENT

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

DFID	Department for International Development
BPL	Below Poverty Line
NMEP	National Malaria Elimination Programme
SDP	Socio-Demographic Profile
OS	Occupational Structure
UP	Upper Primary
HSC	Health Sub-Centre
PHC	Primary Health Centre
CHC	Community Health Centre
LP	Lower Primary
HS	Higher Secondary
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MYS	Mean Year of Schooling
LPI	Livelihood Portfolio Index

CHAPTER 1

INTRODUCTION

1.1 Introduction and Background

Economic literatures, today, are filled with numerous mentions of livelihood, livelihood approaches, methods, practices, perspectives, and frameworks. The perspectives have been central to rural development practice for quite some time now. Over the years, the term has become flexible to be attached to all sorts of other constructs. Livelihood can be related to locales of a particular spatial division such as rural or urban, or can be attached to various occupations like pastoral, farming, fishing and hunting, and can also be seen from the perspectives of social difference like age, sex and so forth.

Livelihood comprises of the capabilities, assets (stores, resources, claims and access) and activities required for living. It is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, and provide opportunities as well as sustainable avenues for progeny. The concept became popular during 1992, when Robert Chambers and Gordon Conway gave their classic paper, *Sustainable Rural Livelihoods: Practical concepts for the 21st Century.* They proposed that:

> *A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term[1].*

Since its appearance, much of effort has gone into refining the concept further, both analytically and operationally. In this regard the Institute for Development Studies (IDS) at the University of Sussex, Brighton, UK, and the British Department for International Development (DFID) have been putting into operation the SL concept as:

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[1] Lasse Krantz (2001), The Sustainable Livelihood Approach to Poverty Reduction: An Introduction, Swedish International Development Cooperation Agency (SIDA) http://www.sida.se

> *A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base[2].*

Assets may be natural and biological like land, water, common-property resources, flora, fauna, or may be classified as social like community, family, social networks, or even as political to include participation, empowerment etc. It may also mean human to include education, labour, health, nutrition and at times as physical to include roads, clinics, markets, schools, bridges and finally as economic symbolising employment, income, consumption, savings, credit etc.

The UNDP conceptualises livelihood from the asset-based perspective. It encompasses and emphasises upon the promotion of people's access to assets and its sustainable use. As such, the approach requires the need to understand the coping mechanism and adaptive strategies pursued by the population under consideration. It includes assets and resources that are both tangible and intangible. While former can be understood, the later includes even entitlements, claims and access.

In spite of the variation in analytical framework, the livelihood perspective itself emanates from earlier development approaches. The logical sequence of the Integrated Rural Development Planning (IRDP) of 1970s, Food Security Initiatives of 1980s, and more so by the emergence of Participatory Rural Appraisal (PRA), and huge body of works emanating from researches on Farming Systems, Gender Studies, Poverty and studies on Risk, Vulnerability and Adaptation Assessments, have all given rise to livelihood framework. It is a holistic approach to look into the micro constituent - the household, so as to integrate the same into the macro level in a more calibrated manner.

The term livelihood approaches even if vogue is vague as well. The most elaborate and commonly used framework is that of the DFID, of course, later the agencies like UNDP, USAID, OXFAM, IFAD did develop their own frameworks. Nonetheless, all the approaches in common, recognise the five broad capital assets, namely; physical, human, financial, social and natural. Each capital asset consists of key indicators which can generate multiple benefits. Altogether, the divergence in approach and theoretical framework was, rather, need based specific to studies that the agencies carried out. In all its divergent formulations, what run in common is, the basic

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[2]*ibid*

definition and its qualifying underpinnings as given by Chambers and Conway during early 1990s.

1.2 Theoretical Background

The origin of livelihood approach can be traced back to the initial work of Robert Chambers in the mid 1980s which was further refined by him and Conway in the early 1990s. It was followed by a number of further refinements specific to the needs of the development agencies per se. In spite of the variations in respective approaches, much of the theoretical underpinnings and contextualisation takes an adaptation of Chambers and Conway's definition of livelihoods.

The starting point of livelihoods analysis is the need to understand the livelihood strategies and the vulnerability context as people makes strategic choices according to their entitlements and access to resources as mediated by the parameters of institutional contexts (DFID 2000).[3] The approach, therefore, *underlines the objectives, scope and priorities for development wherein the populace and their priorities are at the centre stage.*

The focus is to empower the targeted beneficiaries in building avenues, in accessing of assets, and designing enabling policy and institutional environment. In the core of livelihood approach, there lies a set of principles that *underpins the best development interventions practices. Conceptually, the framework includes setting up of priorities that populace expects as their desired livelihood outcomes. The outcome itself depends upon the access to social, human, physical, financial and natural capital or assets, and the ability of the populace to put it to productive use. It also engulfs the different strategies adopted and how the gentry use their capitals or assets in the pursuit of making their livelihood. Thus, it is a holistic framework wherein even policies, institutions and processes shape access to assets and opportunities, thereof, livelihood.*

In their quest of managing or securing a living, individual households often require assets to interact with. Therefore, at the heart of the livelihood approach framework is the individual household's access to assets or what is also known as capitals. While many forms of capitals and sub-components have evolved in the recent past, it can easily be identified in to five basic categories. Some of the capitals are material while others are partly or completely immaterial.

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[3]DFID Sustainable Livelihoods Guidance Sheets, 2000 www.livelihoods.org

The capitals are: *first*, human capital which engulfs within it the dimension of skills, knowledge, health and ability to work of an individual or individual household. *Secondly*, Social capital which comprises social resources, including informal networks, membership of formalized groups, relationships of trust and the likes which facilitate cooperation amongst the stakeholders. *Third*, the natural capital which includes assets or resources of nature like land, soil, waster, forest, fisheries and so forth. *Fourth*, the physical capital includes basic consumables, tools or overheads that releases time or reduces inefficiencies related to the livelihood activities undertaken by household. Such are the household consumables and durables, agricultural tools and implements, infrastructure, and so on. *Fifth* there are financial assets and capitals. It includes financial resources such as savings, credit, and income from employment, trade and remittances.

These capital assets may be created or destroyed consequent upon shocks and variations. These shocks and variations are the vulnerability context which people face. Resultant vulnerability can also be due policies, institutions or processes. But the vulnerability context can be minimised by maximising accesses to assets. It is not, therefore, the accumulation but access to capital that reduces the vulnerability, thereof, inducing, influencing and determining the rates of capital or asset accumulation. Thus, households, with greater access to capital assets are more likely to have bigger matrix of livelihood options or strategies to pursue and secure a living with the capacity to even off shocks.

In the process of securing a living and encountering the shocks, while access to capital or assets plays crucial role, a lot more important is the range of alternative activities that households engage unto. In other words, livelihood strategies are combination of diverse activities that households undertake in achieving their livelihood goals ranging from productive activities, investment strategies to reproductive choices. It tries to understand alternatives pursued and factors determining it, to reinforce the positive aspects of such alternatives as a strategy to negotiate the constraints.

While the set of strategies may be static at a point or over a period of time, but the choice of the set or a particular sub-set do undergo a dynamic process and is the plausible best outcome of series of trials. In other words, the activities (or asset) individual(s) or household(s) combine to meet their changing needs, either at a point of time or over a time period may be the same. But the portfolio of activities (and assets) has been arrived at consequent upon weighing and rescheduling; out of the many alternatives: the few which are remunerating to secure a living. It is in this

regard that access to capitals has crucial bearing, as it influences the choice of livelihood portfolio or strategies, in achieving positive outcomes.
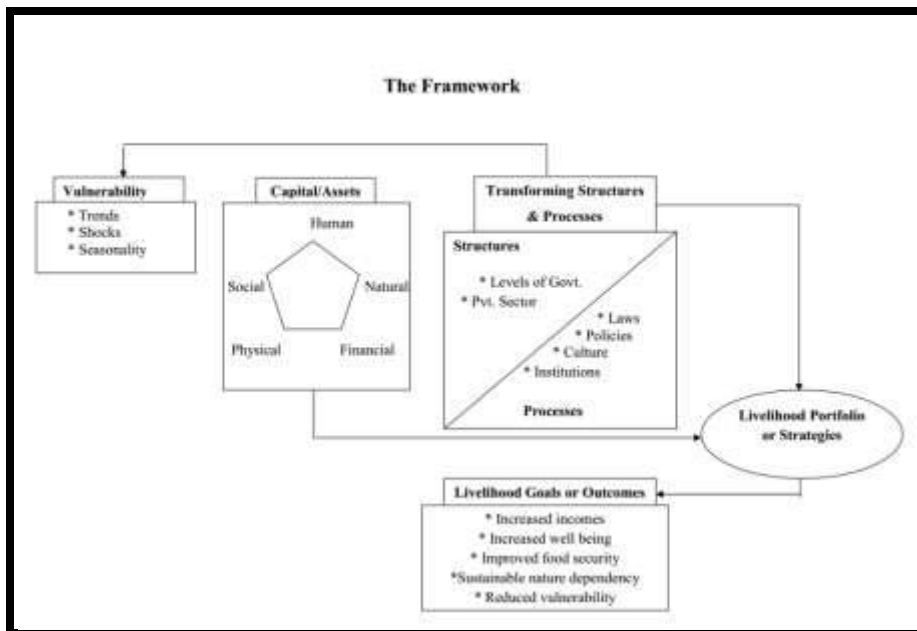
Source: DFID Guidance Sheet

Livelihood approaches stresses upon the importance of understanding and supporting the pursuance of such sets of strategies or livelihood portfolio in achieving positive goals or outcomes which the target populace aspire for. Goals may be in terms of increased incomes, increased well being, improved food security, sustainable nature dependency, and more so the reduced vulnerability. Outcomes are important because it helps in understanding the resultant livelihood portfolio in a particular context, as to why the particular portfolio has been pursued, and within it, what is the priority of one over other, and how and why have they adopted or adapted in a particular context, and to underline the likely patterns of how they will respond to a newer ambience or constraints.

1.3 Review of Relevant Literature and the Context

Livelihood, therefore, in simple words, implies the means, activities, entitlements, and assets by which people make a living. Of the various components of a livelihood, the most complex is the portfolio of assets out of which people construct

their livings. In other words, every individual or a household diversifies its means of livings, ranging from assets, and access to entitlements. Thus, diversification of livelihood is a process by which rural families construct a diverse portfolio of activities and social support capabilities for survival and to improve their standards of living (Ellis; 1998)[4].

Studies on livelihood focus on the material ways through which people produce and reproduce their household economies. Majority of rural populace, therefore, diversify their productive activities to encompass a wide range of activities. As such, rural livelihoods are seen as construct of various activities out of portfolio of resources (Dercon and Krishnan; 1996)[5].

Livelihood can be seen as wide range of activities or responses, but often concurring as a means to accumulation, consumption and investment. It may be a response to shocks over longer or shorter horizons. As such, wealth, capital, access and entitlement plays significant role. Disparities and differential access often brings outcomes that are altogether different even under same environment and ambience (Haidar; 2009).[6]

Selecting livelihood portfolio is a linear ladder process wherein the households may be surviving, coping, adapting or accumulating. The various ladder points is, again, based in accordance with the access that households exercises over assets at the backdrop of their aspirations. Access to assets or capital also determines the degrees of choice and flexibility households have over livelihood strategies(Evans and Hindley; 2009).[7]

Households may lie anywhere on the spectrum from no choice (survival) to a limited range of it (coping-up), or relatively more alternatives to choose (adapting), or may have the range of full alternatives wherein they are actually accumulating. Thus the livelihood ladder enables us to understand transitions that households undergo i.e.

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[4]Ellis, Frank(1998), Household strategies and rural livelihood diversification, The Journal of Development Studies, Volume 35 No.1, pp1-38

[5]Dercon, S. and Krishnan, P. (1996) 'Income portfolios in rural Ethiopia and Tanzania: choices and constraints', *Journal of Development Studies*, 32(6): 850-875

[6]Haidar, Mona (2009), Sustainable Livelihood Approaches: The Framework, Lessons Learnt from Practice and Policy Recommendations, document of the expert group meeting on adopting the sustainable livelihoods approach for promoting Rural Development in the ESCWA region, UNDP Dry lands Development Centre

[7]Farming Lives: Using the sustainable livelihoods Approach in the Peak district farming community (2009) Report of the National Farmers Network and Oxfam GB, written by Val Ponder and Ann Hindley, edited by Carol Evans and Ann Hindley, based on the work carried out by Janice Walton, Jo Williams and John Moseley.

move up the ladder by building their asset-base, and they risk to fall back down the ladder, if subsequently they lose assets (Cox; 2011).[8]

Depending on the objectives and priorities of household, livelihood strategies are concentrated within the core activities; labouring, farming; crop and livestock, gathering of forest products, mining and extraction and some off farm activities (Tuson; 2001).

The understanding of strategies at each level enables us to develop support interventions to bring the livelihoods of women and men in poverty (Orr et al; 2006).[9]

Livelihood portfolio, thus, refers to individual household's ways to raise additional income to smoothen their consumption or transaction requirements – the shocks. It includes both farm and non-form activities undertaken to generate income by the household.It is in this context that the study attempts to understand the complex portfolio of rural livelihood in and around the state of Arunachal Pradesh. It may be noted that few studies concerning certain dimensions of livelihood exists for the state, but so far nothing with regard to livelihood portfolio has been undertaken.

Literally livelihood, therefore, refers to all the means for securing the necessities of life. It includes sum total of households' or community's means and ways to sustain living. In a dynamic setting, it is the process of adoption and adaptation of strategies from a matrix of accesses of capitals; be it independent or a combination of the human, social, physical, financial, and natural over time. However, in a baseline or cross section time frame, it may be considered as the state of means and ways through which household constitutes their living. These means and ways need not necessarily be transacted for other resources, but objected to even out the shocks in income as well as consumption pattern of the households.

The above is true because, rural livelihoods not only evolve in a setting shaped by the actors or agents, but also by factors often extraneous. A household asset may be either in kind or cash and upon it they construct activities to generate income. While other activities may grow or shrink in response to adaptation with surroundings,

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[8]Community Assets First: The Implications of the Sustainable Livelihoods Approach for the Coalition Agenda (2011), Report of the Church Action on Poverty, Oxfam, IPPR North and Urban Forum, Chapters written by Niall Cooper, Lucy Brill, Moussa Haddad, Rachel Newton and Jenni Viitanen, and edited by Ed Cox.

[9] Orr, Sheena, Greg Brown, Sue Smith, Catherine May, Mark Waters (2006) When Ends Don't Meet: Assets, Vulnerabilities and Livelihoods - An Analysis of Households in Thornaby-On-Tees, Report of Church Action on Poverty (CAP) and Oxfam's UK Poverty Programme (UKPP)

some of it may remain unchanged due to interlinked consumption and welfare requirement of the household.

Notwithstanding above, the growing population, urbanisation and modernisation, the inducement to industriousness is ever increasing. This is true, particularly; in the context of globalised world with rapid growth in living standards due to homogenisation of consumption standards and its follow up of increasing transaction requirements. The livelihoods framework, therefore, enables us in a better way to understand how households derive their livings (income/consumption) through range of activities or strategies based on capabilities and assets.

India is rural in nature and the State of Arunachal Pradesh is not an exception. Akin to any other Indian states agriculture plays crucial role in rural areas. Spatially it ranges from mountains and hilly slopes to valleys and foothills. The terrains and rugged slopes make most part of the land surface, thereby, making the available land either inaccessible or unfit for sedentary cultivation. Further, the small proportion of available land also competes for human settlements. Livelihood strategies or portfolio constructed by the farming community can be, therefore, expected to be either through agricultural intensification, diversification or migration (Hussein and Nelson; 1998).[10]

The way in which asset and activity functions relate to livelihood strategies are twofold - *One*, populace aspire to maintain, at least, the present level of consumption welfare and to advance it. *Two*, in trying to advance the level of welfare, households expand their existing livelihood portfolio or activities or adopts newer ones. Therefore, three broad types of livelihood strategies can be stipulated out. *First*, Hanging-In; whereby assets and activities are engaged in to maintain livelihood levels. *Secondly*, Stepping-Up; whereby current activities are engaged in, with investments in assets to expand it to improve livelihoods. *Finally*, Stepping-Out; whereby existing activities are engaged to accumulate assets which in time provides as a base or launch pad to move into different or newer activities that have initial investment requirements leading to higher or more stable returns (Dorward et al; 2009).[11]

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[10]Hussein, K. and J. Nelson (1998), Sustainable Livelihoods and Livelihood Diversification, IDS working paper 69, Brighton

[11]Dorward, Andrew Simon Anderson, Yolanda Nava Bernal, Ernesto Sánchez Vera, Jonathan Rushton, James Pattison and Rodrigo Paz (2009), "Hanging in, Stepping up and Stepping Out: Livelihood Aspirations and Strategies of the Poor", *Development in Practice*, Vol. 19 (2), pp. 240-247, Source: www.jstor.org and accessed on 27-09-2016 at 09:13 hrs

However, in case of the study area, the traditional practice of *shifting* cultivation to an extent evolved through time as rescue to consumption shocks. Consequently, with the increasing development interventions and monetization, some rudimentary commerce based on surplus from *shifting* cultivation emerged as cushion to income shocks for rural gentry. In fact, with monetization the traditional rural set up moved towards cash based economy. The increasing cash (or income), therefore, led to some petty exchanges locally. But the rapid growth of population and continued dependency on *shifting* cultivation resulted into reduced *jhumcycl*e (Gupta; 2005).[12]

Physiographic limitation at the backdrop of reduced *jhum* cycles, and recently the inducement due to market exposure has enlarged the matrix of alternative opportunities along with many newer challenges. It may be noted that productivity in agricultural sector is very low (Rs. 22 per Hectare)[13] despite which it remains the mainstay for majority of the populace in rural Arunachal Pradesh (67.20 per cent of workforce)[14] and contributes a significant share of output (25.80 per cent of GSDP).[15] One can, therefore, expect agriculture to be a key component of rural development in the state.

It is also, but true, that growth of agriculture and allied sector does not occur in vacuum, instead, are intertwined to other sectors of the economy as well. Of course, the relative importance of agriculture is expected to decline with economic advances but it still is necessary for development and for a country's transformation from a traditional to a modern economy. Factors from primary sector characterized by low productivity, traditional technology, and decreasing returns should be systematically reallocated to a modern industrial sector with higher productivity and increasing returns (Adelman, Irma; 2001).[16] In other words, the rural gentry based on low productivity farm and allied farm activities must be systematically shifted towards the non-farm activities which are more productive. But the negligible amount of non-farm activities coupled with labour deficit has been a limiting factor in the study area, leave alone the systematic shift. Then on-farm may not exist for reasons of marginalisation and exclusion of the poor peasantry, resulting from spatial, capital,

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[12]Gupta, Vishal (2005) Jhum Cultivation practices of the Bangnis (Nishis) of Arunachal Pradesh, Indian Journal of Traditional Knowledge, Vol 4(1), pp47-56

[13]Chand et.al.(2009) Regional Variations in Agricultural Productivity A District Level Study, National Centre for Agricultural Economics and Policy Research (Indian Council of Agricultural Research), New Delhi, www. http://agricoop.nic.in

[14] India Brand Equity Foundation Briefs downloaded from www.ibef.org

[15] Department of Agriculture, Govt. of Arunachal Pradesh

[16] Adelman, Irma (2001), Fallacies in development theory and their implications for policy. In *Frontiers of development economics: The future in perspective*, ed. G. M. Meier, and J. E. Stiglitz. New York: World Bank.

infrastructural, and market limitation (Yaro; 2006).[17] This seems true in context of the study area.

With limited spread of private enterprises, the secondary sector in the state is negligible. Further, the tertiary sector is predominated by government with negligible non-government sector. Consequent upon it the employment absorption capacities of these sectors are highly limited. In fact, the government's tertiary sector is almost saturated, given the resources and other constraints facing the state. These problems heighten towards extremity in case of the rural areas. Thus, the constraints at the backdrop of limited availability of land for agriculture, low productivity, and the reducing *jhum cycle* but increasing population and consumption standards compounds the problem of living conditions.

The pertinent query is, therefore, how the rural gentry are managing the income and consumption shocks. In other words, in managing their livelihood, they might have adapted themselves to diversified portfolio of livelihood options. It may be the case that policy interventions, market exposure and such other factors, have induced rapid diversification of livelihood portfolio ranging from traditional to diversified farming or off farm activities.

It becomes lot more important to understand the existing livelihood strategy and portfolio diversification. Such an exercise may help either to foster inter-linkages between various sectors and subsectors and would help in modelling policies for sustainable livelihood options and reduce the risk of income, thereof consumption, shocks. It is in this regard that the study attempts to documents the diverse livelihood portfolio of the rural populace in Arunachal Pradesh; especially along the foothills which is exposed to the neighbouring markets of state.[18]

1.4 Objectives of the Study

The objectives of the study are to:

1.   Enumerate the socio-demographic profile of study area

2.   Document the typical livelihood portfolio of households

3.   Analyse the capital assets and households livelihood portfolio

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[17]Yaro, Joseph Awetori (2006): 'Is Deagrarianisation Real? A Study of Livelihood Activities in Rural Northern Ghana', *The Journal of Modern African Studies*, Vol. 44 (1), pp. 125-156, Source: www.jstor.org and Accessed on 27-09-2016 at 08:28 hrs

[18]Except for the few stories, essays and seminals, interpreting certain skills, traditional practices, production lines, resources availability and constraints as potential livelihood options and its sustainability, to the best of author's knowledge, no study in this direction has ever been undertaken either for the study area for the state.

CHAPTER 2

METHODOLOGY

The chapter is devoted to technical explanation of the concept of Livelihood approach as well as related technicalities in its quantification. From the forgone analysis, the theoretical framework followed by the review of relevant literature, it can be deduced that livelihood portfolio is but the final outcome of the interrelations and interactions of the capitals pressed upon by the vulnerability context and induced by the structures and the processes. It may be taken as a set of activities or portfolio which the households adopt to adapt themselves to counter the dynamic of vulnerability context in the backdrop of the structures and processes.

Hence, identifying the various activities and putting them under the classified capitals yields us the Livelihood Portfolio. This portfolio may seem cross-section in nature but has been evolved over the period under various dimensions of vulnerability context and the changing structures and processes. As such, livelihood portfolio even at a point of time represents the dynamics under which the households have opted for it.

2.1 Conceptualising Analytical Frame: The Capitals and the Livelihood Portfolio

As given in the figure 1.a above the capitals includes five household assets orcapital, namely, the human, social, physical, natural and financial. Within each capital there are sub-components identifying itself either directly or as proxy of the capital at the broader classification. In other words, the lower order capitals can be arrived at by aggregation of higher order capitals at the sub-component level.

In case of each of the capital, sub-components were worked out after collection of the data from the field study. They were then weighted and aggregated under the categories as stipulated in the DFIDs guidance sheets. In case of the human capital socio-demographic profile was used as proxy. The respective subcomponents were Female Population, literate population, BPL (Below Poverty Line) households, household with homestead in percentage. Age, average family size and households with homestead are in average with respect to number of households in the study area.

In addition to it, the occupational paradigm too was included in the human capital. It comprised of farmers, those in services both in government and private sectors, student or dependent or the present human capital investment and the secondary category representing chunk of the population falling under old aged, retired personalities and housewives. The individual sub-components was weighed separately, whereas in the final aggregation both the sub-components were brought under the same classification.

In case of the social capital, the major sub-components included only the few items related to the social overheads, such as namely; the schools Lower Primary, Upper Primary and Higher Secondary, and healthcare facilities as Health Sub Centre, Primary Health Care, And Community Health Centre. In addition, it also included households enrolled under MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act), the total number of person enrolled as well as persons availing benefits per households were taken as sub-components. Further, the saving bank accounts per households were also taken as proxy. Since, the sub-components were more alike the availing access to socio-institutional overheads, it is, therefore, designated as socio-institutional overheads rather than social capital (see Chapter V).

The physical capital included the household assets like durables and white collar consumables, including the means of transportation. It also included the agricultural assets and implements. Finally, in case of natural capital it included the land in terms of agricultural holdings, the percentage of agricultural holdings which are irrigated, rain fed and un-irrigated. It also included the shifting cultivation plots along with plantations. Further, the nature dependent activities like fishing, hunting, trapping, and gathering/extraction were also included (see Chapter V).

Natural capital included in it the access and activities related to land. As such, agricultural landholdings, land use pattern highlighting agricultural practices, allied farm practices, and activities related to nature based resource access such as fishing, hunting, trapping and, gathering and extraction were included. The land use pattern not only highlighted the agricultural practices but also the amount of acres devoted to cultivation of different crops and the status as to whether such are rain fed, irrigated, or un-irrigated. Owing to limited time period, analysis pertaining to social capital was excluded from the study. Instead, a broader proxy of socio-institutional capital capable of covering both social and financial capital is created.

Based on the access to capitals, within the framework of the structures and processes, households bring about a certain schedules of activities or avenues that secure their livings. These activities are primarily for meeting the household consumption or

income that is vulnerable to shocks. Thus, the interrelations and interactions of assets or capital and human effort brings forth such avenues or livelihood portfolio, to which households cling on for survival or surpluses.

The avenues household initiates are scheduled out in accordance with the framework that structure provides; either as private initiatives or as provision by governance at varying tiers. However, the incentives itself are moulded by the processes that exist as norm for the households. While the structure remains more or less static, the processes are susceptible to changing dynamics. Hence, any livelihood portfolio in a time cross section may but highlight the dynamics that incentivised the household to opt for it. The aim of the study is to analyse the direction to which the capitals influence and work out the portfolio of livelihoods that households in the study area have constructed as of date.

2.2 Database

The Study is based on the primary survey and field visits. Data pertaining to the study were collected using a structured household schedule, followed by semi-structures questionnaire and open-ended interviews. During the first-round structured questionnaire are used to collect information on demographic and household level data. There was need for some modifications; hence, during the second round modified version of the structured schedule was again used to collect the information. After the second round of household data collection, close observation and interaction with few select individuals, as part ethnographic preliminaries was undertaken. This was necessary to understand the overall context in a holistic manner. After identifying various dimensions, focus group discussion in accordance with identified specificities was carried out. Close observation as well as ethnographic account and field diary were used to gather as many information as possible.

2.3 Sample Household

Household or sample household is defined as a dwelling unit common to all its members, either joint family or else, with the qualifying norm that they eat or share the expenses of food and drink and they share unpaid labour, production, and consumption.[19] With exception to few houses, majority of the dwelling units coincided as household units.

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[19]Liswanti et al (2012) Practical guide for socio-economic livelihood, land tenure and rights surveys for use in collaborative ecosystem-based land use planning, CIFOR, Bogor, Indonesia

The total numbers of houses in the study area was 167. New Deka being smallest with only 18 houses, Telamis biggest with about 70 houses. This is followed by Old Deka and Potte with 63 and 45 houses respectively. In spite of best effort to enumerate all households in line with census method, few could not be contacted. Hence, data extracted are more in line of sampling method. Of the total of 167 houses, the study covers 116 households(69.46 percent) in accordance with the above norms or definition of a household.

As can be seen in Table 2.1, except for New Deka, which is, completely enumerated, other villages has a sample percentage of more than 50 percent. The percentage of sample household for Old Deka is 50.79 percent, for Potte 62.22 percent, and 54.29 percent in case of Telam. A better insight would have been drawn in case of complete enumeration. Nonetheless, as sample households are more than half the total households in respective villages, it is quite adequate to generate the required perspectives for study.

Table 2.1: Macro Details of the Sample Households

Households in the Study Area		Total Sample Households	Samples as Percentage of Total
Total	167	116	69.46
New Deka	18	18	100.00
Old Deka	63	32	50.79
Potte	45	28	62.22
Telam	70	38	54.29

Source: field data

2.4 Included or Productive Population

For the purpose of analysis, infants falling under the age category of 5 years or less have been excluded. Table 2.2 below gives us the details. The overall population in the study area is about 807 individuals, 65 out of whom are infants, thus, reducing population under consideration to 742. Likewise, excluded population are 11 in New Deka, 16 in Old Deka, 15 in Potte and 23 in Telam. Corresponding to it, respective sample village population are 156 for New Deka, 192 for Old Deka, 151 for Potte and 243 for Telam.

Notwithstanding above, unless otherwise mentioned, the productive population, populace or rural gentry in this study, for the purpose of analysis, refers to populace other than in the age category of 5 years or less.

Table 2.2: Macro Details of the Sample Population

Particulars	Total Population	Infants	Percent of Infant Population	Productive Populations
New Deka	167	11	6.59	156
Old Deka	208	16	7.69	192
Potte	166	15	9.04	151
Telam	266	23	8.65	243
Overall	807	65	8.76	742

Source: field data

2.5 Literacy and Mean Year of Schooling

For the purpose of study and analysis, literate here refers to any individual whoever has either joined school, formal or informal, or whoever can read simple sentences of whatever languages, write in whichever scripts and, do simple math like addition and subtraction either in writings or orally. The MYS (Mean Year of Schooling) are, however, arrived at only for the individuals who went to schools formally.

The MYS (Mean Year of Schooling) is based on criterion suggested by UIS (UNESCO Institute for Statistics). It requires the quantification of population under consideration into various categories. UIS (UNESCO Institute for Statistics) categorise those without formal education as No Schooling having a value score of zero. As such, population without formal education are dropped in analysis. Only those with formal education are divided into more specific category of those with primary, middle, secondary and higher secondary levels of schooling. Care is taken of population in higher education for graduation and post graduation level. Each respective category is further bifurcated into two sub-categories of those who did not complete the level and those who did it.

Further, to get a better insight of the educational scenario, MYS (Mean Year of Schooling) is arrived at for various age groups, ranging from 6 years to 40 years with a class interval of 5 years for each group starting at 6 years.

Thus Mean Year of Schooling *MYS* is given as,

$$MYS = \sum_{a} \sum_{l} HS_{al} \times YS_{al}$$

Where,

> HS_{al} is the proportion of the population in the age group *'a'* for which the level of education *'l'* is the highest level attained.

> YS_{al} is the official duration of the level of education *'l'* for age group *'a'* at the time when this age group was in school.

If the official duration of each level of education remains constant over time, the formula for MYS (Mean Years of Schooling) can be simplified as follows,

$$MYS = \sum_{l} HS_l \times YS_l$$

Where,

> HS_l is the proportion for which the level of education *'l'* is the highest level attained

> YS_l is the official level of education *'l'*

Since, the duration for each level remained static since decades at each level of schooling, the simplified formula holds. As such, the MYS (Mean Years of Schooling) is calculated based on the latter formulation.

2.6 Livelihood Capitals and Portfolio Index

The LPI (Livelihood Portfolio Index) is constructed based on the inspiration drawn from the LVI (Livelihood Vulnerability Index) in literature.[20] The LPI is but constructed based on equal weights of sub-components making the major components. This is done because sub-component being measured by different scale needs to be normalized to be used an index. The following formulae to get the normalized index:

Index $X_i = \dfrac{X_i - X_{min}}{X_{max} - X_{min}}$

Where,

> Index X_i is the index of the ith item

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[20] Can N.G. et al (2013) Application of Livelihood Vulnerability Index to Assess Risks from Flood Vulnerability and Climate Variability—A Case Study in the Mekong Delta of Vietnam, *Journal of Environmental Science and Engineering* A 2, pp 476-486

X_i is the actual observation or value

X_{min} is the minimum value of the item amongst the samples

$X_{max\ is}$ the maximum value of the item amongst the samples

An index for the respective sub-components is, thus worked out. The normalised index is, then deflated by aggregate weights of sub-components based on equal weights of each. This give us the weights of respective subcomponents at disaggregated level and on aggregation that of major components.

$$MC_i = \frac{\Box\ X_i}{\Box\ W_i}$$

Where,

MC_i is the ith major component

$\Box\ X_i$ is the aggregate of the respective index

$\Box\ W_i$ is the aggregate of the equal weights

The aggregate of sub-component or the major components so worked out are deflated by the total weight of all the major components to arrive at the weighted indexed value of respective major components. This gives us the relative importance of various livelihood capitals under consideration.

The LPI (Livelihood Portfolio Index) for the sample villages are worked out by taking equal weights of the entire portfolio under consideration. The LPI is computed as

$$LPI = \frac{P_i}{W_i}$$

Where,

LPI	=	Livelihood Portfolio Index
P_i	=	the proportion of the households with the respective portfolio activity
W_i	=	the weight which is equal for all items in the portfolio.

2.7 Area of Study

The area of study is the foothill villages of Lower RamleBanggo representing the Lower part of East Siang District. The constituent villages are seventeen in numbers namely; Detak, Depi, Depi, DepiMoli, Namey, Lumpo, Nari, Telam, New Telam, Potte, Tojo, Old Deka, New Deka, Pam, Seren, Seren Chapori. Agriculture and allied activities is but the way of life for the rural populace. Akin to any other rural set up of Arunachal Pradesh, the agriculture practice comprises a combination of both sedentary and shifting cultivation. In addition to usual agricultural activities, farming practices includes host of allied activities for the rural gentry. The study covers the four villages of Deka, New Deka, Potte and Telam. The selections of sample villages are done keeping in mind the cluster formation based on spatial commonality of group of village. Total of five clusters can be identified based on the spatial location, namely; Detak, Depi, Depi, DepiMoliat one end, Namey, Lumpo, and Nari as adjacent to it, and Telam, and Potte as one cluster. Similarly, at the other end are the villages Pam, Seren, Seren Chapori as a cluste, adjacent and above it are the villages of Old Deka, and New Deka as a cluster. Since, the four villages are in the middle at both ends of spatial location forming a cluster; they are selected for the purpose of the study.

CHAPTER 3

SOCIO-DEMOGRAPHIC PROFILE

This chapter deals in the socio-demographic or sociometric variables. The data here has been largely drawn from field and generated by processing the information collected through structured questionnaires. The necessity of generating sociometric data or capturing the socio-demographic variable emanates from the fact that such data gives us an insight about the capability and status of the group under study. Further, it gives some clue about how the group under study anticipates, responds or adapt to inherent and inevitable dynamics. Even a cursory idea about the socio-demographic profile may extend a great help in analysing, suggesting and prescribing measures for the betterment of the group.

3.1 Age and Gender

Structured questionnaire was first used to collect and record data. It was again followed by cross checking of the information for consistency. In case of any inconsistency, the households were again enquired for data after some time gap. Out of the sample households surveyed, about 50.43 percent were male (407 males) and 49.57 percent were female (400 females). This included all the population. The overall age of the total sample, irrespective of gender, is 29.82 years. However, the gender specific age is 30.10 years for male and 29.65 for female. Thus, average age of male is marginally higher than that of female (Table 3.1).

Table 3.1: Age Profile of Sample

(Figures in bracket in percentage)

Total Male Population	407 (50.43)
Total Female Population	400 (49.57)
Average Age (Overall)	29.82
Average Age (Male)	30.10
Average Age (Female)	29.65

Source: field data

Demographic profiles of the samples are also given in the village wise breakup format in the Table 3.2. It can be seen that male population is highest in the Old Deka

(52.40 percent), followed by New Deka (50.94 percent), Potte (54 percent) and Telam(48.87 percent). The female population is highest in the Telam (57.13 percent) followed by Potte (50 percent), New Deka (49.10 percent) and least is in the Old Deka (47.60 percent)

Table 3.2: Age Profile of Samples

(Figures in bracket absolute)

Categories	New Deka	Old Deka	Potte	Telam
Total Male Population	50.90 (85)	52.40 (109)	50.00 (83)	48.87 (130)
Total Female Population	49.10 (82)	47.60 (99)	50.00 (83)	51.13 (136)
Average Age (Overall)	29.11	29.98	31.41	29.32
Average Age (Male)	29.99	29.79	31.16	29.76
Average Age (Female)	28.21	30.19	31.66	28.90

Source: field data

In case of the average age village wise, the overall age is highest in Potte with 31.41 years followed by Old Deka at 29.98 years, Telam at 29.32 years and least is in New Deka at 29.11 years.

In case of Gender specific age, the highest male average age has been recorded for Potte village at 31.16 years followed by New Deka at 29.99 years, Old Deka at 29.79 years and Telam recorded the least of 29.76 years.With regard to the female age, the highest is again recorded at Potte village (31.66 years), followed by Old Deka (30.19 years), Telam (28.90 years) and the least is in the case of New Deka (28.21 years).

Gender difference in age within the respective village is found to be highest in case of New Deka – an average difference of 1.78 years- followed by Telam (0.86 years), Potte (0.5 years) and least is recorded in the case of Old Deka (0.4 years).

The age composition of the sample is given in the Table 3.3. It can be seen that 8.05 percent belong to infant category (0-5 yrs). About 23.05 percent arein the age category of 06-18 years, 26.64 percent in the 19-30 group, and 23.05 percent in the age group 31-45 years. The age category 46-65 constituted about 14.13 percent and those in the category 66 and above comprise of 5.08 percent. Leaving aside the category 0-5 years (8.05 percent), population in the age group concentrate largely around 06-18 and 31-45 categories (23-26 percent). The population category thereafter seems to

declined as age proceeded on (14.13 percent for 46-65 years and the least (5.08 percent) for 66 and above).

Table 3.3: Age Composition of Sample

Age Groups	Absolute	Percent
Below 5 Years	65	8.05
06 - 18 Years	186	23.05
19 - 30 Years	215	26.64
31 - 45 Years	186	23.05
46 - 65 Years	114	14.13
66 and Above	41	5.08
Total	**807**	**100.00**

Source: field data

Table 3.4: Age Composition of Samples

(Figures in bracket absolute)

Age Groups	New Deka	Old Deka	Potte	Telam
Below 5 Years	6.59 (11)	7.69 (16)	9.04 (15)	8.65 (23)
06 - 18 Years	29.34 (49)	20.67 (43)	16.87 (28)	24.81 (66)
19 - 30 Years	17.96 (30)	31.25 (65)	29.52 (49)	27.07 (72)
31 - 45 Years	25.15 (42)	22.12 (46)	24.10 (40)	21.43 (57)
46 - 65 Years	19.16 (32)	14.90 (31)	10.24 (17)	12.78 (34)
66 and Above	1.80 (3)	3.37 (7)	10.24 (17)	5.26 (14)
Total	**100 (167)**	**100 (208)**	**100 (166)**	**100 (266)**

Source: field data

Village wise break up of age composition is given in the Table 3.4. In the age group below 5 years New Deka has the lowest (6.59 percent) followed by Old Deka at (7.69 percent), Telam (8.65 percent) and the highest is recorded in Potte village (9.04 percent). For the age category 6-18 years New Deka has the highest percentage around 29.34 percent, followed by Telam (74.81 percent), Old Deka (20.67 percent)

and the lowest in the case of Potte (16.87 percent). In the age group 19-30 years the Old Deka recorded the highest, followed by Potte (29.52 percent), Telam (27.07 percent) and least is in the village of New Deka (17.96 percent). In case of age category 31-45, the variation is relatively less ranging between 22 and 25 percent. The highest in this age category is in the village of New Deka (25.15 percent) followed by Potte (24.10 percent), Old Deka (22.12 percent) and Telam (21.43 percent). In the age category 46-65 the highest is recorded in New Deka (19.16 percent) followed by Old Deka (14.90 percent), Telam (12.78 percent) and the least in the village Potte (10.24 percent). In the age category 66 and above least is recorded in the New Deka (1.80 percent) followed by Old Deka (3.37 percent), Telam (5.26 percent) and the highest is recorded in Potte (10.24 percent).

The same (Table 3.4), within the samples in the village New Deka the population in the age group 66 and above is least (1.80 percent) followed by those below 5 years (6.59 percent) and then in the age group 46-65 (19.16 percent). The highest is recorded in the age category 06-18 (29.34 percent) followed by 31-45 (25.15 percent) and 19-30 (17.96 percent). Thus, akin to the overall scenario in the preceding table, age group 06-18 and 31-45 dominates the composition. However, unlike clustering around the mean, variation could be seen ranging from 17-29 percent. In case of Old Deka,those in the age category of 66 and above are(3.37 percent), the least, followed by those in the age group of below 5 years (7.69 percent). The age category 19-30 years is highest with 31.25 percent followed by 31-45 years group at 22.12 percent and 06-18 years constitute only 20.67 percent. As for the category 46-65 it is nearly 15 percent (14.90 percent).For the Age category below 5 years, it is 9.04 percent in case of Potte village, which is least amongst the sample villages. This is followed by those in the age category of 46-65 and 66 and above each constituting about 10.24 percent. The group 19-30 years has the highest percentage of 29.52 followed by the group 31-45 (24.10 percent).

The Telam village has least composition in the age group 66 and above (5.26 percent) followed by those in the group below 5 years (8.65 percent). The highest composition clustered around 19-30 years (27.07 percent) followed by 06-18 years (24.81 percent) and 31-45 (21.43 percent). 12.78 percent is recorded for the age category 46-65.

Thus, it can be seen that the age composition of the respective sample villages are almost akin to the overall composition. The only exception is with regard to the variation in the range of age group towards which the composition clustered. The least proportion of the population is found to be increasingly related inversely to ageing. In other words, more of the populace werein their youthful age i.e. from 06-

45. In any case, in the age group 19-30 and 31-45 taken together represents the largest group of the composition.

3.2 Literacy and Education

While literacy represents minimum formal education, attempt is made to take an account of those who could read, write, and do simple arithmetic. In case of literacy (Table 3.5), the overall literate population are 74.10 percent and the rest 17.84 percent are illiterate. This excludes the population below 5 years of age, accounting to 8.06 percent of the total population.

Table 3.5: Status of Literacy

(Figures in bracket absolute)

Categories	Overall	New Deka	Old Deka	Potte	Telam
Illiterate	17.84 (144)	14.97 (25)	15.87 (33)	14.46 (24)	68.04 (181)
Literate	74.10 (598)	78.44 (131)	76.44 (159)	76.51 (127)	23.31 (62)
Age Below 5 years	8.06 (65)	6.59 (11)	7.69 (16)	9.03 (15)	8.65 (23)
Total	**100 (807)**	**100 (167)**	**100 (208)**	**100 (166)**	**100 (266)**

Source: field data

Highest number of literates is found in the sample village New Deka (78.44 percent), followed by Potte (76.51 percent) and Old Deka (76.44 percent). The least is recorded in Telam village (23.31 percent). As such, the least proportion of illiterate population is found in New Deka (14.97 percent), followed by Potte (14.46), Old Deka (15.87 percent) and the highest in Telam village(68.04 percent).

From the same table, it can also be learnt that population below 5 years of age, the excluded population in this case, the highest is recorded in the Potte village (9.03 percent) followed by Telam (8.65 percent), Old Deka (7.69 percent) and New Deka (6.59 percent).

The breakup of educational status is given in the Table 3.6. In total, twelve categories were derived out of the six groups (primary, middle schooling, secondary level, Senior Secondary, Collegiate, Post Graduate) i.e. each into incomplete and complete categories. The overall population with incomplete primary schooling accounts about 12.71 percent while those who completed accounts 5.69 percent. Similarly those with incomplete and complete middle schooling are 9.53 percent and 9.36 percent respectively. Those with incomplete secondary schooling are 9.70 percent

and those who did not constitute 14.72 percent. In case of Senior Secondary Schooling group representing incomplete is about 5.69 percent and completed is 13.71 percent. Those still pursing or the ones who left college constitute about 2.34 percent and those who completed account 13.71 percent. Those who could not complete PG or are still pursuing is less than a percent (0.33 percent) but who completed is about 2.51 percent.

The table also reveals the sample specific status. In New Deka populace cluster around the categories, incomplete primary, mid-school or secondary level of schooling. Those who have completed mid school comprise 12.98 percent, while incomplete category constitutes 5.34 percent. Similarly, for the Secondary level schooling, those with incomplete and complete schooling comprise 12.21 and 13.74 percent respectively. The category of population in the group with incomplete primary schooling is 18.32 percent, the highest. Those with incomplete primary schooling are 5.34 percent. In the category, Senior Secondary, those with incomplete schooling is 7.63 percent and those who completed figure at 9.16 percent. There are no incomplete Collegiate or Post Graduation, while those who graduated or post graduated figure at 13.74 and 2.29 percent respectively. Thus, it can be seen that population cluster at either incomplete primary level schooling or in between the range from middle school to Secondary level, least is found as we move up the educational hierarchy.

In the case of Old Deka, in the category of incomplete primary schooling is 13.84 percent and only 8.18 percent completed the same. In case of middle school level, the incomplete category is 9.43 percent and the completed constitute 6.92 percent. In the Secondary level, completed comprise 10.06 percent of the sample population, while 7.55 percent did not complete the level.

Similarly, incomplete Senior Secondary constitutes 4.40 percent and about 10.69 percent completed the same. About 21.38 and 5.03 percent fall under the respective category of complete and incomplete graduates; which is highest across sample villages. Less than a percent of village population; 0.63 percent to be precise, is found under the category of incomplete Post graduation. Those who completed Post graduation is around 1.89 percent. Thus, in Old Deka graduate constitute the largest group, followed by those with incomplete primary schooling. Similarly, it is around 7 to 11 percent for the categories ranging from incomplete middle schooling to Senior Secondary.

Table 3.6: Educational Status

(Figures in bracket absolute)

Educational Status	Overall*	New Deka	Old Deka	Potte	Telam
Primary Incomplete	12.71 (76)	18.32 (24)	13.84 (22)	7.09 (9)	11.60 (21)
Primary Complete	5.69 (34)	4.58 (6)	8.18 (13)	2.36 (3)	6.63 (12)
Mid-School Incomplete	9.53 (57)	5.34 (7)	9.43 (15)	11.81 (15)	10.50 (19)
Mid-School Complete	9.36 (56)	12.98 (17)	6.92 (11)	5.51 (7)	11.60 (21)
Secondary Incomplete	9.70 (58)	12.21 (16)	7.55 (12)	10.24 (13)	9.39 (17)
Secondary Complete	14.72 (88)	13.74 (18)	10.06 (16)	14.17 (18)	19.34 (35)
Sr. Secondary Incomplete	5.69 (34)	7.63 (10)	4.40 (7)	5.51 (7)	6.08 (11)
Sr. Secondary Complete	13.71 (82)	9.16 (12)	10.69 (17)	21.26 (27)	14.36 (26)
Collegiate	2.34 (14)	0.0 (0)	5.03 (8)	3.15 (4)	1.10 (2)
Graduate	13.71 (82)	13.74 (18)	21.38 (34)	14.96 (19)	6.63 (12)
PG Incomplete	0.33 (2)	0.00 (0)	0.63 (1)	0.79 (1)	0.00 (0)
PG Complete	2.51 (15)	2.29 (3)	1.89 (3)	3.15 (4)	2.76 (5)
Total	**100 (596)**	**100 (131)**	**100 (159)**	**100 (127)**	**100 (181)**

Source: field data

*Excludes age group ≤ 5 years (≡ 65) and illiterate (≡144) population in case of overall and for sample villages it excludes the respective population below 5 years and those who fall under category illiterate

With regard to Potte village the largest group is in the category of those who completed senior secondary (21.36 percent) followed by who completed graduation (14.96 percent) and secondary (14.17 percent). About 7.09 percent fall under category of incomplete primary schooling and only 2.36 percent completed. In the category, incomplete middle and secondary schooling, the figure is about 11.81 percent and 10.24 percent respectively. Those with incomplete graduation constitute 3.15 percent while it is 0.79 percent in case of Post graduation. The other values cluster towards the range of 5 to 5.5 percent, except for complete primary and Post graduation, which accounts for about 2.36 and 3.15 percent respectively.

Telam village, the largest chunk of the population is found in the category of those who completed secondary level of schooling (19.34 percent), followed by complete senior secondary level schooling (14.36 percent). The incomplete primary and completed mid level schooling group each are equally at 11.60 percent. With

exception to incomplete secondary level schooling (9.39 percent) and Post graduates (2.76 percent) other figures cluster around the value of 6.08 – 6.63 percent. Nonetheless, graduation completed comprises 1.10 percent and those with Post graduation 2.76 percent. There is no incomplete Post graduation. Thus, we find less and less proportion of population, if we move beyond the secondary level of schooling. In the contrary, we find more and more in the category of primary and mid-level schooling. One important aspect of the data reading is that of primary schooling. More and more of the aged people are found in this group, and this is particularly true of those with incomplete primary schooling.

3.3 Mean Years of Schooling

The proportion of population in various categories discussed above provides brief idea of educational status, Mean Years of School (MYS henceforth) gives us a relatively clear picture and is more representative. As such, the MYS is completed, for various age categories for the study area as a whole and the villages as well (Table 3.7).

Table 3.7: Mean Year of Schooling by Age Group

Age Group	Overall	New Deka	Old Deka	Potte	Telam
MYS 6 - 10	3.16	2.50	2.95	3.80	3.36
MYS 11 - 15	6.81	5.66	6.71	8.06	6.60
MYS 16 - 20	11.02	10.80	11.07	11.98	10.21
MYS 21 - 25	12.38	11.78	13.06	13.59	11.86
MYS < 25*	**8.35**	**7.75**	**8.48**	**9.78**	**7.81**
MYS 26 - 30	10.12	11.20	11.62	11.51	8.65
MYS 31 - 35	9.85	10.62	12.15	11.61	7.25
MYS 36 - 40	8.16	9.85	7.49	8.75	6.78

Source: field data

The MYS for the study area or overall is given in the second column. For the age group 6-10 years, the MYS is 3.16 years. With regard to age group 11-15 years and 16-20 years, the MYS figures are at 6.81 and 11.02 years respectively. Further, it is 10.12 and 9.85 years for the age group 26-30 and 31-35 respectively. For the age group 36-40 the MYS is 8.16. MYS was also computed for all those above 5 years and below the age of 25 years, and it is around 8.35 years for the overall study area.

MYS was also computed for the respective sample villages. For New Deka, the mean year of schooling is 2.50 years for the age group 6-10 years, 5.66 years for age group 11-15 years, 10.80 for the age group 16-20 years and 11.78 for the age category 21-25. The MYS for all under the age group of less than 25 years is about 7.75.

In case of Old Deka the MYS is about 2.95 years, 6.71 years, 11.07 years and 13.06 years for the respective age group 6-10 years, 11-15 years, 16-20 and 21-15 years. The MYS for all the population below the age group of 25 years is 8.48 years. Further, for the age class 26-30 years, 31-35 years and 36-40 years, the MYS is 11.62 years, 12.15 years and 7.49 years respectively.

For Potte the MYS is 3.80 years, 8.08 years, 11.98 years and 13.59 years for the respective age category 0-5 years, 6-20 years, 11.15 years and 16-20 years and 21-25 years. The MYS for all those within the gamut of 25 years or less is 9.78 years. For the age category 26-30 years, 31-25 years and 36-40 years, the respective MYS is 11.51 years, 11.61 years, and 8.75 years.

With regard to Telam, for the age group 6-10 years the MYS is about 3.36 years. In the age group 11-15 years, it is 6.60 years. The MYS is 10.21 and 11.86 years for the age group 16-20 and 21-25 years respectively. The consolidated MYS for those in the age group 25 years or below is 7.81 years. It is 8.65 years, 7.25 years and 6.78 years for the age category 26-30 years, 31-35 years and 36-40 years respectively.

In case of the age group 6-10 years Potte and Telam has MYS higher than the overall MYS, while others are below it. For the age group 11-15 years all other villages have MYS less than the overall MYS, except Potte. Similarly, in case of age group 16-20 years while all villages has MYS higher than the overall MYS, New Deka and Telam cluster around about 10 years, while Old Deka and Potte clustered around a little more than 11 years. Village Potte, in fact, has a MYS nearing 12 years; 11.98 to be precise. For age group 21-25 years, New Deka and Telam has a MYS less than that of the overall MYS of 12.38 years, while Old Deka and Potte has a higher MYS around a little more than 13 years (about 13.59 years for Potte). The MYS for the age group less than 25 years is highest in case of Potte (9.78 years), followed by Old Deka (8.48 years) and rest of the villages are well below the overall MYS of 8.35 years. Thus, it can be seen that, for the age group 6-25 years, Potte village is better placed in case of MYS, which of course is very marginal for some age classes.

In case of the age class 26-30 years, except for Telam village, all other village has MYS higher than the overall MYS of 10.12 years. In fact, the MYS is highest in case of Old Deka at around 11.62 years. Similar trends are found in case of age group 31-35

years, except for Telam Village, the MYS is higher than the overall MYS of 9.85 years. Here too, Old Deka is better placed at 12.15 years. Thus, for the age group 26-35 years, the Old Deka is better placed in terms of MYS. With regard to the age group 36-40 years, the overall all MYS is about 8.16 years. Except for New Deka and Potte with respective MYS at 9.85 and 8.75 years, other two villages are well below the overall MYS.

3.4 Households Characteristics and Size

The Characteristics of households are given in the Table 3.8. It can be seen that out of 116 households surveyed about 91.38 percent are below poverty line i.e. BPL households (Henceforth BPL). Across the sample villages, in New Deka about 94 percent households fall under the category of BPL i.e. 17 out of 18 are BPL households. The figure is 96.88 percent in case of Old Deka (31 out of 32 households). The BPL households are 85.71 and 89.47 percent respectively for Potte and Telam Village. With exception to the last two villages; namely Potte and Telam, the first two villages have percentage of BPL Households higher than the overall percentage of 91.38 percent.

The category of BPL households is further assured if we look into the households registered under the Mahatma Gandhi National Rural Employment Guarantee Act (henceforth MGNREGA). In fact, about 96.55 percent (112) households registered under MGNREGA and have been issued job cards. About 63.21 (469) persons are enrolled under MGNREGA seeking job. Also, in terms of persons enrolled, except for New Deka with 73.72 percent, other sample villages have enrolment lower than the overall percentage of 63.21. The least is recorded in Old Deka (57.81 percent) followed by Potte and Telam at about a little above 62 percent.

Table 3.8: Economic Status of Households

Characteristics	Overall	New Deka	Old Deka	Potte	Telam
No of Household	116	18	32	28	38
BPL Household	91.38 (106)	94 (17)	96.88 (31)	85.71 (24)	89.47 (34)
MGNREGA Household	96.55 (112)	94 (17)	100 (32)	100 (28)	100 (38)
Persons enrolled under MGNREGA	63.21 (469)	73.72 (115)	57.81 (111)	62.25 (94)	62.14 (151)

Source: field data and Ministry of Rural Development Website

**Persons enrolled under MGREGA is relative to total included population

Another important dimension of the household characteristic is the household size. It can be seen from Table 3.9 that on the average the family size for the overall study area is almost seven (6.96) individuals per household.

Table 3.9: Average Family Size

Particulars	Overall	New Deka	Old Deka	Potte	Telam
Total Population	807	167	208	166	266
Total Households	116	18	32	28	38
Average Family Size	6.96	9.28	6.50	5.93	7.00

Source: field data

Across the sample villages, the average family size is highest in the New Deka, 9.28 individuals per household. This is followed by Telam at 7 individual per household, which again is at par with the overall family size of the study area. Though populated, the average family size is relatively low in case of Old Deka at around six (6.50) members per household. The lowest of 5.93 persons per household is recorded in the Potte village. The big size of household membership is also due to joint nature of the family.[21]

3.5 Landholding and Acreages

Land is one major factor in determining the resource base of an individual household and thereof the social status in a rural economy. In this regard, the land holdings were broadly classified, for the purpose of simplicity, as Total Agricultural Holdings and Total Land Holdings. In case of the former, no explicit differentiation is made with regard to types of holdings. Hence, it includes irrigated, un-irrigated as well as the shifting fields. With regard to the later, it also includes landholdings devoted to the homestead. The details are given in the Table 3.9.

It can be seen from the table that the total agricultural holdings for the overall study area is about 2165.62 acres, while the total land holdings is 2256.23 acres. In other words, the total land available or devoted to homestead is about 90.58 acres, which is about 4.01 percent of the total land holdings. As for the 116 households for the overall study area, homestead per household is about 0.78 acres per household.

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[21] In the recent times there is surge of nuclear families. Even in such cases, often the living space was separate and not the cooking space and pots. Having more than one fire hearts or separated cooking pots within a family are still looked down upon.

Table 3.10: Landholding Status

(in acres)

Sl. No	Particulars	Total Agricultural Holdings	Total Land Holdings	Total Homestead	Homestead as Percentage of Total Land Holdings	Homestead Per Household
1	Overall	2165.62	2256.23	90.58	4.01	0.78
2	New Deka	461.50	478.69	17.19	3.59	0.96
3	Old Deka	569.92	590.09	20.17	3.42	0.63
4	Potte	304.79	320.34	17.52	5.47	0.63
5	Telam	415.05	450.75	35.70	7.92	0.94

Source: field data

The table also reveals the land holding status of the sample villages. In case of New Deka, the total agricultural holding is 461.50 acres while the total land holding is 478.69 acres. About 17.19 acres are devoted to homestead which is 3.59 percent of the total land holdings. As such, homestead per household is about 0.96 acres per household. With regard to village Old Deka the total agricultural holdings are about 569.92 acres while the total land holdings accounted for about 590.09 acres. The total homestead is about 20.17 acres which is 3.42 percent of the total land holdings. The homestead per household is about 0.63 acres.

For the sample village Potte, about 304.79 acres are agricultural landholdings while the total land holding is about 320.24 acres. About 17.52 acres of land is devoted for homestead which accounts to about 5.47 percent of the total land holding. Homestead per household amounts to about 0.63 acres per household. In case of Telam village, the total agricultural holdings are 415.05 acres. The total land holdings are about 450.75 acres. The total land devoted to homestead is about 35.70 acres accounting about 7.92 percent of total land holdings. Thus, the homestead per household is about 0.94 acres per household.

Thus, it can be seen from the same table that the total agricultural holdings as well as total land holdings are highest in the case of Old Deka followed by New Deka. Of the four villages, Potte has the least agricultural land holdings. In case of total land devoted to homestead, Telam village has the highest acreage followed by Old Deka with New Deka having the least of the four villages.

However, land devoted to homestead as percentage of total land holdings of individual village is highest in case of Telam (7.92 percent) followed by Potte(5.47 percent) and the leastis recorded in Old Deka (3.42 percent) as against the overall percentage of 4.01. Nonetheless, New Deka has the highest acreage of homestead per household (0.96 acres) followed by Telam (0.94 acres), with Potte and Old Deka at par with each other at 0.63 acres. Except for New Deka and Telam, the homestead acreage per household of other two villages is much below the overall acreage of 0.78 acres.

3.6 Homestead and House Types

Table 3.10 gives us the detailed status of homestead owned. The overall study area has about 11 households without homestead land. It accounts for about 9.48 percent of the total households. In case of village wise samples, Potte village has the highest number (5 households) without homestead land. This is followed by Old Deka (3 households) and the least is in case of Telam (2 households). Similarly, as per the percentage of the total households in respective sample villages is concerned, the highest is recorded in case of Potte (17.86 percent), followed by Old Deka (9.38 percent) and the least is as usual recorded at Telam (5.26 percent).

In majority of the cases, each household shared family lands as homestead. Nonetheless, as convention, there were also provisions of village or *kebang* land wherein families without homestead were accommodated.

Table 3.11: Status of Homestead Land Owned

Villages	Households without Homestead	Total Surveyed Households	Percentage of Household without Homestead
New Deka	1	18	5.56
Old Deka	3	32	9.38
Potte	5	28	17.86
Telam	2	38	5.26
Overall	11	116	9.48

Source: field data

Table 3.12: House Types

(Figures in bracket Absolute)

Particulars	Pucca	Semi Pucca	Traditional
New Deka	16.67 (03)	61.11 (11)	22.22 (4)
Old Deka	6.25 (02)	28.13 (09)	65.63 (21)
Potte	17.86 (05)	21.43 (06)	60.71 (17)
Telam	2.63 (01)	39.47 (15)	57.89 (22)
Overall Total	9.48 (11)	35.34 (41)	55.17 (64)

Source: field data

Equally important dimension is that of the house types. House types not only reveal the economic status but also highlight the resource dependence of the household. As such, from Table 3.11, it can be seen that the house types are classified into Pucca, Semi-Pucca and Traditional ones. While the natural resource dependence of the Traditional type houses are high and recurring, it is relatively less in case of the Semi-Pucca and more so in case of the Pucca house types. It can be seen from the Table 3.12 that only about 11 houses constituting around 9 percent are fully pucca house types. Whereas more than 64 houses accounting more than 55 percent are traditional houses. Semi-Pucca house types are about 35.34 percent accounting about 41 in numbers.

Thus, it is seen that the traditional house types predominates the housing scenario. As percentage to respective totals, the highest is recorded in Old Deka around 66 percent. This is followed by Potte nearing 61 percent and Telam with 57.89 percent. The least is recorded in New Deka.

The least number of house types is Pucca houses. Except for Telam and Old Deka, the other two villages have percentage of Pucca Houses to their respective totals higher than the overall percentage of 9.48. Potte has highest percentage of about 17.86 percent followed by New Deka at around 16.67 percent. Old Deka and Telam figure at about 6.25 and 2.63 percent respectively.

In case of Semi-Pucca, the highest percentage with respect to respective total is again for New Deka (61.11 percent) followed by Telam (39.47 percent) which is above the overall percentage of 35.34 percent. Old Deka and Potte are at 28.13 percent and 21.43 percent respectively.

It is worth mentioning that almost all the semi-pucca houses were built decades back when woods and timbers were available. Still such house types are built by those who have adequate access to timber and woods. Recent trend or recently constructed houses are mostly pucca. Of course, traditional houses are still affordable as required resources and materials are either owned, easily accessible or are easy tomanage locally.

Table 3.13: House Types as Percentage of Overall Total

Particulars	Pucca	Semi Pucca	Traditional
New Deka	27.27	26.83	6.25
Old Deka	18.18	21.95	32.81
Potte	45.45	14.63	26.56
Telam	9.10	36.59	34.38
Overall Total	100 (11)	100 (41)	100 (64)

Source: field data

While house types as percentage of respective totals gives us a fair idea, a deeper insight of the variation can be assessed by house types taken as percentage of the overall total. The same can be seen in Table 3.12. As a percentage of overall total of 11 houses, the respective share of pucca house is highest in Potte (45.45 percent) followed by New Deka (27.27 percent) and the least is in the case of Telam (9.10 percent). In case of the semi-pucca houses, the highest is recorded in Telam (36.59 percent) followed by New Deka (26.83 percent) and Old Deka (21.95 percent). The least is recorded at Potte (14.63 percent). Similarly, highest share of traditional dwelling or house types is found in Telam (34.38 percent) followed by Old Deka (32.81 percent). The least is found in New Deka (6.25 percent).

3.7 Occupational Status

As already mentioned in methodology, for the purpose of analysis, infants falling under the age category of 5 years or less has been excluded. It is already observed (Table 3.13)students comprised the largest group (39.22 percent), followed by the category farmers (26.55 percent). Of the total sample population under consideration, about 18.19 percent were secondary, which included retired personalities, old aged individuals and housewives. Those in the services in the government sector and private sector comprised 12.13 and 3.91 percent respectively.

In case of sample wise distribution, New Deka has 40.38 percent of population as students, followed by 30.13 percent as farmers. While only 2.56 percent are in private sector services, about 19.23 percent are in the government sector.

Table 3.14: Occupational Distribution

(Figures in bracket Absolute)

Particulars	Farmers	Services Govt. Sector	Services Pvt. Sector	Students	Secondary	Total
New Deka	30.13 (47)	19.23 (30)	2.56 (4)	40.38 (63)	7.69 (12)	100 (156)
Old Deka	38.02 (73)	13.02 (25)	0.52 (1)	39.58 (76)	8.85 (17)	100 (192)
Potte	18.54 (28)	13.91 (21)	9.93 (15)	36.42 (55)	21.19 (32)	100 (151)
Telam	20.16 (49)	5.76 (14)	3.70 (9)	39.92 (97)	30.45 (74)	100 (243)
Overall	26.55 (197)	12.13 (90)	3.91 (29)	39.22 (291)	18.19 (135)	100 (742)

Source: field data

In case of Old Deka, 39.58 percent of the population are students and almost equivalent figures of 38.02 percent are farmers. Private sector services account for less than a percent but the services in the government sector account for about 13.02 percent.

In case of Potte village, students account for about 36.42 percent, farmers accounted only about 18.54 percent. The category represented by secondary and those engaged in private sector account for 21.19 and 9.93 percent respectively. Those in the government services are about 14 percent. In case of Telam, while the category students account for about 39.92 percent, the second largest category is represented by the group secondary at 30.45 percent. Farmers account for about 20.16 percent, those in the services; both government and private account for 5.76 and 3.70 percent respectively.

Thus, it can be inferred that there is lack of productive labour at present. In fact, other categories like students, services both private and government cannot be taken at par or equally active contributors as the farming group. Hence, based on necessity and context some kind of labour-labour substitution by farming group takes place. Often they seek labour from the secondary and student category. Rarely do those in the services sectors participate; but often they lend monetary help.

Hence, the study area if not well developed can be categorised as emerging one. There is near about parity in gender and age, literacy and education, landholdings and homestead as well as dwelling units across sample village. This is also true within the sample households. This does not, however, undermine the scope for further improvements. In fact, there are whole lot of areas to harness the potentials of the study area. Further improvements, either in terms of human capital, and gender justice, poverty alleviation and interventions to improve dwelling units may go a long way in unleashing the potential gains.

CHAPTER 4

ASSET AND STRATEGIES

As already defined in the introduction and conceptualised in methodology section, livelihood comprises all and everything that an individual household undertakes for a living. It includes capitals, such as, natural, physical, social, human and financial. An attempt is made in this chapter to classify the various capitals falling under the five broad groups. The aim is also to understand as to how the sample villages have so far diversified their livelihood sources and adapted to themselves. However, we cannot simply classify various activities into categories of capitals as mentioned above. Hence, what follows is an analysis of the occupational paradigm, landuse pattern, agricultural practices and analysis of household assets to contextualise the various capital portfolios of the households.

4.1 Occupational Paradigm

From the occupational status in the forgone chapter it can be construed that the study area has an occupational paradigm representing diverse group. Further, it can also be also seen and inferred that, it is a labour deficit area. As reflected in the previous table 3.13, nearly 40 percent of the population fall in the category students. Further, there are also infant population constituting about 8.05 percent of the total population of 807).[22]Further, about 18.19 percent of the population are included in the so called secondary category. These two categories represented the not so active labour or workforce. While the former category; the students are fully dependent, the latter group falling into the secondary category often rescued the deficit workforce.[23]

Those in the services; both private and else constitute 16.21 percent. While they are not active workforce in terms of their contribution to rural livelihood, they do contribute through their incomes. More often, this group either engage daily wage labourers or employ them by paying monthly salary. As such, the dependency rate is high as only 26.55 percent of the population are engaged directly and actively in the rural production process or livelihood activities.

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[22] It may be noted that, for the purpose of analysis, we have excluded the infant or population of age category which are either 5 years or less, reducing population for analysis to 742.

[23] Of course, productivity in this case can be argued as the secondary category comprised mainly of old aged populace, retired personnel's and housewives.

Many a times, the rescue by the secondary category do not suffice the workforce deficit. Hence, most of the times these deficits are manned by the workforce from the neighbouring labour market, mostly from Assam.

4.2 Land use Pattern

Land use pattern is important not only from the perspectives of production and conservation but also from the standpoint of providing right options and interventions that may incentivise to improve the use itself. Hence, the landholdings were classified and their use pattern examined. The following section is devoted to land use pattern and their classification based on spatial location and use pattern.

The total agricultural holding of overall study area is about 2165.62 acres, while the total land holdings is 2256.23 acres. In other words, the total land devoted to homestead is about 90.58 acres which is 4.01 percent of the total land holdings. For the 116 households of the overall study area, homestead per household is about 0.78 acres per household (Table 4.1).[24]

Table 4.1: Land Use Pattern

Sl. No	Particulars	Land Uses (In Acres)	Per HH (In Acres)	Percentage of Total Holding	Percentage of Agricultural Holding
1	Homestead	90.58	0.78	4.01	
2	Staples (Wet Paddy Cultivation)				
2.1	Rain Fed	169.59	1.46	7.52	7.83
2.2	Irrigated	352.40	3.04	15.62	16.27
	Total (2.1+2.2)	521.99	4.50	23.14	24.10
3	Cultivable Land (Un-irrigated)	339.84	2.93	15.06	15.69
	Total Cultivable Land for Staple (2.1+2.2+3)	861.83	7.43	38.20	39.80
4	Shifting Cultivation	681.82	5.88	30.22	31.48
5	Plantation	622.00	5.36	27.57	28.72
	Total Land Holdings 2.1+2.2+3+4+5)	2256.23	19.45	100.00	104.18
6	Total Agricultural Holdings (Land exclusive of Homestead)	2165.65	18.67	95.99	100.00

Source: field Data

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[24] For analytical purpose, agricultural holdings were differentiated from total holding by lessening the land devoted to Homestead.

Farming is one core facet of rural way of living. As was evident during field visits, even the homesteads were virtually a sanctuary of many different activities. It was used for gardening, backyard poultry and piggery, for growing herbs and spices, and for planting nuts, fruits and citrus etc. In many cases, it acts as nursery for saplings; for own use and market disposal.

Further, the land use pattern reveals that a significant parts of land has been devoted to the cultivation of staples; which in this case is paddy cultivated through wet paddy cultivation. It can be seen from table that out of the 2165.65 acres of agricultural holdings, about 521.99 acres accounting for about 24.10 percent is devoted to the cultivation of staples. Of the total land devoted to staple, about 7.83 percent (169.59 acres) are rain fed or not fully irrigated and has to depend on rain water for cultivation. Rest of the 352.40 acres accounting for about 16.27 percent are fully irrigated.

From the same table, it is revealed that there is about 339.84 acres of land are yet to be irrigated. This accounts for about 15.89 percent of the total agricultural holdings. These lands in most of the cases are occasionally used to cultivate pulses, coarse cereals or mustards seeds. Rarely are these plots used for staples or other high valued cash crops on a permanent basis. One, of the reason for this is the lack of irrigation facilities or sources of it.[25]

Another dimension of land use, and of socio-cultural importance, in terms of cultivation is that of shifting cultivation. About 681.82 acres of land, accounting for 31.48 percent of total agricultural holdings are shifting fields. Outputs from shifting cultivation not only meet the consumption requirements but also act as cushion to transaction requirements and income shocks of the households. In fact, the agricultural surplus drawn from shifting agriculture are disposed off in the markets on weekly basis and is a major source of livelihood of the rural gentry in the study area. In the course of commercialisation of products of shifting cultivation, many of traditional crops vanished from being produced or are at verge of it. In other words, households are driven by the demands of the produces. Table 4.2 below gives us some account of such produces.

It is seen that produce like paddy, chilli, maize, yam, soya, leafy vegetables, cucumber, melon, pumpkin and gourds persist the produce basket of the shifting cultivation. On the other hand, there are few produces like millet and sesame which

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[25]Irrigation source in this case refers to the over ground sources, which according to the respondents are easier to manage and cost efficient.

are at the verge of vanishing from the product mix. There were also traditional crops that are no longer the part of shifting cultivations product mix or have vanished over the period. Usually the reasons cited by the respondents were that it unnecessarily occupied the already limited space, and the younger generation in the households do not have taste for it. Hence, they dropped its cultivation and kept more in tandem with the market disposal ability of the product mix.

Table 4.2: Produce of Shifting Cultivation

Paddy	Cucumber	Elak**
Chilli	Melon	Tay**
Maize	Pumpkin	Tayak**
Yam	Gourds	Tanyak**
Soya	Millet*	
Leafy Vegetable	sesame *	

Source: Field Data

*At the verge of being out of the product mix of shifting cultivation

**already taken out of the product basket of shifting cultivation vanished

#Equivalent scientific or non-local name could not be identified

The shifting fields are either left fallow to rejuvenate after one production cycle or are converted into plantations. Plantations, as such comprise an important space both in case of land use pattern and as livelihood source.

It can be seen from the table that about 28.72 percent (622 acres) of the total agricultural landholding has been devoted to plantations. Plantation in the study area is usually based on silviculture, horticulture, rubber, tea, bamboo, palm (Bismarckia Nobilis), nuts (Areca), pineapples etc. It is worth mentioning here that, bamboo and palm plantations are being practised by the people of the study area since they have migrated to the area before independence of India. Further, except for the practice of silviculture, other plantations were self initiatives of the rural households. Hence, in the recent times, since a decade or two now, plantations are mainly in the nature of horticulture, rubber, tea, betel (Acreca) nuts and other high valued crops.

4.3 Household Farm Practices

The study under consideration is the beginning point or the baseline study in the context of livelihood. Hence, an ethnographic account in an attempt to get past information was carried out. The method was to ignite in the memory of the respondents about present practices and then to trace back to time and record the changing dynamics and adaptation. It was followed by open discussion as well as focus group discussions.[26]

As can be seen from the Table 4.3, 83.62 percent (97 out of 116) households are cultivators. While land use pattern is important, equally important is the way in which the livelihood processes are carried out. Being labour deficit, majority of the households in the study area are engaged in wet paddy cultivation of staple through the institution of sharecropping or by employing wage labourers.[27] Sharecropping as alternative gives a better edge to the land owner in terms of both cost and labour time. Hence, in majority of cases, wet paddy cultivation of staples are carried through sharecropping institutions. However, there is an emerging reality in recent times of owner cultivation due to drastic fall in the jhum-cycle, consequent upon increased plantations and population. At any rate, sharecropping as institution predominates the wet paddy cultivation, while shifting cultivation and plantations are operationally managed by the owners themselves.

Thus, with exception to wet paddy cultivation, all other activities of the households are directly carried out by themselves using family labour. It is found that majority of the households; about 54.31 percent are engaged in shifting cultivation. It is also worth mentioning that the 68.10 percent of the households, who are engaged partly in plantation, were mostly shifting cultivator earlier. In addition to shifting cultivation and plantation, household also engage in gardening around homestead to meet the household consumption, the cost of sharecropping as well as the transaction requirements. Those who engage actively in gardening are about 28.45 percent of the total households.

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[26] Some relevant episodes are given in the Box Item (Box B1)

[27] The sharecroppers are referred to locally as Bhagidar and the waged/salaried labourer as Haluwah. In case of the former, the land owner only shares the cost of production along with informal agreement to provide for the consumption requirement during production cycle. Whereas, in case of the later, landowner undertakes to cover all the cost elements along with supervision and monitoring during the production cycle.

Table 4.3: Household Farm Practices

Particulars	Absolute	Percentage
Total Households	**116**	**100**
Cultivators	97	83.62
Plantation	79	68.10
Gardening	33	28.45
Poultry	31	26.72
Piggery	27	23.28
Fishery	4	3.45
Livestock	63	54.31
Wet Paddy Cultivation	83	71.55
Un-irrigated Farming	56	48.28
Shifting Cultivation	63	54.31

Source: field Data

Another facet of the household practice is to cultivate the un-irrigated plots where coarse cereals, pulses, mustard, yam, ginger, turmeric etc. are cultivated. Mostly, the labour includes the household labour, with exception to minimal amount of hired labour.[28] This category of farming involved about 48.28 percent of households. The sole purposes of such output are for market disposal to cushion the income-consumption requirements and shocks of the household.

In addition to the usual cultivation and farming, households also undertake number of allied farming activities that contributes to their livelihood. One important and direct livelihood activity is that of the backyard poultry. About 26.72 percent of the household in the study area rear poultry in their backyard. The crops include mostly chicken and in few cases duck too. These outputs are reared mostly for consumption (protein) requirements but it also serves the purpose of insuring alternative source of income.[29]

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[28]Often the hired labourer are for the purpose of preparatory works like clearing the shrubs, ploughing, harvesting etc. if the size of the field is big and requires greater amount of labour than the available family labour.

[29] It was interesting to note during the field visit that women of the house would often like to sell off the eggs but not the chickens and ducks. And even more interesting was to note the treat of rice and chicken

In case of livestock, usually bovine, although the household seldom involves in rearing, about 54.31 percent of household owed some numbers of livestock. Usually and preferably, livestock are bulls and oxen, as it serve as draught animals and add immediate economic value addition to owners household. Also, a pair of oxen, if rented out for tilling others land, fetches the owner about 14 maund of paddy.[30]There were some households who owe herds, but are managed by second party (herdsman) with some informal agreements.[31]

Finally, backyard piggery constituted an important allied farming activity of the households in study area. About 23.28 percent of households were involved in pig rearing. Out of the 27 households involved in the activity, only 2 households reared female pigs for offspring that could be disposed off for money. In rest of the cases, it was confined breeding even of the female pigs. Further out of the 27 only 5 households responded that it was not for market disposal.[32] Hence, it can be construed that backyard piggery or pig rearing, in general, was purely on commercial consideration. Since the households banked upon piggery, it formed another major source of their livelihood. However, the scale was small, usually households reared two or three pigs at most.[33]

From the forgoing analysis, it can be understood that the households in addition to principal farming activity also undertake diverse sets of allied farm activities that constitutes their livelihood. One major factor contributing to livelihood of the rural gentry is the nature, type, and availability of lands. However, it should not also be undermined that households cannot just make out livelihood of land. There has to be some additional sets of qualifications in terms of assets and more importantly access to it, in the making of livelihood. What follows is the natural process of evaluation of household assets, access, interest, institutions, and the interaction and interventions.

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they offer but still reluctant to sell it off. When asked why, the response was to sell them off when at hard times, usually when the there is some extraordinary circumstances with bleak scope of alternative arrangements.

[30] Locally called *Baron* (may be from British word), which is equivalent to 522.5388 Kilograms (1 Maund = 37.3242 Kgs.)

[31]For all the cases under the study, herdsman gets a part payment as salary, usually very low and a shed with a small patch of land for their living. However, they retain the right of market disposal of the by-products; milk, manure, and other outputs they grow in and around their accommodated space. It is also worth mentioning that the interest of owners and herdsmen are diametrically opposed, but coexist in the same topological space. The interest of owners lies in propagation of bulls and oxen for draught to add up their livelihood, while that of herdsman, in propagation of cows for milk and valued by-products that adds up their livelihood.

[32] The reason respondent cited were either rituals or feast etc.

[33] Usually the reason cited were lack of feeds diseases.

4.4 Households Asset Base

Understanding livelihood requires minimum knowledge about household's asset base and access to it. A fair idea of asset base may give a deep insight into contextualisation of the livelihood in proper perspectives from the standpoint of the considered samples. It will, therefore, lead to proper analytical frame for further analysis, and draw better conclusions. More so, it will allow us to understand the capacity of absorption, anticipation, and adaptation by household to changing dynamics. Thus, a better and refined strategy can be evolved which will render the household in better stance to cope with the future income-consumption shocks.

It is in this regard that the household asset base is analysed in the following sections. For this purpose, assets are categorised into two broad categories; namely; Durables and Agricultural. Having an asset do not always guarantee its utilisation nor necessarily qualifies its access. Hence, in recording the assets, only the functional assets were taken into account.[34] As such, a simple measure was evolved to highlight the divergence between reality and ideal situation.

Household Durables

The household assets in terms of consumable durables for the overall study area are given in the Table 4.4. With regard to kitchen asset of the 116 households, 73 households has access to functional LPG stoves, 23 to grinder and mixers, 26 to electric cookers/pots and 70 to pressure cookers.

In terms of white collar consumable assets, 22 households have access to room heaters, and 42 to refrigerators, and 101 to mobile cell phones. Further, there are 87 households with functional fans, 79 households with almirah for storage and 94 houses with watch/wall clocks.

With regard to mass media consumable, 40 household has access to radio, and 84 households to television with DTH connections. In the same table we can also find the sample village wise household durable assets. However, for easier understanding and reference discrepancy index has been worked out below (Table 4.5).

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[34]The initial idea to construct Wealth Index was dropped in the course of data collection due to change in perception and the questionable characteristic of the index itself (Box Item B2).

Table 4.4: Household Durables
Overall and Sample Village Wise

(in absolute Numbers)

Particulars	Overall	New Deka	Old Deka	Potte	Telam
LPG Stove	73	16	27	13	17
Grinder & Mixer	23	5	1	10	7
Room Heater	22	1	2	7	12
Electric Cooker/Pot	26	7	6	4	9
Pressure Cooker	70	16	21	13	20
Cell Phone	101	18	31	21	31
Refrigerator	42	7	6	11	18
Radio	40	6	3	10	21
Television with DTH	84	16	30	17	21
Fan	87	17	25	18	27
Almirah	79	15	9	19	36
Clock/Watch	94	18	18	25	33

Source: field Data

Table 4.5: Discrepancy in Household Durables
Overall and Sample Village Wise

Particulars	Overall	New Deka	Old Deka	Potte	Telam
LPG Stove	0.37	0.11	0.16	0.54	0.55
Grinder & Mixer	0.80	0.72	0.97	0.64	0.82
Heater & Room Heater	0.81	0.94	0.94	0.75	0.68
Electric Cooker/Pot	0.78	0.61	0.81	0.86	0.76
Pressure Cooker	0.40	0.11	0.34	0.54	0.47
Cell Phone	0.13	0.00	0.03	0.25	0.18
Refrigerator	0.64	0.61	0.81	0.61	0.53
Radio	0.66	0.67	0.91	0.64	0.45
Television with DTH	0.28	0.11	0.06	0.39	0.45
Fan	0.25	0.06	0.22	0.36	0.29
Almirah	0.32	0.17	0.72	0.32	0.05
Clock/Watch	0.19	0.00	0.44	0.11	0.13

Source: field Data

It can be seen that discrepancy index worked out for kitchen asset is 0.37 for LPG stoves, 0.80 for grinder and mixer, and 0.78 and 0.40 respectively for electric cooker/pot and pressure cookers. With regard to white-collar assets, discrepancies are 0.81 for room heater, 0.64 in case of refrigerators, and 0.13 in case of cell phones. Further, the discrepancy worked out for fan, almirah and clock/watch are 0.25, 0.32, and 0.19 respectively. As for the mass media it was 0.28 for television with DTH and 0.66 in case of radio. Thus, huge discrepancies and variations can be seen in case of the asset base of the households

Across samples, discrepancy with regard to cooking and mass media asset and its access, New and Old Deka villages ranks better, contrast to high discrepancy in Potte and Telam villages. However, in case of white-collar durable assets, there is variation in discrepancy from village to village and with regard to items concerned. Nonetheless, on the average, the status of household asset, if not high, reflects modest level of consumption, keeping in mind the rural backdrop. It can be also construed that, provided with proper incentives, populace shall be self-motivated for assimilation of higher assets.

Agricultural Assets

Agricultural asset to a farming community is as important as the land itself. It is through this asset that they create value, add value, and raise their productivity; and production thereof. These assets include tools, equipments and machinery that save time and enhance mobility, efficiency and production. It includes a host of items from a mere machete to sophisticated machinery.[35]Hence, only the ones with prominent and sizeable impact were recorded. Such an exception is based on the factual evidence that every household had the required numbers of simple tools and implements as their agricultural assets. The details of the agricultural asset are given in the Table 4.6.

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[35]Such were, for instance, the machette, spades, manual weeders, Wooden spiked harrows, Wooden soil leveler, sickles etc. During the first round of data collection, it was found that every house had these in required numbers. Hence, a revised schedule for second round was designed to collect data for more sophisticated assets.

Table 4.6: Discrepancy in Household Agri-Assets
Overall and Sample Village Wise

(in Absolute)

Particulars	Overall	New Deka	Old Deka	Potte	Telam
Tube and Bore wells	3	0	0	0	3
Kerosene/Diesel Engines	7	2	1	1	3
Sprinklers/Drippers	8	0	0	4	4
Sprayers	30	6	7	12	5
Carts	2	0	0	0	2
Pulled Cart	6	1	0	2	3
Bicycles	84	16	26	16	26
Tractors/Power Tillers	2	0	0	2	0

Source: field Data

As seen in the Table 4.6 above, only three households in the sample village Telam has tube wells for irrigation in the overall study area.[36] About 39 additional tube wells found in the study area for the purpose of drawing drinking water rather than for irrigation. Also, it is found from the table that about seven households in the study area uses kerosene/diesel engines for irrigation purposes.[37] However, in most of the cases operations are based on the over ground water from rivulets or reservoir nearby, rather than underground harvesting. Interestingly, engines are leased/rented out sometimes, indicating modest but evolving rental market in agriculture.

With regard to sprinklers and drippers, there are about eight sets of it in the study area, distributed evenly between the two villages of Potte and Telam. The asset is used mainly by small tea growers. The highest number of sophisticated tools used by the households is sprayers. About 30 households have access to sprayers and are functional in operation.

With regard to transportation and mobility, only two households in Telam have carts, while six households have pull carts. The distribution of pulled carts is one household in New Deka, 2 in Potte and 3 in Telam. Similarly, only two tractors exist

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[36] No bore wells were found in the study area. It may be noted that Telam had the highest acres of rain fed fields

[37] Although 17 households had one set of engines, only 7 were functionally operational and rest of the ten were converted used for rice milling.

in the sample villages of Potte. None amongst the sample households owned power tillers.

Thus, we can infer that, while there are no dearths of conventional agricultural assets in the households, modern equipments and assets are highly scarce. In fact, it can be construed that mode of operation is traditional and conservative. Still lot can be done by induction of modern asset thereby, raising not only productivity but also acreage and thereof, the production.

4.5 Dependence on Environmental Resources

Immediate surroundings and availability of its resources drives the individual household's capabilities to adopt livelihood options and adapt to the changing environment. What practice a household has today is adaptation of the livelihood options over the years, at the backdrop of changing environmental dynamics. The study area, primarily being a farming community is also inhabited by tribal; who has close affinity with nature. As such, their day to day activities are in close proximity with environment and so are their interactions with natural resource. Evident and obvious, many of the livelihood activities and sources are nature dependent or derived from physical surroundings and environment.

The list of various livelihood activities based on natural settings and resources are in Table 4.7 below. It can be seen that, akin to any other tribal community, the rural gentry of the study area engage themselves in nature-based activities like fishing, hunting, trapping and gathering and extraction of resources from the surrounding environment.

In case of water-based resources, in addition to channelizing it for irrigation, it is fishing ground. Though there are no big rivers in the three villages of New Deka, Old Deka and Potte, they do have small streams and rivulets for the purpose. Telam village has access to a river, but fishing does not constitute significant livelihood. None of the households in the study area makes a living out of fishing, although it constitutes one of the livelihood activities at the household level (Of course, there isa household involved in hunting of turtles for market disposal). Often, fishing is an occasional group activity rather than individual and not confined to men folk alone. Thus, for every household of the study area fishing is one important livelihood activity, if not the most.

Hunting is another livelihood activity for the households in the study area. As seen in Table 4.7 above that for 28 households out of 116 households in the study area,

hunting is an important livelihood activity. It is carried out by each of the households in New Deka village, followed by seven households in Potte, two in Old Deka and one in Telam. Except for 2 households in Old Deka, it is only an occasional group activity. To one of the two households of Old Deka, game is for market disposal as the household make a living out of it. The same is the case of one household in the Telam village. Nonetheless, hunting both as traditional an occasional group activity has its presence and space.

Table 4.7: Environment based Livelihood Activity
Overall and Sample Village Wise

(in Absolute)

Particulars	Overall	New Deka	Old Deka	Potte	Telam
Fishing	116	18	32	28	38
Hunting	28	18	2	7	1
Trapping	22	17	0	4	1
Extraction/Gathering	31	18	5	9	15

Source: field Data

In Potte, hunting is important livelihood activity at household level for seven households. Here too, it is however, an occasional group activity for every household. Nonetheless, one household do dispose games for earnings. Similarly, except for one household, every household in New Deka practise trapping and it constitute an important livelihood activity. While Old Deka has no household with the skills to trap games, such are four and one in numbers for the respective villages of Potte and Telam. While trapping has an important place in the household livelihood space, none of the games is for market disposal.

Thus for majority of the villages while fishing, hunting and trapping constitute an important livelihood activity either as social or individual, the objectives are mainly for the purpose of meeting the household's protein consumption requirements. This is, however, not the case with the resources gathered or extracted from the natural surroundings. Often many produces are gathered for the household needs, few of it is disposed off in the market. The types of output gathered are given in Table 4.8[38]

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[38] only the households actually transacting the produces are being given in the Table

It can be seen that the produces gathered or extracted from natural surroundings are bamboo, cane, broom, honey, firewood, timber and *Canariumresininferum*; locally known as *Dhuna.* Every household in the study area gathers/extracts these produces for household consumption. However, usually the produces like cane, broom, honey, and Canariumresininferum are disposed off or transacted in the market to earn incomes to cushion household consumption requirements.

Table 4.8: Produces Extracted or Gathered
From Natural Surroundings
Sample Village Wise

(in Absolute)

Particulars	New Deka	Old Deka	Potte	Telam
Bamboo	0	0	0	0
Cane	5	3	3	7
Broom	12	5	6	15
Honey	0	0	1	2
Firewood	0	0	0	0
Timber	0	0	0	0
Canariumresininferum (Dhuna)	2	1	3	1

Source: field Data

From the same table above, out of the 18 households in New Deka, 12 gathers broom, five households also gather canes and two extracts *Canariumresininferum*. In Old Deka, while all the 5 households gather broom, of which 3 also gathers canes and one extracts *Canariumresininferum*. In Potte, out of the 9 households engaged in gathering /extraction of forest produces, 6 gathers broom, 3 households also gather canes as well as *canariumresininferum*. In case of Telam village, about 15 households gather brooms, 7 households gather canes and one household gathers *Canariumresininferum*. With regard to extraction and collection of honey, there are only 3 households in the entire study area; one in Potte and 2 in Telam respectively.

The availability of solid natural cane has fallen drastically due to its reckless exploitation in the past. Hence, market disposal of the produce in bulk is a history for more than a couple of decade. Whatever is left are gathered and peeled as twine or rope for household use, and given a good price, it is often transacted. The fact that very few individuals engage in its gathering and disposal highlights this fact.

Firewood collection is still one important household activity for livelihood, no case has been recorded of its market disposal. Whereas, there has been rampant felling of trees for timber, people do not disclose it for the fear of law. They only reveal that they fell few trees that they planted earlier for the purpose of construction or repairing the houses. However, at any rate, deforestation is rampant more due to felling of trees by timber mafia than shifting cultivation, as shifting plots after the completion of production cycle are left fallow for years to rejuvenate or are often converted to plantations.[39]

4.6 Infrastructure and Interventions

Physical infrastructure is one important variable that not only determines the standard of living but also has crucial bearing in capacitating the society to harness the potential advantages. Better physical infrastructural facilities and its access gives individual households a broader scope for easier, cost effective and better mobility (both product and factor/labour).It helps them to overcome vulnerable shocks; both income and consumption. Unless a minimum amount of physical infrastructure and its access are guaranteed, any productive avenues would cost more than the derived benefits; disincentivising the otherwise productive and sustainable livelihood options.

Infrastructure and Overheads

With regard to social overheads every village in the study area has, at least, a government run schools. Thus, each of the sample village of New Deka, Old Deka and Potte has one Lower Primary (henceforth LP) schools. Telam village has an Upper Primary school. Further, there is also an Upper Primary as well a Senior Secondary school at Telam Camp.[40]All the LP schools are grossly undermanned with dilapidated buildings, inadequate teaching aids, and classroom kits and equipments. The same is the condition of the Upper primary school in Telam. The condition of buildings is at a much better state in case of the Senior Secondary School. However, the condition did not quite differ from others when it comes to teaching aids,

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[39] There are 3 bend saw mills in the study area. Regulations requires that the entity purchases sawn timber (Beams) from the feeder saw mills and size it according to requirement of the attached carpentry. This seldom happens, as the bend saw mills in tandem with timber smugglers are operating as feeder mills themselves. Further, in the garb of a license, nearly two machines are operated.

[40]Telam camp which falls in between the sample village Potte and Telam is in effect, a neutral place not under the effective administrative-political and social jurisdiction of any of the sample villages. It is rather and administrative centre of the government.

classroom kits and equipments. Even the senior secondary is grossly undermanned, especially in case of teaching strength.

In case of healthcare service access, there is one health sub-centre in Old Deka for both the villagers of New and Old Deka manned by a Health Assistant.[41] There is one CHC (Community Health Centre) at Telam, which caters to the requirement of the sample villages and the others falling in Seren Circle. The Community Health Centre is staffed by 2 Doctors, 3 Nurses, 2 health Assistant, 3 Attendants, a dresser and a Safaiwala along with attached NMEP (National Malaria Elimination Programme) Cell. The CHC has a bed capacity of 10 and caters to minimal requirement of the area. The nearest referral hospital is at Ruksin 33 kilometres from Telam and the District Hospital is at Pasighat which is more than 60 kilometres.

Table 4.9: Infrastructure and Overheads

Particulars	New Deka	Old Deka	Potte	Telam
Lower Primary	√	√	√	--
Upper Primary	--	--	√	√
Higher Secondary	--	--	--	√
Health Sub Centre	--	√	--	--
Primary Health Centre	--	--	--	--
Community Health Centre	--	--	--	√

Source: Compiled from the various Govt. records

√ = Exists, -- = Not Available

In case of roadways, the four villages are interconnected through PMGSY road. Since its construction, however, there has been no maintenance and the quality is highly deplorable by every passing days. For transportation of freights and human, the only access is through highways located in Assam, or via railways along the Assam-Arunachal border at Telam.

With regard to electricity, every sample households of the four villages were electrified. However, regularity of power supply and adequacy of voltage is grossly inefficacious. While the households are electrified, no such provision of power

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[41] It also caters to the requirement of the recently instituted village in the name and style of Tojo just nearby the village New Deka

supply for agricultural operations exists. As seen in the foregone analysis, in preceding chapter, agricultural operation for huge acres of land are still carried out either un-irrigated or rain fed.

Thus, lack of proper roads and its maintenance, interconnectivity with the divisional and sub divisional headquarter, to agricultural plots, lack of transportation facilities within the study area, inadequate and gross inefficiency of power supply, huge gap in manning the institutions; education and health, all adds up to the cost of sustenance. Often the household's surplus is not only limited but are vulnerable and threatened by shocks, either consumption or income, rendering them to fall back into traps of poverty.

Intervention and Inclusion

While there are many intervention programmes of the government, often such are a matter of elite capture or are determined based on political and clan considerations. Nonetheless, one right based positive welfare intervention guaranteeing minimum employment is that of Mahatma Gandhi Rural Employment Guarantee Act (henceforth MGNREGA). For the study area as a whole, MGNREGA has been one important element of the household livelihood matrix. As discussed earlier, of the total of 116 sample households about 96.55 percent accounting for 112 households had job card issued. Further, about 63.21 percent of the population (469 individuals) have been enrolled under this scheme. This is also confirmed by the fact that about 106 households (actual BPL data), nearly 91.38 percent of the total households in the study area has BPL card under the scheme of Public Distribution System (see Table 3.8)

<div align="center">**Table 4.10: Status of MGNREGA**</div>

Characteristics	Overall	New Deka	Old Deka	Potte	Telam
Sample Households	116	18	32	28	38
Under MGNREGA	96.55 (112)	94 (17)	100 (32)	100 (28)	100 (38)
Persons Enrolled	63.21 (469)	73.72 (115)	57.81 (111)	62.25 (94)	62.14 (151)
Persons per Household	4.19 (112)	6.76 (17)	3.47 (32)	3.76 (28)	3.97 (38)
SB A/c Per Household	3.30 (383)	6.06 (109)	4.16 (133)	2.64 (74)	1.76 (67)

Source: field data and Ministry of Rural Development Website

**Persons enrolled under MGREGA is relative to total included population (742)

The status of MGNREGA is given in Table 4.10. It can be seen that out of the 116 overall all sample households, 112 are covered under MGNREGA, except for one households at New Deka. In the same line about 469 persons out of 742 individuals are enrolled under the scheme. Thus, coverage under MGNREGA on the average is about 4.19 persons per household. In concordance to it, about 383 saving Bank Account are operational.[42] Thus, on the average about 3.30 saving bank account are operational per household.

Nonetheless, the intervention scheme (MGNREGA)is limited to availability of fund and this is at the whims of the political and bureaucratic class. Ignorance about their rights has constrained the demand for work, and has given scope to unethical practices by the political- administrative duo. Further, the lack of coordination and convergence of various schemes has led to uneconomic use of scarce resources, adding to failure and not so satisfactory outcome of the programme.

MGNREGA despite its failure in delivery has led to financial inclusion, for most of the households have been progressively included into financial sector due to it. Further, additionality of spread effect in terms of small, but growing, savings habits are very much visible. Of course, a lot has to be done in terms of credit delivery and agricultural financing etc. Further, for the programme itself, more awareness of the rights and its access along with bottom up planning and convergence should be emphasised.

It can be observed from the foregoing analysis that households engage in a diverse set or matrix of livelihood options. It can be construed from the household's asset of durable and consumable that households maintain a modest consumption. However, in case of the farming and agricultural assets, it is bleak. Households maintain of a minimum level of conventional asset but have negligible amount of techno based modern mechanised assets.

The asset scarcity constrains the reaping of surpluses to the fullest extent and has determined livelihood activities and trade-offs based on nature and types of natural capital (land). The land use pattern and the trade-offs (between shifting cultivation and others) are but determined by transaction requirement, which itself is due to asset constraint in reaping of surpluses.

Households are also involved in livelihood activities based on immediate natural capital (fishing, hunting, trapping gathering etc.). Unless infrastructures and positive

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[42] This Saving Account is used for remittance of wages under MGNREGA, LPG subsidies etc.

welfare interventions are in concordance to create alternative livelihood options, environmental dependence will be detrimental and unsustainable. In fact, sustainability of surplus is often, threatened by laxity of governing and executing agencies as they fail in creation and provision of institutions, infrastructures and alternatives catering to the requirements of rural gentry.

It will be unfair to term rural gentry as unreceptive of new ideas and approaches for they are in a continual process of human capital enhancement either through learning by doing or through formal education. As can be seen in the foregoing analysis, households are also engaged in the creation of human capital, especially of younger generation, through formal education system. Further, the rural gentry themselves are engaged in learning by doing, as are reflected in the emergence of a group of small tea growers and planters of timber, rubber horticultural produces that requires knowledge and skills.

CHAPTER 5
LIVELIHOODS PORTFOLIOS

This chapter in devoted to the classification of various activities and sources of livelihood in line with the five basic capitals as enshrined in the literatures. As there is no study prior to it, this piece of research sets baseline. As time frame for the study was limited, it incorporates few of the capitals. This has been on the consideration that remnant of data and analysis pertaining to capitals and its sub-components will be undertaken sometime in future. Within each of the capitals, there are many sub-components and proxies to capture the specified capital. These are discussed below.

5.1 Human Capital

Within the category of Human Capital fall the sub-components of knowledge, skills, health and labour. The combination of all these sub-components capacitates an individual or individual household to be receptive to pursue different activities for existence. As such categorical variables, namely, Socio-Demographic Profile (SDP) as well as the Occupational Structure (OS), was created to capture the Human capital.

The SDP includes percentage of Female Population, of literate population, of households Below Poverty Line (BPL) and with homestead. Further, it includes the Average Age of the population as well as the Family Size, and Homestead size (Table 5.1).

The Socio-Demographic Profile constitutes of sub-components, which are either average or are in frequencies. Those in frequency are female population, literates, BPL households, and households with homesteads. Other sub-components like age, family size, and homestead sizes are averaged values. The respective sub-components represent the weighted values of the respective indices. The index is highest in case of literacy with an indexed sub-component weight of 0.42, followed by equal weights of female population and BPL household with a weight of 0.30. The lowest is in case of the households with homestead at 0.19. Thus, so long, the capacities of the households are concerned; literacy, female population, and poverty are of a greater significance to the sample households. The relevant spidergram is given in the figure 5.a

Table 5.1: Socio-Demographic Profile Sub Components

Sl. No.	Particulars	Weights of Sub Components
1	Female Population (Percent)	0.30
2	Age (Av.)	0.21
3	Literacy (Percent)	0.42
4	BPL Households (Percent)	0.30
5	Average Family Size (Av.)	0.21
6	Homestead Size (Av.)	0.28
7	Household With Homestead (Percent)	0.19

Source: Computed from field data

Figure 5.1 : Socio-Demographic Profile
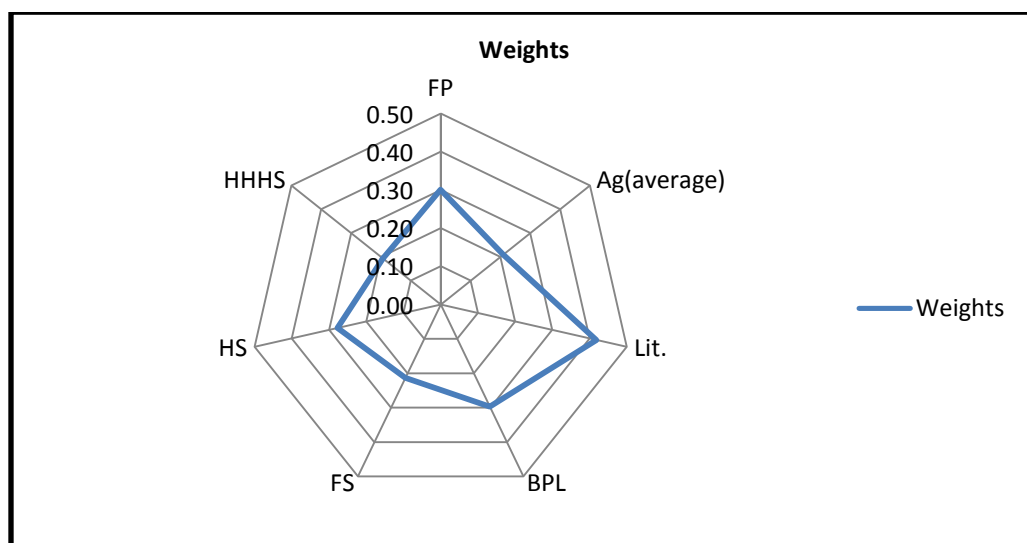
Source: Computed from field data

FP = Percentage of female Populations, Ag = Average Age, Lit. = Percentage of literates, BPL = percentage of Below Poverty Households, FS = Family Size, HS = Homestead, HHHS = Households with homestead

In the second categorical sub-component; occupational structure population are categorised into various classes that could reflect the household capacity in securing livelihood options and avenues. As such, sample population are classified based on

the nature of activities they are involved in, viz., farmers, services in the government sector, services in the private sector, students, and the secondary category which represents the chunk of the population that were either old age, retired pensioners or are housewives (Table 5.2 and Figure 5.b).

Table 5.2: Occupational Structure Sub Components

Sl. No.	Particulars	Weighted Sub Components
1	Farmers	0.34
2	Services Govt	0.43
3	Services Pvt.	0.31
4	Students	0.54
5	Secondary	0.33

Source: Computed from field data

Figure 5.2: Occupational Structure
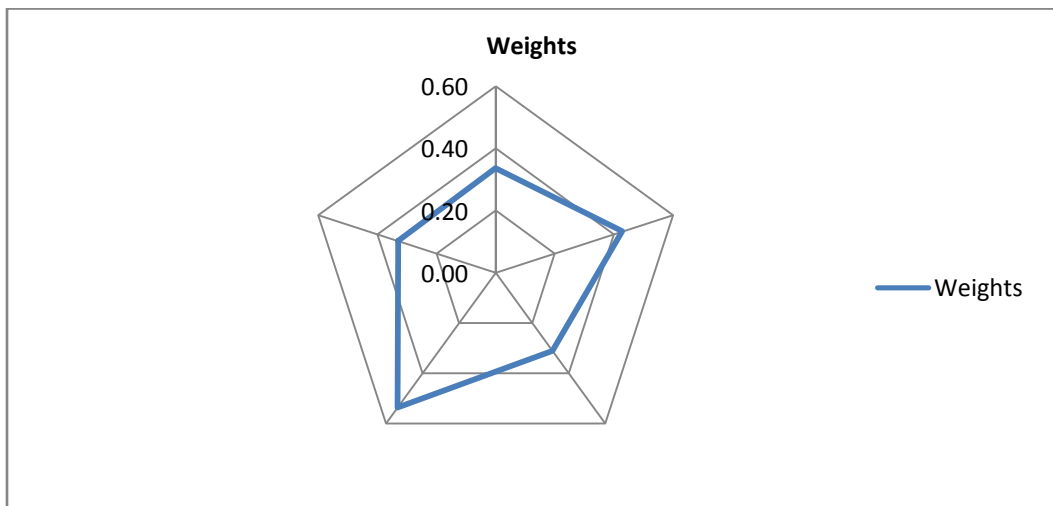
Source: Computed from field data

Far = Farmer, Ser. G = Services in government sector, Ser. P = Services in private sector, Stu = Students and Sec = Old age population including the retired pensioner and housewives.

In case of the sub-components within the occupational structure, all are in frequencies. The highest weight for the indexed sub-component is that of student with a weight of 0.54, followed by services in the government sector at 0.43 and then the farmers with a weight of 0.34. The least of the weight for the indexed sub-

component is in case of services in the private sector with a weight for the indexed sub-component as 0.31. Thus, the relative importance of sub-component student is quite eminent, which negates the household labour time availability. Equally, the relative importance of the services in the government sector is due to the greater relevance and dependence for transaction income requirement.

5.2 Livelihood Sources

Households involve in numerous activities based on the remunerations they get to even out the fluctuation in the income or consumption. Care has been taken to include all activities of households that enter into their sustenance. Households' workout their requirements of output and transaction in the backdrop of limited aspiration and constraints and interacts with related capitals, especially natural and physical capital. This over the period of time has led to evolution of their set of calculus in quantifying the required amount, which in many cases are with least amount of error. Hence, there exists a set of diverse livelihood strategies. The same has been the case of the samples under the study.

It can be seen from the Table 5.3 that households involve in various activities that constitutes their livelihood source. However, the indexed weighted sub-components weights show that Livestock, un-irrigated farming and shifting cultivation constitutes major sub-components of their livelihood activity or sources. This confirms the fact as emerged during analysis in chapter 3, that household attach significance to piggery, shifting and un-irrigated farming to cushion off the income-consumption shocks and as last resort to disposal of the livestock.

Table 5.3: Livelihood Source Sub Components

Sl. No.	Particulars	Weights
1	Plantation	0.15
2	Gardening	0.16
3	Poultry	0.17
4	Piggery	0.20
5	Fishery	0.11
6	Livestock	0.30
7	Wet Paddy Cultivation	0.18
8	Un-irrigated Farming	0.26
9	Shifting Cultivation	0.23

Source: Computed from field data

Almost equal weights are found for the indexed sub-components plantation, gardening, and poultry, while fisheries have the least weight. While paddy through wet cultivation is the main staples of the people, it is to remember that most of cultivation is by sharecropping arrangement. The relevant spider gram is given in the figure 5.c

Figure 5.3: Livelihood Sources
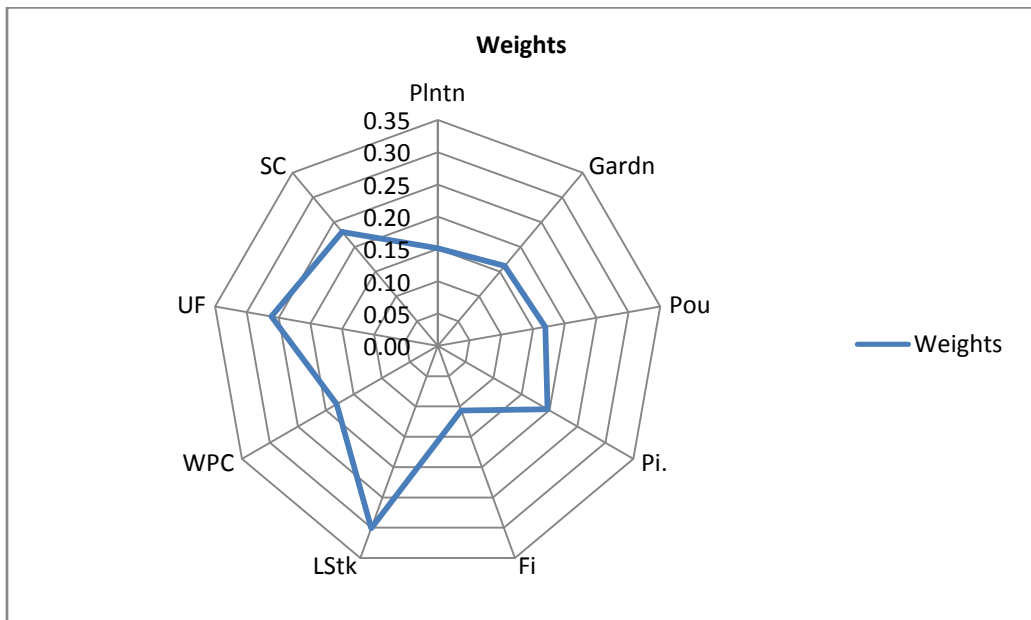
Source: Computed from field data

Plntn = Plantation, Gardn = Gardening, Pou = Backyard Poultry, Pi. = Backyard Piggery,
Fis. = Fishery, LStk = Livestock, WPC = Wet Paddy Cultivation, UF = Un-irrigated Farming,
SC = Shifting Cultivation

5.3 Physical Capital

Physical capital includes assets and accesses that a household has in its possession, tointeract with it tocarry forth livelihood alternatives or activities for sustenance. In other words, these are assets which releases either labour or provides time as a resource or/and are required to support livelihood. Such assets may be the likes of consumables and durables, the agricultural implements required to carry out their farming and production processes, and then the access to infrastructure; either as means of transportation or as a mode through which the communication and transportation are facilitated.

Within this variable, sub-components of assets like agricultural implements, mode of transportation, including white-collar household consumables have been included. Altogether a set of twenty items have been included. Items selected are usually representative or proxies that in some way quantifies household's standard of living and highlighting the labour awareness, skill, time and efficiency. The details of the household's physical asset or capital are given in Table 5.4 with its relevant spider gram representing the weights of the indexed sub-components in figure 5.d.

Table 5.4: Physical Capital (Household Assets) Sub-Components

Sl.No.	Particulars	Weights
1	Tube and Bore wells	0.05
2	Kerosene/Diesel Engines	0.08
3	Sprinklers/Drippers	0.09
4	Sprayers	0.12
5	Carts	0.05
6	Pulled Cart	0.13
7	Bicycles	0.11
8	Tractors/Power Tillers	0.05
9	LPG Stove	0.10
10	Grinder & Mixer	0.11
11	Room Heater	0.09
12	Electric Cooker/Pot	0.08
13	Pressure Cooker	0.08
14	Cell Phone	0.11
15	Refrigerator	0.12
16	Radio	0.10
17	Television with DTH	0.10
18	Fan	0.08
19	Almirah	0.12
20	Clock/Watch	0.12

Source: Computed from field data

Figure 5.4: Physical Capital
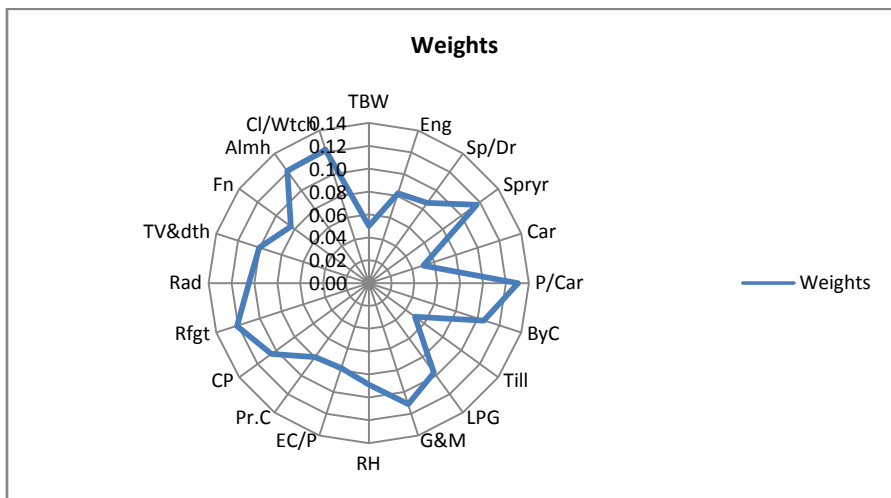
Source: Computed from field data

TBW = Tube/Bore Well, Eng = Kerosene/Diesel Engines, Sp/Dr = Sprinkler& Dripper, Spryr = Sprayer, Car = Cart, P/Car = Pulled Cart, BC = Bicycle, Till = Tiller (tractor/Power Toller), LPG = Liquefied Petroleum Gas Stove, G&M = Grinder & Mixer, RH = Room Heater, EC/P = Electric Cooker/Pot, Pr. C = Pressure Cooker, CP = Cell Phone, Rfgt = Refrigerator, Rad = Radio, TV&dth = Television with DTH, Fn = Fan, Almh = Almirah, Cl/Wtch = Clock and Watch

As can be seen from the table and the figure above, physical capitals includes almost all the households physical assets that either helps the household in the maintenance of their livelihood or in increasing their dexterity or adroitness. Both the table and figure reveals that almost every indexed sub-component has almost the similar amount of weight, except Tube/Bore Well and Tillers that includes both tractors and power tillers. The weighs of the indexed sub-components are respectively 0.05 each. The others range beyond it and vary in between 0.06 and 0.13. It can be, therefore, understood that the relative importance of such capital asset and access of sample households are at meek level. Nonetheless, capital in terms of agricultural assets and transportation are at a level that is lower than modest. In other words, it can be said that, advent of consumption durables and in keeping up with the *Joneses*, households are not prone to mechanisation or have not accumulated stocks for their farming activities. This may be due to incapacity of household to prolong abstinence from present consumption, lack of motivation and habit of saving, inadequate credits, or low level of income compared to high transaction requirements. Notwithstanding the list, one immediate cause of inadequate mechanisation is due to lack of motivation and inefficiency cropping out of sharecropping arrangements.

5.4 Natural Capital

As the sample population are mostly tribal populace, it is but obvious that they are resource dependent. In fact, while living in close proximity with nature, the rural gentry are also dependent upon the natural surroundings and environment. As such, often the households in the study area falls back to nature or environment for their livelihood requirements – right from collecting firewood for fuel to logs for construction of houses and so forth. It may, however, be mentioned here that only such activities in this study were enumerated which are usually transacted amongst the populace or with others.[43]

In other words, each household is dependent on resources generated by nature or available to them around the immediate environment. This is especially true with regard to access to nature-based resources for household consumption. Hence, almost an open access to fishing, hunting ground, trapping zones and in the extraction/gathering of resources exists. However, provision of output sharing with the owner or village community as an age old tradition do exists side by side. The community do, however, put strict restrictions on market disposal of such environmental resources. The recent advent of private property is, however, distorting such institutional regulations and restrictions.

Table 5.5: Natural Capital Sub-Components

Sl. No.	Particulars	Weights
1	Agricultural Holdings	0.20
2	Irrigated	0.19
3	Rain fed	0.14
4	Un-irrigated	0.15
5	Shifting	0.20
6	Plantation	0.17
7	Fishing	0.22
8	Hunting	0.14
9	Trapping	0.13
10	Extraction/Gathering	0.21

Source: Computed from field data

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[43] This pertains in case of fishing, hunting, trapping as well as extraction and gathering. The same applied to Shifting cultivation during earlier time, provided the land falls within the jurisdiction of the village or the community. With the advent of private property, the ownership structures are very evident. The land is possessed by the progeny of family members, generally the male members. In case, the family has no legitimate heir, it goes to clan and so forth back to community in the absence of the clan.

Figure 5.5: Natural Capital
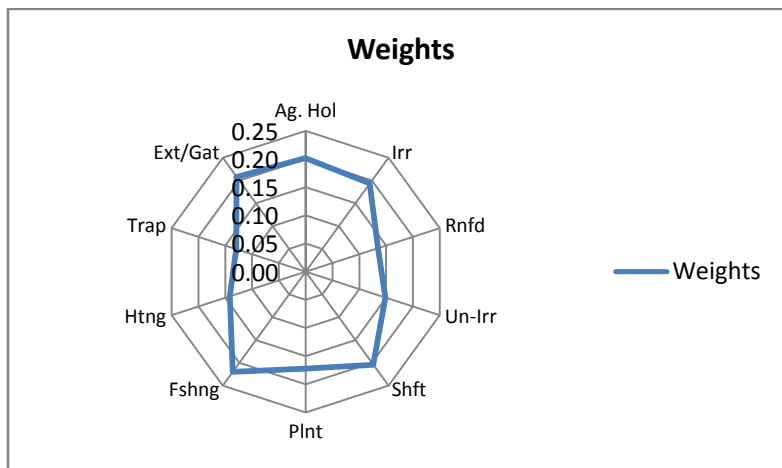
Source: Computed from field data

Ag. Hol= Agricultural Holdings, Irr = Irrigated, Rnfd = Rainfed, Un-Irr = Un-irrigated, Shft = Shifting, Plnt = Plantation, Fshng = Fishing, Htng = Hunting, Trap = Trapping, Ext/Gat = Extraction/ Gathering

In case of agricultural holdings, the guiding factor is more of spatial location, in addition to the transaction requirement to cushion off income-consumption shocks of the household. This is evident from the fact that the relative importance shifting cultivation and plantation has higher weights of the indexed sub-component at 0.20 and 0.17 respectively. Rest of the indexed sub-components has lower weights and ranges in between 15 and 19.

In case of purely nature base resources, fishing constitutes an important part. In fact, fishing is a gender-neutral activity. Though strictly restricted to men folk, hunting and trapping too comprise an important livelihood activity. The indexed values of weights for the respective activities are at 0.22, 0.14, and 0.13 respectively. The relative importance of the activities is high as these are often at household level, though at times, it becomes group activity involving the community. These nature based livelihood activities or option often substitutes the protein deficit of the households. The relevant spider gram of the weights of the indexed sub-components representing the same is given in the Figure 5.e above.

5.5 Socio-Institutional Capital

Social capital includes all those resources such as networks, membership, trust, cooperation; both formal and informal. The nature may, however, be determined by

the class of stakeholders like gender, age or affinity to a group with distinct norms or character. An in depth mapping out of complex network at the backdrop of micro level disaggregate units as households to a greater context of community is not only time taking but clumsy as well. Hence, assuming the population as homogenous, which in many counts is true on aggregate, proxies for common access and claims has been spelt out. Hence, instead of claiming it as social capital, the categorical variable is coined as socio-institutional capitals.

The Socio-Institutional Capital comprises accesses like schools, health facilities, and positive interventionist programmes of the government. This was done on the firm belief that socio-institutional capital too underlines the same theoretical under-pinning that social capital does i.e. that of compensating calamities and shortage of other capitals. Thus, akin to social capital, in fact more than it, socio-institutional capital spelt here is a strong indicator of poverty, access and inclusiveness.

The categorical variable socio-institutional capital is given in the Table 5.6. It comprises of 10 sub-components; namely the Lower Primary (LP) schools, the Upper Primary (UP) Schools, and the Higher Secondary (HS) School.[44]

Table 5.6: Socio-Institutional Capital

| Sl. No.	Particulars	Weights
1	Lower Primary	0.10
2	Upper Primary	0.05
3	Higher Secondary	0.10
4	Health Sub Centre	0.03
5	Primary Health Centre	0.10
6	Community Health Centre	0.00
7	Under MGNREGA	0.30
8	Persons Enrolled	0.16
9	Persons per Household	0.12
10	SB A/c Per Household	0.18

Source: Computed from field data

In case of health accesses and institution, the included subcomponents are Health Sub-Centre (HSC), Primary Health Centre (PHC), and Community Health Centre

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[44] The LP comprises up to primary level or class five, the Upper Primary comprises up to middle school level or up to class eight, and the Higher Secondary includes from class nine to twelve. As there is only one higher secondary which includes the secondary level, hence no separate category has been drawn.

(CHC).[45] Notwithstanding the conceptuality, from the Table 4.6 it can be observed that the relative significance in terms of weight of indexed sub-component is highest in case of positive intervention. In other words, the households under the coverage of right based welfare scheme of MGNREGA, representing the access to governance and administration, has the highest weight of 0.30. Even the weights of persons enrolled under the right based positive intervention is 0.16 followed by the indexed sub-component Saving Bank Account, a proxy for the inclusiveness at 0.18. The weights are equal for indexed sub-components of Lower Primary (LP) and Higher Secondary (HS) schools (which also includes Secondary School). While the relative significance of Health Sub Centre is low, the weight for Primary Health Centre is 0.10.

It can, therefore, be construed that the accesses to socio-institutional capital are more than modest. In fact, relative significance of the sub-components is justification to inclusive as well as compensatory paradigm of the social network and trust. The relevant spider gram is given in the Figure 5.f below.

Figure 5.6: Socio-Institutional Capital
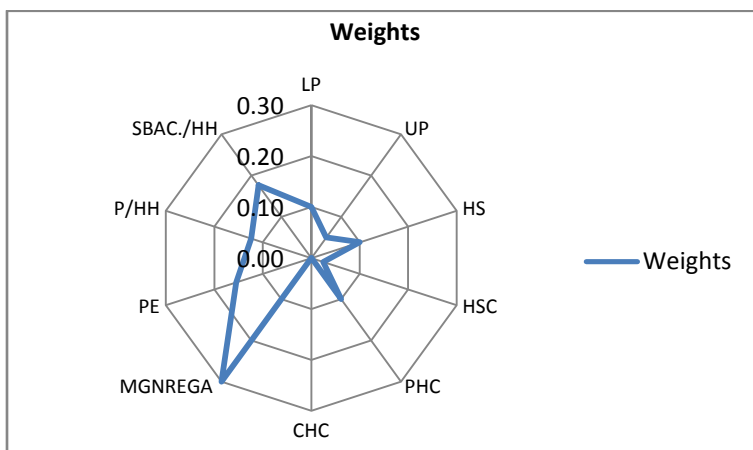
Source: Computed from field data

LP = Lower Primary, UP = Upper Primary, HS = Higher Secondary (Including Secondary), HSC = Health Sub-Centre, PHC = Primary Health Centre, CHC = Community Health Centre, MGNREGA = Mahatma Gandhi National Rural Employment Guarantee Act, PE = Persons enrolled under MGNREGA, P/HH = Person Per Household covered under MGNREGA, SBAC/HH = Saving Bank Account per Household

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[45] As there was a Primary Health Centre (PHC), at least a Health Centre or a CHC in the proximity of the sample villages were expected. Since such was not the case, it CHC was included to take account of the discrepancy.

5.6 Major Components

The macro implications of all the factors discussed above has divergent impact on the household livelihood portfolio. In other words, at the aggregate macro level, all the livelihood options and capitals contribute in different ways on the sample households. However, each of the sub-components is as equally important when compared with each other. Hence, an equal weight is given to the indexed sub-component at the disaggregate level and the sum of all the indexed values are deflated by it. The aggregated indexes of the major components are, then further weighted based on the weight of the respective share in the total portfolio of the household's livelihood options. This can be seen in the Table 5.7 below along with the Bar Chart in the Figure 5.g below.

### Table 5.7: Index and Weights of Major Components

Sl. No	Particulars	Index*	Weights**
1	Socio-Demographic Profile	1.91	0.22
2	Occupational Structure	1.94	0.23
3	Physical Capital	1.89	0.22
4	Natural Capital	1.75	0.20
5	Socio-Institutional Capital	1.13	0.13

Source: Computed from field data

*Indexed on equal weights of Sub Components

** Based on weights of respective categorical variables

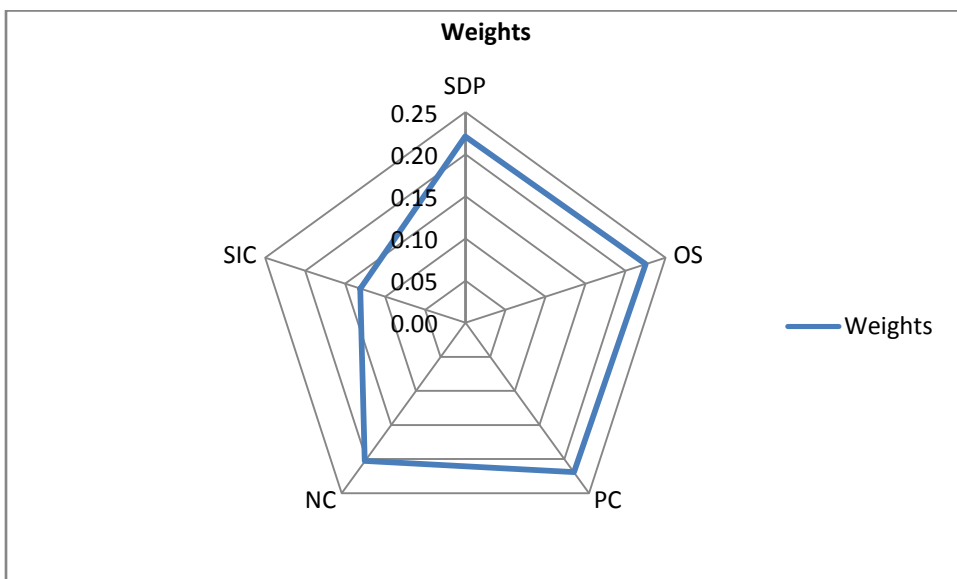### Figure 5.7: Index of Major Components
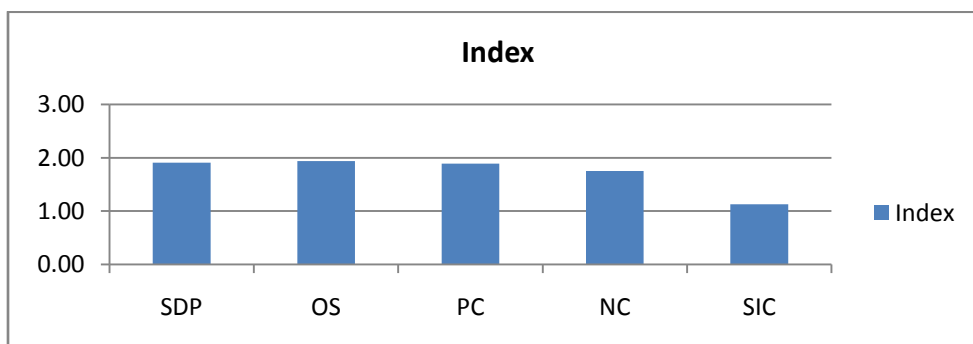
Source: Computed from field data

SDP = Socio-Demographic Profile, OS = Occupational Structure, PC = Physical Capital, NC = Natural Capital,

SIC = Socio-Institutional Capital

It can be seen from the above table and the bar chart graphed that, with exception to the socio-economic capital, which has an index value of only 1.13, other indices have values more than 1.50. In fact, the highest index value is observedin the case of the occupational structure at 1.94. It is followed by socio-demographic profile at 1.91 and physical capital at 1.89. Contrary to the belief that tribal populace are more dependent on natural capital; the index of natural capital turned out relatively low compared to others with a value index of 1.75. The least, as stated above is that of the socio-institutional capital which highlights a poor level of inclusiveness of the rural gentry in the governance network.

Figure 5.8: Major Components

Source: Computed from field data

SDP = Socio-Demographic Profile, OS = Occupational Structure, PC = Physical Capital, NC = Natural Capital,

SIC = Socio-Institutional Capital

The spider gram of the weights of the major components also reveals the same picture. In fact, based on the respective categorical weights, it can be construed that livelihood portfolio in the study area ranges in between 0 and 0.25 for respective major components. Here too, the relative significance of the socio-institutional capital is least at about at 0.13. Whereas, the occupational structure of the households has a predominant importance with a weight of 0.23. The socio-demographic profile and the physical capital shared equal weightage with 0.20 points each. As can be

expected after the previous analysis, the relative significance of the natural capital is intermediate at about 0.20 point.

Further, for simplicity of understanding the human capital aspect which includes labour time, skill and efficiency, the socio-demographic profile and occupational structure have been merged as one major component. The subsumed component has equal weight of the sub-components within it. This has led to reduction of the major components of capitals into four categories, namely, human capital, physical capital, natural capital, and socio-Institutional capital. The details of the major components after merger is given in Table 5.8 along with the chart plot figure 5.i below

Table 5.8: Index and Weights of Four Capitals

Sl.No	Particulars	Index	Weights
1	Human Capital	1.92	0.29
2	Physical Capital	1.89	0.28
3	Natural Capital	1.75	0.26
4	Socio-Institutional Capital	1.13	0.17

Source: Computed from field data

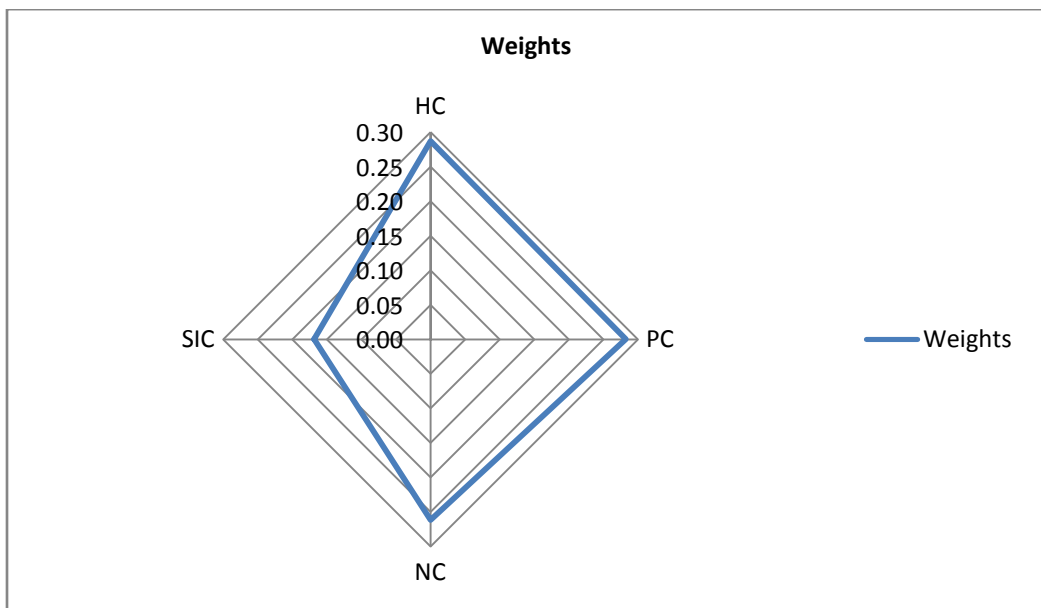**Figure 5.9: Index of Four Capitals**
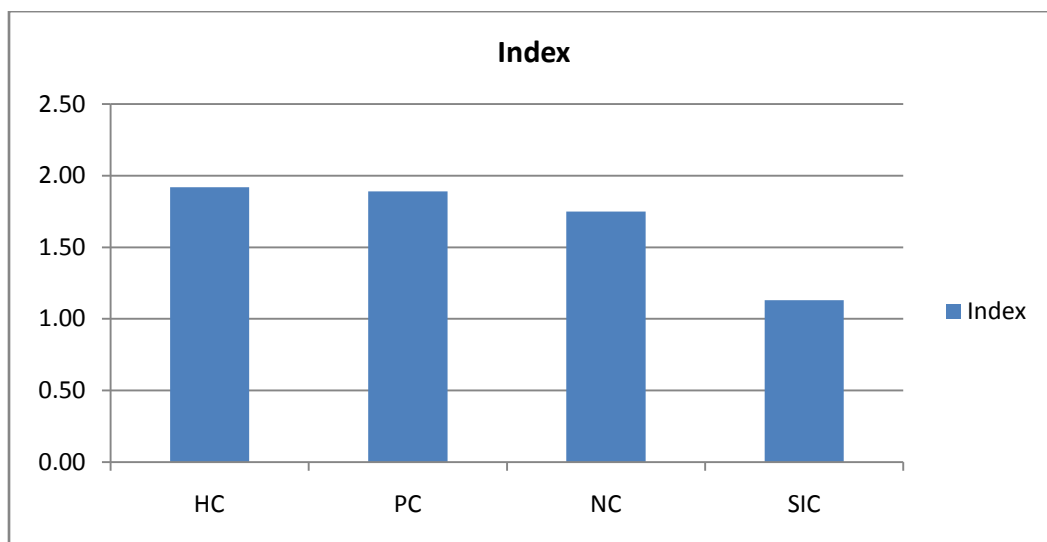
Source: Computed from field data

HC = Human Capital, PC = Physical Capital, NC = Natural Capital, SIC = Socio-Institutional Capital

As can be observed from the above, the indexed value of the sub-components with equal weights, the human capital has an index value of 1.92, followed by the index value of physical capital at 1.89 and natural capital at 1.75. The least is, alike in the foregone analysis, the socio-institutional capital with an index value of 1.13. The same is revealed in the bar chart plotted in figure 5.iabove.

Similarly, the averaged weight of the respective major components to the total too is highest in the case of human capital at 0.29. As above, it follows in a sequential order with weights 0.28, 0.26, and 0.17 for physical, natural, and socio-institutional capitals respectively. This is revealed in the spidergram given below in figure 5.j.

Figure 5.10: Four Capitals

Source: Computed from field data

HC = Human Capital, PC = Physical Capital, NC = Natural Capital, SIC = Socio-Institutional Capital

5.7 Surmising Hypothecations

As can be seen from the previous analysis of the two chapters namely; chapter 3 and chapter 4, that livelihood includes various activities as well as options and so does the portfolio of the activities and assets under various capitals. As such, populace or rural gentry often chose livelihood options based on their access to available asset and capitals. Hence, often the essence of such activities as livelihood is guided, if not governed, by the immediate capitals available to them. It is for this reason that rural

set up and community are usually found to be farm based. In this regards, the natural capital, which includes land, the household labour skills, and time availability predominates the setup of the type of livelihood portfolio rural gentry professes.

However, the study in nature itself has to be dynamic, if the emerging realities are to be answered so as to pave way forward for suitable policy aggregation, intervention and prediction for future. It requires, therefore, a timeline studies across the sample to evaluate their responses and adaptation to construe any future paths. This study is, but, a baseline for the context of study as well as for the study area. Hence, instead of conclusive summarisation, the study surmises hypothecation.

As stated above, livelihood portfolio of rural populace in the study area, too are, guided by the access and availability of household labour time, skill and in interaction with assets/capital including the natural capital. Hence, most of the options and alternatives relating to the livelihood of the sample villages are usually farm based activities. The same is amply evident from the Table 5.9 below.

Table 5.9: Livelihood Portfolio Distribution

(Percentage of Households)

Sl. No	Particular	New Deka	Old Deka	Potte	Telam
1	Plantation	100.00	71.88	57.14	57.89
2	Gardening	100.00	3.13	46.43	2.63
3	Poultry	94.44	3.13	46.43	0.00
4	Piggery	66.67	15.63	35.71	0.00
5	Fishery	0.00	0.00	14.29	0.00
6	Livestock	83.33	0.00	60.71	81.58
7	Wet Paddy Cultivation	94.44	78.13	64.29	60.53
8	Un-irrigated Farming	88.89	90.63	35.71	2.63
9	Shifting Cultivation	88.89	96.88	32.14	18.42

Source: Computed from field data

The livelihood portfolio distribution in the table 5.9 represents the percentage of households that are engaged in the activities. It may be noted that the activities or the options were not imposed but were derived after the field visits. Thus,

cultivation as livelihood option is predominant option either seen in terms of wet paddy cultivation, plantation, farming of un-irrigated land or shifting cultivation. In fact, the functional objective of plantation, farming of un-irrigated lands and more so the shifting cultivations are to cushion off income-consumption shocks. In case of the shifting cultivation, the trend is to convert it into plantation plots after the production cycle is over. These farm based cultivation livelihood alternatives constitute major activities of the rural gentry, and ranged in between from 65 percent to 100 percent. With exception to fisheries, allied farm activities like backyard poultry, piggery, and livestock also constitutes a significant part of the livelihood portfolio of the households. The relevant index of households are given below in Table 5.10

Table 5.10: Livelihood Portfolio Index

Sl. No	Particulars	New Deka	Old Deka	Potte	Telam
1	Plantation	0.11	0.08	0.06	0.06
2	Gardening	0.11	0.00	0.05	0.00
3	Poultry	0.10	0.00	0.05	0.00
4	Piggery	0.07	0.02	0.04	0.00
5	Fishery	0.00	0.00	0.02	0.00
6	Livestock	0.09	0.00	0.07	0.09
7	Wet Paddy Cultivation	0.10	0.09	0.07	0.07
8	Un-irrigated Farming	0.10	0.10	0.04	0.00
9	Shifting Cultivation	0.10	0.11	0.04	0.02
	Livelihood Portfolio Index	**0.79**	**0.40**	**0.43**	**0.25**

Source: Computed from field data

Table 5.10 above highlights the Household Livelihood Portfolio Index. Equal weight is assigned to each of the livelihood activities; as such, equi-weights come to about 0.11 for each sub-component respectively. Given the frequency of households in various livelihood activities, the indices are derived out as the product of the percentages in each of the options and the equi-weights. It has been done with firm belief that the nine livelihood options makes up the total household livelihood. The relevant spider gram for the weights of livelihood portfolio variation amongst the sample village is given in the Figure 5.k below

Figure 5.11: Livelihood Portfolio Variation
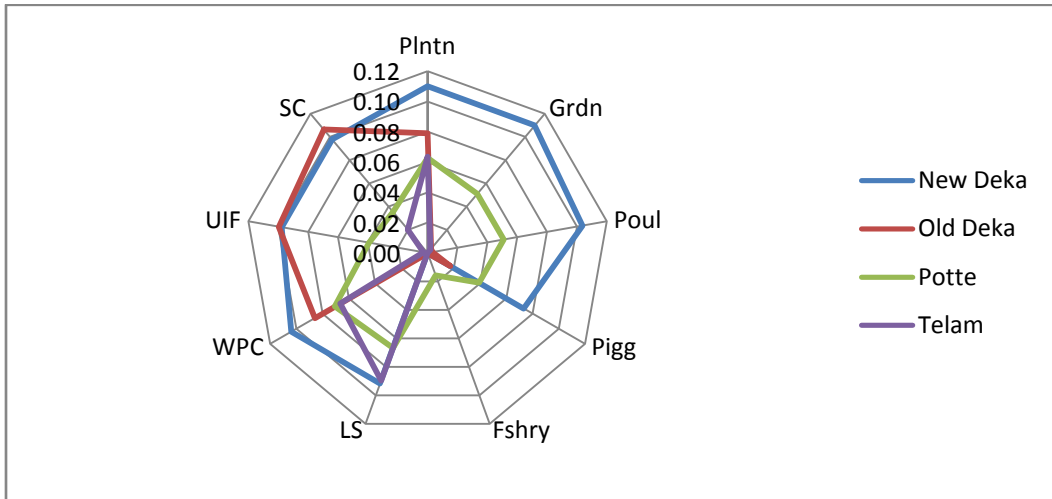
Source: Computed from field data

Plntn = Palnatation, Grdn = Gardening, Poul =Poultry, Pigg = Piggery, Fshry = Fishery, LS = Livestock, UIF = Un- Irrigated Farming, SC = Shifting Cultivation

As can be observed, except for fishery, almost all the livelihood activities or option in the portfolio are relatively significant for the sample village New Deka, while the same is not true for the adjacent village of Old Deka. A minimal of backyard piggery along with wet paddy cultivation of staples, un-irrigated farming, shifting cultivation and plantation makes up the livelihood portfolio of the rural gentry of Old Deka. In case of the sample village Potte, the livelihood portfolio is skewed towards plantation, wet paddy cultivation of staples, shifting cultivation along with some amount of gardening, backyard poultry, and piggery. In case of sample village Telam, the portfolio of livelihood is skewed towards wet paddy cultivation, livestock, and plantation, with a minimal amount of shifting cultivation. Thus, the sample villages has huge variation in the access as well as in the interaction with the capitals; both physical and natural.

Thus, LPI (Livelihood Portfolio Index) is highest in case of sample village New Deka at about 0.79, is followed by a little more than its half by Potte at 0.43. While Old Deka is placed with the index value of 0.40 after Potte, it is half mark below the adjacent village of New Deka. The least is recorded in the village Telam, which has an index value of 0.25. The relevant spider gram representing the overall index for respective sample village is given in Figure 5.*l* below.

Figure 5.12: Livelihood Portfolio Index of Sample Villages
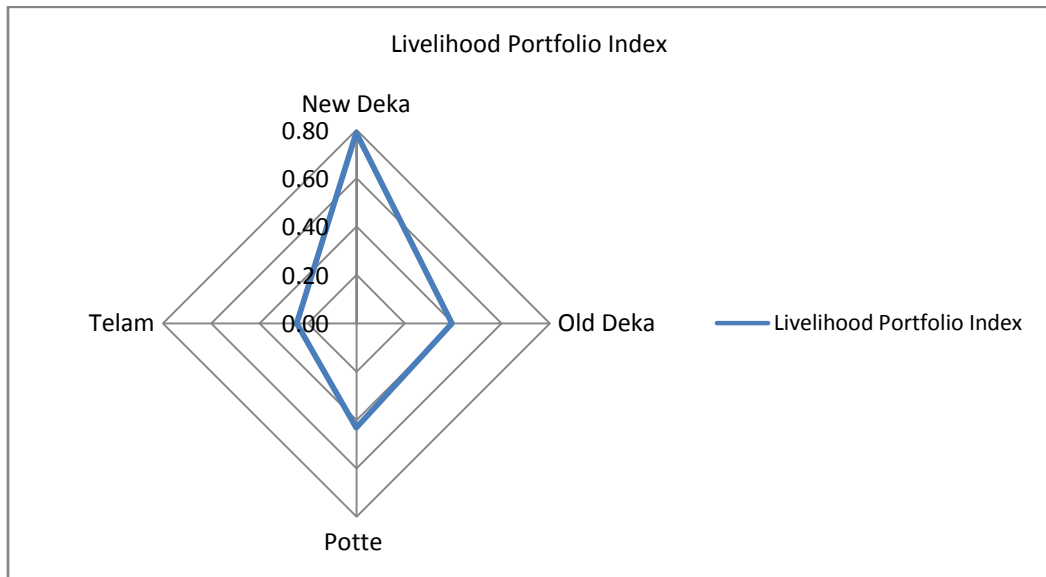
Source: Computed from field data

Thus, it can be concluded that the portfolio of livelihood options in the study area is not only guided by, if not determined by, the availability and access to resources or capitals, usually the physical and human capital. While the natural capital have strong influence over the determination of livelihood activities, the portfolio of options available are often hindered by the inability, inefficient skills, lack of transaction requirements for improvements in production processes. In this regard, while the inclusiveness as captured by the socio-institutional capital is remarkable, the poverty stricken populace are often the victims of elite capture. More so, there is an overwhelming response with regard to the right based access to livelihood (MGNREGA) as welfare intervention by the rural gentry, but, politico-administrative hijacking has left the population with no other option but to fall back below the poverty line. As such, households carry forth recklessly the practice of shifting cultivation in meeting the transaction requirements to even out the shocks, even at the backdrop of drastically reduced *jhum-cycle*, which they are well aware of. Unless, taken care with right incentives, improvement in access to assets; both physical and natural, and an interim livelihood support system through positive welfare intervention, households may fall back on nature and environmental resources. This is ought to be more reckless and unsustainable in the future times due to increasing transaction requirement which follows the improved living standards.

CHAPTER 6

SUMMARY AND CONCLUSION

This chapter is devoted to conclusion. Attempt is to put the analysis and findings of the study into a logically coherent and consistent sequence. In doing so, it relies upon the theoretical underpinnings and the framework underlined in the chapter 1, Introduction and the Background.

6.1 Calibrating Findings

The first chapter introduces the livelihood framework, based on which the study followed the livelihood approach. As such, households design their livelihood portfolio because of the pressures unleashed upon by vulnerability context. The existing structures and processes however, influence and shape the outcome or the livelihood portfolio. Livelihood outcome as a portfolio of activities in securing livings is hierarchal ladder process. The ladder points proceeds from bottom upwards i.e. from mere *survival*, *tocoping*, *adaptation*, and finally to *accumulation*. Any income-consumption shocks actually push the households backward to a lower ladder point in the reverse hierarchical order. Further, households in managing even and smooth consumption pattern, often renders to three strategies of *Hanging-In*, *Stepping-Up*, and *Stepping-Out*. In other words, households by engaging the resources and assets either maintains a particular livelihood levels, or invests in assets to improve it, or accumulate assets to provisions for moving into different or newer activities. For all these to happen, the households requires capitals or assets in the form of human, natural, physical, social, and financial. The access to capital, therefore, has an important bearing in the making of the household's livelihood. Nonetheless, the existing structures and processes do influence the outcomes or the livelihood portfolio. Hence, the capital base and its access by household and its interrelations and interaction with vulnerability context and the structures and processes simultaneously give rise to choice of options in a preferred and prioritised list, which is but the livelihood portfolio.

Given these framework, the study first analysed the socio-demographic profile of the sample population. Here, the socio-demographic profile comprised of the age profile, age composition, state of literacy, educational status, mean year of schooling for various age group, household characteristics and size, landholdings and acreages, homestead and house types, and occupational status.

The analysis of the socio-demographic profile of the study area reveals that about equal proportion of the population are males (50.43 percent) and females (49.57 percent). The overall age irrespective of the gender is 28.82 years on the average with a marginal difference between average age of males (30.10 years) and females (29.65 years). Thus, majority of the population are in their youthful age, with a small proportion of old age population (5.08 percent). It is also observed that most of the households are poverty-stricken. In fact, about 91.38 percent of the households are BPL (Below Poverty Line) as they are the direct beneficiaries of the PDS (Public Distribution System) meant for BPL households. The figures pertaining to registration under MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act), which is a right based intervention for BPL households substantiates this fact. Of the total households, about 96.55 percent has registered under the scheme, while population enrolled and seeking employment is about 63.21 percent.

The average family size of the households are also found big and is about seven (6.96) individuals per households. In addition, the larger chunks of the population are found to concentrate around the range of age category 6-45 years. Further diagnosis, revealed that the age group 19 – 30 years has the highest concentration of 26.64 percent followed by age group 6-18 years which constitutes 23.05 percent. This is in addition to the 13.13 percent of the population categorised as secondary (5.03 percent) and below 5 years (8.05 percent).

Out of the productive age category, only 16.04 percent are engaged in the sectors other than farming. In other words, those in the non-farm pursuits constitutes only 12.13 and 3.91 percent of the population engaged in government and private sector employment respectively. Thus, about 26.55 percent of the population directly engaged in farming pursuit are responsible in securing the households consumption and transaction requirements. Even if we take the consolidated figure of population engaged in non-farm and farm pursuits, it adds up to 43.19 and still has to sustain the larger chunk of population (57.41 percent). All these factors render the households with higher number of dependents. The dependency ratio is, again pronounced more upon the farming community due to tiny non-farm pursuits.

One important findings of the study is that of the literacy and education. While awareness and learning by doing are evident process, literacy and education has its significant impact. The overall literate population is about 74.10 percent. Further, seen in terms of MYS (Mean Year of Schooling), it is 8.35 years for all those in the age group of 25 and less, followed by 10.12 years for the age group 26-30 years and 9.85 for 31-35 years. It is indicative that people value and give weightage or emphasis on

education. In fact, the present parental age group of 36-40 themselves have a MYS of 8.16 years, who looks upon the education as investment on human capital formation for better future of their progeny.

Nonetheless, households have adequate, if not more than available, access to natural capital - land. The total landholding for the study area is 2256.23 acres; of which 90.58 acres are devoted to homestead, thereby, making the remnant of 2165.62 acres as agricultural holdings. Thus, on the average household has access to about 19.45 acres as total holdings and about of 18.67 acres as agricultural holdings.

Drawing on from the analysis on socio-demographic profile in chapter III, it is understandable that the poverty-stricken households with big family size have high dependents and are labour deficit. These have two contradicting implications. First, households have to intensify the limited amount of household labour in securing livelihoods. Second, to cope up with the joneses, household have to strategise alternative options that are remunerating but involve least cost, measured in terms of either capital or labour used. In this regard, since access to land are adequate, rural gentry has evolved the alternative strategy of undertaking themselves the shifting cultivation and that of staples through the sharecropping arrangements. Over the period, the rural gentry have realised the implications of reducing jhum cycle; hence, there is increasing rate of converting the shifting plots to more remunerating pursuits of plantations. Thus, endogenously, an indigenous calculus of least cost principle is at operation, resulting into agricultural diversification and transformation.

Analyses in the previous sections are strengthened by the analysis of land use pattern in the backdrop of the limited non-farm pursuits as dealt in chapter IV. The chapter begins with the analysis of the occupational paradigm that conforms to the high dependency of population on the sample households with deficit labour. Nevertheless, natural capital (land) being accessible to households, farming constitutes the basic option of securing livelihood. It is seen that, 23.14 percent of total land holdings are devoted to cultivation of staples through wet paddy cultivation. In addition, about 15.06 percent of total land holdings are plain and suitable for wet paddy cultivation but un-irrigated due to lack of over ground irrigation sources. About 4.01 percent of lands are devoted to homestead, while 30.22 and 27.57 percent of the total land holdings are devoted to jhum cultivation and plantations respectively.

Thus, in terms of the total agricultural land holdings, about 24.10 percent of the lands are devoted to wet rice cultivation or staples. Of it, about 16.27 percent are irrigated

and 7.83 percent despite being devoted to wet paddy cultivation are rain fed. About 15.69 percent of lands that are plain and suitable for wet paddy cultivation are un-irrigated due to lack of over ground irrigation sources. These un-irrigated plots are often used to cultivate cash crops to cushion off seasonal shocks to household income or consumption. There has been a drastic reduction in landuse devoted to shifting cultivation (although it is still high) as a consequence of reduced jhum cycle and with growing awareness about plantation crops that are more remunerating and requires shorter gestation period unlike silviculture. Thus, about 31.48 and 28.72 percent of the total agricultural land holdings are devoted to shifting cultivation and plantations respectively.

Thus, at the backdrop of large family size, high dependents, and labour deficit, and inadequate non-farm pursuits, the adequate access to natural capital (land) has come as rescue. Hence, households in securing their livelihood are faced with the problems of trading off and substitution of strategies and practices, giving rise to multitude of least cost livelihood portfolios. Analysis of the farm and allied practices of the households points to this direction. As is found in the livelihood activities of the households, their activity portfolio are diverse, ranging from gathering and extraction to fishing, and hunting, from rearing of animals to cultivation and plantations. However, the usual practice of cultivation of the rural gentry is in the form of either shifting cultivation or plantations. The labour deficit households' trades off and substitutes for alternative option of sharecropping in case of wet paddy cultivation, which constitutes their basic staple. The arrangement, although seemingly discarded in theory as inefficient, is best rescue. By entering this arrangement, households only share a part of the cost of production, thereby, enabling them to unleash the limited labour time to raise other portfolio in securing livelihood i.e. households engage in avenues that cushion off income-consumption shock or are incentivising enough to meet their transaction requirements. This is revealed by the fact that about 83.62 percent of households are cultivators and that about 54.31 percent of the households are also into the pursuit of shifting cultivation. Nonetheless, as stated above, the implications of learning by doing and awareness about plantation as resultant of positive intervention during 1980 and 1990s in the nature of silviculture, coupled by drop of productivity consequent upon reduced jhum cycle, the rural gentry adapted to change and have adopted plantation as alternative livelihood portfolio. It is for this reason that increasing proportion of households today, about 68.10 percent, engage also in plantation. In fact, most of the shifting cultivation plots earlier are today converted into plantations, reducing the households engaged in shifting cultivation to about 54.31 percent, which is still high. But in the present scenario, either the shifting plots are relatively smaller in acreage

or the objective of the households engaged is mainly to convert it into plantations. The awareness about shorter gestation period and income generating crops are today replacing the silviculture plantations, which have not only very long gestation but are also un-remunerative due to environmental regulations. In fact, the marginal land holders, to some extent the small holders without irrigation; have recently started converting their plain fields into plantations.

In addition to the livelihood portfolio based on farm activity, there are also set of allied farm activities in the portfolio of the households. About 28.45 percent of households indulge in gardening around homestead, which is sanctuary for diverse crops. In fact, adhering to the least cost principle, households are seen putting up nursery for own plantation, in addition to market disposal. Such nurseries are usually the plantation crops like, rubber, tea, orange, and betel nuts. Further, a host of crops were grown for household consumption, in addition to market disposal. Another important allied activity that was important constituent of livelihood portfolio is that of the backyard poultry and piggery. About 26.72 and 23.28 percent of respective households are involved in these activities respectively. Fisheries, although not as significant as other portfolio do have its presence as 3.45 percent of the households raised this portfolio in securing livelihood.

Thus, the households of the study area trades off or substitutes sharecropping institution in raising the livelihood portfolio for staples, while they are engaged in pursuits other than wet paddy cultivation to raise the diverse portfolio in securing livelihood. In this regard the nature based livelihood activities such as fishing, hunting and trapping, in addition to gathering and extraction also constitutes important part of the livelihood portfolio. While households observed to be making a living out of such activities are insignificant, it does comprise one important portfolio in cushioning off the consumption requirements at household level. Further, the continuation of age-old institution of community fishing and hunting is indicative of a strong case for social capital, which of course is not within the purview of study.

Households raise their livelihood portfolio adhering to the least cost principle, measured either in terms of labour or capitals used. Though the value of imputed cost or the opportunity cost seems high in the realisation of the output, households has their own calculus to juxtapose the cost efficiency. To them, it is not the output generated per unit of investments in terms of labour, but of securing a living. Hence, they impute the value of life and living as cost element rather than book accounting. Further, they also look into the labour or capital involved today as investment for future, wherein time horizon is taken not in isolation but relative to the present

desperation from willingness to move out of poverty, the need to invest in human capital of the progeny, to even out income stream, along with keeping up with the joneses. Taken together, the rural gentry views the present cost as gradually vanishing as time proceeds.

With the advent of monetisation and modernisation, households usually try to keep up with the joneses. Such is revealed by the fact that basic households assets measured in terms of discrepancy are modest, if not adequate. The discrepancy in access to kitchens durables, especially of functional LPG cooking stove, pressure cookers, and refrigerators is 0.37, 0.40, and 0.64 respectively. In terms of the mass media durables, the discrepancy is of about 0.13 in case of cell phones, and 0.28 in case of Television with DTH. Thus, it can be construed that households are no more bounded by limited aspirations; rather there is an increasing aspiration to keep up to the joneses. However, the same cannot be said of the households in relation to agricultural assets. It is found that households are well equipped with the conventional or traditional agricultural assets, but such is not true in the case of modern equipments. Very few households access functional assets related to modern agricultural operation. In fact, only 3 tube wells are found to be functional and operationally used for agricultural purpose. Further, in terms of modern machinery, only two tractors are operational in the entire study area and no power tillers exist. Except for the sprayers amounting 30 in numbers, others agricultural assets are insignificant. This is true for the reason that households cultivate the wet paddy cultivation through sharecropping arrangements and it is not in the interest of already poor landowners to invest. In case other than staples too, functionally operational agricultural assets very negligible. In fact, the poor households substitute labours for capital and in most cases adhere to otherwise least cost production/reproduction in the selection of the livelihood portfolio.

As such, the households being poor are also dependent upon nature based resources. In fact, in one or other way, households are dependent upon the access to natural capital not only to even out the consumption requirements but also the income shocks. In Addition to access to nature based activities or environmental resource dependent by all households; few households also depend upon it to make livings or securing livelihood. About 5 households are found engaged in gathering of cane and 12 in broom, 3 are found to be in the extraction of honey and 6 in *canariumresinferum*. Thus, access to natural capital plays crucial role in the determination of the livelihood portfolio, its exploitation are at rise due to emerging commercialisation and absence of alternative. This in the long run is expected to accentuate and will not

be sustainable, unless households are provided or incentivised with alternative livelihood option to be integrated or calibrated in their portfolio.

Thus, chapter IV dealt about the various facets of livelihood activities and accesses. It ranged from occupational paradigm to land use pattern, from the household assets to farm practices, from dependence on natural resources to socio-institutional access. Chapter V began with the calibration and analysis of the various facets to categorical variables in accordance with the methodology stipulated in the chapter II. The categorical variables were, then put under the appropriate heads of respective capitals. Within the human capital, two categorical variables, namely, Socio-Demographic Profile and Occupational Structure has been included. It is followed by the analysis of livelihood sources. In case of the physical capitals, the household asset base including the household's durables and consumables along with agricultural asset base were analysed. With regard to natural capital, the categorical variable included agricultural landholdings along with the land use pattern and the nature-based activities that make the livelihood activities of the household were considered. Finally, the categorical variable socio-institutional capital, representing access to social overheads is analysed. Each of the variables had many subcomponents within it. As such, indices were constructed out of the raw data, which were then denominated or normalised giving equal weights to each of the subcomponents to see the relative importance of each of the sub-components for the overall study area.

In case of the human capital, index for both the Socio-Demographic Profile and Occupational Structure were worked out separately. As expected, the value of weighted was highest in case of literacy (0.42) followed by BPL households at 0.30. The average homestead size had the weight of 0.28, followed by Average Family Size and Average age of overall population equally at 0.21. Similarly, the exercise also worked out for the categorical variable Occupational Structure. Here the weights was highest in case of the category student (0.54) followed by those in services of the government sector, while the category farmers stood third at 0.34. The human capital, decomposed into Socio-Demographic Profile and Occupational Structure, is indicative that literacy, investment in education of progeny, poverty, family size, and employment other than in farm sector has relatively higher significance.

In case of the livelihood sources, the weights of subcomponents was highest in case of the livestock (0.30), followed by farming of un-irrigated plots (0.26) and shifting cultivation (0.23). Wet paddy cultivation of staples had a weight of 0.18, followed by backyard poultry at 0.17. The weights of gardening and plantation were 0.16 and 0.15 respectively. Thus, the relative importance of sub-components reveals that

household undertakes various activities either to smoothen up consumption or to insure income shocks.

In case of the physical capital, the household assets either consumables and durables or the agricultural assets had almost the same weight or are within the range of values between 0.06 and 0.13. The relative importance of capital asset and its access, especially agricultural assets, when compared to household durables are at meek level. The advents of consumption durables and in keeping up with Joneses, accumulation of agricultural stocks lagged behind. In other words, the incapacity of household to prolong abstinence from present consumption are due to lack of motivation, absence of saving habits, inadequate and unavailability of credits, low level of income compared to high transaction requirements. Also, these inefficiencies crop out partly due to sharecropping, labour deficit and poverty of the households itself. As households are not prone to reinvestments, mechanisation and to induction of newer technology, hence carries forth the inefficiencies. However, change can be brought about by positive intervention, by changing the motivation, which requires the underpinning of the required institutional, financial, physical, and technological needs of the concerned rural gentry.

In case of the natural capital, as was expected, nature based activities, namely, fishing and extraction and gathering had a weight of 0.22 and 0.21 respectively. This was followed by the access to natural capital land, wherein agricultural landholdings and shifting cultivation had equal weight of 0.20. Further, in respect of access to land and its use, those devoted to cultivation of staples (irrigated and rain fed)and un-irrigated plots (used to grow cash crops), the indices had the weights of 0.19, 0.14 and, 0.15 respectively. Thus, access to natural capital reveals that activities or livelihood portfolio raised by the households are influenced by their access to natural capital – the land and environmental resources.

The access to social capital is contextualised by the access to social and institutional overheads or capital assets comprising of the education, health and institutional access and interventions. The index relating to access to right based poverty alleviation interventionist scheme, MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) had the highest weight (0.30), followed by the Saving Bank Account per household (0.18). In fact, the high bank account per household has been realised partly due to interventionist scheme (MGNREGA) which made it mandatory to have a bank account for the transfer of wages. Further, the intervention scheme is also accessed and stressed upon by the population as can be seen from the weight of the index of persons enrolled (0.16) and the beneficiaries per

household (0.12). Accesses to social overheads or capitals like educational and healthcare have almost the equal weight of 0.10. This is true for education at primary and higher secondary and for primary health centre in case of healthcare. It, thus, confirms the earlier claim of poverty-stricken households and the relative importance of need for the welfare enhancement through positive interventions. One positive by-product of the right based poverty alleviation scheme is the increasing inclusion of rural gentry into the financial dimension. It will be interesting to study (in future) as to what extent it is has been successful in moulding and motivating the masses.

Chapter V further analyse the aggregate of the sub-components or the major components. The major components have two dimensions. First, the index of major components itself and, second, the weights of each major components arrived at by equal weight of each comprising the total components. It is found that the index value was highest in case of occupational structure (1.94), followed by socio-demographic profile (1.91) and physical capital (1.89). Unlike what we expected of the samples (as almost all of them were tribal population) the value of index was relatively low for natural capital (1.75). Nonetheless, the index was abysmally low in case of socio-institutional capital (1.13). The weights of respective indices too followed the same pattern. Thus, for the study area as a whole at macro level, the popular belief that social overheads are adequate and that tribal populations are nature dependents, holds little ground. It is, in fact, the occupational structure, socio-demographic status, and access to the physical capital that determines the livelihood profile of the study area. This fact substantiated is by the index of the four capitals – human (1.92), physical (1.89), natural (1.75), and socio-institutional (1.13), and the weights of the respective capitals – human (0.29), physical (0.28), natural (0.26), and socio-institutional (0.17).

6.2 Temporal Conclusions

From the analysis, it was conclusive that the four villages had sample households who raised their livelihood portfolio based on the farming and allied activities. Based on this line of argument analysis pertaining to livelihood portfolio distribution and index for the respective sample villages was worked out to see the variations. It was found that the portfolio of activities ranged from plantation, to cultivation and allied activities such as backyard poultry, piggery and livestock rearing. With regard to cultivation, it ranges from wet paddy cultivation of staples, to cultivation of cash crops on the un-irrigated plots to shifting cultivation. While farm based livelihood constituted major portfolio, allied farming activities of backyard poultry, piggery,

and livestock too contributed significantly in the portfolio of the rural gentry. There were, however, variations in the LPI (Livelihood Portfolio Index). The LPI was highest in case of New Deka (0.79), followed by Potte at (0.43) and Old Deka (0.40). The least of LPI is recorded in case of sample village Telam (0.25). Thus, it can be construed that the sample village; New Deka makes best access of the natural capital (land), in addition to having diverse portfolio in securing livelihood, while the sample village Telam does the least for the same.

To conclude, the need of the hour is the right kind of interventions to make available the physical assets and technology at a lower cost. It may rapid up the pace of induction so that poor households with labour deficit can judiciously diversify their livelihood portfolio. Further, intervention schemes require systematic convergence, calibration, and integration with the diverse livelihood options of the rural gentry on a sustainable basis. Lest, income-consumption shocks at the backdrop of rising aspirations will result into falling back on a greater scale upon natural or environmental resources, which will have drastic consequences.

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