



## **SUSTAINABLE LIVELIHOOD FOR HILLS-POLICY AND INSTITUTIONAL ARRANGEMENTS FOR KALARI CHEESE IN THE HILLS OF JAMMU AND KASHMIR**

This report is a product of a field research funded by the Centre for Civil Society, New Delhi. It demonstrates the need for interactive evidence-based policy making for small hill dairy farm holders by developing dairy value chains (cheese *Kalari*) in the remote hills of the Jammu province in the state of Jammu and Kashmir, India.

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## EXECUTIVE SUMMARY

This paper explores the role of public policy in facilitating the development of a value chain and the market for one such traditional dairy product—*Kalari* cheese, a local delicacy in the hills of Jammu and Kashmir (J&K). It covers a major gap in the literature on value chain development of *Kalari* at the level of small farm unit in the hills. *Kalari* cheese is a high value dairy product that has the potential to raise per capita income of small dairy farm holders in the Udhampur district of J&K. This paper maps and analyses the *Kalari* cheese value chain and its various components including production, processing, marketing, and public policies that affect the production process.

The study uses an 'evidence-based' policy making framework which includes collection of primary and secondary data. Field survey interviews with several stakeholders and focus group discussions in Chatrari village yield the primary information used here. Secondary data comes from reports, records, plan documents, government documents and other published literature.

It identifies lack of innovative public policies, with very little interaction and coordination with the local government bodies, local producers, sellers and consumers of *Kalari*, as a major barrier to the development of a formal and organized market for *Kalari*.

The remote hills in J&K which are the production centers of *Kalari* are not attractive for the private sector unless sufficient infrastructure and incentives are developed and this is where the state needs to step in. There is a need for small farmer groups, co-operatives or farmer-owned professionally managed companies in this area, depending on the level of production, infrastructure and investment available at each location. Local governments like the *Panchayat* are weak and the state government has not enabled the entry and operation of private sector stakeholders in the dairy sector—particularly in dairy-based food processing. In order to have sufficient bargaining ability in the product market, marginal and small producers also need to scale up their operations.

The paper recommends the state government to facilitate establishment of a coalition of relevant stakeholders like the women SHGs, the J&K Bank Ltd., concerned government departments, Village Development Committees (VDC) of the Panchayats, private milk parlour owner, agricultural and dairy science personnel to be involved along with small farmer groups, in building capacities for fodder production, rural infrastructure, and local market development. This demands an innovative and interactive public policy system instead of the current prescriptive public policy system that draws upon experience from mainstream development.

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# SUSTAINABLE LIVELIHOOD FOR HILLS - POLICY AND INSTITUTIONAL ARRANGEMENTS FOR KALARI CHEESE IN THE HILLS OF JAMMU AND KASHMIR

## 1.0 Introduction

Economic development is often attributed to successful public policy. Conversely, in areas where development is still a dream, policy making and implementation is blamed for all the failures. This study explores the role of public policy for economic development in the hills of Jammu and Kashmir (J&K). Using the case of a traditional cheese, *Kalari*, this study shows how public policy can enable the development of value chains and appropriate markets for local products that can improve the livelihoods of small dairy farms in remote hilly areas of J&K.

This study covers a major gap in the literature on value chains and rural development, especially in terms of value addition (production of new products for specific markets) at the small farm unit and in terms of the opportunities for income enhancement through special products of regional importance. Till date no study has been done on *Kalari* value chains thus far except a yeast strain has been extracted from cheese *Kalari* (RRL Jammu, 2001). Specific literature about the district Udhampur is restricted to a few reports of state government, banks and Non-Government Organizations (NGOs).

It covers seven blocks of Udhampur district (Fig. 1) which are the hub for the production of the local cheese *Kalari*. Since there has been no publication on the development of *Kalari* value chains, policy and institutional arrangements till date, this study is an original contribution to the knowledge of value addition in hill dairy, particularly *Kalari* in the district of Udhampur in J&K. The study will be useful to various stakeholders like the state departments of Animal Husbandry, Dairy, and Agriculture; organizations including the National Dairy Development Board (NDDB), research organisations, local governments like *Panchayats*, women's organizations or Self-Help Groups (SHGs), and social entrepreneurs committed to economically and socially sustainable development.

Almost 90% of the farms in this area are small and practice subsistence agriculture due to hill-specific features like rolling topography, fragmented land holdings, and negligible access to rural infrastructure. Unusual market conditions like an informal oligopsony<sup>1</sup> involving some established market actors, and the lack of any organized market activity or exposure adds to the policy related apathy of the state towards issues that matter the most for small farmers in the hills. These small farmers are the target population of this study.

Enabling value chains for small farm dairy products and providing facilities for the emergence of appropriate markets can be a major trigger for changes in the operation of all these actors. Many new value addition activities have already been introduced by several schemes and projects in the hill tracts in India as the hills of Jammu offer indigenous and sustainable value added products with assured market without disturbing the ecological balance of the hills.

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<sup>1</sup> Oligopsony is a form of market in which the number of buyers is small while the number of sellers in theory could be large.

## 2.0 Background

### 2.1 Small farms and value addition

In the current stream of development, especially in the agricultural sector, factors like the role and impact of the organized market, market linkages and value addition have an important impact on the decisions made by both the producers and buyers (Shilpi & Deininger, 2007) engaged in agriculture. The need for organized markets is thus important in rural hilly areas which are mostly left untouched by recent developments in the mainstream dairy sector.

Value chain describes the full range of activities which are required to bring a product from conception, through the different phases of production involving a combination of physical transformations, input of various producer services, and delivery to final consumers (Kaplinsky & Morris, 2007). The dairy value chain begins with the raw milk production, involves processors, institutions and final consumers. (NDA, South Africa, 2001).

There is increasing recognition of the importance of small farm dairy units and opportunities for value chain development, which can lead to poverty reduction and rural development in Asia (FAO, 2000; FAO, 2008). Though there are studies that analyse dairy development and value chains, none of them analyse value addition at the small dairy farm level (FAO, 2008). Traditionally, farmers produce high value dairy food products for home consumption and for formal and informal market with little knowledge about their prices, grades, standards and food safety. To tap the full market potential, innovative institutional models have emerged for developing efficient and value added supply chains especially in the case of small farmers (Joshi, et.al, 2007).

The industries which are linked with the agricultural sector in value chains contribute 30% of the GDP in transforming countries (World Bank, 2008). It is noteworthy that almost two thirds of value addition in agriculture takes place in the developing world and this is an important pointer which indicates that value addition and value chain approach in agricultural products has immense potential to transform the economies of developing countries (World Bank, 2008). But many of these value chain benefits accrue to mid-level or large farmers who have the capacity to integrate into vertical agri-business chains. The agricultural markets have become virtually inaccessible for small holder individual farmers because of the rules of engagement in the agriculture market now. The rules have become stringent based on quality regulations related to traceability and food safety, which makes it hard for small farmers to participate actively. The small holder farmers in developing countries are experiencing market exclusion increasingly because of changes in economic and regulatory rules (GFAR, 2007). To stop further exclusion, it has become important for small holder individual farmers to get integrated in the agricultural value chains and meet the required market specifications (IFPRI, 2008).

## 2.2 Dairy farming in J&K

The average per capita income in the state of Jammu and Kashmir is Rs 18,768 (USD \$440). Data from Chatrari village in Dudu Basantgarh block reveals that the average annual family income is approximately Rs 15,000 (DRDA Udhampur Census Report 2002-07). Given that an average farm family earns one third (IWDP, 2007 ) of its income from livestock activity in the state of J&K, it is deduced that a family earns approximately Rs 5,000 per year from livestock sector and *Kalari* preparation forms around 57% of the livestock component earnings.

Comparing this income information with a similar study (ICIMOD Nepal) in the HinduKush Himalayan (HKH) region at four different hilly locations in Bhutan, Nepal, and at the states of Uttaranchal and Himachal Pradesh in India has revealed that at all locations, each farm family engaged in small holder dairy farming earned around USD\$ 300-500 gross income per milch animal per year from the sale of milk; 80% of this income is net return to the family labour (which means that only 20% of the gross returns flows towards production of milk). This reveals the poor economic condition of smallholder dairy farmers in the hills of Jammu compared to small holder hill dairy farmers in other locations in the country.

## 2.3 Market and policy relevance

Markets for *Kalari* are poorly developed across the six blocks in Udhampur district due to infrastructural constraints (PLP NABARD, 2008, J&K economic survey, 2007, Lead Bank ACP 2007). Consequently the per capita income of *Kalari* producing dairy farmers is very low in the hills of J&K as compared to their counterparts in other hill locations (DRDA Udhampur census of Dudu Basantgarh block, 2002-07, Tulchan & Jabbar, 2001). There has also been a situation of fodder scarcity in the state of Jammu and Kashmir for a long time (Puri, 2004). In 1974 the government initiatives on forage crop development got a very bleak response from dairy farmers (Mal, 1996). Since then emphasis has been given mainly to breeding improvement programmes for milch animals in J&K (State cattle and buffalo interim breeding policy, 2002). The policy initiatives like watershed development and development of pastures, community grazing lands have not yielded the desired returns in terms of development of dairy activity in hills (IWDP, 2007).

## 3.0 Objectives

This study maps and analyses the process through which small and marginal farmers living in J&K's remote hilly tracts producing a traditional delicacy, *Kalari* can be integrated with the organized market. The specific objectives are:

1. To identify and analyze the current *Kalari* production and marketing system and the various associated stakeholder's role.
2. To identify various components of the *Kalari* value chain and the ways in which currently marginalized groups such as women can benefit from the development of such value chains;
3. To map and analyze the gaps in the existing policy arrangements for small holder production of *Kalari* to establish a value chain that enhances their income.

#### 4.0 Analytical Framework

This study uses a development economics theoretical framework<sup>2</sup>, focusing on the interaction between development and policy making. Theoretically, the key question here is how do policy makers learn about and formulate policies for development in non-mainstream regions. Are other modes of public policy making necessary? If so, what are the options for alternative policy making mechanisms for delivery of public goods to non-mainstream or remote areas? Public policy can be more than a mere instrument for intervention; it can be a deliberate plan of action to guide decisions of the government to achieve development. Though it is assumed that policy researchers and makers are learning about the reality around them, that is not always the case.

This study uses “evidence-based policy making” as a theoretical framework to understand the reality in remote areas, the deviations from normal (plains or mainstream dairy production) situations, and the barriers in value addition faced by small dairy producers. It has been inspired by a British white paper, *Modernising Government* (Government of UK, 1999) which states that Government “must produce policies that really deal with problems, which are forward-looking and shaped by evidence rather than a response to short-term pressures.”

In theory the process and results of evidence-based policy making will be different from conventional policy making. It involves three kinds of information about evidence, (i). Primary and secondary data, (ii). Reasoning—which sets the hard data in context, (iii). Stakeholder voice—involving a range of stakeholders and their roles in the issue concerned. This enables the policy makers to ascertain how the information is generated. Unlike data sources (primary and secondary) used in conventional policy research and policy making, evidence-based policy making offers a genuine democratic voice to stakeholders. (Appendix II discusses in details the empirical investigation methods used for research).

#### 5.0 Small Dairy Units – Livelihoods and Value Chains

The components of the *kalari* value chain (filier<sup>3</sup>) in the markets of Udhampur, Ramnagar, Dhramthal (Chennani) are product and location specific. The various inputs and services whose nature and behavior influences the value chain at various stages are discussed in details.<sup>4</sup>

The market chain analysis (which is a part of *kalari* value chain) from the point of entry of *Kalari* into local market of Udhampur, led to the identification of connecting market intermediaries and retailers who govern the terms of entry for small and marginal farm households into the market. These intermediaries influence decisions and capacity to produce more, or upgrade quality, by controlling both the price and access to consumers. All the *Kalari* that is sold in the state comes through an established yet

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<sup>2</sup> Development economics theoretical framework here means the models based on New institutional economics.

<sup>3</sup> Literal meaning in French is thread. It is used to describe the flow of physical inputs and services in the production of a final product (a good or a service), Raikes, Jensen and Ponte (2000).

<sup>4</sup> As no specific study has been done on *Kalari* value chains so far, therefore the findings from primary market survey have been cross checked against secondary sources like Lead bank ACP, PLP of NABARD, and data from Animal Husbandry Department.

informal network of middlemen<sup>5</sup> and petty traders<sup>6</sup>. This product is almost never sold directly by farmers to consumers. The *Kalari* value chains are buyer driven rather than producer driven primarily because of the perishable nature of the cheese and the perpetually high demand for the product.

To understand the *Kalari* value chain, it is essential to analyse the two stages of production before the cheese gets to the market, and the significance of these stages to household labour (employment), the women, milk production, local markets for feed and fodder, and support for dairy.

The *Kalari* value chain is composed of three main components and each component is dependent upon a set of factors whose behavior influences the value chain. These three components are:

1. Milk production and management of smallholder dairy;
2. Processing of raw milk into *Kalari* ;
3. Marketing of the *Kalari* value chain

### **5.1 Milk production and management of smallholder dairy**

Total annual milk production across the six blocks in the Udhampur district was 43,540 MT per year (AHD, 2007). Figure 2 shows block wise differences in milk production. On the whole in J&K, animal husbandry contributes around one third of the income of the rural households people (IWDP report, 2008) and Udhampur district has the largest number of livestock in the state mainly cattle and buffaloes (J&K State economic review, 2007).

Chenani block has the highest number of milch animals in the district followed by Majalta, Pancheri Ramnagar, Dudu-Basantgarh and Ghordi blocks respectively (Figure 6). But interestingly the data also reveals that other than Udhampur block the highest total milk production is in Majalta block followed by Chenani. These blocks have good watershed development programmes; besides they have access to fodder that is brought into J&K from Punjab. The highest quantity of buffalo milk is collected from Chenani block followed by Udhampur, Majalta and Ghordi (Figure 7). This is also an indicator of access to roads and milk routes. The relationship between milk production, collection and value addition by *Kalari* production is revealed by the fact that higher the milk collection from the block, lesser the *Kalari* production in that block. This makes it evident that *Kalari* production is a direct response to lack of efficient market linkages and connectivity to milk markets. Physical infrastructure like roads and ropeways, transportation and communication facilities, electricity, regulated markets, banking facilities and cattle purchase markets are important determinants of quantity and quality of *Kalari* production. The block wise data about these facilities have revealed how credit disbursement among farmers is poor in other blocks compared to Udhampur block. (Figure 9; LBO, ACP- 2007).

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<sup>5</sup> Middlemen or intermediaries in value chain are those people who connect primary producers to final markets and charge a commission for the service.

<sup>6</sup> Petty traders are those who have small in house shops in villages and they aggregate *kalaris* in village and finally sell to middle men, *dhaba* owners and milk parlour owners.

The small farmers in the remote blocks – not well connected to established milk routes face major barriers like:

1. Lack of institutional credit, especially to tide over lean season (winter), when both agriculture and dairy components of the small farm do not yield any income, and the cattle have to be fed and cared for
2. Fodder scarcity, in the lean season when there is no fodder available and the cattle need care
3. Inadequacy and lack of timely veterinary care, which is a major problem due to topographic features of these villages and lack of information about where such help is available.

The government offers superior graded animal breeds through various schemes, but few are available in these remote villages. Moreover farmers worry about their own capacity to feed these superior breeds and the capacity of these cattle to survive the difficult terrain and winters. All of these factors influence management of smallholder dairy units and milk production, which is the basic input for *Kalari* preparation.

## 5.2 Processing of raw milk into *Kalari*

*Kalari* is a product borne out of the inability of farmers in remote areas to sell raw milk due to production and marketing constraints. The decision to process milk into *Kalari* needs to be understood in this context. On an average, daily milk yield is about 3-4 litres per animal and after personal consumption, the milk, which is left, is coagulated to prepare *Kalari*. Daily sale of milk is not feasible because of two reasons. First, the quantity of milk is not very big. Second, markets are far away from production centres and they have an established oligopsony. Therefore the women of the family process the surplus milk and prepare *Kalari*. Recovery percentage is roughly 10-12 percent, which means from every liter of milk 2-3 *Kalari*s (100-120gm).

### ***Method of preparation of Kalari***

1. Milk is collected in a wide mouthed vessel and heated over *chulha* (stove) till it reaches simmering stage.
2. Then it is coagulated with mainly citric acid, but most of the women use sour whey<sup>7</sup> to coagulate.
3. Milk is not boiled completely and is kept at a simmering stage.
4. The coagulate is allowed to cool and shaped into small 60-70 gm circular mass (palm size) manually.
5. It is not pressed like paneer and each mass is allowed to dry over fallen tree leaves or a cloth in the shade. The extra whey is allowed to runoff and evaporates for a day or two.
6. In some villages (e.g. ladda, mada in Chenani block) ladies use dry leaves of pine tree locally called *challater* to dry the mass, as these leaves are needle like and absorb extra moisture faster and aids fast drying. The villagers however, have no idea about the disinfectant properties of pine leaf or bark oil, or the protection that the pine oil may give the cheese from fungus and bacteria.
7. After 1-2 days *Kalari*s are collected and kept in a basket in a cool and dry place.

<sup>7</sup> When curdling of milk takes place, main product out of that is Cheese and byproduct watery liquid is sour in taste called whey.

This component of the value chain is also a function of the: (a). Availability of unpaid household labour, mainly female labour. Women play an important role in *Kalari* preparation, especially regarding care and management of milch animals which involves the provision for fodder and milking of animal; (b). Traditional competency in *Kalari* preparation – which is a skill that is passed on among the women folk in each family and village; (c) Absence of milk storage infrastructure in villages – the women are forced to coagulate even the minimal quantities of left over milk, because there is no way it can be stored without spoiling; (d). Presence of middleman at the doorstep at regular intervals.

### 5.3 Marketing component of the value chain

This is the most crucial component of the value chain as it drives the other components of *Kalari* production. The factors, which influence this component, are

- (a) Poor road density in the hilly areas;
- (b) Absence of storage facilities;
- (c) Market information and communication.

The middle men, who are usually local people, collect *Kalari* from farm women once or twice a week up to 800gm per week depending upon the availability of fodder, water and eventually milk yield. The payment depends upon their relationship with the middleman but mostly it is weekly and in cash. These middle men collect around 30-35 kg *Kalari*s at a time and bring them to towns and sale points like Chenani, Dhramthal, Ramnagar and Udhampur. Usually these middlemen have a very strong commercial relationship with milk parlor owners or *halwais* and they sell *Kalari* to regular buyers (*halwais*, milk parlors) only. This relationship is locally called *laag*. It is noteworthy that the middleman and *halwais* or milk parlors have a business relationship as long as 5-8 years. A conversational interview with a prominent *Kalari* retailer since 1975, Shayamlal Sharma in village Dhramthal in Chennani block revealed that the middlemen even take interest free advance credit from regular clients for purchase of *Kalari*. Rs 300-1000 is the range of interest free credit given by middlemen to farmers to ensure their supply chain.

#### MARKETING CHANNEL AND PRICE SPREAD



The most common marketing channel for *Kalari* is farmer to middlemen to retailer and finally consumer. Middlemen pay around Rs 75-80/kg to producers and they sell it further to *halwais* or milk parlor owners at around Rs100-Rs105/kg. *Halwais* or retailer sell raw *Kalari*s to customers at a price between Rs 120-140/Kg or as individual pieces –

cooked and served hot. Producers share in consumers price ranges between 50-65%. Price increases with movement of *Kalari* from one level of sale to the next.

Unlike other value added product in the agricultural or dairy sector, the producer's share of the consumer's money is very high in the case of *Kalari*. This information drawn from personal interviews of market functionaries and various stakeholders reveals how the *Kalari* producer is valued because it is a product that is considered a delicacy in the State.

### **6.0 Analysis of *Kalari* Value Chains**

To address the objectives of this study we are analyzing: (a). the components of value chain in order to find ways in which currently marginalized groups such as women can benefit from the value chain, and (b). the stakeholders and their relationships in the value chain, in order to assess the opportunities for enhancing small farm dairy incomes and market participation. This will help us understand the existing gaps and problems in policy and institutional arrangements faced by small dairy unit *Kalari* producers.

#### **6.1 Sustainable dairy farming and management**

On the production component side of the value chain, the major bottlenecks for *Kalari* production are low yield of milk, poor transportation infrastructure, lack of institutional credit (bank loans), and fodder scarcity.

On an average a cow yields around 2 lt milk per day and a buffalo yields around 4 lt per day. Milk productivity is low on account of various reasons like scarcity of fodder and lack of round the year availability of nutritious feed, slow penetration of graded murrah buffaloes<sup>8</sup>, and poor purchasing power of farmers.

The average road density in the state of Jammu and Kashmir is 35.75 km (as on 31<sup>st</sup> March, 2006) of road length per 100<sup>2</sup> km whereas the national average is of 105 km per 100<sup>2</sup> Km. At the time when country seeks a faster connectivity for the economic growth under Bharat Nirman policy initiative, J&K still has around 1,600 rural remote habitations which are not connected by motorable roads and most of these are in the hilly terrains. Another barrier is the lack of network of Information and Communication Technology (ICTs) in the remote hilly areas. Although the state government has a specific IT policy and has set up 135 Community Information Centres (CICs) at block level including the six blocks in Udampur, no effort has been made to link small holder dairy and *Kalari* farmers with organized players in the sector.

Analysis of bank data (Figure 9) indicates that the access to institutional credit to the dairy farmers who dwell in remote locations is very poor and this is one of the reasons for rearing indigenous cattles with low milk productivity, which leads to continuation of Low Input Low Output (LILO)<sup>9</sup> milk production. The lending pattern shows that the

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<sup>8</sup> In summers herdsmen take their milch cattle to high ranches/mountains because sufficient green grass is available but in winters September to March, there is scarcity of fodder, hence milk productivity also falls down.

<sup>9</sup> LILO system here refers to low availability of fodder in hills, particularly in winters leads to low milk productivity.

credit planned for those areas (for dairy) are high that are well connected by roads (Udhampur and Chennani blocks), compared to the relatively remote areas like Dudu Basantgarh, Majalta, Pancheri, Ghordi and uphill villages in Ramnagar block which are the main hubs for *Kalari* and other processed milk products like indigenous or *desi* ghee. Banks usually finance dairy to women SHGs in these areas under SGSY scheme of the Government of India (GoI) in tandem with the Block Development Officer's office. The process is tedious and discourages needy and marginal farmers from seeking credit. These farmers often want the minimal line of credit to tide over a few lean months – but that is not often offered by the banks.

Regarding forage and fodder management, there is not much assistance or guidance provided by any state or non-state agency. The poor hill farmers, especially the ones with small holdings, rear their animals under semi-migratory system. During summers (May to September) many of the farmers move along with their livestock (cattle, buffaloes, sheep, or goats) to uphill natural pastures and return during winters (October-April). During these months they feed their livestock the *kharif* crop<sup>10</sup> residue which is left over after crop harvest (usually maize stalks in hills and top feeds like *banj* oak). Since there is scarcity of feed and fodder especially during winter months, supply of milk is also low and therefore *Kalari* production is also low especially from December to February. At the grass root level though, most of the farmers are more or less oblivious of government policies and schemes relevant to their activities. They are at best vaguely aware of schemes like free "fodder seed distribution scheme" that was started by the state government back in 1974. Now these schemes have been rolled back due to bleak response from farmers (Mal 1996, FAO). A Central government sponsored initiative under Intensive Dairy Development programme (IDDP) is currently being implemented in J&K in which fodder crop seeds are distributed among some of the prominent farmers in the villages by the state AH department.<sup>11</sup> From the policy perspective though there is no specific fodder development policy for livestock, under the World Bank funded Integrated Watershed Development Project (IWDP, 1997), initiatives have been taken for fodder development and the agrostology<sup>12</sup> unit which works under the department of forest and has developed some varieties of fodder grasses.

## 6.2 Processing and marketing arrangements

Small holder dairy farming and its management in hills in general and *Kalari* preparation in particular is a gender specific activity in which women have an important role and a stake in the *Kalari* value chains. In many households the women receive the payment from the middlemen. The *Kalari* thus brings the women of the household the only cash income that she receives (since all other crop produce sale and milk sale is handled by the men folk in the household). Several SHGs are discussing this issue – especially the use of microfinance to support fodder supply during the lean months and effective repayment during the season when milk production is high. The gender relationship in *Kalari* production and marketing are crucial for development in these villages – it is the women's skills and labour that goes into the production of the *Kalari* and it is they who

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<sup>10</sup> Kharif season crops are sown in May-June and harvested in September-October.

<sup>11</sup> These seeds are distributed for demonstration plot purposes known as "milk kit scheme".

<sup>12</sup> Agrostology is a branch of science which deals in the study of grasses.

gain (at least a good share of the cash income) primarily from the sale to middlemen. But these women lack entrepreneurial perspectives and training. A major gap identified in this analysis is the absence of a dedicated voluntary organization or NGO, which can play a role of connector among various stakeholders of the *Kalari* value chain, and improve the livelihoods of small farms – women especially – in the region.

The other gaps pertain to proper drying and storage infrastructure at village level. *Kalari* is a nutritious milk food; its clean and hygienic production by the use of suitable infrastructure can fetch a premium price if marketed properly in high income final markets (HIFM) where consumers give more preferences to non-price critical success factors like hygiene, organic production, sustainable and energy efficient production methods. But the farmers are not aware of these aspects. They have no knowledge of clean milk production, scientific processing technologies and such HIFMs which have a potential to make a complete turnaround of *Kalari* value chains.

There is no institutional arrangement for *Kalari* marketing put together by the Department of Animal husbandry or organizations like the National dairy development board (NDDDB). *Kalari* marketing channel involves producers, middlemen, retailers or milk shops and *dhabas* (road-side eating joints) and finally local consumers primarily in the Jammu region. The gaps identified during various interactions with farmers pertain to all the components of value chain beginning from production to marketing of *Kalari*.

In this brief analysis of the components of the *Kalari* value chain we have discussed several policy and institutional arrangements that are present or being implemented in the State. The key question is how these policies and institutions can perform better to facilitate the emergence of *Kalari* as a significant income generation opportunity or enterprise for the women in small farm households in J&K. In order to answer this, we need to address our second objective.

### **6.3 Various Stakeholders and their Interactions**

Several stakeholders in the public, private and voluntary sector influence the practices of farmers and their decisions about value addition, investments and opportunities in value addition. For an effective functioning and implementation of policy, program or schemes it is important to exchange information freely among various stakeholders. Also the presence of coalitions of stakeholders and their ability to inform and influence policy is important for development, especially in cases like this where policy making is often not aware of the local geo-physical conditions and the related production and marketing constraints. In case of *Kalari*, interaction among farmers and line department staff was observed to be very poor at the village level. At another level, among various other stakeholders especially government departments and research institutes like Sher e Kashmir University of Agricultural Science and Technology (SKUAST), the agrostology unit, banks and DRDA, the interaction was found to be intermittent at best.

There exists a serious communication gap among various stakeholders. Empirical evidence from other parts of the country tells us that the most significant missing link in this regional area is a dedicated voluntary organization or a dairy development NGO which can connect all the stakeholders and bridge the information gap. Right now the middlemen are performing this role and are enabling exchange of information (however

meager) as well as the marketing of *Kalari*, with a very good share of the consumer's money going to the producer. Local self governments like the Gram Panchayats have an important role to play in the management of common property resources like water bodies and community grazing lands. Panchayats can play a role in carrying out social audit pertaining to government schemes of dairy and fodder development and can act as a source of *Kalari* business hub in the pattern of a rural business hub in various blocks where *Kalari* is prepared. But they are as of now, non-existent in the state. They also lack the support from other actors in the list of stakeholders who can bring development inputs, fodder production inputs and knowledge, other technical inputs, market information, credit or capital, proper hygienic production practices, and bigger markets.

Below is a flow chart which identifies various stakeholders involved in *Kalari* value chain and their relationship with the farmer. This reveals the nature of coalition that is needed to enable a shift in the condition of the processing of *Kalari* out of desperation to a situation where they can process larger quantities of milk into this value added product and reach bigger organized markets with appropriate business models for each cluster of hills and villages. The clustering is essential to ensure that the small individual producer gets the benefits of a large scale production which is missing right now.

## STAKEHOLDERS AND THEIR ROLES IN THE KALARI VALUE CHAIN

	STAKEHOLDER	ROLES AND INTERACTIONS
1.	<i>Kalari</i> farmers	<i>Kalari</i> farmers especially women are the key stakeholders in the whole value chain. They have a greater stake at various stages of the value chain like milk production and processing but, have no say in the marketing and sale of the produce.
2.	Department of Animal Husbandry and Dairy	Provision of livestock health care. Artificial Insemination and extension of fodder management practices. They are unable to reach small farmers especially in remote areas.
3.	Department of Agriculture	Implementation of government schemes and programmes pertaining to fodder and forage crops cultivation and propagation of package of practices for dual purpose crops. They are also constrained in reaching remote areas and addressing fodder needs there.
4.	Banks	Banks have an important role in enabling adequate credit for investment in dairy, or in ensuring adequate flow of funds during the lean season to milk producers. Banks also finance and enable access to superior breeds of milch animals – which is not very suitable for the poor hill farmers.
5.	Agrostology Unit	The state agrostology unit in Sidra, Jammu, now operates under the Forest Department. It develops fodder grass varieties for natural pastures and grazing lands. This unit understands the grazing patterns, fodder requirements and availability in remote hills.
6.	DRDA	DRDA is an agency which can play an important role in dairy development. Women Self-Help Groups (SHGs) are constituted and linked to formal institutional credit or banks. These SHGs are encouraged to operate economic income generating activities like dairying.
7.	Sher e Kashmir University of Agricultural Science and Technology (SKUAST) Jammu	SKUAST is an important Research and Development stakeholder. SKUAST has developed some fodder varieties and agricultural package of practices. SKUAST can play a vital role in extension of animal nutrition and fodder management practices for increasing milk production.
8.	Dairy Development/marketing organizations	Dairy development organizations like NDDB and AMUL have an important role to play and thus they are important stakeholders. But the problem is that they have formal milk

		routes and collection points which the farmers with low productivity and remote locations cannot access.
9.	NGOs	NGOs can help participatory development planning and implementation but, there are hardly any in this region working on livelihood support activities.
10.	Gram Panchayats	At present Panchayats have been dissolved in the state and no Panchayat elections have taken place since 2006. Consequently, the Central Government has also turned down the request of the state Rural Development Department for a financial grant of over Rs 2 billion for Panchayats and rural development. The potential role that local governments can play in value addition is not realized in J&K.
11.	Village Development Committees (VDCs)	In the wake of dissolved Panchayats, the VDCs have a role in management of CPRs and steering community development programmes like watershed and dairy development. But they don't have the resources – financial nor human to develop rural enterprises or value chains.
12.	Milk parlor owners. <i>Halwais</i> and Restaurants	They are the last link in the value chain before the <i>Kalari</i> reaches the consumer. They are important as the prime market for <i>Kalari</i> and play an active role as <i>Kalari</i> campaigners or market promoters. Supply depends upon the demand created by them.
13.	Middlemen	Middlemen are the second most important actor in the values chain, with active linkages with the <i>Kalari</i> producing households and the market. They transport <i>Kalari</i> from villages to point of sale, inform the women about market preferences and quality parameters. They also know how much each household can produce in each season, and they also communicate news about the programmes and schemes of the Departments.
14.	Political and Administrative actors	The political actors and administrative executives are actors have maintained a confirmed indifference towards the life of small dairy farmers, in spite of being regular consumers of <i>Kalari</i> . They can play a major role in moving the issue up government's policy agenda and supporting a policy and institutional change that can address the value addition and livelihood issues in the hill tracts of J&K.

## **7.0 Current Policies and Options for Development of Dairy Sector and Value Addition**

There is no specific policy in J&K for development of value added dairy products, especially *Kalari* in hills. However, the state government has taken a few policy actions for development of dairy industry. Milk production in the state has increased from 6.66 lac mT in 2000-2001 to 14.03 lac mT in 2003-2004 (J&K Economic review, 2007). But much of this increase has taken place in well connected and well endowed blocks. These blocks are not the main ones where *Kalari* is prepared. Legacy from the experience of dairy development in the plains – where land holding, forage practices, dairy management, and access and milk route issues are very different, has led the government to push livestock breeding schemes in dairy across the state that don't have a focus on problems that small dairy farmers face. The government has taken the following policy initiatives for dairy development.

Institutional role of VDCs in dairy development and management of Common Property Resources (CPRs) like water sources and community grazing lands has been dominant in hills (IWDP, 2007). The dairy cooperatives have developed in an ineffective and disorganized way in the state (SCOPE, 2005) and have very little expertise in market development, and do not handle any product other than the conventional raw milk, which is transported to urban centers. The dairy co-operatives practically play no role in enabling value addition in the households in the villages.

The literature on development policy reveals a significant concern and discusses plans for dairy development, value addition, and market development. The XI FYP document (Planning Commission, GoI, 2008) gives special attention to development of appropriate markets and value addition opportunities for small farmers in remote regions. While policy commitment to small farm value addition in the dairy sector is evident, policy making and the planning processes seem to be based on precedents – namely, experiences in the plains or in previous plan periods.

### **7.1 An Interim Cattle and Buffalo Breeding Policy**

The Department of Animal Husbandry has an active policy to improve the genetic stock of the hilly region buffaloes and cows. As per this policy, the J&K state government has introduced breeding programmes in the state and especially in hilly areas where there is an ample potential and scope for dairy development. 50% Jersey cattle breeds and 62.5% Holstein Friesian cows are promoted for increasing milk production. They also use semen of selected sires of elite herds of Murrah or Nilli-Ravi buffalo breeds maintained in the farms of Central Buffalo Research Institute Hissar, (Haryana)/ Naba (Punjab) to improve the genetic makeup of milch animals in the state. Breeding programmes are used to improve milk productivity.

The small farms with limited access to credit, veterinary care and fodder are not the intended beneficiaries of this breeding programme. These genetic improvement schemes are useful only for the large or medium farms with enough collateral to get sufficient credit and access to sufficient fodder, direct milk markets or cooperatives.

### **7.2 Fodder Production**

As the genetic makeup of livestock is improved due to cattle and buffalo breeding policies, in order to extract the maximum benefit of this, there is need for the availability of sufficient quantity of the nutritious fodder for the milch animals. At present, the fodder requirement (on dry basis) is around 45 lac mT /year but availability is only 28.5 lac mT /year. Hence, there is a need to increase fodder production which can be stored for lean seasons. This is clearly envisaged in the interim breeding policy.

An Integrated Watershed Development Programme (IWDP, 2007) was implemented in the Shivalik hills in Jammu province and in Karewas in Kashmir valley of the state with assistance from World Bank in two phases—1990-1999 and 1999-2005. One of the prime objectives was livestock development, development of grazing lands and pastures. Following this programme, the department of Animal Husbandry took a policy decision and introduced breeding services for remote areas and Artificial Insemination (AI) services for easily approachable areas. The population of livestock (mainly milch animals in Jammu province) was recorded to increase by 8% in 17<sup>th</sup> livestock census as compared to the 16<sup>th</sup> livestock census.

In *tehsil* Ramnagar, in a village called Ritti, the village development committee (VDC) started an ambitious dairy project with credit linkage from bank. But this project was not able to give a big push to income generation activities like dairying and forage production (IWDP, 2007). VDC Ritti is one rare success story pertaining to dairy activity in Udhampur district. The population of livestock (mainly milch animals in Jammu province) increased by 8% in 17<sup>th</sup> livestock census as compared to the 16<sup>th</sup> livestock census. This increase can be attributed to breeding policy of livestock. But at the policy level not much effort has been made to increase fodder production and marketing especially in the hilly areas. The state government however has undertaken centrally sponsored schemes and programmes but at the grass root level in villages, farmers are unaware of such schemes. For fodder development the State Department of Animal Husbandry is the implementing agency. The fodder crops development programmes of central mini kit testing programme on fodder crops is a programme for demonstration of high yielding fodder crop varieties and package of practices with an aim to increase the production of green forage for dairy cattle. Under the Central Fodder Development organization, a research station for fodder crops development is established at a place called as Sahema in J&K.

### **7.3 Policy and Administrative Mechanisms**

Compartmentalized departments of the state with little coordination with each other and rigid mandate-based administrative operations at the ground level (district, block and village level) have an adverse impact on the *Kalari* value chain development. Government departments, agencies and public sector organizations especially banks are the key stakeholders in the small holder dairy and *Kalari* value chain development. They have a crucial role to play at various stages. Their nature of operations at the ground level influence production, processing and marketing of *Kalari* value chain. But that there is minimum official interaction and information pooling at base level between departments and also ignorance of related information on complimentary roles of each department. For example, the Veterinary Department officials are not aware of any fodder subsidy programme or about the role of the state agrostology wing. Similarly their counterparts in the extension wing of agriculture department have no details about any pasture or fodder development schemes like the World Bank funded programme, IWDP-Hills. A banker from NABARD was interested in starting a credit scheme but had no details about the marketing aspect or dedicated NGOs or the number and scale of operation of the middlemen in the district. Such compartmentalized approach has resulted in a situation dominated by a single line of middlemen, *halwais* and restaurants as ultimate buyers and price fixers. This oligopsony goes unchallenged primarily because of imperfect information accessible to decision makers and actors, and inability of farmers to bargain as they are disorganized.

Poor Information Communication Technology (ICT) network has had an adverse impact on the presence of organized market players in the sector. The community information centres (CICs) are available at the block levels, but access to this state infrastructure is not readily

available to the *Kalari* farmers and most of them were found to be unaware of such a facility at the block level. The CICs can be leveraged to connect dairy farmers with a coalition of other stakeholders and promising urban markets so that farmers receive better price for *Kalari* than what they get from the middle men, and also can produce more *Kalari* for organized markets besides the ones operated by the restaurant owners. This demands a policy level initiative for pooling of resources and information for the value chain development for *Kalari*.

#### **7.4 Market Development – Response to Policies vs. Opportunities to Shape Policies**

Development of organized market for small holder dairy and *Kalari* largely depends a lot on government policies, their acceptability by key stakeholders especially bureaucracy and actors in line departments and private sector market players as well. But this is not enough as the major challenge is social marketing of developmental ideas, policies and change programmes in rural areas among small holder dairy farmers. Practices like clean milk production, hygienic *Kalari* preparation, active involvement of men in *Kalari* production process may require a higher level of awareness among farm families. The key lies in a broader public policy paradigm and a meticulously crafted strategic plan which can lead to transformation of small holder subsistence units into small holder economic units.

There are two aspects to the development of such an anticipatory and innovative public policy. The first is the capacity of the government to meet basic commitments like infrastructure and fodder. The availability of physical infrastructure is essential for development of organized market in dairy sector (Singh & Vaidya, 2001 ICIMOD). Physical infrastructure leads to commercialization which further paves path for development of competitive value chains. In hilly areas of Nepal, Bhutan and India (Uttaranchal and Himachal Pradesh) the state actors had played a prime role in the initial phases of development of dairy markets, by organizing small dairy farmer groups and spearheading activities like milk procurement and processing. Later private sector players have joined in. The second is the capacity of the government to decentralize decision making and become part of a wider coalition of locally relevant actors in the *Kalari* value chain.

The state in coordination with other actors should be given an opportunity to shape policies for development of smallholder dairy and *Kalari* in hilly regions of Jammu province by providing infrastructural support and facilitating private sector participation. Organized private sector players have a market incentive to focus on diversification and *Kalari* can fit in very well in this dairy diversification scheme. This demands pro-active engagement of the government with these location specific coalitions, and a flexible anticipatory public policy regime.

#### **8.0 CONCLUSION**

This study reveals that there is an opportunity for value addition and significant improvement in the livelihoods and incomes of small dairy farmers, especially the women, by enabling and promoting *Kalari* value chains in J&K. The state government can play a significant role here by enabling an active coalition of stakeholders in each cluster of hills and villages that are not well connected to road networks now. These coalitions aided by a proper business plan and linkages to organized markets are essential to provide economies of scale and bargaining capacity to small farmers.

This study highlights the following points relevant for policy—

1. *Kalari* has the potential to pull small farm families out of this poverty trap but, this requires a sound public policy involving an active coalition and participation from all relevant stakeholders of the value chain.
2. Compartmentalized administrative behavior and operation of the key department actors who are the main drivers of several factors that influence the *Kalari* value chains and small holder dairy development, has led to information asymmetry and loss of development opportunities. This rigid compartmentalization has led to infrastructure, information, and marketing gaps in small holder dairy and *Kalari* production.
3. Organized market actors and capacities for market development are limited in the state, being largely the result of a strong bureaucracy (for historical reasons) and inadequacies among local market actors to develop markets and trade linkages. The state thus far has not enabled market development and encouraged private sector players in getting linked with *Kalari* farmers for sustainable *Kalari* production and livelihoods development in the hills. There is no formal institutional arrangement for marketing of *Kalari* either by the state or by private sector, neither is there any policy incentive either for producers or for organized market players to get connected for a profitable *Kalari* production.

From the point of view of policy this study recommends—

1. The state government to initiate a stakeholder dialogue. The purpose should be to enable a pro-active public policy regime that is committed to value addition and livelihood improvement in small dairy farms in the hills of J&K.
2. This state-driven dialogue can bring to the forefront the key actors and their capacities to work in a coalition of actors, for *Kalari* value chain and market development. It can empower VDCs in the state and enhance their role in dairy development activities, management of Common Pool Resources (CPRs) like community grazing lands, and water sources.
3. The dialogue should involve NGOs who can play a key role in enabling market linkages, transfer of modern technologies pertaining to fodder management, animal health care, clean milk production and *Kalari* production and post production handling. Other organisations who can bring market expertise, flexible and locally responsive credit, and business skills, are the Jammu Cooperative Milk Producers' Federation Ltd (JCMPFL), the Jammu and Kashmir Bank Ltd., and the Institute of Management and Public Administration (IMPA).
4. The dialogue can also be a forum to discuss administrative reforms in the stakeholder departments by steps like formation of inter-department *Kalari* development teams. These teams may exclusively focus on development of *Kalari* value chains along with women self-help groups who may be linked to the resources like institutional credit, veterinary aid for milch animals, adequate fodder supply, dairy infrastructure and market information.
5. The key private stakeholders, the middlemen, whose knowledge of the hills and production patterns of milk, *Kalari*, fodder, input and product markets, and social networks are crucial for the value chain—need to be involved in the dialogue both as potential organized private players, and as experts who know the local terrains and markets. Other private players in the food retail sector may also be part of the dialogue to assess the market potential for local traditional delicacies like *Kalari*. Such a coalition of stakeholders needs to be developed for sustainable *Kalari* value chains. These coalitions can operate with minimum or no extra administrative overhead costs to the state government.

The findings of this study point towards the inadequacy of the current policy making and the need for a participatory policy making in tandem with challenges and opportunities of emerging markets in agriculture sector in general and subsistence dairy segment in particular. Development of markets to enable economic growth and social development depends on the capacity of the government to move from prescriptive to anticipatory policy making based on evidence. The success of such a step depends on a positive attitude and adequate incentives for bureaucrats and other Government officials, and the support of major political parties committed to economic integration and development in the hills of J&K.

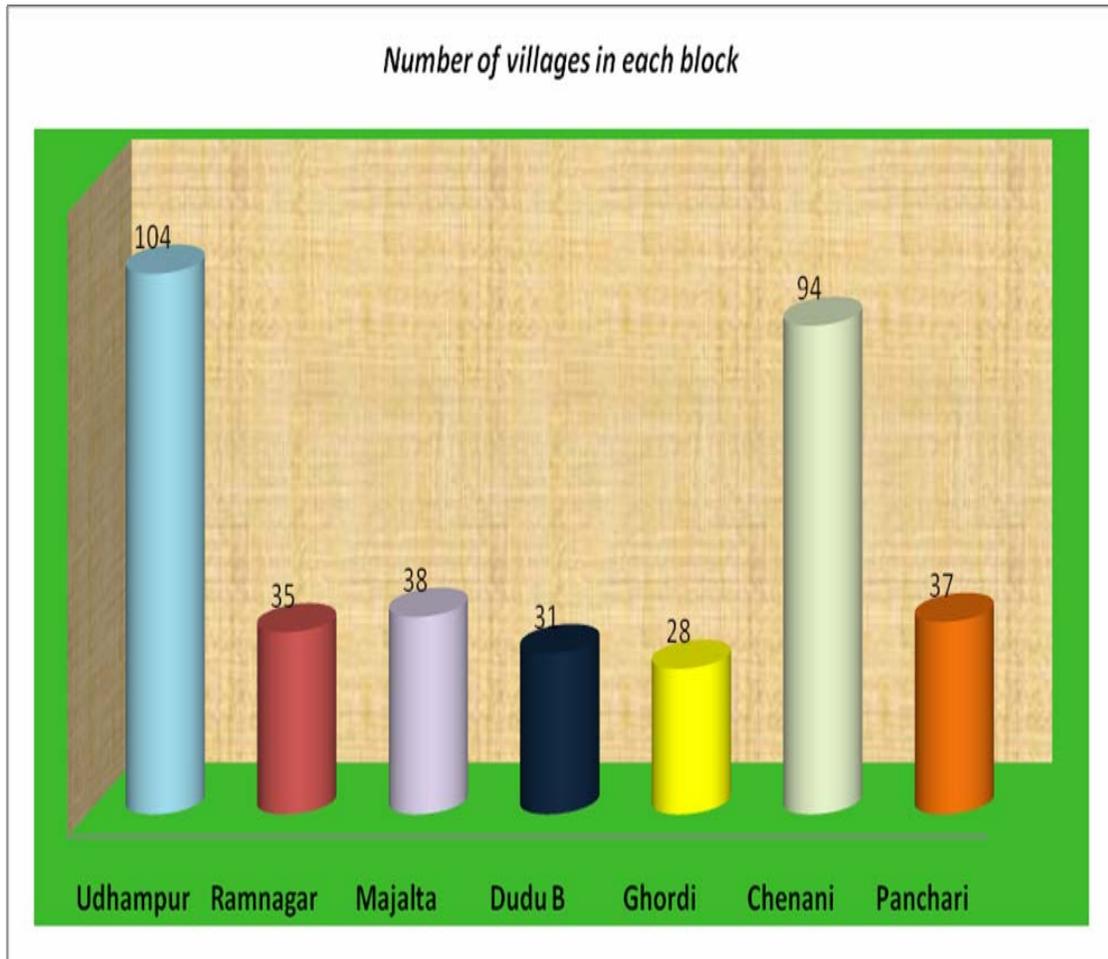
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## APPENDIX I

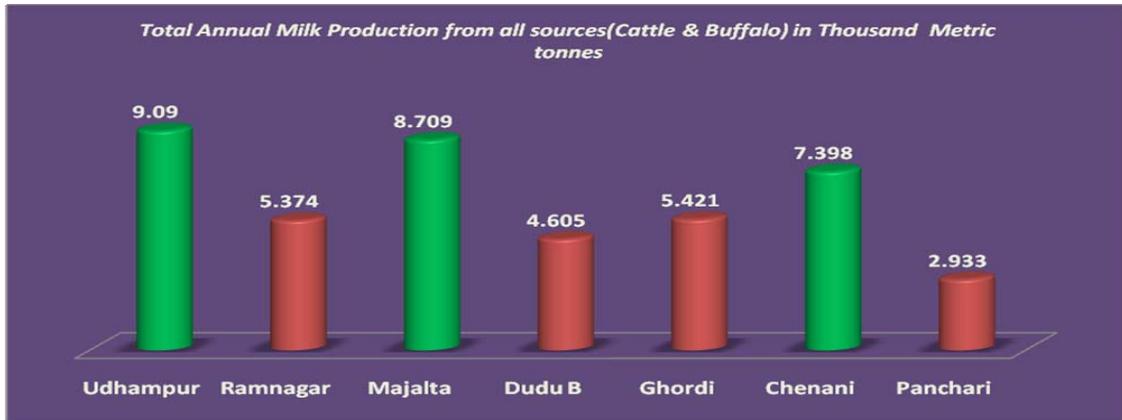
TABLES AND FIGURES:

Figure 1



Source : Department of Animal Husbandry, Udhampur (2008)

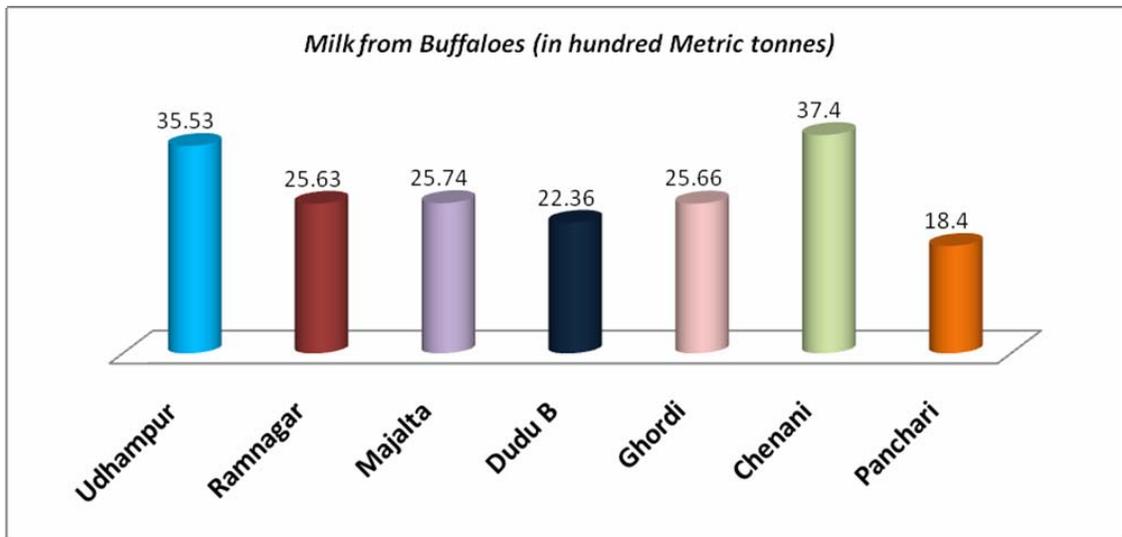
Figure 2



Source : Department of Animal Husbandry, Udhampur (2008)

Bars depicted in green colour are blocks with good road connectivity, therefore milk production and collection is higher as compared to the *brown* coloured bars which represent blocks and areas where road connectivity is poor. Majalta is an area where the milk production from exotic cattle (Jersey & H.F) is the highest (nearly 5500 MT/Year) whereas on the other hand Chenani is a block with 94 villages (some of them in remote hills like Ladda, Champari, Mada, Kither and Bashth) where there is the highest production of buffalo milk in the kalari cluster. Interestingly, even banks did plan comparatively higher credit for dairy activity in Chenani block in the year 2007-08 as per the Annual Credit Plan (ACP) 2007-08 Prepared by Lead Bank (SBI) Udhampur.

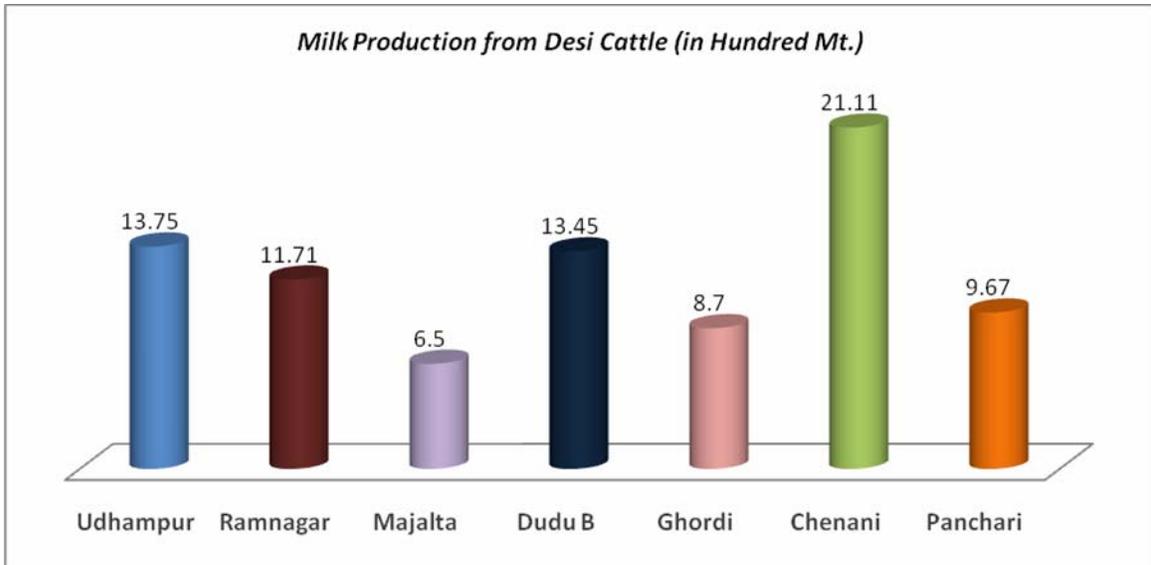
Figure 3



Source: Department of Animal

Husbandry, Udhampur.

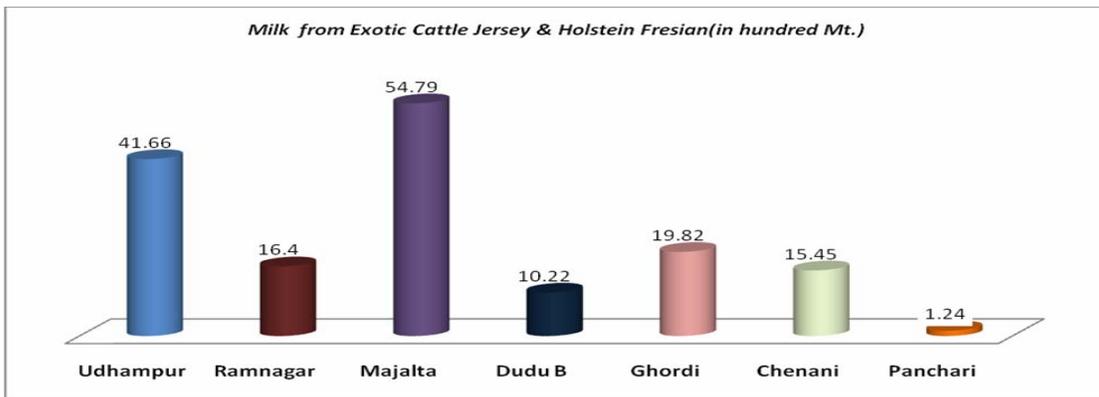
Figure 4



Source: Department of Animal

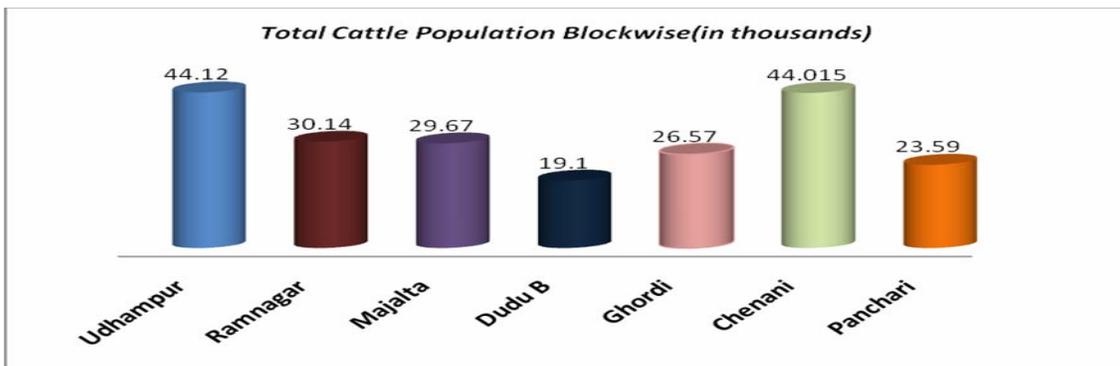
Husbandry, Udhampur.

Figure 5



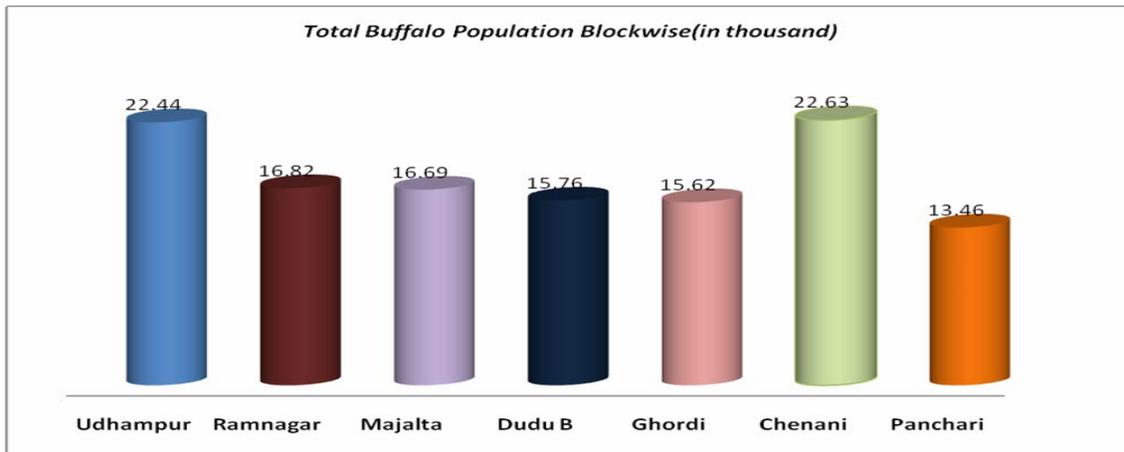
Source: Department of Animal Husbandry, Udhampur.

Figure 6



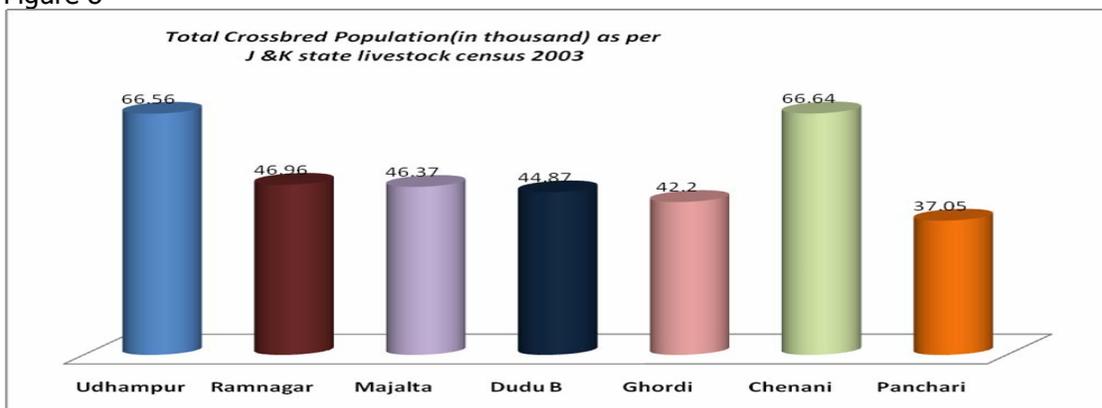
Source: Department of Animal Husbandry, Udhampur.

Figure 7



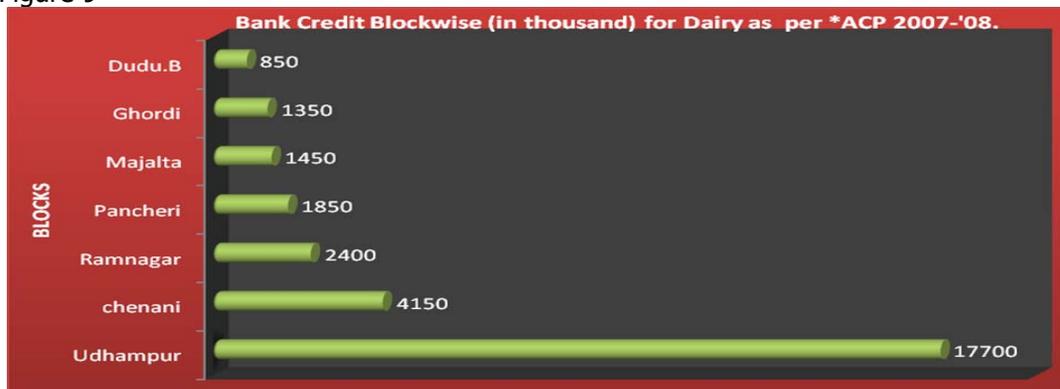
Source: Department of Animal Husbandry, Udhampur.

Figure 8



Source: Department of Animal Husbandry, Udhampur.

Figure 9



BANKING INFORMATION AS PER ANNUAL CREDIT PLAN 2007-08 OF LEAD BANK OFFICE UDHAMPUR

Figure 10



Source: Annual Credit Plan 2007-2008, Lead Bank Udhampur

### ***Characteristics of Kalari***

There are neither any quality parameters of *Kalari* nor any premium price paid for clean production. But still while purchasing, middlemen, milk parlor owners, *halwais* and retail customers look at some characteristics which are basically visual observations:

1. Colour and Texture : *Kalari* prepared from buffalo milk is cream white in colour, dry to touch and firm whereas *Kalari* prepared with cow milk is pale white in colour, oily to touch and has a plastic like appearance. It has been observed that *Kalari* prepared from buffalo milk is preferred by consumers.<sup>13</sup>
2. Moisture content: It should be firm in texture and shape. Moisture content should be around 20-40% of total weight. Generally, if a *Kalari* can softly be broken with index finger and thumb, it is considered to be of good quality.
- 3 Odour: It should have a sweet fermented cheesy smell.
- 4 Weight: Usually each *Kalari* weighs around 60-70 gm and is equal to the size of a circular bangle, not very big in size.

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<sup>13</sup> This is due to the higher fat percentage, stiffness of texture and optimum moisture in the buffalo milk *Kalari*. The J&K State Department of Animal Husbandry has promoted exotic breeds like Jersey and Holstein Frisian (HF) cows in some of the villages. Hence, some farmers also prepare *Kalari* with cow milk. But market demand for cow milk *Kalari* is comparatively less.



Kalari prepared of buffalo milk (high fat percentage)



Kalari prepared of cow milk (low fat percentage)

#### List 1

#### **NAMES OF OFFICIALS/ACTORS WHO WERE CONTACTED AND PERSONAL INTERVIEW AND OTHER INFORMATION:**

1. Dr S P Gupta, Chief Veterinary officer, Department of Animal Husbandry, Udhampur, (J&K State);
2. Mr Rattan Lal, Manager, NABARD, District Udhampur (J&K State);
3. Mrs Parkashoo Devi, Mukhyia Sevika, Department of Rural Development, Block Ramnagar (J&K State);
4. Mr Arun Kumar Raina, Chief Engineer, J&K Department of Irrigation, Udhampur,
5. Mr Kanwaljeet Singh Sodhi, Horticulture Development Officer, Department of Horticulture, Block Pancheri, Udhampur District (J&K State);
6. Mr V K Bhardwaj, District Agriculture Extension Officer, Department of Agriculture, Udhampur, (J&K State).

#### **Appendix II**

#### **Empirical investigation method**

A representative block—Dudu Basantgarh, and a particular village, Chatrari was selected for the socio-economic profiling of Below Poverty line (BPL) farm families who prepare *Kalari*. Collection of the data was done by the method of systematic sampling. Dudu Basantgarh is located about 70 Km away from Udhampur (135 km from Jammu) and has 14 Panchayats and 31 villages with a total population of 38,759. Chatrari is one of these fourteen Panchayats from where a sample was drawn from a set of homogenous BPL population for socio economic profiling. For accuracy and credibility of data, details were taken from the BPL Census report 1997-2002 of block Dudu Basantgarh prepared by the District Rural

Development Agency (DRDA) Udhampur. This particular village was selected because it is accessible by road and the data is replicable at other locations.

Other than this secondary source, the methods employed for primary data collection were Focused Group Discussion (FGD) and personal interviews at Ramnagar and Dhramthal (in Chenani Block).

### ***Focused Group Discussion (FGD)***

A FGD was conducted on 16<sup>th</sup> May 2008 at the Ramnagar and at Dhramthal on 14<sup>th</sup> June 2008 (in Chenani Block). There were 8 participants including farmers and middlemen in both the discussions. Each FGD session lasted for about an hour. The groups were homogenous and the main points of discussion were:

1. Method of preparation of *Kalari*;
2. Market for *Kalari* and institutional support for marketing;
3. Institutional arrangements for feeding and fodder; and the market mechanism for the availability of fodder;
- 4 Institutional credit facilities for farmers from banks
5. Spoilage of *Kalari*, its cycle of production, and the role of women in Kalari preparation.

### ***Personal Interviews***

Personal Interviews (open ended) of shopkeepers, middlemen and the key officials in line departments were conducted for the study. These actors are instrumental in implementation of policy at the grass root level (Animal Husbandry Dept., Agriculture Dept., Rural Development Dept., NABARD).

Three structured, open-ended interviews were conducted in Udhampur, with Dr S P Gupta, Chief Veterinary officer- Udhampur, Department of Animal Husbandry and Dairy and Mr V K Bhardwaj District Agriculture Extension Officer, Department of Agriculture, Udhampur, Mr Rattan Lal, District Manager, NABARD, Udhampur. In addition a few more unstructured conversational interviews were conducted at Ramnagar and Pancheri blocks.

The discussions were structured on following main questions:

1. Have you heard of *Kalari*?
2. Does the Department have any record of value-addition (at the household level) due to *Kalari* production? What difference does it make to the income of the poor households (selling milk instead of selling *Kalari*)?
3. Has the Department tried to increase its production, develop markets, bring better technology (for drying or for coagulation), and when was this and what happened?
4. What are the schemes for fodder development?
5. What is the status of the Training and Visit Extension System?
6. What is the Role of State Agriculture University?

In addition to these structured questions a lot of other pieces of information were extracted through individual interviews on other aspects (See List 1).

### ***Secondary Data***

- (a) State Government reports and publications,
- (b) Data collected from Department of Animal Husbandry and Dairy,
- (c) Research studies on dairy development conducted by NGOs,
- (d) Other online sources (mentioned in the bibliography).