Community Innovations in the Informal Sector: Study of Kashmiri Pashmina Shawls

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1.0. Introduction

'Innovation', has played an essential role in the economic and social development of many countries. It has played a decisive role in the survival of many business firms and is recognized as a major component in the economic growth (Dougherty 1992, Druker 1993). Innovation helps improve productivity and is considered as the foundation of competitiveness. Many innovation theorists believe that the process of innovation is not a new thing, or a phenomenon not known before. They argue that innovation is as old as human civilization itself. Rightly argued, that there is something inherently "human" about the tendency to think creatively and produce new products (Fagerberg, 2004). Taking this economic contribution into consideration, innovation is thus rightly regarded as the "elixir of life for firms, regardless of their size or other attributes" (Varis and Littunen, 2010). Almost all studies in the innovation literature have studied the role of the formal sector firms and big corporation in the innovation process. However there is paucity of the innovation literature which explicitly explores 'community innovations' in the informal sector. How different communities in the informal sector innovate, manage and gather the knowledge and information required for the innovation processes are some puzzles to be delineated in this paper.

This study is worth of undertaking for many reasons. First, this research is one of the attempts to explore community innovations in the informal sector, which otherwise has remained a grey area in the innovation literature. Second, in India more than 390 million workers constituting 92% of the total workforce are employed in the unorganized sector (NSS Survey 1999-2000-2004-05). The contribution of the unorganized sector in India to the net domestic product and its share in the total NDP at current prices has been over 60%. Unorganised sector or informal economy plays a vital role in terms of providing employment opportunities both in the developing and developed countries However, despite its large, substantial place in the economy, the unorganized sector is a relatively neglected field both in the policy making and in the academic discourse (Kabra 2003). Our study thus will be helpful to understand the informal-community linkages, knowledge management mechanisms and the innovation processes, different innovation-communities follow in the unorganized or informal sector.

To understand informal sector and informal sector community innovations, we have taken up the case study of Kashmir Pashmina Shawls[2]. During our field research we found that as many as thirteen different communities working in the informal sector are directly involved in the manufacturing process of the pashmina shawls in Kashmir[3]. These thirteen different communities have introduced many innovations in terms of new designs, new products and new processes. And have also developed strong innovative ties for sharing knowledge within the communities. We also found strong systems of intellectual property protection developed indigenously by some innovative communities.

We have divided this paper into six sections. In section 2 we dealt with some selected literatures on community innovations and tried to explore the gaps, dynamics and intra-relationship among them. In section 3 we reflected the brief history of Kashmiri Pashmina and tried to locate the role of innovative communities in the history of Kashmiri Shawls. We described our research sample and methods of collecting data in section 4. The findings of this paper are reflected in section 5. This is followed by a conclusion in section 6.

2.0. Community Innovations: A Conceptual Framework

Community innovation although is emerging as a new concept in the innovation literature but one can see communities innovating and producing new knowledge from the very inception of human civilization. Joel Mokyr (2005) reflects that even before the Industrial Revolution there where many innovative societies who invented and discovered many important things and laws. Rightly, reflected by Mokyr, (2005) that it "was a world of engineering without mechanics, iron-making without metallurgy, farming without soil science, mining without geology, water-power without hydraulics, dye-making without organic chemistry, and medical practice without microbiology and immunology (p.7)". Similarly Alessandro Nuvolari (2004 p.347) in a paper *Collective invention during the British Industrial Revolution: the case of the Cornish pumping engine* argue that "collective invention settings (that is, settings in which competing firms share

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[2] The word 'shawl' broadly signifies a soft piece of woolen fabric used to drape. Shawls can have many types but we are interested in the Pashmina Shawls explicitly. Traditionally, the pashmina shawls from Kashmir are made from the soft fleece of Central Asian mountain goat *Capra hircus or Changthani goat*.

[3] Kashmir the northwestern region of the Indian subcontinent denotes a larger area that includes the Indian-administered state of Jammu and Kashmir (the Kashmir valley, Jammu and Ladakh), the Pakistani-administered Gilgit–Baltistan and the Azad Kashmir provinces, and the Chinese-administered regions of Aksai Chin and Trans-Karakoram Tract.

technological knowledge) were a crucial source of innovation during the early phases of industrialization". Even during "industrial revolution" we cannot ignore the contributions of various guilds, particularly by 'craft guilds' whose innovations played a significant role. Epstein and Prak (2008), contends that the innovations by guilds contributed a lot to the European economy. And, argue that the single most important contribution by guilds to innovation and the pre-industrial economy was generally in the training of human capital.

In the recent past both firms and innovation scholars have started to recognize the role of communities outside and across the fortified walls of the firm in creating, shaping and disseminating technological and social innovations (Fichter, 2009 p.358). But to define and conceptualize 'community innovations' is little illusive. There is a lot of overlapping literature and terms similar to community innovations and even the word 'community' used in the community innovations is not explicitly defined.

Eric von Hippel (1976, 1988, 2005) was the first to highlight the significance of 'end user innovations' and also the first to reflect the role of 'communities' in the innovation process. Hippel in 2005 used the word 'innovation community' in his book *Democratising Innovations*. Von Hippel (2005, p. 96), define innovation communities as "meaning nodes consisting of individuals or firms interconnected by information transfer links which may involve face-to-face, electronic, or other communication". Hippel further argue that innovation communities can have users and/or manufactures as members and contributors. According to Hippel, the important aspect about user communities is that they reveal information freely. "The practical value of the 'freely revealed innovation commons' these users collectively offer will be increased if their information is somehow made conveniently accessible. This is one of the important functions of innovation communities (von Hippel, 2005)". But Hippel's understanding on user innovations or innovation communities has some limitations. According to Fichter, (2009 p.358-359) the shortcomings with the user innovation concept is that it is limited to user communities or user manufacturer communities only. Second, according to Fichter, it is not taking into account other possible transformations which can have a possible affect on the overall innovation process. Third, shortcoming with Hippel's conceptualization of community innovations according to Fichter, (2009 p.359) is the lack of clear and explicit framework to define the dynamics of social interaction in the innovation communities. In short, Hippel is trying to reflect the role of 'users' as more central and essential in innovation processes. Even Oost et al. (2007) reflect that the

"work of von Hippel and his colleagues is primarily business oriented and aims to enhance the quality of a company's innovation processes by making companies aware of users as a potential rich source of innovative ideas for product development. Specifically, von Hippel has developed methods and toolkits for finding and tapping this source (p.3)".

Lynn et al. (1996) in another attempt to conceptualize community innovations reflects that community innovations refer to the organizations directly or indirectly involved in the commercialization of new technology. To Lynn et al,. the " innovation community is by definition a set of interacting populations embedded in a dense web of social and economic relationships (p. 97)". Lynn et al. (1996) further contends that innovation community consists of a substructure and superstructure and argues that the organizations in the substructure produce either the 'innovation' or its technological complementaries and the superstructure organizations provide collective goods to their members. But one can argue that Lynn's understanding of community innovations is incomplete in the sense that in many innovation communities, superstructure or to say the influence of government, trade unions and universities is not that pervasive or visible.

Social anthropologists Lave and Wenger (1991) in their writings highlighted the role of 'situated learning' through socialisation in communities of practice within organisational settings. In their theory of 'community of practice (CoP) Lave and Wenger (1991 p.98) define CoP as 'a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice". Wenger (1998: p.3) further writes:

> "CoP provides the social construct that places learning and knowledge in the 'context of our lived experience of participation in the world' as it refers to a group of people who share a common practice, have the need to share and exchange knowledge about a specific domain on an everyday basis, and are bounded by informal relationships and a shared identity within organisational boundaries."

Although Wenger's focus is on the local 'situated' nature of CoPs, within 'low-tech' apprenticeship communities but how communities in the informal sector gather and diffuse knowledge is something which is missing in the CoP theory of Wenger.

European Union Member States in the recent past have published many 'community innovation surveys' to get the fair understanding of the innovation process and to measure the innovative potential of their firms. Community Innovation Survey (CIS) according Eurostat'

book on Science, Technology and Innovation in Europe (2008 p.86) "was created to add more details to the traditional innovation indicators, such as R&D expenditure and patent statistics. The Community Innovation Survey (CIS) which is conducted after every four years by EU Member States to monitor Europe's progress on innovation has not till now considered 'communities' who do innovations in the informal sector. CIS is based on the Oslo Manual for its methodological basis and has covered innovative activity from 1990, but no reference to informal innovation communities is seen in these survey reports.

Franke and Shah (2001) in a similar study on community support to the innovation process explains in detail that how different 'sports user communities' gather and diffuse information used in the innovation process. They also explored the community support given to the user innovators in the development of new innovations. After studying four different sports communities, Frank and Shah (2001, p.4) in their findings reflect that 'user innovative communities innovate in groups and not in isolation'. Second finding reveals that the assistance to user innovators is provided for free by the community members. Third monetary profit is not the key motivator for either the innovators or to the communities.

Fichter, 2009 (p.360) define innovation community as " an informal network of likeminded individuals, acting as universal or specialized promoters, often from more than one company and different organizations that team up in a project related fashion, and commonly promote a specific innovation, either on one or across different levels of an innovation system". Fichter (2009) also differentiates a community innovation from other forms of social networks in an innovation process using three criteria. First, "the community is always related to a specific innovation idea or project". Second, "all community members play a promoter role in this process". And third according to Fichter "the community members collaborate closely and informally and they perceive themselves as a 'team', a 'group' or a similar entity, with a feeling of group identity (p.360)

There are some other related concepts to innovation communities like Social innovation (Crozier and Friedberg 1993) Open innovation (Chesbrough 2003), Wisdom of Crowds (Surowiecki, 2004 and Outlaw Community Innovations (Celine et al. 2008). However all these studies have overlooked community innovations in the informal sector.

After reviewing some selected literature on community innovations, what becomes apparent is the paucity of literature for informal sector community innovations. Despite the large

amount of efforts deployed, one can hardly find any study which will explicitly explore the community innovations in the informal sector. How the communities in the informal sector gather the information and assistance they need to develop their ideas and how they share and diffuse the resulting innovations are some broader issues to be analyzed in the present study.

3.0. Kashmiri Pashmina Shawls: A brief History

As already reflected to understand various dynamics of community innovations in the informal sector we have considered the case study of the Kashmiri Pashmina Shawls. In Pashmina shawl trade more than 3 lac weavers are making their livelihood (J&K, Economic Survey Report 2010-2011 p.361). And most of them work in 'communities /groups' in the informal sector. Kashmiri shawls were well-known exports within Asia and moved through established trade networks linking international areas of demand long before the shawls became European commodities. From the royal courts, to the so called 'elites' of the society, no other element of dress has been singled out so strangely as the Kashmiri shawl. Bennett (1935, p48) contends that "Due to its novelty, the glamour of its Oriental origin, and the patronage of royalty, the shawl rapidly became an indispensable item of fashionable dress leading eventually to a new weaving industry in the British Isles and France, the chief centers of production being Paisley near Glasgow, and the city of Lyons".

In this section we will try to trace the history of the Kashmiri Pashmina Shawls and will try to explore the 'royal patronage' it enjoyed and the role, local communities had played in the development of the Pashmina shawls. This historical account of Kashmiri Shawls is imperative for this paper for numerous reasons. First, it will help us better understand and locate the role of various local communities and individuals in the development of shawl industry in Kashmir. Second and important all the historical chronicles, textbooks and travelogues on Kashmir have overstated and extolled the 'royal patronage' and have overlooked the innovations and changes introduced by the local communities. Third as Lazonick (2002, p 3) has pointed out that innovation processes are shaped by social contexts and has argued that the "theoretical analysis of the innovative enterprise must be integrated with historical studies".

3.1. Genesis of Kashmiri Shawls

The word 'shawl' broadly signifies a soft piece of woolen fabric used to drape. Shawls can have many types but we are interested in the Pashmina Shawls explicitly[4]. Traditionally, the shawls from Kashmir are made from the soft fleece of Central Asian mountain goat *Capra hircus or Changthani goat*. The word 'shawl' to some historians is derived from the Indo-Persian word *shal* which means a fine woven woolen fabric. In Arabic it is called 'al-shawl', English 'shawl' and in Hindi 'do-shalla'. Ahad (1987) however is tracing the origin of the word shawl in a Dard tribe who live across the mountains of northern Kashmir. He argues that the word 'shawl' is probably derived from the word 'Sha' which in Dards language means the shawl-wool goat. From the most ancient times, one can find many reference both archaeological as well as from various travelogues of 'wool made shoulder mantles' used and produced in India and Kashmir in particular. Pathak (2003) argue that the ancient literary references and travel accounts provide ample evidence of the woolen tradition in India right from the Indus Civilization (2700-2000BC).

Nonetheless some scholars and historians hold the opinion that the shawl industry in Kashmir originated during the reign of Sultan Zainul Abidin (1420-1470)[5]. It's believed that Zainul Abidin sponsored and facilitated many artisans and craftsmen from the neighboring Central Asia and Persia. According to Jafri and Rehman (2006 p.42) Sultan Zain not only invited painters and weavers from Persia and other Central Asian places but also encouraged them to settle down in Kashmir. Jafri and Rehman (2006) further contend that "if he (weaver/painter) couldn't comply, then he was not allowed to leave Kashmir until he had trained local men in his craft". The only chronicle of Kashmir history *Rajatarangini* by Sultan Zain's court historian,

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[4] Shawls are classified according to the materials used and the manufacturing techniques involved. On the basis of raw materials used, shawls are of three types 1) Woolen shawls 2) Pashmina shawls 3) Shahtoosh shawls. Woolen shawls are made from pure wool called "ruffle". Pashmina shawls are made from the hair of Himalayan ibex found in Leh and Tibet. And Shahtoosh, which means 'Kings' choice or 'ring shawls' are made from the wool of Tibetan antelope 'Chiru' or 'Pantholops Hodgsoni'. On the basis of manufacturing techniques shawls can be of two types 1) Kani shawls and 2) Amlikar shawls. Kani shawls involve more than 1500 small bobbins on the loom while as Amlikar shawls are the imitation of the Kani shawls and needs needles instead of bobbins. For more details see Dewan Parvez 's *The People and Culture of Jammu-Kashmir-Ladakh* (2011 p. 310-320)

[5] Sultan Zain-ul-Abidin ruled Kashmir from 1420-1470. His rule is considered one of the best in the history of Kashmir. Mohibbul Hasan in a book titled *Kashmir Under the Sultans* is arguing that "of all the Sultans who sat on the throne of Kashmir, Zain-ul-Abidin was undoubtedly the greatest. He acquired a halo in popular imagination which still surrounds his name in spite of the lapse of nearly five hundred years." Sultan Zain is still remembered with the name 'Bud Shah' (the Great King).

Pandit Srivara also mentions about the role played by Sultan Zain in the development of the shawl industry in Kashmir.

However many other textile scholars argue that the technique of shawl weaving is indigenous to Kashmir and hold the argument that shawl industry developed because of the local artisans. Rizvi and Ahmed (2009 p. 145), Pathak (2003, 15) while quoting the text of the eleventh-century author Kshemendra (990-1065) maintains that shawl industry particularly the twill tapestry[6] technique was already in Kashmir even before the Zain's rule.

3.2. Kings or Communities: Who introduced innovations in the Kashmiri Shawl?

After briefly discussing the genesis of the Kashmiri Shawls we will now try to explore another main aspect of this study that is who really transformed Kashmiri shawl industry. All the historical chronicles and travelogues have overstated the role of the Kings in the development of the Kashmiri shawls. Nowhere is the role of the local communities delineated. Almost all historians and scholars who have worked on shawls have consensus on the "fact" that all the 'new' technicalities visible in the Shawl making were possible because of the Kings who ruled Kashmir in the past. But, which political rule has more influenced the shawl industry can't be ascertained with certainty. That is why Ames (1986) contends that "it is impossible to speak of one 'great period' in the development of the Kashmiri shawl; each culture brought its own unique contribution. The development of the Kashmiri shawl is influenced directly by changing historical circumstances (p.16)". In this section we tried to deconstruct this historical claim that the shawl industry in Kashmir developed because of the innovations introduced by various Kings. We explored the nature of this 'royal patronage' and the role various Kings played in the development of the pashmina shawls in Kashmir. We found that Kashmiri pashmina shawl industry developed because of the ingenuity and creative potential of the local communities. Innovations by the local communities and local individuals were basically the main impulse behind the success of the shawls and not the Kings.

Till the end of 11th century, we cannot find any reference from the historical chronicles which will suggest the role of Kings or communities over the development of this industry. But,

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[6] According to the *Encyclopedia Britannica*, twill is one the textile weaving technique distinguished by diagonal lines and tapestry is a woven fabric usually a luxury art in which the design is built up during weaving.

the role of Sultans in the 13th and 14th century is well documented. Many historians hold the argument that among the sultans who ruled Kashmir, Sultan Zain who ruled Kashmir from 1420-1470 took personnel interest in the development of the shawl industry. They (Historians) argue that Sultan Zain-ul-Abidin took many "great" steps in the 'revival' of this industry and made elaborate arrangements to make shawl weaving a great economic, profit making industry. Ames (1986), Ahad (1987), Rizvi and Ahmed (2009) and Pandit Srivara, Sultan Zain's court historian in Rajatarangini all have eloquently delineated the role of Sultan Zain in the development of the shawl industry. Even some argue that Sultan Zain, known as the 'Akbar of Kashmir' encouraged many innovations in this industry. Pathak (2003) reflects that during the time of Zain-ul-Abidin many woolen goods began to be manufactured in Kashmir and the King himself was interested in patterns 'citra' and creeper designs, 'latakritih'.

However one can contest these historical claims which project the Sultans as the sole developers of the shawl industry in Kashmir. These claims raise many doubts. First, the 'new' changes introduced or encouraged by King Zain are not explicitly clear and well documented. What is documented in the history gives us the blurred picture of both the King's and the community's role. Second, many historians hold the argument that Sultan Zain improved the traditional loom by encouraging 'new' changes into it. But what is not reflected is the description of the 'old'/traditional' loom and the 'new' loom. When there is no description available about the old loom then how can one argue that Zain improved it on the new lines?

Similarly the role of Mughal Kings towards the development of pashmina shawl is well documneted. Many historians are of the view that it was during the Mughal period (1586-1753) that Kashmir shawl industry reached its zenith. Jafri and Rehman (2006 p.60) is arguing that the influence of the King Akbar "on the evolution and modeling of new textile forms, weaves, dyes, motifs and symbolism in the Indian aesthetic cannot be underestimated". The authors in detail are extolling the role Akbar played in the development of the shawl industry in Kashmir. Ahad (1987 p. 11), is talking about the technological development of the shawl industry during the time of the Mughals in Kashmir. But what kind of 'technological' developments were introduced no reference is given. The A'in-i Akbari by Abu'l-Fazl 'Allami also gives a detailed account of the role King Akbar played in the development of the shawl industry in Kashmir. We also found the contribution made by the Afghanistan kings towards the pashmina shawl. Afghan rule of Kashmir from 1753 - 1819 is considered one of the worst and darkest periods in the history of

Kashmir. According to Ames (1986) Kashmir was reduced to the lowest depths of penury and degradation during the Afghan rule. Some historians hold the argument that Afghan kings also introduced some innovations in the pashmina shawls. However we could not find a single explicit reference of any technological or non-technological innovation introduced or encouraged by the Afghan rulers in Kashmir.

Instead we found that some important innovations (radical) were actually introduced by the local community members without the intervention of any government support or kings patronage. During our archival work we found that the colour patterning in the shawls was introduced by Nagz Beg a cook and not by the King Akbar. Doruka Shawl (double sided shawl) was invented by Mustafa-Pandit and Aziz Pandit, two local natives and the embroidered Amlikar shawl by Ali Baba. We also found that the weavers introduced a new pattern of shawl weaving during 18th century. Even today these communities have introduced many innovations in terms of new designs, new products and new processes. And all these innovations were possible without any government of 'royal' patronage.

4.0. Study Method

4.1. Areas for Study

The fieldwork for this study was exclusively carried in those districts of Kashmir where shawl manufacturing is mainly concentrated. After going through many reports, chronicles and interviews we found that shawl trade is mainly concentrated in the districts of Ladakh, Srinagar, Budgam and Ganderbal. We visited all the four districts and interviewed many weavers, dyers, cleaners, washer men and also held one-on-one meetings with many government officials, historians, teachers and shawl merchants.

4.2. Data Collection

Four semi-structured questioners were used to interview the randomly selected respondents of thirteen different communities involved in the making of pashmina shawls. They were complemented with interview of some respondents' as well as personal observation of the weaving process.

4.3. Research Questions

    1. Who are the main actors in the informal sector community innovations – Individuals or communities?

    2. What is the nature of support to such innovations?

    3. What is the nature of networks within the informal sector innovations? And

    4. How they manage and protect the knowledge systems ?

### 4.4. The process of pashmina shawl making

During our field visits we found many different communities involved in the manufacturing of the Kashmiri pashmina shawls. This section precisely explores the process of making a Kashmiri pashmina shawl. This will help us better understand the communities involved in the making a pashmina shawl. Weaving pashmina shawl is not an easy task. It takes one to two years to weave a single piece of Kani-shawl. There are more than thirteen different steps involved in making a pashmina shawl. And various communities with special skills are consulted at every step.

Step 1and 2 : Collection and distribution of Pashm

Pashm (the raw form of pashmina) is collected in the outskirts of Leh by the nomadic pastoralists known as Changpa (northern people) who are scattered around Chnagthang, a vast and complex terrain in Ladakh. The main occupation of these nomadic pastoralists is to collect pashm from the pashmina goats which are locally known as Changra goats. According to the 2007 official records the number of pashmina goats kept by the Ladakhi Changpa was about 170,590. The pashm collected is then sold to the brokers, merchants and retailers in Srinagar, Budgam, Ganderbal and Anatnag.

Step 3 and 4:: Cleaning and Spinning

After the raw form of pashm is distributed to various merchants and brokers in Kashmir, the second step involves the cleaning and the spinning of the pashm. The step of cleaning the pashm is considered very difficult because to separate the coarse and hair from the pashm is very tedious and back breaking job. The job is traditionally done by the women spinners and cleaners. According to Ahad (1987 p 29) "during the 17th and 18th centuries almost the entire women population of the city of Srinagar was engaged in spinning and the turn of the century saw their number increased to 1,00,00". However during our field visits we found many new innovations incorporated by the local communities in Kashmir.
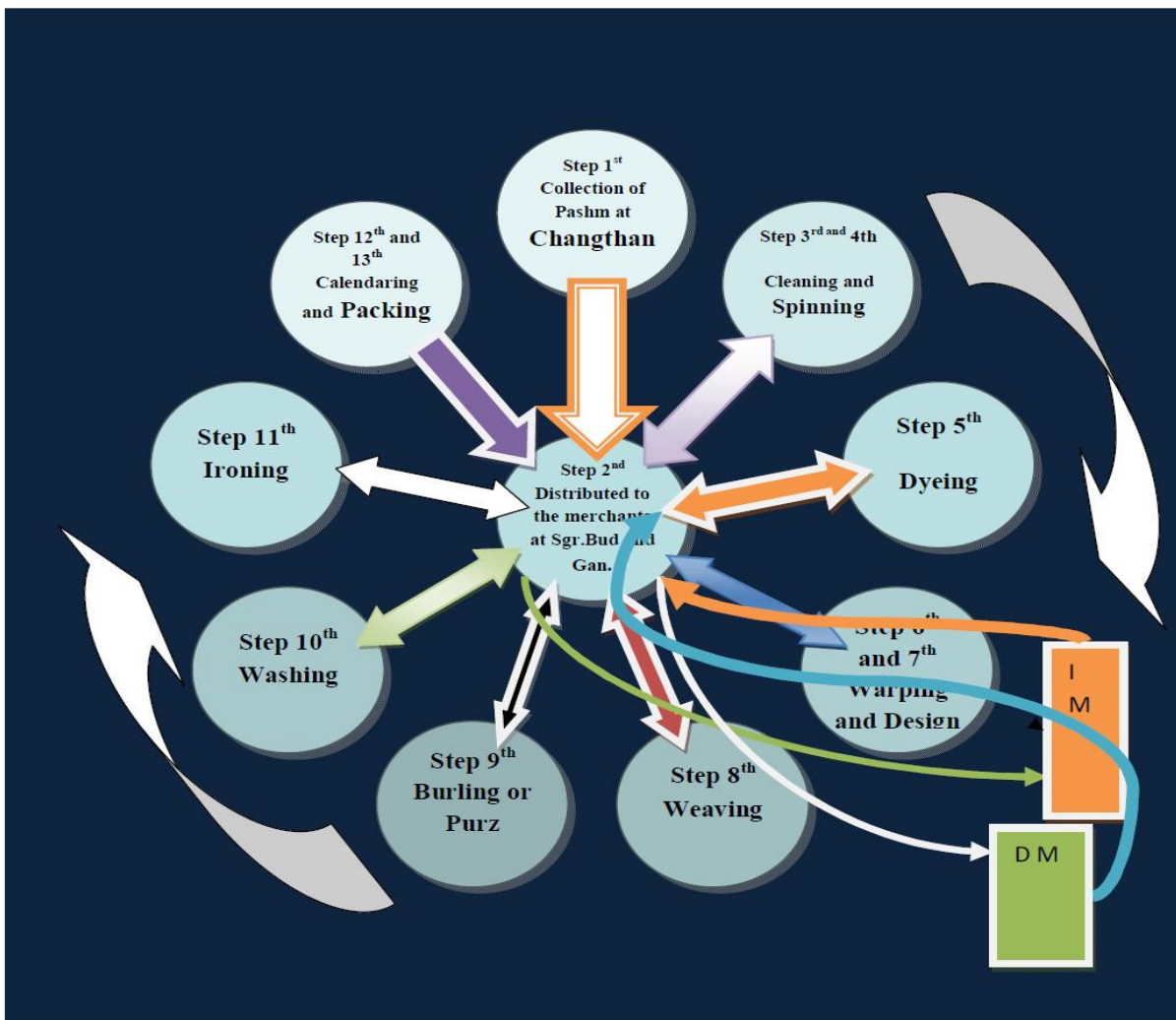
Schematic diagram showing the steps required to make a pashmina shawl.....prepared by author himself

Step 5: Dyeing

Step 5 involves the dyeing of the pashmina into different colors. Constituting a separate community of dyers known as 'rangrez', this community can dye the pashmina into various colors and shades. Traditionally they were using vegetable dyes but now chemical dyes are used.

Step 6 (a): Warping

In this step the pashmina is subjected to warping, wefting, dressing and reeling. For each job the services of separate skilled persons is needed. The wrap maker or what is popularly known as 'nakuta' adjusts the dyed yarn for wrap and weft.

Step 6 (b,c,d): Design Drawing , Color fixing and Talim writing

These steps needed the services from three specialists from different three communities. The communities involved here include 1) Naqqash 2) Taragur 3) Talim gur. Naqqash or designer draws the designs, taragur or gandunwuol is a color expert and adjusts different colors according to the designs and finally the talim gur writes the designs in a code form for the weaver.

Step 7, 8, 9 10, 11 and 12

Once the design is ready, the next step is weaving, followed by burling and washing. After the shawl is washed it is sent for ironing and packing.

5.0. Findings
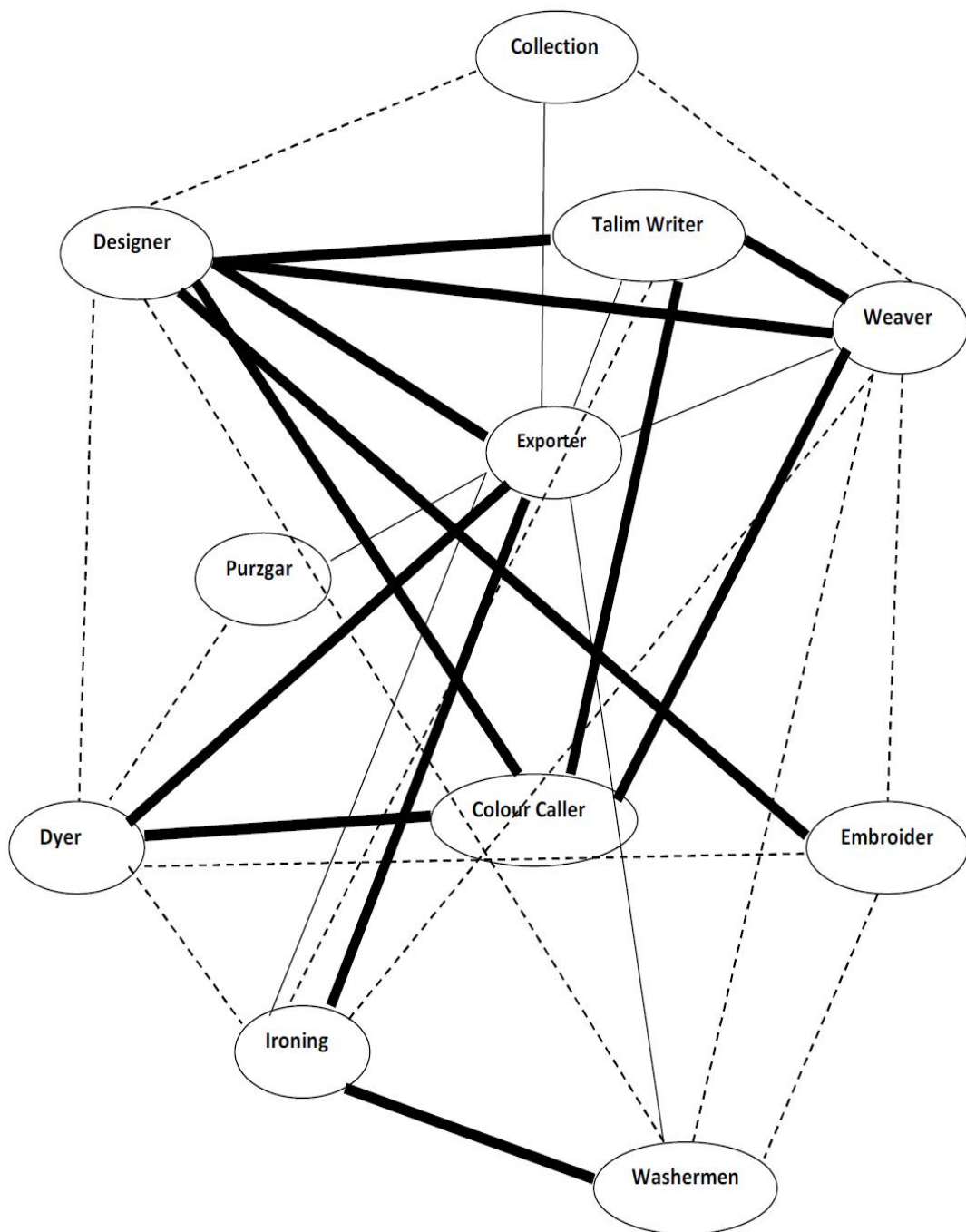
5.1. Community Innovations

Our first finding reveals that instead of individual innovators, communities can be best regarded as the main agents of innovations in the Kashmiri Pashmina Shawls. We found many such community innovations introduced by different communities at various levels. We found new combs have been introduced by the Changthan pastoralists. Combs made of Yak horns and wood are seldom used by the Changthan people for combing wool, instead steel made combs are used nowadays. We also found innovations being incorporated for cleaning the pashm. Some

community innovators have introduced 'deharing machine' used for cleaning the coarse from the pashm. However the technicalities of this innovation are freely reveled within the community members. It is not protected with any modern IPR laws. Innovations in terms of different dyes introduced by the dyeing community are also visible. One can also find new designs, products and new marketing techniques incorporated by the pashmina shawl communities in Kashmir.

5.2. Network of Innovative communities

In innovation literature many empirical studies have demonstrated the benefits of inter-organizational relationships. How various organizations and firms in the formal sector benefit out of the information diffusion, resource sharing, access to specialized resources and interorganisational learning has been well explained by innovation theorist. Walter W. Powell and Stine Grodal (2004) in a paper *Networks of Innovators* argue that the networks in the formal sector contribute highly to the innovative capabilities of firms by "exposing them to novel sources of ideas, enabling fast access to resources and enhancing the transfer of knowledge (p 79". Nevertheless the study by Powell and Grodal explicitly talks about the networks in formal sector organizations and firms. There is no reference of how informal innovators connect with each other. Hippel (2010 p. 413) although highlights informal innovation networks in his open user innovations studies but his argument that users and other agents who divide the tasks and costs of innovation development and then freely reveal the results is in contrast with our findings. We found that many innovative communities involved in the pashmina shawl making have not only developed strong and weak ties but also have developed strong mechanism for the protection of their intellectual property rights.

In Kashmiri shawls many communities have developed certain strong informal networks thus share and diffuse knowledge and innovations with each other. For instance, strong ties are visible between the designer, color caller, talim writer and the weaver. The members of these four communities interact on a regular basis, share and diffuse information within the network and help each other in case some problem arises. Nevertheless, the same communities have very weak or no ties with other communities. (see the model below)

Networks of Innovative Communities in Pashmina Shawl Making
(Prepared by the Author)

5.3. Intellectual Protection by the community innovators

Our third finding is related to intellectual property management. Many innovation scholars like Nikolaus Franke, Sonali Shah (2001) and Hippel (2010) argue that the innovations developed by the end users in the informal sector freely reveal the fully developed innovations within the community. Franke and Shah (2001) argue that the innovation related information and assistance are freely shared within the communities of end user innovators. However in our case, we found many innovative communities in the shawl making process seldom share innovation related information with other communities. Instead some these innovation communities have developed strong systems for the intellectual property protection. For instance, talim or the shorthand notation; this arcane system has been developed to protect the designs, color patterns and the weaving styles from the intellectual pirates. Talim Gur after reading the designs and the colour patterns writes the talim in the form of codes and symbols which alone the weaver, designer and the color caller can understand. This coded language used to weave shawls and carpets is called hieroglyphics.

Some Symbols used in talim writing:

1 is represented by 0, 2 is represented by 9 , 3 is represented by M, 4 is represented by Q, 5 is represented by N similarly 6 by I and 7 by 7. Colours are also represented by various symbols like red is represented by √ , white is represented by 0, and Green is represented by X

Similarly we found dyers very secretive. They discourage the sharing of their art to other communities. Even during my field visits they refused to respond to our questions. They are very conscious about their intellectual property rights. The knowledge system dyers have developed over the centuries is all in tacit form, they don't like its codification. No code system has been developed so far by the dyers. They use both organic as well as chemical dyes.

We also found that dyers, weavers, Naqqash, and talim gur do not involve the women in their art. With no women participation one can argue that this deliberate exclusion of women has to do with the intellectual property rights. We can find the women cleaning the pashm and spinning it into the yarn but in other important areas she is excluded. We thus argue that the knowledge about certain arts is selectively shared within the family as well. Daughters are excluded because after marriage they go to different families.

However there are certain innovative communities involved in the pashmina shawl making who freely reveal the innovation related information. For instance the cleaners, they

freely reveal the information regarding their innovations. They have not applied for the patent for their 'deharing machine'. Similarly the washer men do not hesitate in sharing the information they have in terms of washing pashmina shawls.

6.0. Conclusion

In this paper we investigate the process by which different communities in the informal sector without the firm and government intervention do produce new products, new designs and explore new markets. We examine and provide insights into the structure of Kashmiri pashmina shawls, in which more than 13 different communities are directly involved in making the pashmina shawls. Our findings reveal that the innovation communities in the informal sector not always freely and openly reveal innovation related information. We found strong systems of intellectual property mechanisms developed by the informal community innovators. Strong innovation community linkages between differnt communities are also visible in the informal sector. The findings of this study are limited to pashmina shawls only, we are hopeful of more exciting findings in other similar areas. Many good questions related to the informal sector community innovations are yet to be addressed.

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