

GENDER AND INNOVATION IN SOUTH ASIA

February 2008

Sujatha Byravan

**13, 12th Cross Street
Indiranagar
Chennai 600020
India
sbyravan@yahoo.com**

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	3
1. INTRODUCTION AND CONTEXT	6
2. A MATTER OF DEFINITION	12
3. THE VALUE OF INNOVATION.....	14
4. ARE WOMEN MISSING FROM INNOVATION?	19
5. THE RULES OF THE GAME FOR WOMEN	25
6. RECOMMENDATIONS TO ENHANCE THE ROLE OF WOMEN AS INNOVATORS	32
7. WHERE ARE THE KNOWLEDGE GAPS?	39
8. REFERENCES	43
APPENDIX: METHODOLOGY AND PEOPLE INTERVIEWED.....	47

Executive Summary

To understand how gender, women's rights and citizenship intersect with innovation in South Asia, one must begin by considering some of the main features of life for South Asian women, about a half of whom are illiterate. This report looks at 'innovation' in the specific context of knowledge — generation of, access to and utilisation of it — and the progressive economic and social changes that go with it. There is ample evidence to show that the overall prosperity of a country or region is related to its innovative capacity. Over the last few decades there have been numerous instances of innovative approaches to solving some of the seemingly intractable problems such as poverty alleviation, education, energy services, transportation and public health. There is also considerable interest in the possible solutions that innovations can bring, and therefore in strategising to unleash their potential. But then how do women figure in this picture?

The typical South Asian woman at home is subordinate to the man and, as such, few married women have any say in decisions, whether household, or regarding the manner in which their own earnings are to be spent. It is a society where traditional gender norms such as dowry, wife beating, and *purdah* (in Muslim communities) remain firmly entrenched, where infant mortality rates are some of the highest in the world, where malnutrition is widespread and most pregnant women are anaemic. Women do not have the same rights to land and wages as men and have fewer employment opportunities. Most women work in the informal sector. In India, for instance, 90 percent of the workforce is in this sector, 60 percent of which is composed of women who occupy the lowest rungs, carrying out the more precarious and low-wage jobs.

Women are, and can be, innovative in various sectors, that is, when they have access and/or when they receive special training. However, there appear to be few women who step forward to don the mantle as innovators. The reason why women are perceived to be absent as innovators and entrepreneurs has mainly to do with the way innovation is evaluated; who is asking the question and of whom; whether women's innovations are acknowledged; the innumerable number of barriers they face to their participation; which sectors women have had access to and which are closed. It is a fact that in most places women's knowledge and contributions are not valued or validated.

For both men and women, access to capital, lack of business management skills and government policy/regulations are the three biggest challenges in the start-up phase of a business, while access to finance, availability of markets and lack of technical skills are the problems in the growth phase. Spatial mobility, choice of business and family support are the three main difficulties for women entrepreneurs during start-up. However, once they enter the

growth phase of the business, there arises yet another three-fold challenge for most women — acceptance of their authority, networking and trust building, and credibility with their employees, customers and suppliers.

Women in South Asia have a great balancing act to perform, what with the dual burden of taking care of their homes and families and working outside the home or running a business. For them, mobility, family, transportation, financing, limited opportunities for social interactive learning and their tendency to be more risk-averse are some of the significant stumbling-blocks to innovation. In business women face gender bias in recruitment, sexual harassment in the workplace, and income inequality, and then bump into the the glass ceiling as they advance in their career.

Women's role as innovators could be enhanced through appropriate training, flexible work arrangements, childcare facilities and parental leave, support from incubators set up specifically for technologies that aid women, social and business networks, improved public transportation, and through a process of enabling social, health and political conditions that favour women. Since agriculture is increasingly feminised in South Asia, we need laws that will strengthen women's rights to land and water. The focus must be on the development of agricultural tools and technologies designed for easy use by women, access to credit, information systems and value chains from which women are often excluded, increased access and support for participation in farmers' collectives and cooperatives which will improve their bargaining power and reduce transaction costs.

South Asian economies are characterised by inequities in development. Economic growth is propelled largely by dynamic urban centres even while 71 percent of the people live in rural areas, and about half the people in the region work in the agricultural sector, though with low productivity. More than three-quarters of the rural population of South Asia earns less than \$2/day. In order to address the growing development inequities in South Asia, agricultural productivity and non-agricultural employment need to be augmented in rural areas. Therefore, even though innovations in South Asia are required in both urban and rural settings, concentrating on those that yield benefits to rural areas will have the effect of bringing development where it is required. Since the majority of South Asian women live in the rural areas, innovation, if it is to yield effective and efficient results, must concentrate on these women.

South Asian nations need institutions of cooperation where they can have joint programmes. Existing institutions for partnership, such as the South Asian Association for Regional Cooperation (SAARC), are weak and need to be strengthened. International trade regulations which have been dominated by developed nations need changes that remove market protections and make the system fair to everyone. A level playing field must be created world-wide for access to knowledge resources over the Internet. This would lead to a transformative change that enhances every aspect of innovation.

There are a number of knowledge gaps in the interface between innovation and gender and women's rights. Research should develop a new set of indices to measure innovation and understand its role in development. Innovation needs to be redefined through the lens of context and gender. Studies should express the value of women's contributions so that they can enter the national accounts in terms of GDP. Research should support women's rights by funding the collection of national data on women's contributions to the national labour force, and support the analysis of this information and identify how it could be used to formulate policies that would enhance women's economic security.

National governments need to ensure that women are not discriminated against with regard to inheritance, land rights, wages and a host of other legislation. Existing laws must be audited for discrimination so that there is clear understanding of what must be changed and how, for gender mainstreaming, and we must identify areas in which agricultural tools and technologies need to be designed specifically for use by women.

There are plenty of innovative ideas across South Asia, but the need is for impact evaluations of select innovations that have a very positive effect on the lives of women. Research must be carried out in the methodology for successfully changing social perceptions about women as innovators. Research must also uncover the extent of gender differentials between men and women with regard to financing requirements, the use and extent of social capital, the impact of good public transportation and telecommunications access on innovation, and the role of the various components of innovation systems for men and women. Research relating to "What Works" for addressing gender challenges for innovation in different sectors is essential, along with a central resource that will carry such work and make it readily accessible. In this context, South-South and South-North innovation networks need to be promoted for research policies and practices that remove barriers to women becoming innovators.

Other priorities include support from key opinion leaders, research in national policies and organisational practices that support women as entrepreneurs and global debates on policies that have national relevance, in order to shape a broad framework to promote gender and innovation. Finally, it is important to create an organisation which will carry out research and plays a pivotal role by working with business and professionals in South Asia, for the purpose of building inclusive environments and expanding opportunities for women in the workplace.

1. Introduction and Context

In the late 1970s and 1980s, when development projects continued to fall far short of their goals even after decades of serious effort, donors, governments and others began to wonder what was going wrong. This led to the realisation at least in some quarters that the failure was mainly because women had been disempowered, marginalised or largely ignored in the way development policy and projects had been framed, executed and delivered. Since women in most societies take care of children, families, communities and local ecosystems, their powerlessness meant that women could not deliver. This understanding led to a new urgency to bring gender issues into mainstream development policies. Fighting for equity and rights, often viewed as if inherently misplaced and simply as a political agenda, rather than an argument for effective human development, is an ongoing struggle to include the part that has been left behind in our search to improve the world as a whole. The conversations that now take place in many development circles centre around effective ways of bringing gender into development, about sectors and places with success stories, if any, and what we can learn from them, whether we should be thinking of replicating the success in other areas, and if so, how.

Some other failures have also become apparent. For example, technology transfers tend not to succeed as expected. Most ideas and practices cannot be taught through training modules invented to deliver expertise in a few days, and successful local models are often not replicated as desired. After struggling — and failing — to address each of these challenges through the 1980s, the application of systems theory in development caught on. Seeing the interconnectedness, providing the right social, economic and political circumstances, recognising how the elements of a system are linked, and which ones can be tweaked for wider system-wide change became part of ongoing efforts. In this continuing search for the appropriate tools for development, innovation is gaining new respect. While the term innovation was exclusively in the lexicon of economists for decades, the language is now being applied to non-market activities and is garnering new appeal. Some critics would, however, argue that the “new” innovation model is simply another way to find products for the market. Be that as it may, in the early 21st century the market and business have become undeniable stakeholders in development processes. Besides, it appears that many social and technological innovations do indeed have the potential to transform economic, social and human development in various sectors such as education, health, Internet and communications technologies, agriculture, and microfinance.

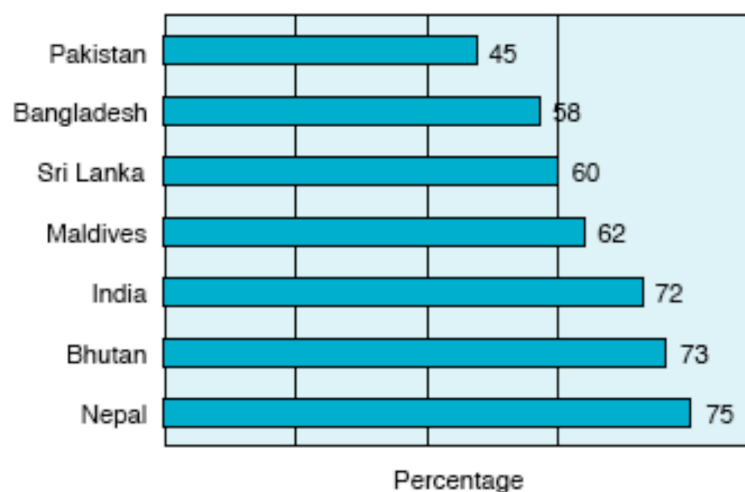
	Period	Inequality (Gini)		Headcount rate	
	Start-End Year	Start	End	Start	End
Bangladesh	91/92 – 2000	25.9	30.6	58.8	49.8
India	93/94 – 99/00	29	32	29.2	22.7
Nepal	95/96 – 03/04	34.2	41.4	41.8	30.9
Pakistan	01/02 – 04/05	28	30.1	34.4	29.2
Sri Lanka	90/91 – 2002	32	40	26.1	22.7

Note: Poverty lines are defined differently across countries; so poverty headcount ratios are not comparable across countries.

Table 1: Making Growth Inclusive, World Bank Report on South Asia (Devarajan and Shah 2007).

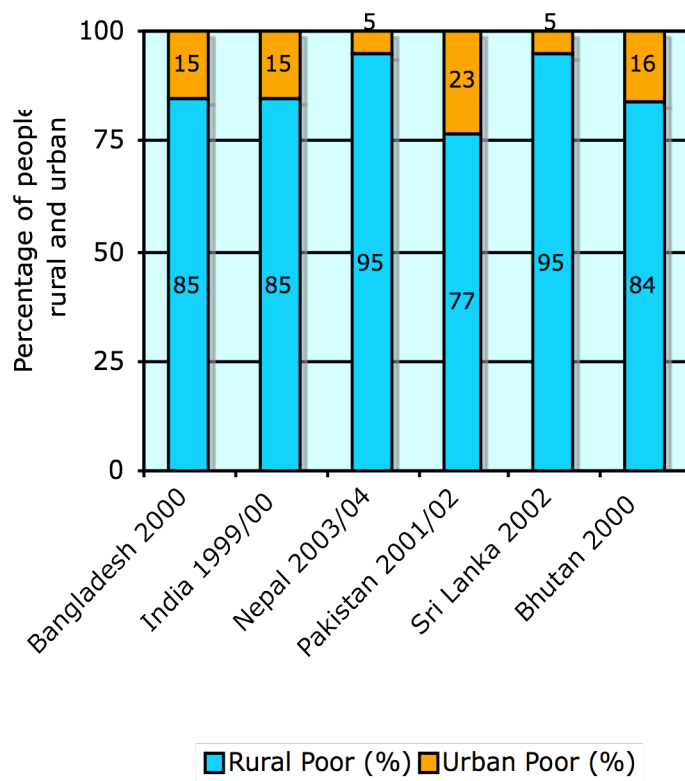
We know that many parts of the developing world, including South Asia, are rife with poverty, income disparities, rural–urban and regional imbalances in growth and development, and ecological degradation (Table 1). About 70 percent of the people and 75 percent of the poor live in rural areas in South Asia (Figure 2). Even if liberalisation has resulted in growth with high GDP and ensuing improvements in income for some, it has left large sections of rural areas and most of the people in South Asia, especially women, far behind. In order to bring about a harmonious and sustainable development with benefits accruing to all segments of society, the human potential of both women and men in rural and urban areas needs to be harnessed effectively. This calls for a process of deliberate and redistributive growth in which economic growth is combined with social policies and effective innovations, so that all people in South Asia benefit from development. Social policies are not something that can be carried out after a period of growth, but need to be done simultaneously with economic development. Such a “development for all” agenda requires that we not only take into consideration social and technological innovations at local, regional, national and even international levels, but also recognise that these are interconnected, so that capacity-building, resources and markets can be provided appropriately. It also requires that we emphasise the development of the rural areas, where productivity is low.

Figure 1: Percentage of Pregnant Women with Anaemia in South Asia (HDRSA 2000).



We also need to develop a problem-solving approach, rejecting beliefs when they do not work. For instance, recent results from Kenya and subsequently from Rwanda, Ethiopia and Zambia showed dramatic drops in the incidence of malaria in two years after the free distribution of mosquito nets and drugs by the

Figure 2: Where Are the Poor in South Asia? (World Bank, 2005).



Global Fund to Fight AIDS, Tuberculosis and Malaria (Anon 2008). Such findings teach us to be aware of the limits of market-based solutions for the very poor. We need to determine in each circumstance, the kind of response that would be most appropriate to address a particular development problem. There

appears to be no easy formula.

What is still doubtful is whether the profound economic and social changes that innovation seems to promise will involve men and women with participation by both and with benefits accruing to everyone. How do women and gender equality figure in the innovation landscape? Are women innovative in all the different sectors? How will they feature in the changing dynamic of the language (and tools) of innovation for development? Would women be innovative if conditions were more conducive to them, and what would such a climate look like? Instead of adopting a “just add women and stir” (Harding 1995) approach, can we develop a framework for research and action that will transform the institutions and systems of development? Can we ourselves, as development analysts, be innovative about women and innovation? This report looks for answers to some of these questions.

Table 2: Demographic Data for South Asia (World Bank, 2005).

SOUTH ASIA				
	1980	1990	1995	2004
Crude birth rate (per 1000 people)	36	32	27	25
Age at first marriage				
Male	..	..	..	..
Female	..	..	..	..
Total fertility rate (births per woman)	5.2	4.1	3.3	3.1
Adolescent fertility rate (births per 1000 women aged 15-29)	..	..	92	80
Women at risk of unintended pregnancy (% of married women aged 15-49)	..	..	16	..
Contraceptive prevalence (% of women aged 15-49)	..	45	..	46
Women 65+ as:				
% of total women	4	4.3	4.9	5.2
% of total population	1.9	2.1	2.4	2.6

Note: Data in italics refer to most recent data available within the two years of the year indicated

The main focus for many years has been on ways to absorb more women in the area of science in schools and colleges; on the discrimination women face as they move up the career ladder in science; and institutional policies that would give them the flexibility they desire in their careers. Although the flavour of the overall problem might change with the local context, the general challenges and the measures to be initiated are quite clear. That these are not being implemented is another matter. Of course the issues around women and science are not just about numbers, but the political and hegemonic construction of scientific inquiry that marginalises women. Living in the patricentric societies of South Asia, women are located in social and cultural spaces that give them limited freedom. Since much has been written about challenges relating to women in science and technology and Internet and communication technologies (ICTs), (Subrahmanyam 1998; Committee 2004; Gupta and Mashelkar 2007), this report avoids the beaten path to explore gender issues as they intersect with innovation in other areas.

	<i>Rural</i>	<i>Agricultural</i>	<i>Below US\$1/Day</i>	<i>Illiteracy, Male/Female</i>
Bangladesh	73	22	36	50/69
India	72	22	35	32/55
Nepal	87	41	38	38/74
Pakistan	66	23	13	–
Sri Lanka	76	19	8	29/51
World Average	51	4	–	20/27

Table 3: Various Proxy Indicators of Traditional Sector (Dahlman 2007).

Since the focus of this report will be South Asia, it is useful to examine the Human Development Indices (HDI) of the region. South Asia encompasses HDI rankings that range from Sri Lanka (93) to Nepal (138). The South Asian countries with HDI in between these values are: India (126), Bangladesh (137), Pakistan (134), and Bhutan (135) (<http://hdr.undp.org/>). Even in India, the South Asian giant, while the last decade has seen impressive GDP growth (9.0 percent during 2005-06 and 9.4 percent during 2006-07) the benefits have quite obviously not trickled down to most of the people. Infant mortality rate in India still remains very high at 55 deaths per thousand live births. In Pakistan it is 67.7, while Sri Lanka's is 11, and that of Bangladesh is 52.5.

Most of the population in South Asia, about two-thirds, is rural, and agriculture remains a large part of the economy (see Table 3), with its share in the GDP ranging from 19 to 41 percent. Overall, 48 percent of the population are employed in agriculture. Illiteracy levels are high and except for Sri Lanka, a significant portion of the population earns less than \$1/day. South Asia therefore needs a major push to improve literacy, increase school enrolment and keep children in school, especially girls, who drop out at a high rate.

Key Findings of the National Family Health Survey of India (2005- 2006)

- Women are disadvantaged absolutely and relative to men in terms of access to education, media exposure, and employment for cash.
- The majority of married women do not have the final say on the use of their own earnings or all other household decisions asked about.
- Traditional gender norms, particularly those concerning wife-beating, remain strongly entrenched (Source: NFHS-3 India 2005-06).

According to the 2005-06 National Family Health Survey (NFHS-3) of India, which was released in October 2007, the prevalence of anaemia and malnutrition is widespread and high among women and children. Indeed, as many as 46 percent of the children are under-weight, and nearly half the women in the country are illiterate. These depressing statistics provide the context within which any inquiry into gender and how it intersects with innovation must be embedded.

The Millennium Development Goals (MDGs) have galvanised the world into action over the past few years. As has often been said, even though the third MDG is the only one that directly mentions gender, women's rights and gender issues are both an overarching and a cross-cutting theme running through all of them. Thus, concentrating on the MDGs so that the countries in South Asia are on a clear path to accomplishing them, will certainly lead to advances in women's potential and create the capacity for innovation.

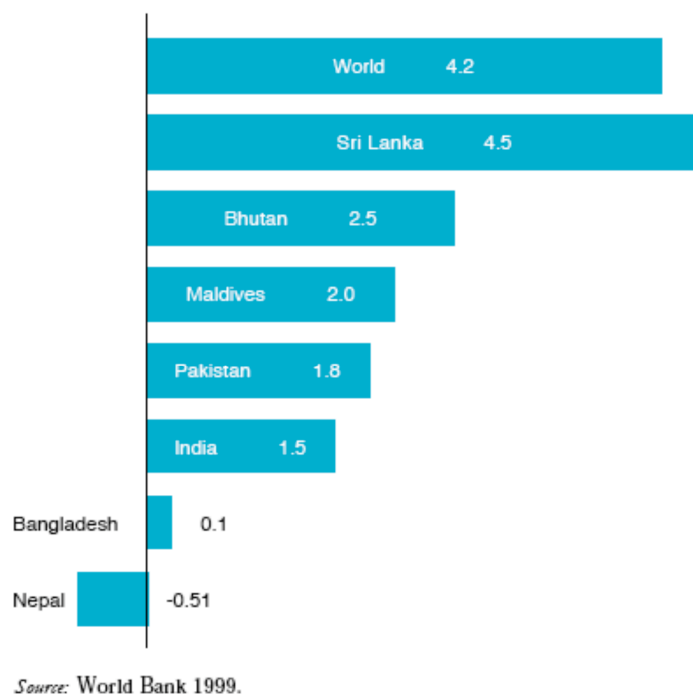


Figure 3: Gender Differences in Life Expectancy at Birth Female-Male (in years) in South Asia (World Bank 1999).

GENDER EQUITY INDEX AND SOUTH ASIA

The Gender Equity Index produced in Nov. 2007, by the World Economic Forum compares differences between men and women with regard to their salaries, access to education, political representation and health including life expectancy. India (114), Bangladesh (100), and Pakistan (126) hold some of the lowest positions in Asia. India, Pakistan and Bangladesh, perform very poorly in areas of education, health and economic well-being, but their overall scores are partially bolstered by relatively good performances on political empowerment. Relative to their own performances in 2006, Bangladesh and Pakistan register small increases in scores, while India's sex ratio at birth fell to 0.89 girls for every boy, causing its overall score to decrease.

Sri Lanka (15) is the only country from South Asia to be in the top 20 of the rankings. Sri Lanka showed improvements on the ratio of women and men's labour force participation rates as well as wage equality for similar work. On political empowerment (7), Sri Lanka continues to hold a privileged position, having been led by a female head of state for 21 of the last 50 years. It also continues to have the smallest gap on educational attainment (56) as compared to other countries in South Asia.

The Gender Equity Index also provides evidence for a strong correlation between GDP per capita and the gender gap scores. While this does not imply causality, the possible theoretical underpinnings of this link are quite simple. The index shows that the world (115 countries) has on average closed over 90% of the gender gap in education and in health. On the other hand, closing the gender gap in economic participation and opportunity is still a challenge with only a little over 50% of this gender gap being closed, and only 15% of the gap in political empowerment.

2. A Matter of Definition

The term innovation must mean different things to different people. In the 1930s Schumpeter included in his definition the introduction of a new good or method of production, the opening of a new market or source of supply of raw materials and the new organisation of an industry. Although this description is wide in scope, the term innovation has quite often been used to refer specifically to technological innovation. Concentrating on the first two aspects of Schumpeter's definition, the OECD refers to a technological innovation as the generation of a new *technological product or process* — TPP. With this view, based on the Oslo Manual, the OECD¹ aims to provide innovation benchmarks for its member countries.

Yet, an innovation need not be technological or even new. McDonald's new way of running a restaurant, for example, revolutionised the food service industry, but is not technological. An idea could be innovative when it is carried out in another country or in a different industry; thus it is a novelty in one place or sector, but not necessarily in another. For instance, novel methods that are used to provide health services through the Internet use existing technology but apply it to a different sector than the one the application was intended for. In general, the emphasis is on the value addition that takes place in the steps between the birth of an idea and the point when the output — a product or process — is successfully marketed to increase wealth or is disseminated to improve human welfare.

The dominant paradigm that defines an innovation needs to be understood in the context of the 20th-century industrial complex that characterises OECD countries. The value of an innovation has been defined in terms of its ability to provide a firm or a product a comparative advantage in global markets. Therefore when policies are developed to improve capacity for innovation, governments tend to focus on activities that have the greatest market penetration. The concept of innovation has thus been silently interwoven with export-based theory (Blake and Hanson 2005).

This view, however, is being challenged by researchers who believe that local economic development cannot be excluded from the general definition of an innovation simply because it serves a local market. In addition, people live in a place within a certain context — within the social cultural and geographical “space-holders” of that society. That is to say, what is valued in one location might not seem to be important in another. A flower treasured in one place might be a weed in another. Since in most societies women are located in social spaces that are different from men, gender differences become especially important when we think

¹ OECD: Organisation for Economic Co-operation and Development. The Oslo Manual is an international set of guidelines for the collection and use of data on innovation activities in industry.

“No matter which class or region Islamic women belong to, their situation is one of systemic subordination determined by specific patriarchal forces.” (Roomi 2007)

about opportunities for innovation and the value of their contribution.

Most South Asian societies are patriarchal and women’s position is in general subordinate to that of men. Women’s challenges, social location, opportunities and the economic opportunities available for innovation are therefore quite different from those of men in the same societies and also perhaps differently challenging from

those of women in other parts of the world. Thus an innovation needs to be defined contextually, rather than universally, by taking the local geography, gender and other local factors into consideration (Blake and Hanson, 2005). Scholars who work on rural innovations also point toward the importance of recognising innovation systems wherein the components of the system and their relationships are dependent on local context (Hall et al. 2005).

Although an entrepreneur is one who establishes or runs a business, the term “innovator” is often used also to describe an entrepreneur. We need to recognise, though, that an entrepreneur need not necessarily be innovative; a good entrepreneur, however, can certainly use her business for innovation.

What about when someone generates an idea to serve a social need? If the idea is tried and found feasible and when others replicate it, thereby disseminating it, this could be referred to as social innovation. A social innovation could lead to changes in the way we view a problem, the way people think about the broader issue involved and subsequently to changes in behaviour. Social innovations need not produce any product for the market, but could lead to an improvement in people’s lives. Microcredit, for example, is an innovative idea that is being applied in various parts of the world in differing contexts in response to particular problems related to raising capital. Along the way, it led to improvements in women’s lives and helped change the way people thought about women and entrepreneurship.

Some scholars like Raina, who works on rural innovation, do not recognise social and technological innovation as being located in distinct categories and believe that they go hand in hand. “Innovation is the generation, access to and utilisation of knowledge and the progressive economic and social changes that go with it,” she says.² Social, technological and institutional innovations have to go together if we want a social practice or a technology to bring about a lasting transformation (Raina 2006).

In the rest of this report, the term innovation generally encompasses this broad and inclusive understanding of the term.

² Interview with R Raina October 2007.

3. The Value of Innovation

Even though many ancient civilizations such as the Chinese, Roman and Indian societies were known for their numerous inventions and even had business ventures in those times, it would appear that the productive entrepreneur, for a variety of reasons, did not feel supported and encouraged till free-market economies were born. Economic growth as measured by GDP per capita grew 20-30 percent in 18th-century England and 200 percent in the 19th century. In the US, growth in the 20th century has been conservatively estimated to be 700 percent. Technical breakthroughs, incremental and radical innovations, basic research and active participation by relevant public institutions have all played an important role in producing a range of innovations that have led to prosperity and growth (Baumol 2004). The innovative capacity of a country, region or a place defines its economic fate and overall prosperity (Amin and Wilkinson 1999; Vaitheeswaran 2007).

Over the last few decades a number of innovative approaches to solving various weighty development problems have begun to dot the landscape. The potential of social and technological innovations to address a range of deeply embedded and seemingly intractable development challenges such as poverty alleviation, public health, sustainable transportation, energy services and education has led to excitement among various experts including funding agencies and research institutions. For example, innovation systems such as Product Development Partnerships and Advance Market Commitments have been launched to develop and distribute drugs and vaccines for various diseases (Gardner et al. 2007).

The Grameen model of microfinance, another excellent example, has been replicated in numerous countries including North America, Latin America and Africa (Yunus 1999). New non-linear models of innovation systems in agriculture in developing countries, including India, are beginning to demonstrate the importance of going beyond the traditional model consisting of technology transfers and information dissemination. The need for institutional changes to deal with the challenges is also being recognised (CRISP 2005).

"We discovered a new reason to focus on women borrowers...The more I got involved, the more I realised that credit given to women brought about changes faster than when given to men. Relatively speaking, hunger and poverty are more women's issues than male issues." (Yunus 1999)

Women's entrepreneurial activity in particular has been shown in some recent research to lead to substantial improvement in the well-being and development of communities, regions and even countries (Brush and Hisrich 2000; Dionco-Adetayo 2005). This is not surprising, considering that entrepreneurial activity results in wealth and

prosperity, and that women have been known to invest their income in their children, homes

and long-term gains for the family. If Muhammad Yunus found a reason to loan to women, instead of to men, for better development outcomes, the same or similar reasons would hold true for concentrating on entrepreneurial activity among women.

Some developing countries such as Brazil, India, South Africa and China are being referred to as Innovative Developing Countries, as they are viewed as being far ahead of the developing country pack in their innovative capacities (Morel et al. 2005; Gardner et al. 2007). The increase in the number of publications, patents and social innovations is a testament to the tremendous potential for change on the ground. Often the total number of patents filed in the US is used as a proxy for the innovative ability of a society. Instead, if one were to rank countries based on the number of US biopharmaceutical patents per capita per GDP the top fifteen countries would include India, China, Brazil and South Africa in addition

At its simplest, an innovation system can be described in terms of three elements: (1) all the organisations and individuals involved in generating, diffusing, adapting and using new knowledge; (2) the interactive learning that occurs when organisations engage in generation, diffusion, adaptation and new use of knowledge, and the way in which this leads to innovation (i.e., new products and processes); and (3) the institutions – rules, habits and conventions – that govern how these interactions and processes occur. (Hall et al. 2005)

to the OECD countries (Morel et al 2005). In the health arena, for example, public and private investments, the low cost of material and labour, and the availability of excellent local skills in these countries have led to changes that have the potential to bring about a sea change in this sector (Gardner et al. 2007). CK Prahalad in his now famous “Bottom of the Pyramid” thesis believes that hyperspecialised division of low and high skilled labour and a commitment to excellence form the cornerstone of success in some developing countries’ approach to solving health problems.

In order to address the challenges facing countries in South Asia, we need to make efforts to unleash the potential of innovations, evaluate new initiatives, provide support for the ones that show promise, and scale up and replicate, if it is appropriate, the successful innovations. With this model in mind, a number of efforts are being launched to provide a supportive climate for ideation, so that there can be a pipeline of ideas that one can experiment with and the successful innovations developed into programmes for broader application.

The Honey Bee Network (HBN), Rural Innovations Network (RIN), Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI), Bhartiya Yuva Shakti Trust (BYST) and Aavishkar are all examples of organisations in India that are now devoting their energies to activities that include identifying promising innovations, providing early support, serving as incubators and sometimes even providing additional marketing and investment assistance. The large number of innovations that these groups have identified are impressive and the best-known of such non-governmental programmes in India are HBN and

SRISTI. Their work encouraged the Indian Government to establish the Grassroots Innovation Augmentation Network (GIAN) and the National Innovations Foundation (NIF) — set up by the Department of Science and Technology (Dutz 2007). In addition, the Government has also set up the Traditional Knowledge Digital Library (TKDL), a database on traditional knowledge about the medicinal properties of plants.

Social and technological innovations have the potential to use local talent and skill and, fill development gaps. They can be modified or tailored to address very specific local needs (thus they may not always be replicable or even require replication). They can also have a transformative effect on the lives of the people in current and future generations. Microfinance has pulled families out of poverty in Bangladesh and in other parts of the world. The Jaipur leg has given hundreds the ability to walk again; placental manipulation by a *dai* can save the life of a newborn; and forest protection practices promoted by women provide food, fuel and fodder and transform the local environment and climate for generations.

Another good example of an innovation is a collection of techniques used by *dais* — woman who serve as midwives to pregnant women in many rural and even in urban areas in various parts of South Asia (Abdul Hafeel 2000; Pottu 2000). These women stimulate the placenta by various methods either with heat or manually and thereby revive a lifeless newborn. Such techniques are practised by *dais* while the umbilical cord is still connected. Similar methods are believed to be in use in various countries in South and East Asia including Burma, Pakistan and Bangladesh.

It is difficult to measure the full value of these social innovations except perhaps as improvements in the quality of life, health, food security and general well-being, and other such indicators that may not lead to an increase in the GDP, to a patent or to a marketable product. So, are these examples one-off instances or is it possible to derive from them certain principles for how an organisation can promote innovation at the rural level? Take the example of Technology Informatics Design Endeavour (TIDE), a civil society organisation based in Karnataka, India, which has successfully worked in the area of energy by providing dryers, smokeless *chulhas* and other energy services while partnering with local NGOs and Self Help Groups. TIDE's example is invaluable in demonstrating that the following principles are germane to the successful diffusion of a technology within a pro-poor programme. *First*, the need to recognise that one has to work with several actors/players with differing skill levels, knowledge inputs, learning capacities and interests and these players are all part of the innovation system that is developed. *Second*, technological, social and institutional innovations go together. One cannot view them in separate compartments since each aspect is an integral part of a successful innovation system. *Third*, for a successful system, learning must take place at different levels and on an ongoing basis. The NGO, for instance needs to work with partners with an open learning attitude, working through others at the local level when necessary and even playing by their rules if that will build trust. There

must be room for learning by doing, making corrections and adjustments while the programme evolves. *Fourth*, there must be enabling policy and the right institutional

“When women do something it is often referred to as traditional knowledge or practice, not necessarily as an innovation.” Anil Gupta

environment to make the system work. The players of the innovation system must express habits and practices that enable successful innovation (Raina 2006).

Based on these principles, quick technology fixes such as training programmes and technology transfers will not work for pro-poor innovation. Perhaps these above rules, or each of its aspects, are not equally important for successful innovation in every initiative or sector and might not apply equally to urban settings, but these broad principles provide an excellent framework to begin the study of diffusion of innovations in any context. They can also serve civil society organisations, governments and other agencies interested in innovations and their successful diffusion.

Activities	Government	Nongovernment	Private
Documenting and disseminating information	<ul style="list-style-type: none"> • National Innovation Foundation (NIF) • Department of Science and Technology (DST) • CSIR's Traditional Knowledge Digital Library (TKDL) • Ayurveda Yoga Naturopathy Unani Siddha and Homeopathy (AYUSH) • Grassroots Innovation Augmentation Network (GIAN) 	<ul style="list-style-type: none"> • Honey Bee Network (HBN) • Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI) • Foundation for Revitalization of Local Health Traditions (FRLHT) Community Biodiversity Registers (CBRs) • Kalpavriksh • Gene Campaign • Beej Bachao Andolan • Anthra 	<ul style="list-style-type: none"> • Publications <ul style="list-style-type: none"> ◦ Eenadu's Annadata ◦ Adike Patrike; Malayalam Panorama ◦ Baliraja ◦ Prakurthi
Resource conservation		<ul style="list-style-type: none"> • FRLHT CBRs • Beej Bachao Andolan 	
Value addition and experimentation	<ul style="list-style-type: none"> • DST's Technology Information, Forecasting, and Assessment Council (TIFAC) • CSIR • NIF • GIAN 	<ul style="list-style-type: none"> • SRISTI • Rural Innovation Network (RIN) • Magan Sangrahalaya • Centre for Innovation, Incubation and Entrepreneurship (CIIE) at IIM-Ahmadabad 	
Commercialization	<ul style="list-style-type: none"> • CSIR • NIF • GIAN 	<ul style="list-style-type: none"> • SRISTI • GIAN 	<ul style="list-style-type: none"> • Aavishkaar
Dissemination	<ul style="list-style-type: none"> • NIF 	<ul style="list-style-type: none"> • HBN and network collaborators • SRISTI • Centre of Science for Villages (CSV) 	
Finance	<ul style="list-style-type: none"> • DSIR Techno-entrepreneurs Promotion Program (TePP) • DST Science and Society Program 	<ul style="list-style-type: none"> • SRISTI • RIN • NIF • GIAN 	<ul style="list-style-type: none"> • Aavishkaar
Intellectual property rights protection programs and services	<ul style="list-style-type: none"> • NIF 	<ul style="list-style-type: none"> • SRISTI 	

Table 4: Grassroots Innovations: Activities and Actors (Source: Dutz 2007).

4. Are Women Missing from Innovation?

Women, as is often said in China, hold up half the sky,. Inside the home women's work generally involves cleaning, cooking, raising children and taking care of their husbands and families. Outside the home most women are in agriculture and in the informal sector, working as housekeepers, cleaners, small vendors and in other aspects of the informal economy. Women's work inside the home goes unacknowledged and is not accounted for in economic terms. And the same situation extends outside the home. Their innovations, their contributions and their work in general are not adequately acknowledged. This extends across various economic groups, and in both areas, rural and urban (Appleton et al. 1995).

According to the 2006 report by the Global Entrepreneurship Monitor (GEM), which was based on a study of more than 100,000 people in 40 countries, including India in South Asia, there is a gender gap for entrepreneurship across the globe. For the purpose of this study, GEM divided countries into two groups — low/middle and high-income — based on the GDP per capita and examined their businesses after separating them into early stage or established depending on their relative age. The GEM study found that entrepreneurial activity, irrespective of gender, is higher in low/middle income countries. But across both country groups it is clear that there is a significant gender gap for both early stage and established businesses. In all countries reviewed, men tend to be more active in starting a business compared with women, the Philippines alone being an exception. Low/middle-income countries also have the highest prevalence rates of early-stage entrepreneurial activity among women and high-income countries the lowest. But this gender gap widens from 27 to 45 percent in the case of established businesses (Harding and Bosma 2006).

“Forget China, India and the Internet: Economic growth is driven by women.” (The Economist, April 2006)

We learn from the GEM study that, on the whole, women entrepreneurs are to be found in every country, in every circumstance and are thus important for the economic activity and prosperity of any nation. Women are not missing at least in those

countries that were studied in the 2006 report although there is a significant gap in the overall entrepreneurial involvement of women and men and this is more pronounced in high-income countries and in more technology-intensive sectors. Nevertheless, we do know that things are getting better since the increase in female employment in the rich world in the last two decades has been responsible for much of the growth in these countries. In fact, women entering the workforce have contributed more to global GDP growth than new technology or even the growing giants — India and China (Anon 2006). If one adds to this the value of housework and child-rearing, then women have contributed to more than half of the world's productivity and growth.

Even though we know that some women do run small businesses from home, if a person’s opportunity to be innovative needs a boost they should first and foremost be able to leave their homes — that is, they must have mobility and opportunities to do the kind of work they choose. In other words, if we want to find ways to get women to spread their wings, they should first have a chance to learn to fly. Thus it is important to also consider the general presence of women in the labour market when one discusses their innovative abilities.

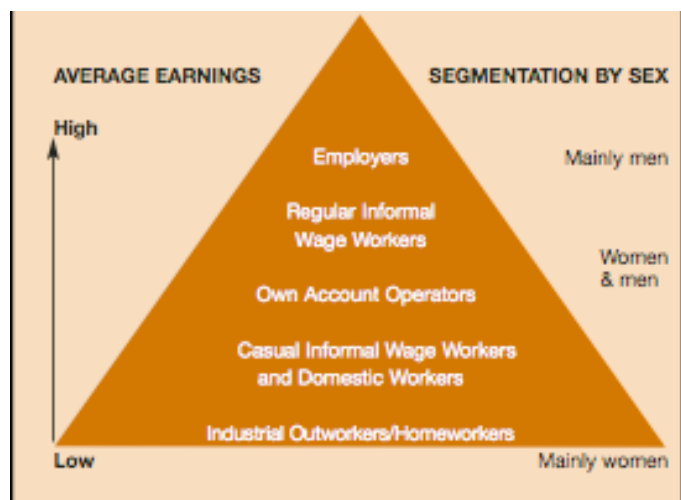
“Promoting decent work as a fundamental instrument in the global quest for gender equality will go a long way in raising incomes and opportunities for women and lifting families out of poverty.” Juan Somavia, Director-General, ILO.

In developing nations, the informal economy provides up to 80 percent of total non-agricultural employment. According to a recent World Bank Report, the informal economy in India employs 90 percent of the workforce. There are more women than men in the

informal sector; over 60 percent of working women are in the informal, non-agricultural sector (Chen et al. 2005). According to International Labour Organisation (ILO) Director-General, Juan Somavia, despite some progress, too many women are still stuck in the lowest-paying jobs, in the informal economy. There is a high-level of insecurity, little legal protection and certainly no social protection for such women. Women carry out the more precarious and low-wage jobs within the informal sector (see Figure 4) and unless their rights can be protected and efforts made to improve their condition, the world cannot achieve gender equality or eliminate poverty.

Men and women also do not earn equal pay for the same work. Economists at the International Monetary Fund have calculated that the gender disparity is expensive and costs the world billions of dollars each year. When women’s economic and social status improves, economic growth is high and when women do not have education and access to good healthcare, economic growth suffers. Thus there is a strong correlation between the two (Mees 2007).

Figure 4. Segmentation of Informal Employment by Average Earnings and Sex. (Chen et al. 2005).



THE INFORMAL ECONOMY

“Picture any Indian city or town you know well. Except in its modern commercial and residential areas, the sidewalks are lined by barbers, cobblers, waste recyclers and vendors of vegetables, fruit, meat, fish, snack-foods and a myriad of non-perishable items ranging from locks and keys, soaps and detergents, to clothing. Head-loaders, cart pullers, bicycle peddlers, rickshaw pullers, camel, bullock and horse cart drivers and auto rickshaw drivers jostle to make their way along the streets through the maze of cars, trucks, vans, buses, scooters and motorcycles. On the street corners, even in some residential areas, there are countless small kiosks or stalls that sell goods of every conceivable kind.

Down the crowded lanes are small workshops that repair bicycles and motorcycles; recycle scrap metal; make furniture and metal parts; tan leather and stitch shoes; weave, dye, and print cloth; polish diamonds and other gems; make and embroider garments; sort and sell cloth, paper, and metal waste; and more. The least visible informal workers, the majority of them women, produce or sell goods from their homes: garment makers, embroiderers, incense stick rollers, cigarette rollers, paper bag makers, kite makers, hair band makers, food processors, and others.

This picture can be invoked for most cities and towns in India and across the developing world. But such workers are not confined to developing countries. New York city has its share of pushcart vendors, street vendors, street-side performers and artisans, horse cart drivers, sweat-shop workers, industrial outworkers, and more. Indeed, industrial home-workers are to be found around the world, including garment workers in Toronto, embroiderers on the island of Madeira, shoemakers in Madrid, and assemblers of electronic parts in Leeds.”

Rethinking the Informal Economy by Martha Chen, Seminar, 2003.

There is insufficient valuation of women’s contribution to innovation and entrepreneurship leading to little support for their actions. Women’s special needs are often not taken care of. They typically need flexibility to raise children, manage their homes, and careers and contribute to society. Women have had to be creative about how they manage their various responsibilities. That despite being unacknowledged and unsung they manage multiple demands constantly, even as they deal with the pressures of patriarchy, is indeed most admirable.

In South Asian societies, women often find themselves unable even to get out of their homes [see Section 5]. They have little time left after their primary responsibilities at home are addressed. But whenever they have come out of the home, they have found creative ways to stay out. For instance, when faced with opposition for sending their girls to school, women have often found ingenious ways to get around the opposition.

There is a general acceptance that women are important in the *spreading* or *marketing* of a technology; interestingly, this is often perceived or described as if it were inferior to the

generation of the technological innovation. But as discussed earlier, diffusion of a technology is an integral part of innovation systems. Besides, as the TIDE example teaches us, even with limited resources and education, rural women can be quite innovative.

“My work led me to understand the importance of innovation, which is the process of converting an idea into a product in the economy. It is amusing therefore that technology generators consider themselves a breed superior to the technology disseminators.” (Reddy 2002)

Women can and have played important roles in innovation systems. They are quick at grasping the social and sustainability aspects that are part and parcel of a successful technological innovation³. One sees these skills in the ways in which TIDE’S stove-builders have modified and sold the smokeless

Sarala stove to various villagers, often changing them as each user required. They have accomplished this by making alterations in aspects of the stove design and materials, drawing artwork on the stove and kitchen, even building chimneys with discarded electrical poles and making other aesthetic changes to the stove as desired by the users⁴. Women recognise, as smart innovators, that simply selling a technology such as a stove or a fish-dryer, for example, will not work. The innovation system must be modified to address the local user’s needs. Women thus enable institutional innovation, which determines how successful a technology finally becomes (Prabha and Bhogle 2005; Raina 2006).

Take the example of Madhavi Kuckreja, an Ashoka Fellow, who has brought about a social and political transformation through technical training of women and what appears to be an intuitive appreciation of how to engage with an innovation system for change. She works in rural Uttar Pradesh in an area dominated by caste politics, and addresses women’s rights as they relate to female foeticide and domestic violence. She trained Dalit women to repair and install handpumps and they “went on to train 800 other mechanics, mostly men from higher castes, who resisted at first, but in the end accepted these women as teachers. The program resulted in a shift in policy and instead of state governments, today the local panchayat is the controlling authority for water and other issues” (<http://www.ashoka.org/>).

There are numerous examples of women who have been forced to innovate due to their dire circumstances. Women in many poor communities have a close relationship with natural resources and also rely on them for their survival, but government policies do not acknowledge the value of these relationships and the contributions they make to the well-being of their communities and the ecosystems. There are also stories of how women cope with state-coercion. Women’s knowledge systems need to be valued so that their work, innovations and contributions receive support (*Dance with Hands Held Tight* by K Bose). The fisherwomen in coastal Karnataka struggle against large foreign boats that deplete their

³ Interview with R Raina October 2007.

⁴ Interview with S Bhogle and R Prabha September 2007.

catch. The Apatani women of Ziro, in the North-eastern state of Arunachal Pradesh carry out a unique fish-paddy agriculture and grow numerous varieties of rice paddy, but the future of this kind of farming is bleak. The adivasi (indigenous people) and dalit (lower caste) women of Kashipur, in the Indian state of Orissa protect the forest and raise an income from forest products. They were forced to take their fight against the forest department to the state court, and, sure enough, they finally won (Bose 2005).

Technological changes can lead to the exclusion of women from areas in which they have been making a contribution. The Green Revolution, for instance, marginalised women and placed the technology as a package in the hands of men. Women, who had played a key role in agriculture, were thus gradually excluded from agriculture (Shiva and Dankelman 1992). But women have always been important in the post-harvest stages of agriculture. They contribute in a vital manner to food security through horticulture, sericulture, fisheries, seed saving, drying, storing, packaging and processing of harvested products. Women form the backbone of agriculture in India, comprising the majority of agricultural labourers and women farmers have also been increasing because of migration of men to cities, rural poverty and farmers' suicides in some parts of rural India. Agriculture is thus becoming increasingly feminised. According to the ILO, the agricultural sector also provides employment to most of the people in South Asia and this is quite unlike the global scenario where the service sector overtook agriculture for the first time in 2007.

According to the ILO's global employment trends of 2007, South Asia's economies are unique because they are less integrated into global markets and they remain strongly dependent on agriculture, which accounts for more than half the total employment of the region. Given the fact that the labour force in South Asia is increasing and most rural women work in the agricultural sector, this sector should be given high priority in policy and planning with regard to employment, poverty alleviation and women.

Many women also start small ventures that involve handicraft, cosmetics, prepared spices or other activities in sectors that are relatively open to women. Women have thus featured extensively in the various sectors to which they have had access, in which they have training, or when they gain entry into a field through problem-solving. While problem-solving by itself is not an innovation, it can result in the development of ideas that evolve into innovations.

Studies suggest that women thrive collaboratively and since a lot of business relies on networks, if women are present in large enough numbers, they are likely to do well over time. The responsibilities for a position within an organisation will remain the same whether a man or a woman fills it, but how many women there are in the organisation and what positions they occupy are key considerations in determining the impact and influence that women

wield in the group.⁵ While men and women may have similar motivations with regard to changing the status quo, a woman has to do a fine balancing act between her family and her career. The superwoman as a stereotype is alive and well. How far can she push the envelope given her time and family constraints?

Dissent and the freedom to express it are essential for healthy innovation in an organisation. Women in South Asia are generally taught to be accommodative and “to manage” somehow. There is no longitudinal study on women entrepreneurs in India, so we do not know how many give up mid-way. Yet in the face of all these hurdles, there are some outstanding examples of successful women entrepreneurs such as: Ekta Kapur (Balaji Telefilms), Viloo Patell (Avesthagen) and Vinita Jain (Biotique). Some organisations such as ICICI have specifically adopted policies that are supportive of women and encourage them to grow within the organisation; consequently they have large numbers of women at senior levels (Elliott 2006).

The reasons for women not being noticed as innovators and entrepreneurs include:

- **The way innovation is evaluated;**
- **Who is asking the question and of whom;**
- **Whether women’s innovations are acknowledged;**
- **The stumbling-blocks on the path of women innovators;**
- **Which sectors women have had access to and which are closed; and**
- **The fact that in most places women’s knowledge and contributions are not valued or validated.**

⁵ Interview with R Chadha August 2007

5. The Rules of the Game for Women

Economists have long argued that one of the main determinants of entrepreneurial behaviour by a society is the prevailing rules of the game (Baumol 1990). We could say, therefore, that if the rules favour a particular group, impose social disgrace on the other and place impediments in their way, then, other things being equal, the group that is favoured will engage in enterprise and the other will be dissuaded. Given that women in South Asian societies have to overcome huge obstacles before they even step out of their homes, and that the system is favourable to men, obviously the men must have it relatively easy, and there are bound to be fewer women entrepreneurs as compared to men.

Establishing a business can be a formidable challenge for both men and women, but some researchers believe that women face specific problems different from those faced by their male counterparts. An important observation is that women who face social constraints tend to choose businesses that are “low-tech”, locally focussed and are unscaleable. Other women who are in growth-oriented industries suffer from lack of access to (and control over) capital, land, business premises, information and technology, production inputs, appropriate child care, qualifications and/or experience, and notably, appropriate training facilities and assistance from business development agencies (Roomi 2007).

With regard to gender-neutral challenges, access to capital, lack of business management skills and government policy/regulations are the three biggest challenges faced in the start-up phase of business while access to finance, availability of markets, and lack of technical skills are the biggest challenges faced in the growth phase of the business (Roomi 2006).

As entrepreneurs, women have to grapple from time to time with a large number of challenges that may arise either in the early phase as they set up the business or later as they develop it. Table 5 lists the challenges as described by women entrepreneurs in the start-up and growth-phases in a study conducted in Pakistan (Roomi 2006). These have been divided into gender-neutral and gender-related categories, but it appears that even in the case of problems that are gender-neutral, women’s challenges appear to get intensified by their gender. *Purdah*⁶ and *Izzat*⁷ are big hindrances to women in Muslim societies. Even though

⁶ *Purdah*, meaning veil or curtain, symbolises the practice of secluding women and enforcing high standards of female modesty in South Asian societies. There are two instruments of *Purdah*: first is the system of female seclusion (amounting to exclusion) and sex-segregation, defining different spatial boundaries for the activities of men and women; the second is the veil, or the concealing cloak known as the ‘*burqa*’, worn by women whenever they venture outside the home. It is meant by to act as a portable means of seclusion.

this particular study was conducted in Pakistan, a largely Muslim society, it would be reasonably accurate to extend these findings to South Asia as a whole, except that the problem is likely to be more severe in communities which conform to *pardah* and *izzat*.

TABLE 5: Challenges Before Women Entrepreneurs

Gender-Neutral Challenges	Gender-Related Challenges
<ul style="list-style-type: none"> • Access to Capital/Finance • Lack of Business Management Skills • Government Policy/Regulations • Registration • Utility Connections • Tax Harassment • Lack of Technical Skills • Purchase of Raw Material • Availability of Market • Access to Information Technology 	<ul style="list-style-type: none"> • Spatial Mobility • Choice of Business • Support of Family • Networking and Trust-building • Acceptance of Women's Authority • Credibility (Employees, Customers, and Suppliers) • Fear of Failure • Time Distribution (between Family and Business)

“Women Entrepreneurs in Pakistan: Profile, Challenges and Practical Recommendations” by MA Roomi.

Women prefer not to approach banks for loans because they do not have collateral and are frequently turned down. They then end up relying on family members for funds, which are often limited, compared with lending agencies (Roomi 2006). Even though these are gender-neutral issues, when a woman has to stay out late or go to unfamiliar places, any delays or frustrations further intensify the problems she deals with as a woman.

With regard to gender-related challenges: spatial mobility, choice of business, and family support are the three biggest challenges faced by women entrepreneurs in Pakistan in the start-up phase. However, once they are in the growth phase of the business, acceptance of a woman's authority, networking and trust building, and credibility with employees, customers and suppliers are the three biggest challenges they face (Roomi 2006).

The issue of *mobility* came up repeatedly in interviews and is probably the biggest obstacle women face to be an innovator and/or set up a business. Mobility might quite simply be related to problems in getting out of the house. Women in South Asian societies are generally discouraged from being independent and moving freely with other men. Thus the family, social and cultural factors including *pardah* in Islamic societies keep them within the confines of the house.

⁷ Women are considered to be the custodians of a family's *izzat*, i.e., honour.

Once a woman wants to or can leave home, at least for some time, she has also to be prepared to face problems which elate to mobility, that is, the lack of good public or private **transportation**. Since housework, taking care of the family and agricultural work tend to be the main priorities in the lives of many South Asian women, they have limited time for other activities. Thus anything that helps her accomplish her business-related activities efficiently would help her, and transportation does continue to be a serious challenge for rural and urban women in most of South Asia. If transportation facilities were reliable and easily available, much more might be accomplished in the short time that is available to women for work outside the home. This would then allow her to fulfil her main responsibilities and also take care of business.⁸

WOMEN work 2/3 of the world's working hours, produce 1/2 of the world's food, and earn 10% of the world's income. Oxfam America

Most women entrepreneurs will state that they received support from their **families**. A study in Pakistan found that 70 percent of women entrepreneurs have a husband and/or father who is in business and these men supported the women in their business. Evidently, the family is the overarching factor governing a woman's world; thus women can only give their "extra" time to business. We therefore find that the family could be a hurdle or a support depending on the circumstances. Either way, the family plays an important role in a woman's life and this has implications if she is an innovator/entrepreneur, especially in South Asia. The family and the dual burden that women carry figured in almost every interview conducted by the author. The primacy of family in a woman's life is perceived as being part of tradition and will probably be one of the toughest challenges to address. This challenge is still being negotiated in the West and is far from resolved.

Innovation and entrepreneurship also require building, nurturing and taking advantage of a **social network** that one can turn to for all kinds of assistance including investments, partnerships, exchanging information, and seeking advice (Maxfield 2005). Extensive work from Sri Lanka indicates that the ability to be able to mobilise resources in a resource-poor environment for a new venture is no doubt of critical importance, but what is paramount is the ability to extract value from one's social networks (Kodithuwakku and Rosa 2002). Although this research did not concentrate on women but on entrepreneurship in general, it recognised in no uncertain terms the importance of social capital in providing a distinct advantage.

⁸ In urban areas, the response to the transportation problem by a number of large businesses has been to provide private buses for use only by their employees. While this might indeed alleviate immediate problems, over time it simply increases the number of exclusive vehicles meant for a select group of people in big business. Most others continue to suffer and the private buses further add to public congestion and slowing of public transportation on the roads.

Other research on social capital also suggests that it is a strong determinant of entrepreneurial success (Davidsson and Honig 2003; Chrisman et al. 2005). Being part of formal and informal networks is paramount to business success. Therefore for women, who in general are excluded from such networks, the hurdles they face and their chance of success are diminished by poor social capital. A number of studies regard the limited range and diversity of women's networks as a serious limitation to women setting up and making headway in a business (Cooper et al. 1995). Women primarily rely on their immediate family and friends, but their networks usually do not extend much beyond that. A woman needs "a space of her own," said one person the author interviewed.⁹ This is related to what other researchers have found; a space, a community room, or a network — basically an area or a group of people who will support her and her venture.

Given the challenge of limited social networks and time, women have little scope for *interactive learning*.¹⁰ Such learning is an important element of innovation systems and without the time, opportunity and social interface to participate and benefit from such learning, women would find it harder to be innovative or enterprising.

Some studies in Vietnam suggest that when women are unable to rely on government institutions because they are weak, they depend on an informal network of government contractors to get their projects approved (Scheela and Hoa 2004). Others suggest that the nature of women's networks is the challenge. They tend to be more geographically focussed than the networks that men rely on (Minniti et al. 2005). It is important to research this area further to learn the nature of women's networks and how women use them, since this will influence the solutions one seeks to enhance them.

Financing their business and entrepreneurial ventures is no small challenge for women. This particular obstacle has been discussed in a number of papers, but almost all of them examine data and carry out research in Europe or North America. In general, women have lower start-up capital than men. The reasons are believed to be related to the fact that they have a smaller amount of equity capital, and therefore often start business in sectors in which they require less money, and they are likely to be more risk-averse than men (Verheul and Thurik 2001). Despite the fact that women-owned businesses are proliferating, women use less commercial credit (Klein 2005). While men made more use of equity and credit, a study by the Center for Women's Business Research in Washington, D.C showed that 20 percent of female business owners used commercial credit in 1996 and by 2003, that figure rose to 34 percent. According to Rebecca Macieira-Kaufmann, Executive Vice-president of the small business segment at Wells Fargo (WFC), which underwrote the study, there has been a 50-percent growth in the number of women getting loans in nine years, but a lot of the businesses are still in start-up mode and either do not require funds or need only small amounts. She

⁹ Interview with A Kapur August 2007

¹⁰ Interview with R Raina October 2007

“Gender bias in recruitment, gender inequality and sexual harassment at (the) work place are the major issues affecting women as is evident from the study which quoted that 25 per cent women faced gender bias on jobs.”
Anu Aga, CEO, Thermax Limited & Chair, Confederation of Indian Industries National Committee on Women Empowerment.

believes that it is only a matter of time before women gain more experience in raising capital for their business through credit and equity financing.

There are studies that suggest that certain cultures are more *risk-averse* than others and women in general are more risk-averse than men (Kolvereid et al. 1993). Individualistic cultures supposedly provide a better climate

for innovation as opposed to collectivist cultures and those that tolerate uncertainty or are less risk-averse are more innovative than those that are more risk-averse. When national cultures are more accepting of risk, women appear to take risks at the same rate as men do (Mueller and Thomas 2001; Maxfield 2005). Most of these studies are of course based outside South Asia and, in any case, there are few studies that look at cultural factors and how they influence innovation. However, it makes sense that being risk-averse would be a handicap for business in South Asia as well, since innovators everywhere learn from failure and accept risk and possible reward as being an integral part of their efforts.

Glass Ceiling

According to Catalyst¹¹, a women’s management research and advisory group, women occupied 16.5 percent of corporate officers in Fortune 500 companies and 14.7 percent of Fortune 500 corporate boards in 2005. In contrast, in the business world in India, according to a Confederation of Indian Industry study, women managers are generally missing at the strategic management levels of organisations and form just 4 percent of middle and senior levels. Women are generally restricted to the human resources and market research departments, but some of them hold senior positions in family-owned companies even though their numbers are small. The public sector does have more women in comparison with the private sector (Chadha and Chadha 2007).¹²

Poonam Barua, convener of Forum for Women in Leadership in Bangalore, believes that Indian companies are presently only testing the waters to see if senior women executives are able to perform to the companies’ needs. They have no real commitment, she feels, to bringing women into the mainstream of top-management positions (Murali 2007). People in corporate circles are hiring people in their own likeness. In other words, they are perpetuating the stereotype, which must make way for a completely different way of approaching the issue. There are plenty of talented women; it is the attitude of corporate boards that warrants change.

¹¹ <http://www.catalystwomen.org/>

¹² Interview with R Chadha August 2007.

Organisations lose out when they have fewer women. Data from Catalyst shows that the return on equity, on invested capital and on sales is 42- 66 percent higher in organisations with more women on their board as compared with those with the least. Obviously, having more women as decision-makers makes not just for better equity returns, but makes smart business practice. Studies in governance, management and marketing suggest that women make decisions differently from men. One might conclude then, even if merely in the interest of having a large pool of diverse ideas, that opting for gender diversity at the highest levels of an organisation would greatly contribute to the success of the enterprise.

Source: www.womendeliver.org
The Lancet, Vol. 370 October 13, 2007



GARMENT INDUSTRY IN INDIA

The example of the garment export sector in India helps us understand the gendered nature of labour markets and the barriers to women's entry in paid jobs as workers. Sex segregated workforce data across several countries show that women dominate in the ready-made garment sector workforce. However, this is not the case in India where garment manufacturing is still dominated by male workers. If we examine the reasons for this (besides the generally low workforce participation rates for women in India), the answer can be found in the production relations in this sector. In India, most ready-made garments are still produced not in organised factories but in unorganised workshops – the *karkhanas*. The workshops, particularly in north India, are operated by groups of migrant workers who normally come from the same villages, migrate without families and work long shifts during the peak season. The workshops where they work during the day double as hostels after work hours. This type of work arrangement where the boundaries between work (a part of the public realm) and leisure (the private space) are blurred, quite successfully excludes women workers' participation in employment. This is even more so if the women are first-generation industrial workers from regions such as Uttar Pradesh and Bihar with especially entrenched patriarchies. Clearly, how production is organised also contributes to the segmentation of the labour market along gender lines.

Another example from the sector relates to a different kind of barrier. This refers to occupational segregation, of both the horizontal and the vertical varieties, which relates to men and women in different types of jobs and the concentration of women workers in low-wage processes. Cutting is the highest paid skill category in garment production, but there are very few women cutters in the Indian garment export industry. The reason often mentioned for excluding women from cutting is that they cannot translate the abstract designs and cut as required. However, if we observe the garment sector more carefully, we shall see that a large number of garments are cut by women and they manage to do this quite well. Interestingly, in the non-export garment sector, there are women cutting masters though they are confined to a few specific garments. In Ahmedabad, for instance, women are employed for cutting and stitching shorts, the wage for which is calculated by the dozens of pieces prepared. No women are employed for trouser-cutting jobs even though one may regard trousers as extended shorts. Besides, trouser-cutting wage is by the piece and the rate is much higher than in shorts-cutting. Only men do trouser-cutting and stitching.

Women therefore seem to be kept out of high-paying jobs through various ways and there are all kinds of reasons that are invented to maintain the status quo. One way to respond to occupational segregation and help women break the entry barrier is by ensuring women's entry into the design schools and by training them in specific jobs from which they are excluded for reasons of gender-based discrimination. One could learn from the very successful Mahila Samakhya Programmes where rural women were trained as hand-pump mechanics and even to ride bicycles, thus breaking gender barriers.

Based on a conversation with Navsharan Singh, IDRC, New Delhi, August 2007.

6. Recommendations to Enhance the Role of Women as Innovators

It seems obvious now that women are innovative, are wage earners and are entrepreneurs. In addition, they take care of their homes, partners and children. What is more, they do all of this in spite of the huge challenges they face in their communities and their day-to-day lives. What are the kinds of activities that may be carried out to enhance or support the role of women as innovators/entrepreneurs?

Training

Research in various countries in the world suggests that there are numerous gender differences among business owners at various levels: personal (being taken seriously, or lack of respect, readiness of men to do business with women), individual (motivation to business ownership, owners' occupational background, time management, planning and delegation, etc.), and institutional (access to advisory and training services, programme eligibility criteria, and terms of lending, etc.) (Brush and Hisrich 2000; Young 2000; Carter and Anderson 2001; Brown et al. 2002; Orser and Riding 2003).

Women are frequently absent from certain sectors unless they receive special training. Thus training women to be bicycle repairers, cutters in the garment export industry or as mechanics, for example, may allow them to enter into sectors from which they are traditionally excluded. Some scholars emphasise the important role of women-only training in the growth and development of women's careers and in generating women leaders (Singh and Vinnicombe 2003). Other researchers, however, believe that women-only training reinforces gender stereotypes and are not beneficial (Orser and Riding 2003).

A study in Pakistan was specially designed to provide women-only training to those interested in starting a business. The observations suggest that such training provides a less threatening climate in which women build their confidence. It offers them the skills they need, gives them a chance to learn about challenges faced by others and to evaluate their own abilities in that context. The results indicate that indigenously developed training that is conducted specifically to address a local need can be very helpful; in this particular case it was in the context of an Islamic society in South Asia (Roomi 2007).

Further research is needed in different contexts in order to prove that training can indeed fill a void. The focus then should be: what kind of indigenous training will work and which areas can benefit through training and which ones might not be suitable for training? Research also suggests that technical training and management experience are important in enhancing women's performance in business. These are valuable inputs, which should be augmented with appropriate support by business development agencies, including venture investors.

Flexible Work Arrangements, Childcare Facilities and Parental Leave

According to the OECD, part-time work plays an important role in determining female employment. Given the limited time that women have for work, flexible work schedules would relax the demand constraint they face and provide an incentive to be gainfully employed. Part-time work and flexible start-times are ways by which women's participation can stimulate the economy as women can continue to be employed while caring for family. However, it has been argued that the availability of flexible work arrangements provides a strong incentive for women to become wage-employed and may therefore negatively affect female entrepreneurship. The pressure on women to start their own business in order to combine work and family responsibilities is lowered.

Kovalainen et al. (2002) find a positive relationship between the percentage of women working part-time and female business start-up activity. Flexible work arrangements are important for all entrepreneurship as it enables business owners to adequately adapt their workforce to market circumstances. But in a peculiar twist, it may negatively affect female entrepreneurship if the part-time work arrangements in wage-employment sufficiently satisfy women's needs and also allow them to combine their various responsibilities. Nevertheless, if the goal is to move towards both men and women being responsible for housework and children, then flexible work opportunities should be created for both men and women to make it possible for both sexes to work outside the home. In fact many companies such as Volkswagen, Google, and Mercy Health System are experimenting with flexible work arrangements and plenty of free time for employees, with the intention of stimulating creativity and innovation.

Since women are still responsible for most of the child-rearing activities, the availability and price of child-care facilities influence women's employment. When quality childcare is unavailable or costly, more women are likely to discontinue employment or refrain from re-entering the labor market when they become mothers. An increase in the supply of publicly provided daycare facilities may lead to higher employment continuity of women.

Governments can stimulate participation of the female labour force through the distribution of subsidies for child-care as well as by providing for parental leave. It has been argued that when countries have parental leave schemes that are not generous, more working mothers give up their jobs (Gustafsson and Jacobsson 1985). In general, the availability of child-care facilities and parental leave schemes is more likely to influence female than male entrepreneurship positively, as child-rearing activities are a gender-specific constraint for working women. Research suggests that although self-employment offers women more flexible work schedules, enabling the combination of work and family activities, child-care facilities and parental leave are important, as self-employment is usually accompanied by more working hours than wage-employment. However, parental leave schemes generally are available to wage-employed people and not to those who are self-employed.

Incubating Ideas with Emphasis on Women and Their Needs

There is need for setting up regional and country-level incubators that will support innovative ideas that improve the lives of women. A network of such organisations would do two things: support women who are innovators and also support the development of tools and technologies that are specifically meant for women in the kitchen, in the fields, in the markets and in their personal and everyday lives both in rural and urban areas. For instance, such an organisation could support ideas for agricultural tools that women could operate easily and which reduce their hardship, bicycles that can be used by women to carry water long distances, better cook stoves, indoor lighting, access to price information, access to affordable health services, etc.

Business Networks for Women

Social capital — the people one knows, the information they provide, the contacts they have and the advice or funds they are willing to provide — is of vital importance in setting up a business. Women have been found to have smaller social networks as compared to men and are therefore not able to extract value from their social capital in the same way. [Details regarding social capital and women have already been addressed in section 5 on The Rules of the Game for Women.]

It would therefore seem that setting up business networks that women can turn to for advice, information, mentoring, even funds and specific training as and when required would be very useful to their business ventures. Rural and urban networks are likely to have clientele with differing concerns and challenges. Thus any efforts to provide networking opportunities must take this into consideration.

Policy and other measures that will **remove discrimination towards women in finance** will certainly remove a major constraint that women face. Flexible loans and other arrangements are required for women, as they don't have collateral.

Improve Public Transportation

The impact of easy mobility on the lives of women is addressed in section 5 on The Rules of the Game for Women. Improving public transportation and allotting extra seats or special services for women is one of those ideas bound to have a positive ripple effect on various aspects of development. Usually a limited number of rows is earmarked on each bus for women in many parts of South Asia, but these are insufficient to meet the transportation needs of women in most places, especially during rush hours.

Cultural Factors and Creating Enabling Conditions for Women

Some dearly held beliefs that are part and parcel of the South Asian experience are: women are certainly not equal to men; women should be married off early, for otherwise they are a burden on the family; and daughters do not need to go to school if an extra pairs of hands is

needed at home or in the fields. Most women, except the most privileged, are part of families given to such notions. In addition to these kinds of family and social values, *izzat* and *pardah* play their role in the culture of Muslim communities.

Since values and beliefs shape the social, political and economic landscape within which women struggle to become innovators, these cannot be ignored. Hence it would be unrealistic to apply a reductionist method and proceed on the basis of whether a culture is low-risk or high-risk for innovation.

Achieving the Millennium Development Goals in South Asia will provide the right framework to promote innovation by women. Working at promoting innovation, however, is likely to fall short of set goals if it is carried out ignoring the larger social factors of high illiteracy among women, high infant mortality rates, female infanticide, high levels of malnutrition and anaemia among women and children.

Heleen Mees suggests that in general policy measures that cultivate traditional role patterns should be abolished. Instead, one must promote the economic empowerment of women to help generate economic growth. There appears to be some support for this in Western Europe. The early break with patriarchy in Europe in the late Middle Ages (1200-1500) accounts for the rise of capitalism and growing prosperity. Girls were no longer married off, but selected their own spouses. As a result, it became worthwhile for parents to invest in girls' education and well-being (Mees 2007).

The importance of paying serious attention to the broken education and health systems in India must be underscored (Kapoor and Khilnani 2006; Mehta 2007). In order to boost innovation as a whole and provide support for women as innovators, steps taken should ensure that women are in good health and are educated. Every effort towards this end will bring rewards in the form of poverty alleviation, and improvements in human development, thus furthering democratisation, economic growth and prosperity.

As agriculture is becoming increasingly feminised, it is necessary to have:

- **Laws that will strengthen women's rights to land and water;**
- **Development of specific agricultural tools and technologies that are so designed as to enable women to use them easily;**
- **Access to credit, information systems and value chains from which women are often excluded;**
- **Increased access and support for women to be part of farmers' collectives and cooperatives, which will improve their bargaining, power and reduce transaction costs.**

Creating Enabling Conditions in South Asia

Uneven development, economic growth aided largely by dynamic urban centres, high employment to population ratios in the rural areas, and the large numbers of people employed

in agriculture (48 percent of all jobs in South Asia are in this sector) are characteristic features of the South Asian economies. People in rural areas do not lack work, but productivity is low. The need of the hour is to increase agricultural productivity along with non-agricultural employment in rural areas. Therefore, even though innovations in South Asia are required in both urban and rural settings, concentrating on those that yield benefits to rural areas will have the effect of bringing development where it is urgently required. Since most women in South Asia are in the rural areas, innovation, to yield effective and efficient results, must concentrate on rural women.

South Asian nations need institutions of cooperation where they can have joint programmes to address innovations and the specific needs of women. Setting up a network of organisations in South Asia will enhance this work and can have a multiplier effect. Existing institutions for partnership, such as the South Asian Association for Regional Cooperation (SAARC) are weak and need to be strengthened.

Macroeconomic policy frameworks in South Asian countries need to prioritise the rural areas with special emphasis on increasing productivity in agricultural and non-agricultural sectors. International trade regulations have been dominated by developed nations and much-needed changes such as the removal of agricultural subsidies and other forms of market protection must be hastened.

ASSISTED REPRODUCTIVE TECHNOLOGIES (ART)

Assisted Reproductive Technologies have developed quite rapidly since 1978 when the first test-tube baby, Louise Brown, was born. The term ART generally refers to reproductive technologies used in infertility treatment. This is estimated to be a \$3 - 5 billion dollar industry per year in the US where fertility clinics, egg brokers, surrogacy services and sperm banks are thriving enterprises (Spar 2006), with womb rentals and fertility tourism adding to the international business landscape of ART. Even though this is clearly an area in which the technologies developed have a direct impact on women and their lives, this sector remains largely unregulated in South Asia and also in the US, where reproductive technologies and their applications have seen a phenomenal growth in recent years.

The main problems and concerns with ART lie within a number of domains and include the following (<http://www.gene-watch.org/programs/women.html>) (Multiple 2001; Hubbard 2002; Galpern 2007; Team 2007):

- They lead to health problems in women from hormone treatment and egg extraction, and there is some evidence that they cause development defects in children born through ART;
- They have resulted in a global market for eggs and wombs;
- They reinforce the notions that being a woman means having to be a mother and having a child requires a genetic connection with the child;
- They have pushed us onto the slippery slope of “soft eugenics” by allowing the selection of eggs with specific characteristics through pre-implantation genetic diagnosis;
- They pose serious challenges to the rights of the disabled; and
- They have resulted in confusion arising from equating infertility with other public health concerns.

Advertisements for intelligent and pretty egg donors appear in many college newspapers in the US and several young women are choosing to donate eggs to infertile couples and are undergoing hormone treatment. The hormones are used to shut down the ovaries and hyperstimulate them. They produce a large number of eggs simultaneously and are thereby harmful to a woman’s health. The US FDA is aware of the health hazards, but the drugs are being used off-label, as is often the case. This off-label use is legal, but drugs such as Lupron have not undergone formal review for the new application (Norsigian 2005).

The public discourse on reproductive technologies has been subsumed under the political umbrella of “choice”, a long struggle by women for personal autonomy and the right to have control over their bodies. Framed in this way, discussions about the problems with ART seem foreclosed to some feminists. Nevertheless, even if reproductive technologies might appear to present a choice in certain circumstances and liberate women (for example, you can bear a son by selecting only male embryos and thus be free of social burden, harassment and the guilt of bearing a girl child), this is really a false choice if it is understood within the larger framework of the patricentric and patriarchal societies in South Asia (Mallik 2003). Besides, for South Asian women, there is little choice with regard to other matters, so this notion flies in the face of their everyday realities.

Canada and the UK are the only two countries with comprehensive regulation that covers the use of all sperm, eggs and embryos whether for fertility or research. In the UK the Human Fertilization and Embryology Authority (HFEA) regulates ART and was established in 1990. The 2004 Canadian legislation, the Assisted Human Reproduction Act, resulted in the establishment of the Assisted Human Reproduction Agency of Canada (AHRAC) to develop and oversee regulations covering these technologies. Still, in these and in other countries, the baby business thrives through international markets. Women in poorer nations such as those in Eastern Europe and South Asia provide eggs and rent their wombs to women who are desperate for children elsewhere. Even though earlier guidelines for ART in India ban the sale of gametes and embryos, the guidelines are routinely flouted in clinics across the country. "Spare" embryos are used for stem cells needed for research and raise a whole host of ethical concerns. Women view these opportunities as a way to offset the high cost of in-vitro fertilisation. Articles in newspapers carry stories about non-resident Indian women and the wombs they rent for cheap from women living in India.

Technologies related to reproduction have a sordid history in India. The government and international agencies have forced certain contraceptive methods on women and men to meet the country's population control quotas. In particular, ultrasound imaging has contributed to an increase in sex selection. While women who are poor do not even have affordable sanitary napkins – they are still waiting for such an "innovation" – in-vitro fertilisation is readily considered as a fertility option by those in wealthier communities. The dual economy conundrum and the varying needs of women in different economic strata are quite apparent in the area of reproductive technologies as they are in other aspects of life in South Asia.

What women in South Asia need is easy access:

- To a wide range of safe, effective and affordable contraception;
- To basic reproductive care for themselves and healthcare for their children; and
- To information, education and health products that are safe and effective.

Women must have a say in the technologies that are developed to modulate and control their bodies so that they are in resonance with what they need, women's rights and the struggle for social justice and citizenship.

What is required in South Asia is:

- Wider public debates on ART both within the feminist and the health movements and in public forums;
- A comprehensive set of laws that relate to contraception and the range of technologies that relate to women's health and reproduction;
- The need to ensure that laws that are in the books already are enforced.

Since concerns about ART are not limited by national boundaries, we require international regulation in the absence of which we will continue to have a global market for gametes, wombs and embryos in spite of national regulations.

7. Where are the Knowledge Gaps?

Redefining Innovation through the Lens of Context and Gender

Throughout this research, it has been clear that although a few academics and some international agencies are attempting to redefine innovation, such a reconstruction of the meaning is far from the dominant thinking. The export-based OECD definition continues to influence the thrust of mainstream innovations research.

- Research should develop a new set of indices to measure innovation, understand its impact and its role in development.
- We need research that embraces the gender dimensions of innovation by valuing and evaluating the contributions of work done by women in different sectors.
- We need more research that takes into consideration local context such as local community, geography and indigenous capacity and recognises that replication may not always be possible or even desirable in some instances of innovation.

Women in the Informal Sector

Women make up a large proportion of the informal sector. Their contributions are not valued because they are not visible. Therefore one needs to begin with lending visibility to women's contributions.

- Require studies that express the value of women's contributions that can actually enter the national accounts in terms of GDP.
- Support women's rights by funding collection of national data on women's contributions to the national labour force in countries in South Asia.
- Further, support the analysis of this information and identify how it could be used to formulate policies that would enhance women's economic security and also support their rights (Chen et al. 2005).

Women in Agriculture

National governments need to ensure that women are not discriminated against with regard to inheritance, land rights, wages and a host of other legislation (Agarwal 1994).

- We require existing laws to be audited for discrimination so that there is clear understanding of what must be changed and how, for gender mainstreaming.
- Identify tasks for which agricultural tools and technologies need to be specially designed for use by women.

Impact Evaluations

Across the map of South Asia, there has been a mushrooming of innovative ideas in the shape

UNLOCK ALL KNOWLEDGE RESOURCES

Imagine a world in which a student at the University of Karachi and a woman with a small plot of land on the outskirts of Dhaka will both have access to knowledge and information over the Internet: openly, freely and as easily as a professor at the University of California. The reason this is not possible right now relates to problems that include: the lack of desire and commitment by all stakeholders to leveling the playing field for accessing knowledge; the commercial nature of publishing; the stranglehold on the market by a small number of Internet providers; the absence of high-speed Internet and wide bandwidth in many parts of the developing world; and the inability to gain entry into most knowledge resources, which require passwords, special status, or membership. If everyone could have access to the same level of information, it would bring about a transformative change and result in enhancing every aspect of innovation.

of Gonoshasthaya Kendra, Grameen Bank, Aravind Eye Clinic, and so on. Large and small innovations, one might say, are what have kept South Asia going in spite of the huge inequities in the region.

- What is required are impact evaluations of select innovations in different sectors. One may carry out such evaluations, especially the ones that have an impact on the lives of women (health, education, credit, networking, etc.), and learn which ones could benefit from being tested in other places, scaled up or replicated.

Factors that Influence Female and Male Entrepreneurship

There is little country-level information on factors that influence female and male entrepreneurship. Most of the studies have been done in OECD countries and have been extended to developing nations. Other research takes comparative data from GEM studies for its analysis. Research gaps to be filled require the following:

- Uncovering of the extent of gender differentials between men and women with regard to financing requirements;
- The use and extent of social capital;
- The impact of good public transportation and telecommunications access on innovation; and
- The role of various components of innovation systems for men and women.

Such information could contribute to policy design specifically tailored to meet the needs of women. For example, if women indeed seek fewer funds due to lack of confidence, small funds given to them as credit would perhaps help their confidence grow and also build their creditworthiness for larger loans. On the other hand, if women seek less credit because they start businesses that do not require large sums of money, then developing policy to increase the amount of credit may not necessarily advance women's entrepreneurship.

- Research should also be supported to determine the value and kind of training

(whether it should be solely for women, for instance) effective in imparting various entrepreneurial skills to women in the informal and formal sectors.

What Works

There have been some successful approaches that have supported women as innovators and entrepreneurs in rural and in urban areas, but there continues to be scattered knowledge of what works.

- We need research that tells us “What Works” with regard to addressing gender challenges for innovation in different sectors. There are several success stories that can be shared and experimented with in different parts of the developing world.
- There also needs to be a **central** resource that will carry such work and make it readily accessible to everyone working on this topic for research over the Internet without limiting access to members, or those with any kind of special status.

Changing Social Perceptions

Social perceptions about women as wage-earners, as a strong entity quite capable of bringing about positive changes in societies, are all important for providing a social climate conducive to women innovators. Certain imperatives will help societies move towards that desired transformation:

- Explore the most successful methods by which to change in any given country or region, social perceptions about women as innovators. Advertising, identifying and highlighting role models, educational methods, and identifying famous spokespersons for this cause might contribute to changing societies’ notions about women and work. But we still need to know what works well in each region/country. There could be clues in methods that have been successful in addressing other social problems in the same countries. For example, to contain the spread of HIV-AIDS, the public education campaigns adopted in Brazil, South East Asia and India were notably different.

Supporting Innovation Networks

- South-South and South-North innovation networks need to be promoted on research policies and practices that remove barriers to women becoming innovators.
- Garner support from key opinion leaders.
- Foster research in national policies and organisational practices that support women as entrepreneurs and
- Engage in global debates on policies that have national relevance so that a global framework for promoting gender and innovation is shaped.

Creating a Research and Advisory Organisation

Catalyst (www.catalyst.org) is a non-profit corporate membership research and advisory organisation working globally with businesses and professionals to build inclusive

environments and to expand opportunities for women in the workplace. Catalyst concentrates on business in North America.

- As a first step, research could be carried out on the specific gaps that an organisation such as Catalyst South Asia could fill, and a feasibility study could be conducted for establishing such an institution.

Funding the setting up of an organisation like Catalyst in South Asia would be an excellent way to compel businesses to change the way they work. For example, female business graduates in South Asia could look up a database developed by such an organisation to decide which companies they should join. Corporations could be rated on the basis of the working environment for women. For instance, ICICI Bank is well known as an organisation that has several women in key senior positions and which provides working conditions favourable to women. The ratings could take into consideration factors such as the number of women in senior management, facilities for childcare, flexible work arrangements and other conditions that favour women in the workplace.

8. References

Abdul Hafeel, S. T. S. (2000). Monumental Heritage. *The Hindu* Chennai October 8

Agarwal, B. (1994). *A Field of One's Own: Gender and Land Rights in South Asia* Cambridge University Press.

Amin, A. and F. Wilkinson (1999). "Learning, proximity and industrial performance: an introduction." *Cambridge Journal of Economics* **23**(2): 121-125.

Anon (2006). A Guide to Womenomics: Women and the world economy. *The Economist* April 12

Anon (2008). Net Benefits. *The Economist* Jan 31 2008

Appleton, H., et al. (1995). *Claiming and Using Indigenous Knowledge*. Ottawa, Canada, IDRC.

Baumol, W. J. (1990). "Entrepreneurship: Productive, Unproductive, and Destructive." *Journal of Political Economy* **98**(5): 893.

Baumol, W. J. (2004). "Entrepreneurial cultures and countercultures." *Academy of Management Learning and Education* **3**(3): 316-326.

Blake, M. K. and S. Hanson (2005). "Rethinking innovation: context and gender." *Environment and Planning A* **37**(4): 681-701.

Bose, K. (2005). Dance with hands held tight. India, Earthcare Films: 62 min.

Brown, S., et al. (2002). Women Entrepreneurs in Canada in the 90's. Montreal, Business Development Bank of Canada.

Brush, C. and R. Hisrich (2000). Women-owned Businesses: An Exploratory Study Comparing Factors Affecting Performance. *Working Paper Series 00-02*. Washington, DC, Research Institute for Small & Emerging Business.

Carter, S. and S. Anderson (2001). *On the Move: Women and Men Business Owners in the United Kingdom*, The National Foundation for Women Business Owners.

Chadha, P. and R. Chadha (2007). *Innovative India; insights for the thinking manager*. New Delhi, Penguin, India.

Chen, M., et al. (2005). *Progress of the World's Women 2005: Women, Work, and Poverty*, United Nations Publications.

- Chrisman, J., et al. (2005). "The influence of guided preparation on the long-term performance of new ventures " *Journal of New Business Ventures*. **20**(5): 22.
- Committee, I. (2004). *Science Career for Indian Women*. New Delhi, Indian National Science Academy.
- Cooper, A. C., et al. (1995). "Entrepreneurial information search." *Journal of Business Venturing* **10**(2): 13.
- CRISP (2005). *Capacity Development Workshop on Applying Innovation Systems Concepts to Agro-cultural Research*, Centre for Research on Innovation and Science Policy (CRISP), Hyderabad.
- Dahlman, C. J. (2007). *Improving Technology, Skills and Innovation in South Asia South Asia: Growth and Regional Integration*. Washington, DC, The World Bank.
- Davidsson, P. and B. Honig (2003). "The role of social capital and human capital among nascent entrepreneurs." *Journal of Business Venturing* **18**(3): 330.
- Devarajan, S. and S. Shah (2007). *Can South Asia End Poverty in a Generation?* Washington, DC, The World Bank.
- Dionco-Adetayo, E. A. (2005). *Evaluation of Policy Implementation in Women Entrepreneurship Development*. ICSB-2005 Conference Washington, D. C. .
- Dutz, M. A., Ed. (2007). *Unleashing India's Innovation*. World Bank Report. Washington, DC, The World Bank.
- Elliott, J. (2006). The women of ICICI bank. *Fortune* October 16, 2006
- Galpern, E. (2007). *Assisted Reproductive Technologies: Overview and perspective using a reproductive justice framework.*, Center for Genetics and Society, Oakland, CA: 20.
- Gardner, C. A., et al. (2007). "Technological And Social Innovation: A Unifying New Paradigm For Global Health." *Health Affairs* **26**(4): 1052-1061.
- Gupta, A. K. and R. A. Mashelkar (2007). *Women and Formal and Informal Science (Working Paper)*. IIMA Working Paper, Indian Institute of Management Ahmedabad.
- Gustafsson, S. and R. Jacobsson (1985). "Trends in Female Labor Force Participation in Sweden." *Journal of Labor Economics* **3**(1): 256-274.
- Hall, A., et al. (2005). "Institutional Learning and Change: a review of concepts and principles."
- Harding, R. and N. Bosma (2006). *Global Entrepreneurship Report, 2006*: http://www.gemconsortium.org/about.aspx?page=global_reports_2006.
- Harding, S. (1995). *Just add women and stir?* Ottawa, Canada, IDRC.

- Hubbard, R. (2002). "Where is women's health in the debate on embryo research?" from <http://www.gene-watch.org/programs/women/where-women.html>.
- Kapur, D. and S. Khilnani (2006). Primary Concerns. *Hindustan Times* April 23, 2006
- Klein, K. (2005). The Capital Gender Gap. *Business Week Online* May 20, 2005
- Kodithuwakku, S. and P. Rosa (2002). "The entrepreneurial process and economic success in a constrained environment." *Journal of Business Venturing* 17(5): 34.
- Kolvereid, L., et al. (1993). "Is it equally difficult for female entrepreneurs to start businesses in all countries?" *Journal of Small Business Management* 31(4): 10.
- Kovalainen, A., et al. (2002). "Entrepreneurial activity of women in the global economy: analysis of data from 29 countries." *Babson Kauffman Entrepreneurship Research Conference, Boulder, CO: 6-8.*
- Mallik, R. (2003). Reproductive Technologies in India: Confronting Differences. *Sarai Reader* 3
- Maxfield, S. (2005). "The Entrepreneurship Gender Gap in Global Perspective: Implications for Effective Policymaking to Support Female Entrepreneurship." *CGO Insights*(22).
- Mees, H. (2007). "The Cost of the Gender Gap." from <http://www.project-syndicate.org/commentary/mees4>.
- Mehta, K. D. a. P. B. (2007). Mortgaging the Future? Indian Higher Education *Brookings-NCAER India Policy Forum*.
- Minniti, M., et al. (2005). Global Entrepreneurship Monitor 2004: Report on Women and Entrepreneurship. Babson Park, MA, The Center for Women's Leadership at Babson College and London Business School.
- Morel, C. M., et al. (2005). "Health Innovation Networks to Help Developing Countries Address Neglected Diseases." *Science* 309(5733): 401-404.
- Mueller, S. L. and A. Thomas (2001). "Culture and entrepreneurial potential: A nine country study of locus of control and innovativeness." *Journal of Business Venturing* 16(1): 24.
- Multiple (2001). Eugenics, Reproductive Technologies and "Choice". *GeneWatch* January 2001
- Murali, D. (2007). Wanted Women Directors. *Business Line* Chennai Oct. 29, 2007
- Norsigian, J. (2005). Egg Donation Dangers. *GeneWatch*
- Orser, B. and A. Riding (2003). "Estimating the impact of a gender-based training program." Carleton University, Canada."
-

- Pottu, S. (2000). Skilled Dais. *The Hindu* Chennai October 8
- Prabha, R. and S. Bhogle (2005). "Smokeless Chulhas for Rural Homes--An initiative by rural women." *IREDA News* 2(3).
- Raina, R. S. (2006). Development and Diffusion of Energy Efficient Devices--Lessons for pro-poor innovation from TIDE. *Innovation Systems for Competitiveness and Shared Prosperity in Developing Countries*. Trivandrum, Kerala.
- Reddy, A. K. N. (2002). "The Evolution of an Energy Analyst: Some Personal Reflections," , Vol. 27: 23-56." *Annual Review of Energy and Environment* 27: 33.
- Roomi, M. (2006). Women Entrepreneurs in Pakistan: Profile, Challenges and Practical Recommendations.
- Roomi, M. (2007). "Behind the Veil: Women's Entrepreneurial Competence and Islamic Tradition." *Entrepreneurship and Regional Development* (under review).
- Scheela, W. and T. Hoa (2004). "Women entrepreneurs in a transition economy: The case of Vietnam." *International Journal of Management and Decision Making* 5(1): 1-20.
- Shiva, V. and I. Dankelman (1992). *Women and Biological Diversity: lessons from the Indian Himalayas*. London, UK, Intermediate Technology Publication.
- Singh, V. and S. Vinnicombe (2003). "Women-only management training: An essential part of women's leadership development." *Journal of Change Management* 3(4): 12.
- Spar, D. L. (2006). *The Baby Business: How Money, Science, and Politics Drive the Commerce of Conception* Harvard Business School Press.
- Subrahmanyam, L. (1998). *Women Scientists in the Third World; The Indian Experience*, Sage Publications Pvt. Ltd.
- Team, S. (2007). "Assisted Reproductive Technologies in India: Implications for Women." *Economic and Political Weekly*: 2184-2189.
- Vaitheeswaran, V. (2007). Something New Under the Sun: A Special Report on Innovation. *The Economist* Oct 13 2007
- Verheul, I. and R. Thurik (2001). "Start-Up Capital: Does Gender Matter." *Small Business Economics* 16: 16.
- Young, J. E. (2000). "Entrepreneurship education and learning for university students and practicing entrepreneurs." *Entrepreneurship*: 215-238.
- Yunus, M. (1999). *Banker to the poor*, Public Affairs New York.

Appendix: Methodology and People Interviewed

The research for this report was conducted using books, electronic library facilities, face-to-face interviews, phone-discussions and email exchanges with people who work on gender or innovation. Given the scope of the topic and the fact that the fields of innovation and women's rights are separate well-developed fields of inquiry, there is plenty to study. Recently, researchers have been working on women and entrepreneurship in some of the South Asian countries, but such work is limited and somewhat preliminary. For fuller information, the author researched various possible areas of intersection between gender and innovation, then used a combination of the limited/preliminary data, trends in other countries and information gathered through interviews to analyse the South Asian situation. The geographic scope of the research was limited by the location of the author and the duration of the project and is, for the most part, based on India, the largest country in South Asia. A significant amount of material was also based on research in Pakistan on gender and entrepreneurship.

The following is a list of people interviewed for this study:

Name	Institution/Profession
Basil, Paul	Rural Innovations Network, Chennai, India
Batliwala, Srilata	Kennedy School of Government, Harvard University
Bhal, Ruchika	Ashoka Foundation, New Delhi
Bhogle, Svati	Technology Informatics Design Endeavour, Bangalore, India
Chadha, Radhika	Author, Innovative India
Gupta, Anil	Indian Institute of Management, Ahmedabad.
Kapur, Aanchal	KRITI, New Delhi
Karunakaran, Kalpana	Madras Institute for Development Studies, Chennai
Kumar, Sucharita	Former CEO Biotech Park for Women, Siruseri, Tamil Nadu
Nair, Sudha	MS Swaminathan Research Foundation, Chennai
Nanda, Priya	International Center for Research on Women, New Delhi
Patell, Viloo	Avesthagen Inc. Bangalore, India
Prabha, R	Technology Informatics Design Endeavour, Bangalore, India
Pradeep	Aavishkar, Chennai Office
Raina, Rajeswari	Centre for Policy Research, New Delhi
Roomi, Azam	University of Bedfordshire, UK
Singh, Navsharan	International Development Research Center, New Delhi
Sood, Aditya	Centre for Knowledge Societies, New Delhi