Third International Conference on Creativity and Innovations at Grassroots

January 19 to 22, 2015

Indian Institute of Management Ahmedabad
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Introduction

From Sink to Source: Enriching the ecosystem for inclusive and empathetic innovations requires rethinking educational, institutional, technological and cultural edifice of our society. The creative impulses in the society at different levels and in various sectors need reinforcement from actors from formal and informal sectors of any society. Management science has restricted its exploration of knowledge systems and economy essentially to intra-form level or in some cases with the larger society but from the firm’s perspective. Seldom have we pursued the discourse from the perspective of knowledge rich-economically poor people. This was the major departure that the Honey Bee Network ensured. Disadvantaged people in villages or cities were not just sink of advice, assistance and aid but also source of ideas, innovations and practices of traditional or contemporary origin.

The third International conference on creativity and innovation at/for/from/with grassroots [ICCIG 3], Indian Institute of Management, Ahmedabad from Jan 19-22, 2015 will pool the insights from the ground and global playfields of ideas, institutions and initiatives. The conference covers four major themes of grassroots innovations: Technological, Cultural, Institutional and Educational. We are expecting participation from various countries namely, India, China, US, UK, Russia, South Africa, Canada, Germany, France, Brazil, Portugal, South Africa, Singapore, Malaysia, Indonesia, Zimbabwe, Togo, Nepal, Ethiopia, Kenya, Pakistan, Bangladesh, Mali, Nigeria, Italy, Sri Lanka. We had received close to 230 abstracts. We are expecting over 300 participants from across the globe. There will also be an exhibition of innovations and glimpses of shodhyatras during the conference. We have a Doctoral Colloquium organized by FPM students in which 26 students have registered from around the world.

Voice, velocity and visibility for creativity at grassroots

In the two and half decades of its existence, the Honey Bee Network (HBN) spawned and sustained at IIMA has initiated and supported many efforts to highlight the untapped potential of grassroots innovators in alleviating poverty and generating sustainable development. Twenty five years ago, HBN started to add voice, velocity and visibility for collaboration between formal and informal sectors. Recognising, respecting and rewarding local and indigenous knowledge, innovations and practices for conservation of biodiversity and other resources required sharing of benefits through ethical supply chains. One could learn from innovations using local resources for solving persistent social problems frugally at a) artefactual, b) metaphorical, c) heuristic and d) gestalt level. Large corporations have begun to realise only recently that internal research and development is not enough to generate frugal innovations for the society and market. Hence, there is an effort to move towards open innovation models (started originally by Honey Bee Network decades ago). Frugality in terms of resource use as well as waste generation is an essential attitude for sustainability. How to generate frugal solutions, systems and attitudes can be best learned from grassroots innovators who have found solutions in severe resource deprived situations. We have to move from cradle-to-grave oriented Life Cycle Analysis (LCA) which is
premised on the production of waste to Circular Economy i.e. cradle to cradle with minimum or zero waste. HBN hopes to reinforce heuristics of frugality in the formal sector and build a sustainable innovation system. Frugality is not just about affordability, a mistake often committed by many scholars in the field. A one rupee sachet may appear highly affordable but only till we calculate the cost of collecting small pieces of plastic from hundreds of thousands of villages. Thus we should look at ecological, social and financial costs together to arrive at affordability of an innovative solution.

Towards empathetic and autopoeisis model of Innovation

One of the significant drivers of innovations is Samvedana, i.e, experiencing the pain oneself as intensely as the other person feels so that one does not solve a third party’s problem. Instead, one innovates for one’s own happiness [swantah sukhyat]. However, the paradox is that we all have limited emotional and spiritual bandwidth. Not all problems that we sense and feel, we can really act upon. It is like an inverted triangle. We know a lot, we feel only about some of the issues that we know and we act even on fewer things that feel about. In such a context, how do we sense the unmet social, institutional and technological needs? And if we don’t sense them at all, then how will new innovations emerge? The marketers will tell us that we don’t have to only respond to the felt needs. There are many needs of clients or potential customers which even they may not be aware of. So the paradoxical pendulum swings between the felt and not felt needs. The responsible organisations will not make those needs felt which are bad for the environment or for the health of the people or widen the moral distance between us and the perfect strangers. If we pause and reflect for a minute, we will realise that perfect strangers are the ones who are unknown and unknowable. It could include an ant on the wall, a squirrel on the tree or a child unborn. We cannot figure out what do they think, what their needs would be and how do we create a society which they find as hospitable as we could make it to be. Samvedansheel innovations will emerge if society at large adopts such an attitude. There are several changes required in our way of thinking to make a society samvedhansheel [empathetic is not the right translation, empathy is towards others, samvedansheelta is within oneself]: a) I don’t have to personally suffer from a problem to experience the pain that somebody else suffers; b) The increasing uncertainty in the world can put me in a situation when I may be even more vulnerable than the people whose pain I may ignore today. God forbid, if there is a train accident in a remote area, the question of who lives and dies will depend upon how well the nearby primary health centre works and how much voluntary spirit in communities in the nearby villagers have to save life; c) I have received so much help from strangers in my life to whom I have no way to reciprocate. I am not the only one; d) We have all enjoyed resources, the shade of an old tree on the roadside or other services for which we have not paid anything and in creation of which, we have no contribution; e) Need for respecting other’s ideas. Creative ideas and innovations are seldom completely original. Any new building needs a lot of bricks, many of which were not baked by me, or for me, or based on my ideas. Open source sharing of ideas has helped society to solve so many of its problems; and f) We can balance or compare our personal ambitions, desires and aspirations
with the unmet needs and desires of those who may seldom be able to dream a flight in an open sky of freedom.

There are several other paradoxes that need to be resolved:

**Autonomy vs. Agency:** many actors in public and private system know what needs to be done to overcome various asymmetries in knowledge system between formal and informal systems but lack agency to take relevant decisions to avail of the autonomy granted to them. We need almost a cultural revolution for changing the mind set of such bureaucracies.

**Accuracy vs. affordability:** In general, higher accuracy is always better than less accuracy. But sometimes, there is an optimal accuracy which is enough. The cost of achieving higher accuracy may make the product or service unaffordable. Many GPS solutions are accurate within the range of ten metres. For most purposes, that is fine and the result is that even ordinary phones can have GPS system. If the choice is to have only extremely accurate systems, this function may go out of our hand. This is something that must also be learned from grassroots innovators.

**Symetrical vs. assymetrical open innovation:** A large number of companies, public and private organisations are starting to have open innovation models in which they seek ideas from outside with or without compensation. But, they very seldom share their own ideas in public. They also don’t tell the idea providers as to what did they do with the ideas they got. The idea provider doesn’t get feedback and therefore her self-esteem may not go up. Her ability to come out with better ideas may not increase. Obviously, she won’t be able to demand much more value than what she got. The tension between these two kinds of open innovation model is waiting to be resolved slowly and slowly. The grassroots innovators are becoming aware of these possibilities and thus may be much more demanding in future.

**Blueprint vs. autopoiesis:** Blueprint implies a pre-determined trajectory for a project. Such an approach does not give a chance for learning, reflecting, revising and recorrecting the trajectory. The autopoiesis systems are based on self-design and self-correcting capabilities. Innovations are likely to emerge much more when flexibility, responsibility and consciousness allow learning and self-design. This is one quality that many grassroots innovation embody.

**Building upon the potential of youth**
As far as the role of students in developing frugal and affordable solution is concerned, a platform serving several important institutional objectives is needed such as: a) promoting originality among the students so that they do not try to do what has been done already before; b) trigger distributed design so that lateral instigations forge new communities of practice. c) support kho kho or relay model of frugal innovation, d) put the unmet social needs and grassroots innovations with on the agenda of the students; e) link MSME needs with academic community through students, f) create a ‘market for merit’ for the faculty guides of outstanding projects of the students why may be in small colleges and cities many times, g) offer challenge awards to students to take up wicked or persistent social problems to
overcome civilizational inertia, and h) create funding and mentoring and entrepreneurial opportunities to encourage early stage start-ups. Dream is that in due course, all the student projects all over the world will be at this common platform so that a new revolution of democratic, frugal, extremely affordable solutions to social problems any where will emerge in the next five years. This was achieved through Techpedia.in to some extent. We need a similar portal for the student projects of management science.

Though the concern for inclusive innovation has become much more widespread, the voice of the knowledge rich, economically poor people and the youth is still not heard adequately. This generates an urgent need for the Network to introspect, debate, analyse and improve upon our limitations and find ways to serve the grassroots innovators and traditional knowledge holders. The first International Conference on Creativity and Innovation at the Grassroots (ICCIG) was held in 1997. The ideas exchanged on this platform gave rise to Grassroots Innovation Augmentation Network (GIAN) in 1997. In 2007, the Tianjin Declaration led to a cooperative research program between IIMA, Honey Bee Network and Tianjin University of Finance and Economics. The second ICCIG Conference was organised at Tianjin (Dec 3-5, 2012), China and Ahmedabad (Dec 7-8, 2012), India. The Conference aimed at pursuing the idea of grassroots to global (g2G). The Ahmedabad Declaration issued at the end of Second ICCIG at IIMA pointed out new areas where much more work was needed. In order to enrich the ecosystem for inclusive and empathetic innovations, the third ICCIG will pool the insights from the ground and global play-fields of ideas, institutions and initiatives. This compilation contains the abstracts received for the ICCIG III. We have tried to give voice to innovation agents from Technology, Education, Institution and Culture from all across world hoping to give respect and do justice to creativity at the grassroots.

National Innovation Foundation, which has supported this conference in a big way, is an autonomous institute of Department of Science and Technology. It has spawned and or implemented several new models of supporting grassroots innovations. The concept of Technology Commons implies that people to people copying is not allowed but also encouraged but people to firm transfer of technology has to be through licensing only. Likewise, the GTIAF (Grassroots Technological Innovation Acquisition Fund) has been developed to acquire the IP rights of the innovators after some advance compensation and of course with their written consent and then make these innovations available at no cost or low cost for small entrepreneur to expand public domain. The principle of prior informed consent (PIC) of knowledge holders has been evolved over the years though a great deal of improvement remains to be done. Many students at IIMA and other institutions continue to learn from these Honey Bee Network organisations as inclusive innovation labs. Critical feedback from young minds will be constantly needed to improve the national and global ecosystem. Many countries around the world are learning from this experience of several decades. China has one of the strongest following of Honey Bee Network outside of India.

A key output of the conference will be the Ahmedabad declaration on forging creativity and innovation at/for/from/with grassroots and many more policy, institutional and practical initiatives through voluntary partnerships forged at the conference.
Building the bridge between formal and informal science at grassroots level will unfold hitherto unexplored opportunities for socio-economic development of common people excluded from economic growth processes around the world. Creativity and innovation at grassroots and dynamic traditional knowledge systems have in past helped in solving many problems. But many have remained unsolved. Honey Bee network has facilitated over last two decades people to people learning to learn from existing solutions and explore collaborative solutions to the ones not solved as yet. These grassroots innovations developed by common people unaided from outside, can extend the frontiers of science in some cases and make new applications apparent which may have been ignored for long. Honey bee network has also insisted that whenever any wealth is generated form value addition in local knowledge, innovations or practices or otherwise, fair share of benefits should accrue to the knowledge providers. It has thus advocated the need for acknowledging the contributions of grassroots innovators and traditional knowledge holders, protecting their knowledge rights, and ensuring their dignified participation in the global value chain for valorizing their knowledge systems.

The solidarity among academic institutions, civil society organizations, national and international support organizations and eventually of the national governments around the issue of empowerment of grassroots innovators and traditional knowledge holders will unfold their entrepreneurial potential for improving their lives and conserving environment. We have to ensure that grand children of our children today, that is at least hundred years hence will be able to draw upon the knowledge and innovation traditions for solving problems of future. We cannot allow the traditional knowledge developed over centuries to erode and be lost forever. We cannot conserve the resources without conserving associated knowledge systems. Without incentives to valorise their knowledge, young people in our communities may not have incentives to conserve, experiment and innovate. The grassroots scientists and technologists have to be enabled to articulate their excellence, experimental and conservation ethics and educational pedagogies for achieving equitable, empathetic and efficient allocation of resources and opportunities in society. Incubation of grassroots innovations and outstanding traditional knowledge in a distributed, decentralized and social democratic manner provides an opportunity to address global concern for providing solutions to persistent social problems.

Participants of the International Conference on Global GIAN (Grassroots Innovation Augmentation Network) from Asia, Africa, Latin America, Europe, Canada and America met at Tianjin, May 31-2, 2007 to launch an online platform to recognize, respect and reward green grassroots innovators and traditional knowledge holders.
It was realized that many economies, which are growing faster than most parts of the world provide a valuable opportunity for generating market based avenues for social development. However, it was also recognized that process of market led growth is not always inclusive and thus leaves many regions, people and sectors out of the purview of the development process. Tianjin Declaration stresses that for pursuit of harmonious and balanced social and economic development, Green Grassroots Innovations and Traditional knowledge provide a very valuable opportunity. The cooperation between SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions) and Tianjin University of Finance and Economics provide a model for international cooperation in support of building a value chain around grassroots innovations and traditional knowledge. India, China and Brazil have come together in this initiative to provide an online platform for incubating green grassroots innovations and traditional knowledge to protect knowledge rights of local communities and individuals, alleviate poverty, generate employment, reduce drudgery, and conservation of environment.

In order to operationalise the Global GIAN (Grassroots Innovation Augmentation Network), the Tianjin declaration endorses following recommendations:

a) To commemorate the international solidarity for harmonious and inclusive development through support to grassroots scientific, technological and institutional innovations and traditional knowledge, May 31 be celebrated as Grassroots To Global (G 2 G) day for recognizing, respecting and rewarding creativity and innovation at grassroots all over the world.

b) To develop an international registry/bank of open source as well as proprietary grassroots innovations and traditional knowledge after taking Prior Informed Consent (PIC) of the knowledge providers so that communities and individuals struggling with similar problems around the world are able to access affordable solutions.

c) To invigorate the promotion of grassroots innovations and traditional knowledge, at least four kinds of gaps have to be filled: (i) creation of mechanism at national and international levels to scout and document the grassroots innovations and traditional knowledge in national and international registry, and to give awards as well as to provide support for value addition through design and technological and product/service development, ii) provision of Micro-Venture capital investment to convert grassroots innovations and traditional knowledge into economic and social enterprises, iii) arrangements for diffusion of social technologies developed by grassroots innovations and traditional knowledge. It may help to create a global innovation commons so that relevant proprietary technologies developed by grassroots innovations and traditional knowledge holders are acquired for licensing these at no, or very low cost to small artisans and farmers, pastoralists and others producers around the world; and iv) enabling and empowering the grassroots innovators with modern tools of fabrication so as to enhance their capacity to do R and D and innovate through an international network of Fab Labs run and managed by grassroots innovators.
d) To pursue creation of an international treaty to protect the rights of the grassroots innovators and traditional knowledge holders around the world through new instruments, mechanisms and by blending the relevant features of existing IPR systems with lessons of open source movement.

e) To persuade every national government to create a national body dedicated to scout and document, add value, provide risk capital, protect their rights and diffuse these green grassroots unaided solutions developed by people without any outside help through commercial as well as non commercial channels. Honey bee network will facilitate lateral learning among such national foundations so that global pool of affordable green solutions to persistent social problems increases. Grassroots innovations and traditional knowledge should thus become part of the national innovation systems and global guidelines for the purpose should be appropriately modified.

f) Strengthening multi-language multimedia Online Incubation Platform for incubation of grassroots innovations and traditional knowledge launched at the conference to reduce the transaction costs of innovators, investors, entrepreneurs, designers, scientists and mentors from all around the world.

g) Need to make special efforts to highlight, recognize and reward the creativity and innovation of Women. The science underlying the knowledge domains in which they excel should be brought within the purview of R and D studies and policies and not treated with lesser attention and respect as has been the tradition so far.

h) To persuade science and technology academies to have dedicated sessions in their annual research conferences to explore ways of engaging with local creative communities and individuals to humanize the science and also empower knowledge rich-economically poor people.

The Tianjin Declaration resolves that the cause of grassroots innovators and traditional knowledge holders will be pursued to widen the real options of creative and innovative people at grassroots around the world. These people should not remain poor because they share their traditional knowledge and contemporary innovations generously with the outsiders. Their spirit of sharing and community solidarity must be preserved and universalized through blend between formal and informal knowledge systems, institutions and networks. We have to recognize that such people are not at the bottom of innovation, ethical and value pyramid, even if many of them happen to be at bottom of economic pyramid. Tip of their creative iceberg has to be recognized, respected and rewarded through monetary and non monetary incentives aimed at individuals and communities by involving youth in this global grassroots innovation movement so that future generations continue to care for each other and the environment and share their innovations with others generously.
Ahmedabad Declaration-2012

Second International Conference on Creativity and Innovation at Grassroots

December 2012, Indian Institute of Management, Ahmedabad, India

Grassroots innovations evolve in response to local problems but not always the ones faced by the innovators themselves. Many times, third party problems inspire the innovators to attempt solutions. Thus, these unaided, self-triggered and self-inspired solutions underlie the pursuit of inclusive development by the Honey Bee Network during the last twenty-four years. The International Conference on Creativity and Innovation at Grassroots provided a platform to scholars, activists, teachers, innovators, entrepreneurs, investors and other stakeholders including policy makers both from India and abroad to identify specific milestones that the Network should pursue in the coming decades. The Tianjin Declaration in 2008 had stressed

Grassroots scientists and technologists have to be enabled to articulate their excellence, experimental and conservation ethics and educational pedagogies for achieving equitable, empathetic and efficient allocation of resources and opportunities in society. Incubation of grassroots innovations and outstanding traditional knowledge in a distributed, decentralised and social democratic manner provides an opportunity to address global concern for providing solutions to persistent social problems.

The concern for inclusive development has become stronger in the recent times, so has the need for open innovation platforms. Even the formal sector is recognising that new solutions cannot always emerge from within organisations. The need for recognising, respecting and rewarding creativity in the informal sector has been recognised much more in the last five years. Thus, incentivising various stakeholders such as youth and institutional scientists to engage with individual and community innovators in the informal sector was emphasised strongly in this conference. The willingness of innovators to share their knowledge generously and without the expectation of much reciprocity was also articulated equally strongly. The dialectics of generosity and unfair exchange as well as the need for reciprocity and a lack of attribution reverberated all through the conference. Scientists working on validation of and value addition in grassroots innovations must be encouraged to share the summary of their findings in an easily comprehensible manner with the innovators and knowledge providers in their local language. Several of the recommendations involve use of ICT infrastructure. However, given the digital divide, not many grassroots innovators may be able to use these facilities without some institutional help. The fact that many innovators solve problems without being aware of scientific concepts underlying their ideas means that the awareness about scientific temperament and methodology needs to be increased. Even otherwise, the knowledge about scientific approaches might make the innovative pursuits more efficient. However, without practising the ethical values underlying the philosophy of the Honey Bee Network, the efficiency of such pursuits will be short-lived.
The conference participants reached a consensus that future strategies for empowering grassroots innovators will have to be more entrepreneurial, collaborative and open in nature. To ensure that opportunities for technological, educational, cultural and institutional innovators at grassroots are expanded meaningfully, the Ahmedabad Declaration endorses the following:

1) Incentives

1. There are innovators who may not be interested in material rewards for themselves while sharing their ideas or innovations. But their children, if needed, could be assured access to good education as an incentive to promote generous spirit among innovators. Likewise support for community and conservation of ecosystems could be other ways of incentivising generous innovators.
2. A contingent framework needs to be developed for a pay-as-you-wish model for accessing open source ideas, innovations and sustainable practices. For different kinds of users and different purposes of use, the preferred conditions for voluntary payments can be specified.
3. Every country needs to set up GTIAF (Grassroots Technological Innovation Acquisition Fund) so that innovators don’t subsidise the societal cost of learning and accessing new ideas and innovations. State or some other agencies should pay for acquiring the IP rights of selected technologies to make them available at no or low cost.
4. A model of advance payment in part or full for an innovation yet to be actualised may be tried so as to provide an incentive to innovators. The risk of product development, thus, is transferred from an innovator to one or many investors.
5. The avenues for economic and/or social enterprise development have to be increased through the provision of risk capital, mentoring and other kinds of support such as an international platform for incubation of innovations.
6. Grassroots innovations should be aligned with the newer and emerging concepts of natural resource management and their impact on climate change should be taken into consideration.

2) Dissemination

1. Gamification can help in problematising inertia and spur people into creating solutions. New games need to be developed for encouraging collaborative problem-solving with built-in incentives for doing the same. Games can also be developed for exploring new applications of existing innovations.
2. Software applications (mobile or online) could be developed which will help users to access content of innovation databases in various languages.
3. A specialised search engine and/or a well annotated, hyperlinked database for innovations need to be developed in order to facilitate their access for lay people, children, innovators and others. It may also provide links to those who may have referred or used a particular innovation to develop other derivative innovations (akin
to the publication search facilities where references in which a particular paper is cited are given alongside the paper). People using the search engine may be encouraged to upload their ideas, innovations and publications which may enrich the innovation ecosystem for which an innovation portal may also be developed (see point 20).

4. Public broadcasters, particularly radio station managers, need to be persuaded to allocate regular slots for broadcasting information about innovations. Likewise mobile exhibitions and sms services could also be used to create wider awareness. A YouTube channel can also help in promoting dissemination of innovations and underlying heuristics.

5. The agricultural and industrial extension centres have to be mandated to provide space for demonstration/trials of grassroots innovations so that local communities can experience the innovations. If necessary, an appeal to Members of Parliament needs to be made so that they recognise the value of this suggestion for their own constituency development.

6. School and college textbooks should include lessons on innovations so that youth can be inspired for trying things out and acquire the humility, empathy, compassion and collaborative spirit of grassroots innovators.

7. Traditional cultural formats should be used to embed the stories of innovations for wider interest and involvement.

8. The translation of the Honey Bee database in various languages would facilitate cross-cultural learning, experimentation and diffusion. In some cases it may lead to derivative innovations which may enrich the original innovation itself.

9. The concept of Technology Commons needs to be institutionalised so that protection of intellectual property rights does not come in the way of people to people (p2p) copying, learning, sharing and at the same time firms are obliged to license the rights before use. The legitimisation of Technology Commons will require changes in the policy and implementation system for IPRs.

10. A fast track system for IP protection for grassroots innovators needs to be developed compatible with the concept of Technology Commons.

11. Translational research needs to be encouraged to validate and promote cross-domain and cross-cultural applications of innovations.

12. Reduction in taxation of GRI based products may encourage their use and thus enhance dissemination.

3) Institution Building and Open Innovation

1. An offline and online open source and open access platform facilitating integration of grassroots innovation with the formal sector needs to be created.

2. Social and health security for herbal healers and other traditional knowledge holders are needed in order to ensure that their unique knowledge is kept alive for future generations. Institutions like a herbal healer academy may facilitate knowledge transfer to the younger generation.
3. A database of challenges needs to be developed so that academic institutions can mobilise young scholars to address them through post-graduate or project research. Since most academic institutions may not have a very close contact with communities nearby, such a database will help them make indirect connections with the ground. Databases of mentors and subject experts should be created. A supporting database of materials, tools and protocols also needs to be developed to enable efficient value addition to people’s ideas.

4. There is a need for experienced innovators to offer their expertise and incubation support to other innovators. An open source database of innovators with specific skills and expertise may be built, which would help other innovators and also possibly help in generating more income from skill/expertise specific assignments.

5. A consortium of designers, fabricators and calibrators/testers is needed to provide low cost and flexible services for the innovators.

6. Despite all the efforts by the Network the share of women innovators remains very small. New pedagogies have to be used to unfold the creative potential of women in all sectors of society. Entrepreneurial opportunities for women have to be expanded so as to trigger more innovations.

7. Institutional innovations are extremely important for sustainable management of scarce resources often through commons. For replicating such innovations, instead of spreading the specific components or their sequence, one may have to disseminate the heuristics or the models of problem solving. Building capacity to abstract these models and apply them to location specific conditions requires considerable effort.

8. Certification of skills, knowledge and innovations may require special facilities and policies so that grassroots innovators are not put at disadvantage while competing with the products and services of the formal sector.

9. The Inverted Model of Innovation implying innovation by children, prototyping by technology students and other fabricators, commercialisation by companies and social diffusion by other agencies needs to be developed worldwide.

4) Youth and Education

1. Platforms like techpedia.in should be created in every country to link academia with the problems of small industry and the informal sector. A database of social challenges should be provided at this platform to encourage students to take real life problems for research and projects. A kho kho/relay model can be developed for projects that have not yet led to product development to be taken up by students elsewhere.

2. A distributed model for collaborative problem solving needs to be encouraged across disciplinary and institutional boundaries.

3. The national social service scheme may be supplemented by a national innovation services scheme to motivate the youth to engage with unsolved problems of society.

4. To strengthen the societal capacity to deal with climate change and other associated risks, the youth should be encouraged to document the survival strategies under stress
such as use of uncultivated plants as foods. A database of such strategies can provide spur for empirical research and action to add value to community knowledge.

5. Academic credit may be given to students who wish to put their complete project reports in the public domain. A registration system akin to the ISBN number may be followed for proper cataloguing of the projects.

5) Cultural Creativity

1. Dissemination of cultural creativity may require recasting the employment generation programmes, media policy, educational pedagogy and other extension services. The role of cultural symbols in deepening the innovative spirit needs to be recognised in a greater manner. The linkage among these cultural facets of public policy has to be made comprehensible at different levels of society.

2. Language, culture and local meanings and metaphors provide a context for communication to take place among communities. Without maintaining the synergy among these factors, the culture of creativity cannot be fostered.

3. Distributed and interlinked platforms to unfold the entrepreneurial potential of local art and cultural forms will require institutional and technological innovations. Building capacity of creative people to access these platforms, however, requires new kinds of educational efforts and infrastructure, lacking in most societies.

6) Investment/Funding

1. Community or sectoral brands may be developed to increase the market acceptance of related grassroots innovation based products. It may not be possible for individual innovators to create a similar identity in the minds of consumers. Investment in creating such brands is beyond the capacity of individual innovators. Hence, the need for public investment.

2. There is a lack of risk funding and grants for grassroots innovations. Unlike the worldwide acceptance of micro finance as a vehicle for meeting capital needs of small enterprises, the concept of micro-venture innovation funds (MVIF) remains to be properly understood, accepted and amplified through policy and institutional support.

3. To promote institutional, cultural, and educational innovation, there is a need for a social venture fund of at least Rs 1 crore per district.

4. Successful innovator-entrepreneurs may contribute in an innovation fund created and managed by innovators to finance other regional innovators. Periodic training of innovators for improving their technical, accounting and other entrepreneurial skills is required as well.

5. Appropriate means of funding should also be provided to cover the cost of failed, less or unproductive R&D considering wear & tear, breakage, loss of resources (material and financial), travel for procurement of right parts/components for prototyping etc.

6. Instead of a uniform set of financing rules for all kinds of technologies, differentiated rules may be evolved to fund different kinds of sector specific or high impact
technologies with high risk of failure but higher societal value. Moratoriums on interest/principal repayment may also be planned accordingly.

7. Creating a global GIAN (Grassroots Innovation and Augmentation Network) as a foundation to support and incubate grassroots innovations having regional as well as worldwide relevance for inclusive development.

7) Horizontal Supply Chain and Logistics Management

1. For a distributed, collaborative and open economy to work without creating monopolies, there is a need to develop a horizontal supply chain, i.e. different steps in the value chain are completed in different spatial units or villages. The idea of leveraging comparative advantage of different villages is inherent in this model. Mutual dependency will thus increase and alienation might decrease. Neighbourhood economies might evolve and vertically integrated structures may dissolve due to excessive transaction and management costs.

2. Supply and distribution chains for cultural creativity are very important for maintaining autonomy and agency of each creative community. In many craft and artisanal occupations, supply chain problems have posed a threat to the very survival of creative and innovative traditions.

3. Documenting and disseminating educational innovations may involve process improvements or use of different material ingredients for creative pedagogies. Organising supply chains for the ingredients thus becomes crucial for diffusion of innovations.

4. A larger number of distributed school specific innovations has to be communicated among other school teachers to trigger further experimentation and innovation. Apart from legitimising the experimental ethic, there should be freedom for teachers to incorporate local material, content, metaphors, etc. in the curriculum.

5. A multi-media, multi-lingual database of innovations by teachers needs to be created and disseminated globally to ensure that children get opportunities to fulfil their potential.

6. Given the high probability of dropouts in the regions having high biodiversity or higher environmental or economic stress, the erosion of knowledge and resources may go hand in hand. Educational policies and programmes have to be tailored to the needs of such regions.

The Ahmedabad Declaration stresses the pivotal role of grassroots innovations for inclusive development. It also recognises the hurdles to be crossed for realising the potential of GRI. It is hoped that an urgent policy and institutional reform will follow. A network, within and among universities, educational institutes and research institutes, needs to be created to expand the space for grassroots innovations in the minds of the youth. There is a huge opportunity for expanding the meaning of open innovations by bringing the elements of reciprocity without impairing the prospects for people to people learning. It is hoped that the Honey Bee Network would continue to provide the largest source of open source solutions for global alleviation of poverty and conservation of the environment. The model of g2G
(grassroots to Global) holds enormous promise for changing the terms of the discourse on globalisation. The time for distributed, diversified and decentralised problem solving through collaborative platforms has come. The Honey Bee Network is bound to revitalise the repertoire of educational, cultural, institutional and technological innovations at different levels of society.

The spiritual basis of the grassroots innovations movement is no less important than the utilitarian aspect. Empathy is the predominant feature of innovations in various sectors and social spaces. In a materialistic worldview it is difficult for many to understand why knowledge rich, economically poor people prefer to be so generous in sharing their knowledge widely. And yet, should they remain poor because they have superior ethics. The challenge is to create platforms for collaboration, compassion and co-optation among creative forces in the formal and informal sector. Frugal, flexible and friendly innovations would inevitably follow from the synergy across sectors.
Gandhian Young Technology Innovation (GYTI) & Beyond: Linking Academics, Enterprise and Investors

Chair:
Shailendra Mehta, Vice Chancellor, Ahmedabad University

Co-Chair:
Mahesh Murthy, Founder Pinstorm
Rajnish Shrivastava, Director, NIT Hamirpur

Discussant:
Sunil Parekh, Faculty, Board Member, NDBI-NID and CIIE-IIM Ahmedabad
Calvin Kebati, Student Innovation and Industry Liaison lead, JKUAT Kenya

Date: Jan 19, 2015
Time: 14:00-15:30
Venue: Audi-2, KLMDC

This session will bring together young faculty members from IITs, NITs, IISER and Central Universities, and professionals to map the key challenges that have to be addressed in the coming years to meet the unmet social needs.

On one hand we have large number of grassroots innovations which remain to be augmented and on the other hand we have many social needs which even the grassroots innovators have not addressed adequately or not attempted at all. Some of the unmet needs have been spotted by the technology students as a part of their final year UG projects or Master/PhD thesis. There is no adequate meeting ground for all the three subsets of Samvedansheel (empathetic) innovation ecosystem (i.e. students, grassroots innovators and society).

We want to discuss examples where colleagues like you have made a significant effort to bridge the social gaps. But the policies and institutions for providing financial support, regulatory approvals, certification, testing facility, market access, and incorporation in public programmes have not been synergized appropriately.

One of the key challenges being faced by the country is that the majority of students, who do outstanding projects and get awards like Gandhian Young Technology and Innovation (GYTI) Award, do not wish to take their ideas further for social and commercial diffusion and entrepreneurship development. This situation is unlikely to change in coming few years. Therefore, we have to find a way for letting good ideas grow in the hands of entrepreneurially oriented students or existing entrepreneurs or companies by having an appropriate/licensing/co-creation/joint venture and other such collaborative arrangements.

We should also reinforce the idea of open source technologies from students from around the world to build upon each other’s ideas. Our hope is that the session will bring out precise strategy for a platform like techpedia.in as a collective playground for innovative ideas and a sanctuary for sustainable innovations.
1.

**Missing links for fostering student ventures based on academic student innovations after recognition: insights from GYTI Awards**


Honey Bee Network played crucial role to shape National Innovation System (NIS) in India particularly through the inclusion of informal sector innovation as a key component of it. While developing innovation ecosystems and institutions it was found that various stakeholders including children, informal sector, university students, professionals play as major innovation actor. Techpedia (www.techpedia.in) at SRISTI has designed a platform to link challenges of informal sector and MSMEs with technology students across Universities/Institutes. Since 2012, we have introduced Gandhian Young Technological Innovation (GYTI) Awards to scout and award young innovators across technology institutions from India. This was the first such initiative across country. Till now more than two hundred fifty Universities have participated from twenty seven states and ninety seven teams have been awarded by Dr. R. A. Mashelkar. During this process we are trying to give handholding support including IPR, design and virtual incubation support through a recently launched Social Innovation Fund (SIF) at SRISTI (sif.sristi.org). Sensing the need of each of these teams in past three years, we have tried to create *in-situ* support system for each of these innovators. While, few innovators among these awardees have started their entrepreneurial venture based on their innovation, there are many who not been able to convert their innovation to start-up yet. While we have tried to analyze various factors which may have played role in converting these innovations into potential enterprises, we have also looked into factors which inhibit the innovator to start-up. Given the fact that most of the young innovators are in the transition phase of their academic and professional career, they are influenced by various factors like availability of resources, support from mentors, temptation of joining a job, parental and social pressures, lack of necessary entrepreneurial skills, market dynamics and others. We have looked at each case of these award winners of GYTI and derived insights on how they are trying to overcome the inertia at multiple levels. During this analysis we have tried to figure out what kind of strategies need to be developed to ensure that the good innovations across colleges can be taken beyond Awards and Appreciations for creating value for money and/or value for many. This analysis also looks at the role of faculty guide of the particular innovation beyond formal academic project duration. While we believe that not in each case Innovators may start enterprise themselves based of their innovation, we are looking at various options like Kho-Kho model (relay model of Innovation), assigning the innovation to other entrepreneurs and keeping it in Open so that anybody else can take it forward worldwide. While more than a million students pursue engineering and related professional studies every year across Universities in India, there is no doubt that at-least one per cent of them are developing Innovative practical solutions. By understanding their situation, and hence implementing a practical way to
handhold these innovative students at their colleges, we envisage creating ten thousand student start-ups per year in India driven by Innovation. These student ventures will not only solve persistent need based solutions for society and market but also develop futuristic solutions as found in many cases of GYTI. It has been seen that winners of most of the Innovation Awards in India are previously recognized by GYTI at SRISTI, which proves the credential and benchmarking process of the platform. After GYTI intervention, many Organizations, MNCs have started awarding innovators, but most of these recognition are yet to integrate a post award handholding mechanism to ensure that the innovation reach to market or impact stage. The analysis of the ninety seven GYTI Awardees of the previous editions gives enough insight for policy makers and national agencies to design various interventions at various stages of Innovation value chain. We have to ensure that the worthy Innovations do not die a premature death despite having significant potential for improving productivity of MSME or solving persistent social problems. Some of these inputs will be crucial for designing the new in-situ incubation ecosystem around young innovators to take them from an early stage of their Idea to market.
1. Design for Multiple Life Cycles: A teaching-learning pedagogy for designing products for multiple life cycles

Amal-\textit{t}as \textit{Khan}, Masters in Design (Product Design), PDPM Indian Institute of Information Technology, Design & Manufacturing Jabalpur India

\textit{Puneet Tandon}, Doctor of Philosophy, PDPM Indian Institute of Information Technology, Design & Manufacturing Jabalpur India

In this work, an effort has been undertaken to imbibe a culture of “Design for Multiple Life Cycles” to maximise the utility of resources used in developing a product by planning its multiple life cycles during its design stage. At the end of a product’s life cycle, some features of form and materials still serve their function. The goal is to develop not only the product but also product semantics. The life cycle of a product starts as soon as it is shipped out the factory where it is created. It is advisable that at every stage, the user should identify the new use of the product rather than buying completely a new product for a purpose. In this work, for a product, the designers are required to identify the users, various context of use of the same product and then redesign it so that the user can identify the next use of the same product after completion of one task. The materials for design solutions are strategically considered so as to be recyclable even after completing all desired life cycles, it is originally designed for.

\textbf{Keywords:} Design for Multiple Life Cycle; Sustainable Design; Cradle to Cradle Design; Redesign; Design Education
2.

**Between open hardware and grassroots innovation: The case of the Global Village Construction Set**

Justin Pickard and Dr. Georgina Voss, STEPS Centre, University of Sussex

This paper presents the case of the Global Village Construction Set (GVCS), a project which operates in a space that might be defined as ‘grassroots innovation’ while drawing on the protocols, practices and rhetoric of the open hardware movement. We reflect on the role and place of users in design, technology, and innovation practices and systems to interrogate the case of the GVSC, and ask: where and who are the users in grassroots innovation? How do you design around them? What does this tell us about the limits and elisions of current grassroots innovation approaches?

**Keywords:** Grassroots Innovation, Open Hardware, Innovation Design

3.

**Green Technology for Clean Pond**

Pradeep Sane Manager (Industrial Engineering), ONGC, Vadodara

Most ponds in our locality created long back for the main purpose to collect rain / storm water. They can potentially provide various ecological, economic and cultural services. But instead, these ponds have increasingly become eutrophic and have also become a breeding ground for mosquitoes. The thriving algae in the pond create anaerobic conditions inhibiting the growth of aquatic flora & fauna. Chemical treatment of these ponds is not effective and may disturb the nutrient balance of the pond. With the use of hydroponics, a floating level of vetiver grass [*Chrysopogon zizanioides* (L.) Roberty] has been introduced in the pond. Vetiver competes with algae for nutrients and thereby starved the algae of nutrients.

**Keywords:** Biological control, Eutrophication, Storm water management

4.

**Low Income Communities and Crowd Design: An Approach for Problem Scouting**

Aguinaldo dos Santos, Professor Federal University of Paraná, Brazil

The present paper presents a protocol for problem scouting, aiming the identification of relevant community issues to be tackled within a crowd-design process. The proposal derives from an ongoing case study within the Sustainable Maker Project, an initiative that consists of a consortium of organizations and Universities that aims at the creation of an online platform (http://www.innonatives.com) based on the principles of open innovation, connecting people to develop sustainability-related solutions. The proposed protocol for problem scouting involves the use of direct observation; open ended interview, video recording, storytelling, “photo ethnography” or “paparazzi”. The paper reports in detail this
process for problem scouting during a field study on a low-income community on the Metropolitan Region of Curitiba, Brazil.

**Keywords:** Problem scouting, crowd-design, design for sustainability

5.

**Design, Development and Implementation of First Flush System**

**Sourabh Bhati,** Undergraduate student, BITS, Pilani, Rajasthan  
**Rajiv Gupta,** Senior professor, BITS, Pilani, Rajasthan

Rainwater is collected from rooftop for drinking purpose in rural area. Water collected from roof top contains many impurities and contaminants like rotten leaves, debris, dust, fecal droppings of birds and animals etc. This water is not suitable for consumption and requires proper treatment. Number of first flushes is designed but they have certain limitations and not maintenance free. This low cost, low maintenance first flush system is designed to allow greater contamination removal efficiency. The system is implemented in number of villages and performance is compared with other available first flushes. The proposed flush not only performs well but is more affordable in terms of purchase and maintenance costs. It is also easy to use.

**Keywords:** Storm water/Rainwater management, First Flush systems, Sanitation

6.

**Eco-friendly toilets for sustainable world**

**V V Rangarao and G. Shankar Narayan,** Doctoral student Architect IIT, Hyderabad  
Shankar Narayan Architects

A new innovative and eco-friendly natural stone toilet unit is developed in this study. This paper presents the construction details of the proposed stone panel system. The proposed system is based on holistic approach and improvises the currently practised local technology in some parts of India. This engineered approach enables erection of toilet units by skilled as well as semi skilled artisans. Engineering improvements aim at resistance against natural forces such as wind etc. Foundation systems are suitable to majority of hostile ground conditions. Integrated base with water sump is proposed to avoid need for water lifting to overhead tank. The concept of pedal pump from sump into toilet units uses human energy for water lifting. Roof of the cubicle, which is also made of stone slabs, can directly take solar panels for lighting the toilets. Presently, proposal is limited to cubicle and can be connected to treatment plants.
7.

Design education: Empirical investigations of design theory in practice in specific context

Dipanka Boruah, Research Scholar, Department of Design, Indian Institute of Technology Guwahati, India

Dr Amarendra Kumar Das, Professor, Department of Design, Indian Institute of Technology Guwahati, India

The present extent and content of designers’ work has changed from those in the past. Green and Bonollo mention seven phases in the product development process. The global market becoming increasingly competitive; it has become necessary to integrate design into the concept-to-market process and encourage designers to participate in decision-making for product planning and positioning. While one considers the underdeveloped or developing countries, above considerations need to be modified in the local context and cultural perspective. A new product begins as an idea or a concept and product developers are interested in lean product development to get products faster and at a lower cost to market. The constant change in markets and technology require companies to meet new challenges. Developing new products and improving existing products forms an important step in meeting this challenge. However, this set of knowledge base may not be able to satisfy contextual situation and design students from underdeveloped and developing countries have to understand the stark context of the use of their product. In these places, even people without formal education solve variety of problems through innovation. A designer can learn a lot from this and needs to contribute by integrating design to make these innovations a marketable product. Understanding of various needs of the user and market forces constitute integral knowledge for the design students for initiating new product development based on innovation. The paper discusses research work to evolve a method to assist in bringing these innovations to global customers through design.

Keywords: Design Education, Design Practice, Grass root innovation
1. Impact of the Medicinal Plant Conservation Area (MPCA), a conservation technique, on rural development: Mohan, Almora District, Uttarakhand

Nikita Kala, School of Environment & Natural Resources
Jyoti K Sharma, Doon University, Dehradun

The communities living in the Indian Himalayan region of Uttarakhand depend on the native plant species for sustenance of their traditional health care system. Medicinal plants play an important role in the health needs of the people living in the developing nations but due to its unsustainable way of harvesting is affecting the health scenario of such nation. Medicinal Plant Conservation Areas (MPCA) has been established in the country to capture and conserve the diversity of the medicinal plants in the wild. This study focuses one such MPCA in Mohan Almora district, Uttarakhand to determine its impact on the health of local communities living in the nearby villages surrounding this area. The study adopted a questionnaire based local household survey to determine the overall impact of the MPCA. The outcome of the study revealed that MPCA intervention has been able to create good awareness but the overall impact was 4.9 out of 9 due to the limited use of traditional health care practices and continued harvesting from the wild. With the findings it was found that still there is need for more awareness in the village about the conservation and cultivation of medicinal plants and also that people should be encouraged to establish home herbal gardens for managing their primary health care needs.

Keywords: Medicinal Plant Conservation Area (MPCA), rural development, medicinal plant conservation, Participatory rural appraisal, Mohan MPCA.
2.

**Adaptation of environment friendly entrepreneurship for forest waste management and livelihood generation- A case study**

*Dr. Prabir Kumar Panda*, Siliguri Institute of Technology Siliguri, West Bengal

*Analjyoti Basu*, PhD Scholar, Entrepreneurship Development Institute of India, Gandhinagar, Gujarat

Using available local resources through participatory management can help in sustainable development. Energy and Environment are two wheels of journey of civilisation. The study looks at the case of Prashant Soni, a young energetic entrepreneur from Siliguri; a city located north of West Bengal. By making pellets from dry forest leaves and using forest refuses in smokeless ovens, he not only converted biodegradable waste into valuable fuel but also generated job opportunities for poor forest dwellers, rural unemployed and unskilled labourers. This study emphasises on the journey, idea generation and strategies employed by an innovative entrepreneur Prashant Soni who practiced Environmental Entrepreneurship for forest development, waste management and livelihood generation.

**Keywords:** Sustainable development, Livelihood generation, Environmental entrepreneurship

3.

**Innovations in food processing industry: Ethnography of bamboo shoots in Manipur**

*Wairokpam Premi Devi*, PhD Scholar, Central University of Gujarat

This paper attempts to explore the linkages of human and non-human actors on the one side and formal and informal sector on the other side in the innovation processes by taking one case study of bamboo shoot. Traditional bamboo shoot is manufactured in informal sector that supplies raw material to the formal sector where bamboo shoot is manufactured in the form of ready to eat (e.g. Bamboo candy, bamboo shoot pickles, canned bamboo shoot in syrup etc.). By adopting Actor Network Theory (ANT) of Bruno Latour and others in the empirical context of bamboo shoot, this paper analyses the networks of key actors in the innovation process. In this process, there has been a close association between human (framer, practitioners, proprietor, food technologist, managers, marketing and production staff, customers, and government organisations) and non human (bacteria, enzyme, time, technologies, and texts). Methodologically, ethnographic study is used to understand the socio-cultural and ethnographical context of key actors in the bamboo shoot innovation process. Semi structured in-depth interview has been conducted in the traditional bamboo processing areas, markets, food processing industries, government officials, R&D laboratories and universities. It concludes that Actor Network Theory is critical to understand the networks of human and non humans associated with the bamboo shoot innovation process thereby giving a new theoretical interpretation in the Science and Technology Studies (STS) domain in the food processing sector.
Keywords: innovation, informal, formal, bamboo shoot, ready to eat food, food processing industry, actor network theory

4.

Exploring the role of Micro Propagation Innovation in biodiversity erosion: A case of cultivated bananas in Andhra Pradesh

Prasanna Kumar K. L, Research Scholar, Agri Biotech Foundation, Rajendranagar, Hyderabad

Innovation is imperative for economic development of any country. Some technological innovations have led to the emergence of new industries across various sectors. Innovations in Biotechnology have revolutionised the scope and size of the industry and have created new avenues for economic development. Recent trends in the development of innovations in biotechnological innovations and its application reveals that, there has been a lack of inclusiveness that threatens the reciprocity between economic development and sustainability. Tissue culture technology, which was originally conceptualised and developed for the conservation and propagation of endangered plant species, is an example of such innovations that have lost inclusiveness in the process of commercialisation. In this case study, application tissue culture technology for the commercial micro propagation of non-traditional banana varieties and their impact on the erosion of biodiversity in cultivated bananas of Andhra Pradesh is explored and provided perspectives of various stakeholders on the improvement of inclusiveness in commercialisation of tissue culture innovation and biodiversity conservation.

Keywords: Tissue Culture Innovation, Micro propagation, Biodiversity

5.

Bamboo and innovation for biodiversity conservation and sustainability in North East India

Dr. Tapas K. Giri, Associate Professor, Indian Institute of Management, Mayurbhanj Complex, Nongthymmai, Shillong-793014

Bamboo the “poor man’s timber” and the “Green Gold” though used traditionally in the North Eastern States has attracted the world attention in the last decade for its multipurpose usage and as a substitute for commercial timber. The present paper is intended to highlight how these abundant valuable resources remain neglected in the North Eastern States in India which have the huge potential for new and innovative product based enterprise development, forests and biodiversity conservation, climate change mitigation and adaptation and considerable employment generation at the grassroots. The paper has also attempted to document the various innovative products and processes being practised widely in the North Eastern Region and suggested how with right kind of policy and support the poverty-ridden
region can transform into a prosperous one by promoting bamboo based innovations. Apart from traditional usage of bamboo for low-cost construction, utility and edible purposes, we have also demonstrated how value addition can be done on bamboo processing to produce construction materials like bamboo mat corrugated sheets, bamboo mat particles board and veneer’s composite have been highlighted. Besides, many other uses of bamboo in different other sectors like handicrafts, furniture and furnishing, activated carbons in the region are also presented in this paper.

**Key Words:** Bamboo, Biodiversity, Environment, Conservation, Innovation and Development.

6.

**How to recognise the role of pastoralists / livestock keepers in conservation of animal biodiversity**  
**P. Vivekanandan, SEVA, Dr. D.K. Sadana, NBAGR, Prof Anil Gupta, IIMA, PK Singh, NBAGR and Dr Ilse Köhler-Rollefson, LPPS**

Traditional pastoral communities in India such as raikas, maldharis, gaddis, gujjars, yadavas, gawlis, todas, konars etc., play important role in keeping variety of livestock through nomadic or semi nomadic way of life. They conserve local livestock breeds which provide valuable animal products such as meat, milk and wool, draught power and manure to the society and not only contribute to the economy of our nation but also secure their livelihood. Over the last one and a half decades, the pastoral communities have been deprived off their grazing rights and they are marginalized leading to loss of local knowledge, breeds and livelihoods. In order to protect and improve their lifestyle and livelihood, and pastoral system of animal production, there is need of policy level intervention proposed in this paper.

7.

**Ethnobotany genomics in the context of conservation and protection of biocultural diversity/local knowledge**

**Dr Ragupathy, Chief Curator, Biodiversity Institute of Ontario, University of Guelph, Canada**  
**Dr Satishkumar, Assistant Professor, Plant Genetic Engineering Laboratory, Department of Biotechnology, Bharathiar University**

The concept of ethnobotany genomics is founded on the idea of ‘assemblage’ of biodiversity knowledge. This includes a coming together of different ways of knowing and valorising species variation in a novel approach seeking to add value to both traditional knowledge (TK) and scientific knowledge (SK). Ethnobotany genomics is defined as exploring the variation in genomic sequences from many species. Our recent work demonstrates the potential benefits
of this approach for conservation and protection of bio-cultural diversity; conservation of traditional knowledge, including securing the rights and economic interest of local people. We present DNA bar-coding research that was used to identify millet landraces and medicinal plants products that are economically important to society-at-large.

Furthermore, we identified considerable variation that is recognised by several indigenous cultures. The impacts of ethnobotany genomics will extend well beyond biodiversity science. Explorations of the genomic properties across the expanse of life are now possible using DNA bar-coding to assemble sequence information for a standard portion of the genome from large assemblages of species. Developing and creation of Biological Reference Material (BRM) DNA barcodes libraries in the context of securing bio-cultural diversity would be ideal for indigenous knowledge stakeholders. Perhaps, the most important contribution is that major barcode projects will leave an important legacy - a comprehensive repository of high-quality DNA extracts that will facilitate future genomic investigations. The assemblage of modern molecular tools with that of traditional knowledge will allow for the development of tools that will serve both conservation of biodiversity and support the development of commercial tools for rural communities. This is aligned with the Convention on Biological Diversity that was signed by over 150 nations, and thus the world’s complex array of human-natural technological relationships has effectively been re-organised.

8.

Is all traditional knowledge community knowledge?

Vivek Kumar, VARD, NIF

The transfer of Traditional Knowledge (TK) over generations may be through individual to individual, family to family or community to community. This knowledge is historical and sustained by knowledge holders. However, in cases where the knowledge holders make suitable functional modifications in traditional knowledge by adding, deleting or replacing plant(s) or its part(s), it becomes contemporary knowledge – an innovation in traditional knowledge itself. When it comes to the knowledge of a herbal healer, it is believed widely that the knowledge is traditional and hence the benefits of IPRs and possible commercialization should be passed on to the community and not an individual. National Innovation Foundation – India, which has filed hundreds of patents in the names of herbal healers for practices relating to animal, human or plant health, has long argued against this belief. As a support to the view, in this article we present a case of a veterinary herbal medication to emphasize that not all traditional knowledge can be or should be considered traditional knowledge. Even ordinary individuals outside the formal system of research are capable of modifying or adding value to a traditional knowledge.
Continuous Evaluation as a Transactional Network: a feedback loop of teacher educators, teachers and students

Elizabeth Mehta and Meenu Thomas, Muktangan

Elementary education in India has gone through significant changes from 2005 onwards when the revised National Curriculum Framework was introduced. The educational world expected something similar in 2009 when, as part of the Right to Education Act, the CCE pattern was implemented across schools. Its aim was to introduce a uniform, comprehensive pattern for the ongoing evaluation of student learning outcomes across the country. Whilst the idea was well intentioned, CCE has still not gained much acceptance either in the student or teaching community. Research has repeatedly demonstrated that extensive orientation and training programmes are an essential pre-requisite for the success of any educational innovation. Such programs, apart from costing a minimum of Rs 10,000 per year, require substantial time for teachers; away from the classroom. Many educational administrators and politicians are now questioning the efficacy of CCE. But, rather than giving up on such an educationally meaningful initiative, would it not be better relook at it?

As an answer to this question, we are presenting Muktangan’s “Curriculum Understanding and Development Meetings” (CUD Meetings) as an exemplar. We will show how this model conceptualises evaluation as a participatory, active, ongoing process in which the teacher educator and teachers in interactive meetings continuously evaluate the teaching-learning process that they are offering students in the classroom. This ensures consistent feedback, which in turn facilitates further interventions according to the needs of individual students. We will also share our experiences with the designing of different rubric assessment systems,
making the teaching-learning process more ‘outcome’-oriented whilst at the same time encouraging a more student-centred and flexible planning and implementation.

Thus, this paper presents an existing working model of continuous evaluation that brings the main stakeholders in elementary education together, namely; the teacher educator, the teacher and the student, creating a regular feedback loop regarding the teaching-learning process. This model is different from the existing assessment systems which unintentionally push individuals, who do not conform to standard, age-level expectations out of the educational system. Many survive by rote memorising material that is developmentally inappropriate or leave the system entirely, viewing themselves as failures. The Muktangan mode, with its unique features of “CUD Meetings” & “Assessment Rubrics” helps individual students, working in groups to work, each, at their own level, developing at their own pace. This pace is seen in many cases to speed up as they meet daily success rather than failure.

2.

Vigyan Saralikaran Prakalp

Indu Parashar, Indore

It is difficult to teach and learn science in primary and secondary levels in schools because while children are learning basics in English and Hindi, they are also taught science and environment. Now the first difficulty in front of the children is to learn languages and memorise spellings. Secondly, children find it difficult to understand the fundamentals of the subject. Also, the predominantly theoretical and passive teaching methods normally used, fail to keep the student interested. This causes the child to be physically present in the classroom but mentally they neither listen to the teacher nor understand the subjects. Due to this, gradually, the subjects become boring and difficult. This trend is carried forward to the next class.

To solve this problem, we explain science in conversations such as granny, nanny and friends relating it to surrounding and teaching methods where the basics of science are made and taught in games and short poems that are entertaining and lyrical. These poems are in six small books available on basis of syllabus of different standards. These books teach many things inadvertently when students read them for entertainment in free periods.

After reading these books understanding the lessons in textbooks become easy and science becomes an interesting experience. Such methods help in building a scientific perspective.

3.

Exploring agency and multiple expressions: Creative arts program in a low-income secondary school model in Bangladesh

Alia Kamal, Researcher, Institute of Educational Development, BRAC University (IED-BRACU)
This paper explores the effect of the inclusion of the creative arts program (CAP) in SSCOPE, a low-income secondary education model for adolescents from lower socioeconomic status (SES) backgrounds. The education model is developed by the Institution of Educational Development, BRAC University (IED, BRAC U). The aim of CAP is to introduce a holistic approach to the arts, incorporating elements of visual arts, movement and drama into the school program. Unlike the traditional arts class in secondary schools in Bangladesh, CAP puts a greater focus on the creative process of ‘art making’ and less focus on gaining aesthetic skills and techniques. As such CAP is inspired by the philosophy of art therapy where the creative process of the arts is given greater importance than the final product. CAP also aims to transform the classroom into a fluid and creative space where imaginative thinking is encouraged. The non-hierarchical learning space that CAP tries to create is an attempt to negate the hierarchical nature of education inside Bangladeshi classrooms, which focuses heavily on rote memorisation. More often than not, student performance is evaluated based on standardised tests and national level examinations. This exam driven and memorisation culture makes the classroom static where teaching and learning becomes a hierarchical and power laden process. There is little room for creative expression, which should be seen as a fundamental tenet for holistic education. The creative arts allows for the social, emotional and cognitive development of the child. Research has shown higher exposure to the arts for children, particularly from lower SES backgrounds, results in a range of positive academic and social benefits in the short and long run. Keeping all these socio-economic factors in mind, CAP was developed and implemented. The CAP sessions are not conducted by teachers, but by Shomaj Shongees (SS) that could be translated to “friends of the community.” The SS are women of ages 24-25 who live in the same community where the SSCOPE schools. Prior to CAP, SS also conducted activity-based sessions on Sexual and Reproductive Health and Rights and Gender (SRHRG) and psychosocial wellbeing with the students. Given that the SS and the students already shared a friendly rapport, it was possible to instil the theme of non-hierarchy and fluidity of the CAP sessions in the classroom settings, where the SS allowed a space for multiple ways of expression among the students. CAP was initiated at two SSCOPE schools for six months in the year 2014. The total number of students in the CAP program for both schools was 81 (39 in one school, 42 in the other). There were two control school groups where CAP was not carried out. Data was collected at the end of the program in the form of questionnaires from CAP students, interviews of SS and in-class observations of the author of this paper. The results indicate that there was an overall positive outcome of the CAP program for both the students and the SS. According to the SS, the attendance rates for CAP students were consistently high in comparison to the control groups. The students and SS both enjoyed the non-formal atmosphere as well as the opportunity to engage in fun and imaginative art activities. It was observed that students expressed more and were more enthusiastic about group collaborations. Through this paper, it will be possible to see how CAP aims to curb dropouts among students by ensuring agency of students and by creating a non-hierarchical learning space where both students and the SS can learn from each other and thrive.
Can teachers learn from children, and build upon their curiosity, compassion and empathetic value system?

Akanksha Agarwal, Research Catalyst, Design for Change

Design for Change designed a thirty hour curriculum for middle school students which provided them with a hands-on experience of the design thinking process. DFC Curriculum incorporates the core values of Design Mindset, which are Empathy, Optimism and Collaboration. These values are put into practice through the four steps of Feel, Imagine, Do and Share. Children go through these four steps to break down a problem into different parts. Most importantly, they are introduced to look into the multiple perspectives about an issue. The focus is on people who are involved in the problem and the ability to understand the problem from their perspective. Next they learn to incorporate this understanding into the solutions they design for their chosen problem. This curriculum has been put in a textbook format and is currently being piloted in sixty four schools across India. The schools have been chosen to represent a diverse sample. Teaching design thinking offers teachers a new experience of building relationships with their students and learning with them. Through this research, we have explored the impact of design thinking on teacher pedagogy. Our research objectives for this study have been to understand the change in the relationship between teachers and students due to factors like increased belief in children’s capabilities, increased understanding of motivations and concerns of children and increased understanding of children to enhance student learning. We have been conducting interviews with both students and teachers to understand the shift in teaching practices in a set of fifteen sample schools from our sixty four pilot schools. Sampling has been done keeping in mind the diversity of schools. Through both in-depth interviews and focus group discussions, we have insights from teachers on how their perspectives about their students are shifting as they see them taking more responsibility and initiative. Furthermore, the space for discussions in classrooms where students can freely share their thoughts has allowed teachers to get better understanding and build stronger relationship with their students. Different processes of design thinking have allowed teachers opportunities to learn with their students as they collaboratively work on this project. Through the paper, we would like to elaborate on the shifts in teacher mindsets about their students while teaching them design thinking.

5.

Pratham Open School of Education

Renu Seth, Pratham

Drop out from schools, particularly towards the secondary level, has emerged to be one of the central concerns for the education system in India. Literature and Research, as well as Pratham’s experience, suggest some of the key reasons for dropout as lack of reasonable access to secondary schools, inadequate learning levels and unfavourable social and cultural norms for girl’s education and secondary education in general. There emerges a clear need
that education needs to be brought closer to the homes of these young women and the opportunity to access this education be provided at stages appropriate to them.

In 2011-12, with an aim to address this challenge, Pratham launched the Pratham Open School of Education. A program being conducted in 31 blocks across seven states, POSE has taken education to the door steps of rural and urban young men and women, giving them a second chance to complete their Secondary Education. The POSE program is strongly related to the support of families and community, as their outlook facilitates the access to Secondary Education. The program attempts to empower women through education, and also community at large. A cadre of trained faculty members and tutors from within the community who can deliver content for higher grades, especially in rural areas where there is shortage of trained teachers, is created. This can be a valuable resource for the community. In this paper, both academic performance through the educational processes, results, perceptions of stakeholders will be discussed that would help define guidelines to take such projects on scale.

Session 2: Papers 6-10
Chair:
Ankur Sarin, Faculty, IIM-Ahmedabad

Co-Chair:
Seshagiri Madhusudhan, Education Specialist, UNICEF, Chhatisgarh

Date: Jan 20, 2015
Time: 11:30-13:00
Venue: Audi-2, KLMDC

6.

RTE Watch
A civil society engagement to strengthen RTE Implementation in Chhattisgarh

Sheshagiri Madhusudhan, Education Specialist, UNICEF, Chhatisgarh

Background
There are two key elements in the successful implementation of any legislation. The first is the ‘Capacity to Deliver’, the ‘Capacity to fulfil duties’ – the welfare state must develop the needed capacities to deliver and fulfil the promises of any piece of legislation that guarantees certain rights to people. The second is the ‘Capacity to Demand Rights’ – civil society at large must have the capacity to engage with the welfare state to demand rights that are committed in various legislations. It is only when both sets of capacities are developed well does any legislation get implemented as per commitments made. The same applies to the RTE Act.
The term ‘capacity’ has been used here to connote several aspects. Broadly, it includes finances, technical abilities, and the intricate aspects governance and motivation. The capacity to fulfil duties vests largely with the state through its legislations, policies and structures, while the capacity to demand rights mostly rests with civil society at large. However, these two dimensions are not watertight compartments. For example, parents are also expected to deliver on the RTE Act, by ensuring that their children regularly come to school. Similarly, teachers or any other representative of the government can also make demands from the state that is under the purview of the RTE Act.

On the whole, both these dimensions are linked closely to each other, and there needs to be a ‘creative tension’ between the two for efficient implementation. Further, those whose primary responsibility is to deliver are also vested with responsibilities to demand, and vice versa.

For the purposes of this note, we will focus on the enhancement of the Capacity to Demand Rights in the context of the RTE Act, through Civil Society engagement in Chhattisgarh. The idea is to eventually influence the capacity of the state to deliver on the Act.

7. Civil Society and Education Reforms in India

Praveen Khanghta and Bikram Daulet Singh, Central Square Foundation

A successful education system stands on a triad of access, equity and quality. In the past few decades, India has made remarkable strides in universalisation of primary education. Unfortunately the focus has primarily been on increasing student enrolment, without adequate attention to the issues of equity and quality. This inefficient provision of public education has resulted in a tremendous rise of the private schooling, especially in the last decade. Yet there is a considerable debate over the efficacy of private schools, especially the low-fee charging ones, in providing high quality, affordable education to all children. This government and market failure in delivering primary education has increased the importance of the civil society as an alternate voice.

In this paper we analyse the role of the civil society, not as a principal provider of primary services, but as a catalyst for systemic reforms. A vibrant civil society can play this role by leveraging the unique strengths of both the government and the market and become an innovation lab for ideas with a strong bias towards implementation. We explore the key features of such a role- independence of voice, constant innovation, evidence based and willingness to invest for long. We also try and identify key ecosystem-level enablers to help civil society play such a role.

We base our paper on the experience CSF has had investing in the early stage entrepreneurs and the difficulty in linking the action on the ground to policy changes. There is a need for foundations which support such entrepreneurship opportunities to look at them not only as means for navigating ‘institutional voids’ and policy fixes, but as a fundamental step for building high quality organisations with a credible voice.
8.

The Story of Roshni: A Humble Attempt to Light the Lamp of Knowledge

Dr. Savita Bhagat, Founder, Roshni Educational Society, Faridabad
Arun Bhagat, Associate Professor, DAV Centenary College, Faridabad

That the children from a disadvantaged background display poor learning outcomes and high dropout rates is a distinct reality, however sad or disappointing it may be. It is quite evident that conventional models of education are not really tailored to suit the specific needs of this vulnerable segment of the population. Armed with the conviction that we need to do something different, something innovative to save these children from falling through the cracks, we initiated a humble attempt to bring the light of education into their lives. The guiding principle of Roshni Educational Society, Faridabad, is to view each child as a distinct being with unique needs and customise their learning plan based on their needs and learning potential.

The story of Roshni started with an empathetic concern for the children of construction and domestic workers who roamed around aimlessly in the vicinity of their parents’ workplace inviting disdainful looks of the neat and clean well off children of the area. What started as a small attempt to make a handful of children literate has morphed into an organisation committed to the cause of transforming the lives of underprivileged kids in the area. Roshni formally came into existence in 2007 and at present there are 250 children under its wing.

We have never believed in the ‘one size fits all’ philosophy. Our system is very open, flexible and transparent. All the admissions are done on a “first come first served” basis. There is no age bar and children do not have to take any admission test. We follow a student-first approach in fulfilling our key goal of making our students contributing members of society. Our four-pronged approach includes imparting literacy and numeracy; promoting hygiene and health, inculcating values and working towards their social inclusion. Each student attends classes to attain a certain level in the two centres run by Roshni. Based on each child’s potential and goals, there are various options made available to them. One, they can continue their learning at the Roshni School. Second, we support keen and academically oriented kids by putting them into CBSE affiliated schools in the area. Third, in the case of those who because of any limitation cannot join a regular school, we support their education through The National Open School. Moreover, vocationally oriented students have the option of learning tailoring or computer to help them acquire the relevant skills in these areas.

No doubt, the origin of such work lies in concern and compassion. As for collaboration, we have established meaningful partnerships with various stakeholders from the local industry as well as college and community members. One such example at creating synergies is our collaboration with DAV Centenary College, Faridabad, by way of motivating the college stakeholders to share knowledge, physical space and resources with the Roshni children. The attempt has been quite successful as young students and the faculty of the college are learning to spare their time and share their resources with the school children.

The glow and shine one sees on a disadvantaged child’s face when she is given love, care and compassion dims every other shine of the world. This is just a glimpse of the small effort
have made here in Faridabad and we would love to share this interesting story with others if given a chance to make a presentation.

9.

**Education through an integrated, micro-level approach**

**Virendar Khatana**, Project Director, Joint Initiative for Village Development (JIVA)

A rapid assessment of the Sakrawas Panchayat in Rajsamand District of Rajasthan, India was conducted to inform the design of a five-year integrated development project, later named the Joint Initiative for Village Development (“JIVA”). The assessment, followed by a census baseline study six months later, found that the standard of education in the villages was so poor that the children studying in class VIII were not able to read or write simple sentences in Hindi, and their numerical ability was equally as weak. To tackle high drop-out and low performance rates, JIVA established Education Resource Centres (ERCs) to provide after-school tutoring in the three project villages. By August 2013, 228 children in all five ERCs, including drop-outs (under the age of 14 years) were enrolled in ERCs. All the drop-outs of up to 14 years were identified with the help of micro-planning and enrolled at ERCs. Majority of drop-outs were not willing to go the school again and JIVA began providing them life skills training which include topics such as basic calculation, reproductive health, and child marriage. Of the remaining 72% of total drop-outs, 60% who showed potential have been re-integrated into the government schools in the villages, 68% of whom are attending the schools regularly. JIVA would be presenting their experience on this integrated, multi-sector, micro-level approach to community development.

10.

**Mobile matters: BRAC experiences in mEducation**

**Wahid Newton**, Program Manager, BRAC Education Program, BRAC, Dhaka

Bangladesh experienced significant progress in primary and secondary education in the last 2 decades. Enrolment is up, classrooms are full of students (50-60 students) and no less than half of them are girls. A good portion of students represent first generation learner. Teachers’ education and development barely kept pace with changes that have been taking place in other areas too. This brought up questions associated with quality of education particularly in rural and remote areas. Some learners face challenges with particular subjects eg: English, Mathematics or Science. In many cases they fail to get required additional support due to different social and financial constraints.

Many countries across the developing world are also now using mobile technologies to increase and improve teaching and learning along with communication. This is especially valuable for rural and isolated schools with limited teacher, but also for overcrowded urban schools facing difficulties in monitoring vulnerable children. As network coverage continues
to expand and reach more of the world’s population, the possibilities seem endless for delivering truly incredible volumes of rich academic content.

In the attempt to find viable solutions to these challenges, much hope has been placed in new information and communication technologies (ICTs), mobile phones being one of them. First, mobile phones are the most prevalent ICT in our country (120 million subscribers, as of November 2014) and the penetration rate is rising rapidly. If mobile phone can be used successfully in the teaching and learning process, they would become a popular and effective tool for supporting learners.

Considering these issues, BRAC Education Programme (BEP) has initiated the mEducation pilot activity in collaboration with BRAC Institute of Languages (BIL) in 36 secondary schools of 4 sub-districts in July 2013. It is an attempt to find a viable solution to the challenges faced by students by providing academic support. In this effort, students can make phone calls to resource persons for their academic queries through mobile phones. Subject’s experts will receive calls and provide instant support over mobile phone from 6 pm to 9 pm everyday for English and Mathematics of class 6 and 7.

Quality education has no alternative and answers to its associated problem are not always given. Technology however has a role to play and as experiences indicate careful planning, thoughtful process can make it meaningful and viable. Initial experiences make known that student especially girls, childhood disables and first generation learners found it very helpful as they cannot go out at night or do not have support at home. Parents and Teachers, especially in rural areas, see technology as an eventual serving hand for the students.

Session 3: Papers 11-14

Chair:
C. K. Koshy, Member, Governing Board, Gujarat Grassroots Innovation Augmentation Network (GIAN)

Co-Chair:
Ankur Sarin, Faculty, IIM-Ahmedabad

Date: Jan 20, 2015

Time: 14:00-15:30

Venue: Audi-2, KLMDC

Educational Transformers: Dare to Dream

Anvit Phatak, B.E. M.Ed., Pune University
India is poised to be the country with the greatest working human resources. However, the current practices of teacher training and upgrading curriculum may not be fast enough to keep pace with the empowering our young Indians into resources that country expects. Can such a strategy exist at all? Every reform comes with a bagful of tricks and techniques. The master trainers demonstrate it to the teachers. For some time the effects of the reform seem promising, but very soon the momentum is lost. The reform does not sustain. The implementers lose sight of the purpose for which the new system was introduced. The purpose becomes the system itself, the means become the end. Such is the life-cycle of a typical reform. Yet, there have been some reforms that have lasted long enough to be noticed. It is worth pondering over the reasons for their long life. Large scale implementation of reforms requires a system to be in place, rigid enough to ensure that it is implemented and yet not so rigid as to lose sight of the purpose. Possibilities while disseminating the reform through master trainers, will educating the institution heads be more effective than directly educating the teachers? Can student participation be increased in day to day decision making in school? Can schools be shown a career path, so that they can look forward to achieving the next higher level after achieving the minimum norms? Can school accreditation exist, but not be made compulsory? Can accreditation process detail the kind of interaction expected out of the students and teachers within the institute? Can we make learning purposeful? Can we have an efficient STA (Student Teachers Association) and thus eliminate the necessity and the trouble the school management faces in interacting with the parents of the students? The transformation of a school into a learning organisation should be able to showcase not only the end product, but a model for the process of transformation. If it can be done for a school, conventional in its thoughts, we can hope to duplicate it not only at a mass level for similar schools, but to different models of schools as well. The reform will affect all levels of organisation, all stakeholders because everyone is in it together. It will be democratic yet authoritarian in some way. The final expectation is that the classroom becomes an exciting, enriched space. Children and teachers ensure that education becomes relevant to them. More of the world is brought to the school. More importantly the reform would make institutions literate enough to understand what reforms to adopt and what to refuse.

12.

Plugging Leakage of Vulnerable Student Supply Chain: An Innovative Interventional Initiative

Narayan B. Iyer, Jayaraman A.P, Ramakrishna Pillai A. Indian development Foundation Realising that a seamless zero-drop out in the class segment 4 to 8 of Student Supply Chain (SSC) Management is vital for economically disadvantaged societal strata, Indian Development Foundation (IDF) conducted a root cause analysis and isolated homework noncompliance as the single critical variable of school drop-out proneness. Noncompliance of teacher given home work triggers a chain reaction beginning with the ire of the teacher, sneer of homework friendly co-students leading to the eventual exit of vulnerable students from the school. Numerous remedial measures are in place. IDF has designed a low cost, high value
innovative interventional initiative within the constraints of resources and restraints of logistics. The teacher centric, multiclass, outside school time endeavour is popularly known as Bal Gurukul System (BGS). After establishing the first ad hoc BGS for poor rural children in Rajasthan in 2005 and systematically continuing the initial phase, five variants of BGS Version 0 were test run and a standard model was abstracted within a year. Subsequently over 5 years, 170 units were deployed on demand driven mode negating geographical adjacency diffusion model of penetration. Ingrained in the BGS are cross cutting concepts of women empowerment and inclusive growth of the girl child. This paper highlights the strategy of innovation within innovation, the tactical leveraging of a national NGO and the operational outcome over a five year period. BGS stands validated as a viable and sustainable interventional model to safeguard SSC in drop-out prone vulnerable segments of society.

13.

Changing Dynamics of Higher Education Research and Innovation in India: Key Issues

Sheeraz Ahmad Tantray, M.Phil-Ph.D, Central University of Jammu

There is the need for dynamism in higher education, research and innovation in India due to changing lifelong learning needs, growing communication and information technology usage and enhanced networking and social engagements, both with the economic sector and community at large, which have become strategically interlinked in terms of their objectives and modalities. The widening gap between basic and applied research is dominating the challenge of “think global and act local”, necessitating flexibility in research systems and pragmatic approaches serving societies in the widest sense. The advent of knowledge society along its principal engine, the knowledge economy and widening “Digital Divide” has shaped the social change resulting in the acceleration in the risks of marginalisation. With most of the innovations occurring outside academic environments, the diminishing dividends of Indian higher education with public money at stake has failed to translate the knowledge into innovative actions thus losing competitiveness in the global knowledge society. The need for growing dynamism of “research for innovation” and “research on innovation” with meta-analysis of crucial knowledge systems, the need for growing partnerships between governments, the economic sector and the research institutions so that new knowledge becomes linked to developmental goals has been thoughtfully deliberated in the present paper. Though the analysis focuses on redefining of Indian higher education system, the global trends and future directions are also mentioned therein.

Keywords: Applied research, Knowledge Economy, Digital divide, Innovation.
14.

Shift from structured to unstructured education system

Sachin A Mandavgane, Associate Professor, Department of Chemical Engineering
Visvesvaraya National Institute of Technology, Nagpur

Over a period of time, pedagogy has been developed with a focus on ‘how to think’ than ‘what to think’. It is a blend of project based learning, participatory learning and evolutionary learning. Effective use of ICT, social media (Facebook and Whatsapp) is done. Assessment is based on the response to unknown challenges than correctness in solving known challenges. The entire process of teaching-learning (education) is very structured. Everything is prescribed and recommended. The challenges thrown to pupil are also either ‘known’ or ‘similar’ to known. Obviously those who excel in this process lead very structured, safe, conventional and a ‘comfort zone’ life. They live above ordinary life but rarely extraordinary life!!! We find that those who lead an extraordinary life, a life of a torch bearer for the society or who are synonymous of excellence generally have not shined meritoriously during their learning process. During their student life most of them were either mediocre or dropout or had a low profile or missed out from the mainstream. They somehow missed the ‘skills’ imparted through teaching system. One change I would like to propose is to make education system unstructured. Let the thick walls of examination ‘pattern’, assessment ‘schemes’, ‘framed’ course curriculum and all such rigid structures be demolished. Instead let student be taught fundamentals of the course and made to ‘explore’ the course of his own. An eco-system should be developed where a student will be provided a kitchen space, groceries, utensils, a recipe book and even access to a foodie channel. Let teacher be all along with him for hand holding, guiding, cautioning and teaching just ‘fundamentals’. In short very limited ‘classroom’ contact time and maximum ‘student-teacher’ meeting time. Let entire education process be made as unstructured as possible and lifelike. Let the students be assessed based on their response to ‘unknown’ challenges/situations. Structured program has smothered innovative ideas, risk taking ability and killed independent thinking. The system is extremely good to produce a disciplined and obedient herd. The approach to transform from structured to unstructured education system is explained by using author’s courses as a case study.

Session 4: Papers 15-19

Chair:
K B Jinan, Visiting Faculty, NID-Ahmedabad

Co-Chair:
Ankur Sarin, Faculty, IIM-Ahmedabad

Date: Jan 20, 2015
Time: 16:00-18:00

52
Innovation in education: introducing creative training in language, intellect, and originality

Prasad Sundararajan, Visiting Faculty, Chandragupt Institute of Management Patna, Chajjubagh, Patna

The ‘innovation’ proposed is about the application of a new methodology for training high-school level students for evolving their ‘language’, ‘intellect’, and ‘originality’ to function at higher levels of entelechy. By research data, these three were found to be critical in ‘originalising’ the knowing, and ‘translating’ that knowing into doing and beings. The methodology, named ‘Framework of Creative Entelechy’ has been testified for its efficacy by feedback reports and behavioural event interviews of a sample of those who had undergone training since 1995. The concept ‘entelechy’ refers to the unfolding of a potential; the realisation and actualisation of a potential as contrasted with its mere presence. Entelechy occurs in almost everyone due to normal survival-sustenance activities as well as conventional schooling. Therefore, the requirement proposed is ‘creative entelechy.’ If a few human beings had the entelechy to originate and create ‘new knowledge’ [concepts, ideas, methods, perspectives, and so on] by observing the world outside and inside; then, the learner-humans too can try at least certain entelechies relevant to ‘originalise’ their ‘knowing’ and for translating that ‘knowing’ into ‘doing’ and ‘being’. The research draws upon the observations of great mystics and philosophers, countless researchers, and education-policymakers have suggested the need of such entelechies for real learning and development. Creative analysis of schooling vis-a-vis the objectives of education and the required entelechies resulted in identifying three dimensions of training. They are named: ‘creative language competency’, ‘creative intellection’, and ‘originality’. The three dimensions are trained by a unique methodology named ‘Framework of Creative Entelechy’. The methodology is explained in detail in the paper.

Changing role of the teacher in building environmental leadership skills amongst students - experiences from student environmental action

Annie Gregory, MS Natural Resources and Environment (Behaviour, Education, Communication) Centre for Environment Education

Pramod Sharma, Pursuing PhD in Education from Calorx Teachers University Centre for Environment Education

Even as actors in the education recognise the need to build students skills to join a global workforce and adapt to a constantly changing world, from our interactions with teachers, we see that teachers find it difficult to teach students in ways that achieve these objectives. Environmental education (EE) and Education for Sustainable Development (ESD), as with all other subjects in the school is teacher-led with students as passive receivers of information. Studies in environmental education indicate that to build environmental leadership students
need to be engaged in real life experiences of planning, implementing, problem-solving, working as a team, etc. To address this issue and to make teachers understand this as a learning process we thought it necessary to show examples of what student initiated environmental work could look like. What could be their learning outcomes? What environments facilitate such work? What skills or competencies do students acquire? What role does the teacher play? The paper shares experiences from the Paryavaran Mitra Young Leader for Change, a student initiative of the nationwide sustainability and climate change education programme, Paryavaran Mitra. In this programme, students from rural and urban areas prepared and implemented action projects on environmental issues in their vicinity. We also discuss and invite inputs on the aspects of the initiative which might connect or overlap with what we know about “innovation” and “entrepreneurship” and how we can take this initiative forward informed with this knowledge.

17.

Empowering Quality of Primary Education at the Grassroots Level Through Volunteer Educators: An Interpretive Case Based Analysis

Rajneesh Choubisa, Assistant Professor (Psychology) Department of Humanities and Social Sciences, BITS Pilani

In some critics’ viewpoint, the state of primary education is tenaciously bad and requires ineluctable attention towards its empowerment. As with the solutions, this can be done either through formulating convincingly innovative interventions that can raise the proverbial bar high enough or by engaging communities and stakeholders. As per statistics, almost, all the research activities that have been conducted and carried out by the centre and state government institutions and other bodies have highlighted some serious concerns in their documentations. To address one such problem, an innovative initiative was taken by a student group in BITS Pilani whose efforts culminated into establishment of a not for profit organisation named "Nirmaan". With the passage of time, the organisation has earned it reputation through its various project based activities and efforts. One of its project requires student volunteers to educate rural students in the vicinity of the institute during their free time and the targets of this are achieved in a coordinated manner. This case based analysis provides an experientially interpretive understanding of the various dividends that followed and resulted in the upliftment of the status and quality of primary education at the designated intervention sites.

Keywords: Volunteer-Educators, Empowerment, Nirmaan, Case-Analysis etc.
18.

Creating conditions for creativity in schools by responding to the inherent nature of child and biological nature of learning: Lessons from indigenous cognitive conditions and the re imagining schools initiative at Sadhana village school, Pune

K B Jinan, Visiting Faculty, NID

The paper draws upon the authors experiences with non-literate artisans in various parts of this country studying their knowledge system as well as the conditions that enabled the creation of their knowledge and formation of their worldview. Children have also been the focus of the study as they are the knowledge-link between generations. How they learn and what they learn are very crucial aspects that needed to be studied to understand the cognitive process among traditional communities. Learning is the basic nature of life. The natural process of learning, by its very condition, is an act of creativity because knowledge is created by the learners as they engage with the world. Children study the way the world looks, the quality of its materiality and various phenomena that happen around them. The holistic nature of the world awakens the holistic nature in the child.

19.

Relevance of Gandhian Education System and Economic Model in Contemporary Times: A case study

Malay R.Patel, M.sc, M.B.A

According to Mahatma Gandhi education system should be based on personal, real time life experiences. He believed that education should be self-supporting and local craft centric; which essentially enables an individual to earn decent living and thus cuts the root of unemployment. Gandhi believed that characteristics of craft centred curriculum stresses on co-operative activity, accuracy of planning and individual responsibility. Here, an endeavour has been made to prove the relevance of Gandhian education & economic model in present economic scenario, through a case study of a fervent Gandhian by heart Veljibhai Desai. The case takes you through his life experiences which enabled him to create his own social entrepreneurship venture. Veljibhai incorporated a proprietorship firm called Tiny-Tech Plants in Rajkot in the state of Gujarat, India in 1982. Tiny-Tech plants as an enterprise is mainly engaged in developing and disseminating affordable rural machineries with local assistance as advocated by Mahatma Gandhi. Another firm associated with Tiny-Tech Plants is Aadhunik Global Energy established in the year 2002. This firm is basically engaged in manufacture and development of low-cost renewable energy technologies. Today Tiny-Tech plants and Aadhunik Global Energy are successfully developing and exporting their machineries to 109 countries with an Annual turnover of INR 4 crores. Through Gandhian Veljibhai’s example, we attempt to show the outcome and possibilities of motivating the youth towards sustainable entrepreneurship, which can be proved as an effective step towards the sustainable rural development of India, as proposed by Mahatma Gandhi in his book “Hind-Swaraj”.

Keywords: Vocational education, Rural development, Gandhian-economics, Social Entrepreneurship, Frugal Innovations
Panel (INHLTH): Innovations in healthcare devices, diagnostics and service delivery
Papers: 6

Chair: Richard Fletcher, Faculty, MIT, USA
Co-Chair: Keyur Sorathia, Faculty, IIT-Guwahati

Date: Jan 20, 2015
Time: 09:00-11:00
Venue: Audi-1, KLMDC

1. Mobile Technologies for Global Health Applications

Dr. Richard Fletcher, Research Scientist, MIT & Massachusetts General Hospital
Assistant Prof., U. Mass Medical School, Dept. of Psychiatry

A large fraction of the world’s population now owns mobile phones and the use of mobile health accessories is also growing. These personal devices not only support our personal needs but also enable us to connect to other groups and other communities. Since these technologies are now becoming a permanent part of our daily lives, it is useful to consider how these technologies could be employed for use in global health and public health. In the short term future, we can consider how mobile technologies could be used by health workers for decision support, patient screening, and managing resources. This talk will review a few key technological advances that are enabling new capabilities for health screening and monitoring including neonatal assessment and screening for pulmonary disease. In the longer-term future, however, we recognize that many of the challenges in public health require more than simple screening or monitoring tools, and are related to negative behaviours. As the use of mobile phones and social media extend to more segments of the population, we can begin to consider how mobile technologies could also be used for behavioral interventions as well; sample areas include: household air pollution, mental health and substance abuse. In addition to clinical validation, future mobile technologies will also require advances in health policy and privacy issues, financial business models, technology standards, and healthcare reimbursement channels for these new technologies. While technology alone cannot solve global health problems, mobile technologies are an important tool to help enable new ways of delivering care and scaling best practices.
2.

**XrayTo3D: Conversion of 2D X-ray Images into 3D Bone: Models using Novel Algorithm**

*Vikas Karade, B. Ravi*, Mechanical Engineering Department, IIT-Bombay

Conventional methods of 3D bone model reconstruction from CT scans deals with high radiation dose, cost and time. A 3D model generated from 2D x-ray images may be a useful alternative. Hence, a novel algorithm for 3D reconstruction from 2D x-ray images named as XrayTo3D was developed and tested. The algorithm involves reconfiguration of a template 3D bone shape to match it with the input x-ray images. The reconfiguration and matching is performed using self-organizing maps and Laplacian mesh deformation. The proposed reconstruction method was tested and benchmarked with the existing methods and showed better performance in acceptable range. The method was applied to 22 sets of simulated x-ray images of the distal femur shape. The method was also tested in practical conditions with real x-ray images as inputs. An acceptable range of reconstruction error of 1 mm and 1.2 mm with double and single x-ray images respectively, were obtained based on comparison with the corresponding reference models/ground truth. Computation time for the 3D bone modelling algorithm was less than a minute for each case. Based on the XrayTo3D technology, a tablet/mobile device based 3D surgery planning software named as Tabplan3D was developed for knee surgeries. The software is being tested in a case study which included planning and simulation of tibial osteotomy surgery. The performance of the proposed 3D reconstruction method in practical situations, the software prototype and the case study demonstration proves that XrayTo3D and Tabplan3D can be used to solve real life surgical planning problems. XrayTo3D also has a lot of scope in scaling, performance improvement and many other futuristic applications.

3.

**Human health and effect of Zn, Fe, Cu and Mn deficiencies in soil on micronutrient uptake pathways across soil-plant and animal or human systems**

*Dr VP Ramani, Dr Subhash Parnerkar, Dr KP Patel, Dr AK Shukla, Dr Jaydeep Kagathara, Dr Anita Verma, Dr Anand Mistry, Dr Jitendra Patel, Dr Jasmine Patel, Prof Anil K Gupta, Dr Subodh Bishnoi, Dr Nirmal Sahay, Chintan Vinod Shinde, Dr MA Shaikh, Keyur Panara, Dr Jayshree Patel, Ramkrishna Agarwal, Rahul Jaisingh*

Micronutrient deficiency in humans is widespread across the world. However, measures to tackle micronutrient deficiency and problems associated with it using nutrient supplements and other end have not been as effective as desired. Majority of the common people cannot afford basic health needs and are often short of even meeting the recommended calorie consumption. Mass nutrient supplementation is financially and logistically not viable. The restoration of soil health and thus the micronutrient profile seems to be most cost effective
way of overcoming health disorders caused by deficiency of nutrients. To build on this, a study was carried out in Panchmahal district of Gujarat to find out how human and animal health was affected by the micronutrient health of the soil and the nutrient content that was transferred taken up by the plants that were consumed by humans and animals. Surveys were carried out in 88 villages and recorded possible symptoms of chronic disease incidences. A total of 6541 respondents from 1127 households were interviewed to profile the villages based on the general health status. Using this information, four villages were selected; two each with high and low incidences. A detailed sampling was done for nutrient content in soil, grains, fodder, animal and human serum of all households that grow their own food. Interactions between nutrients within and between three media - soil, plant and human/animal serum were found and are reported.

4.

**Novel Approaches for inspiring innovations in healthcare**

*Keyur Sorathia, Faculty, IIT Guwahati*

Healthcare is a primary focus for a growing and developing country like India where challenges of high maternal mortality ratio (MMR), neonatal deaths, higher rates of malaria, tuberculosis, HIV, malnutrition etc. still persist at larger extent. Such scenario demands an immediate attention, need for appropriate health interventions, diagnosis, delivery and care across the country. These interventions should not limit to urban regions with access to better healthcare facility, but cater to larger set of people across all section and strata of society. This becomes even more important when we thrive to achieve Millennium Development Goals (MDGs) in near future. The recent advancement in technology and its potential impact to deliver critical health services in remotest regions, irrespective of demographics, religion, caste, color and literacy is seen a new ray of hope to achieve better healthcare. Use of new research methods, novel technologies, delivery mechanisms, interdisciplinary approaches, public-private partnerships and involvement and passion of young brigade to seek a change is allowing us to deliver new initiatives like Chetna, Parichaya and many more to cater life-threatening diseases. Understanding contextual problems, use of new medical, technological, scientific and on-field approaches ensure effective and efficient diagnosis, analysis and healthcare delivery among the targeted user groups.

This session aims to bring potential stakeholders, researchers, innovators and all possible people associated with healthcare and to discuss about the needs, problems and potential ideas/approaches/methods to solve a much needed and demanded area of healthcare innovations.
5.

**Scintilla – a portable urine protein analyzer**

**Dr. Pankaj Parashar**, MBBS, PhD (pursuing Biomed Engineering – CBME, IIT Delhi)

When proteins are present in urine the condition is called Proteinuria. This is a marker of much pathology, ranging from Malnutrition to Complications in pregnancy, to kidney diseases, Diabetic nephropathy, cardiovascular diseases etc. There are around 300 million potential patients in India, who need this test for their disease diagnosis, monitoring the progress and prognosis, and even plan future lines of treatment.

Presently, the test is performed on costly imported auto analyzers, which are far away from the reach of the vast majority of the population. There is poor penetration of these advanced healthcare services in the bottom of the pyramid. In the absence of even such a simple test like protein estimation for e.g., a pregnant women lands up into fatal complications of Pre-eclampsia/Eclampsia and requires an emergency cesarean section. This is a dangerous situation and most of the time it is difficult for them to reach the hospital in time. Whereas, if regular protein estimation is done in high-risk pregnancies, then, just by this simple test, planned Cesarean sections can save many lives and huge government funds.

For these and many more cases we come up with – “SCINTILLA,” an innovative “Point-of-care, portable (hand-held), automatic Diagnostic device that can instantly estimate proteins in the given sample of urine, “ANY TIME & ANY WHERE.” Our device can be used by a less educated ASHA worker in the remotest of the villages and equally by a patient for ‘At Home’ monitoring. The tests performed by our device would cost around 10 Rs in comparison to conventional Rs. 50 – 200/test

We are seriously working to bring the product for the betterment of the masses. The Product development is being supported by a grant from BIRAC under BIG Scheme. A private limited Company has been incorporated and the being incubated by Technology Business Incubation Unit at Indian Institute of Technology Delhi.

6.

**Mobile identification of High Risk Pregnancy (MiHRP/CareMother) - Novel approach to provide at door ANC Care and Reduce Maternal Mortality**

Shantanu Pathak, Dr. Shital Munde, Avinash Joshi and Anurag Meena

Science for Society, Mumbai

Every 10 minute a pregnant woman dies in India due to pregnancy complication. 60% of the deaths are due to high risk pregnancies which can be prevented with better healthcare access. With field survey and discussions with stakeholders it has been identified that there is need of
regular healthcare access at doorstep, early identification of high risk pregnancy and empowerment of health-workers with smart tools. MiHRP is the mobile application tool and solar powered portable medical devices kit to provide at door medical care access to pregnant women during 0-9 months. It uses preventive approach to provide care at door with recording details of pregnant women. High risk condition parameter considered are Anemia (Hb<11 g/dl), BPsys (>140 mmHg), BPdia(>90 mmHg), Urine Protein (>30mg/dL, 60 sec), Urine Sugar (>1000mg/dL, 30 Sec), FHS (<110 bps and>160bps), RBS (>200mg/dL), Weight (<45 Kg), Height (<145 cm) and symptoms like bleeding, ankle swelling are noticed. Further based upon the patient history, clinical test results and trends for various parameters are considered and high risk is identified with ‘iHRP’ algorithm for Anemia, Hypertension, Gestational Diabetes, Fetal Distress and mother growth. With development of the solution Proof of Concept (PoC) was established with organization called Doctors for You, Mumbai, Kamineni Hospitals, Hyderabad (nearby rural) and Hedgewar Ruganlaya Rural Mission, Aurangabad. All three locations health workers who are less educated were trained to use the mobile application and devices. It has been observed the high risk pregnancy detection in rural region is ~60% and urban slum it is ~40% done over 230 pregnancies. Multiple languages enable the low educated health workers to use the system effectively and it is observed the socio-economic gains to them are motivating factors for successful use of CareMother. Further the features of the system include voice message sharing, ability to function in no network condition, solar power and divider unit etc. Further for gynecologist/hospital/government it becomes first of its kind “mHIMS-mobile Health Information Management System” to instantly receive and maintain the data on system without managing papers and avoiding delay which is roughly 15 days from ground to current tracking system. To achieve Millenium Development Goal of reaching MMR to 105, India requires smart tool with better access and early intervention mechanism with focused approach for worst performing cases. Willingness of the government proposed system can also be integrated with the existing practice.
1. Challenges of Grassroots Innovation: Designing effective organizations for weaver community

Sumit Mitra, Associate Professor, IIM Kozhikode, Kerala
Suresh Kalagnanam, Associate Professor, Edwards School of Business, University of Saskatchewan, Canada
Margie Parikh, Professor, B.K. School of Management, Gujarat University, Ahmedabad

Recently emerged social entrepreneurship (SE) approaches have been criticised for their excessive focus on stage-based activities and characteristics rather than the dynamics involved in ‘the evolution of the processes’ through these stages, particularly, the intermittent stage modification of systems and processes to improve performance using a path-dependence approach. This paper is aimed at filling the gap existing in these accounts by extending the research focus to an intermittent lifecycle stage of an existing SE process where demands arise out of evolving linkages across the formal and informal sectors. These demands are addressed using organisational innovations that involve the weaving communities. This was done by introducing ‘knights in armour’ weaver assistants, trained assistants from among peers of weaving women as role models. Linking the headquarter staff more closely to the grassroots was done by introducing them to the founders’ vision of weaver welfare through the value and knowledge transfer of “founders’ mentality”. A single site longitudinal case study helps to understand the grassroots organisational innovation discussed.
2.

Bio-tourism: A Community Based Endeavour for Promotion of Ecotourism and Local Resource Based Employment Generation in Himalaya

J P Maithani, AAGAAS Federation, Chamoli, Uttarakhand

AAGAAS is running a Biotourism Park Chamoli which linked with the 75 SHGs and more than 400 members working for hill bamboo craft, promotion of Himalayan Nettle as a natural fibre, ecotourism, fruit and vegetable processing, conservation of medicinal and aromatic Plants and organic farming. The organisation provides internship opportunities for students. The aim of project is to explore and promote ecotourism-linked livelihoods in Uttarakhand. For sustainable livelihoods existing community based cultural practices linked with natural resources can be adopted.

3.

Limits to Innovation in Indian Handicrafts: Issues in Exclusion in Two Rural Clusters

Keshab Das, Gujarat Institute of Development Research, Ahmedabad

Rural clusters in India have been estimated to account for a whopping 94 per cent of all clusters in the country suggesting their significance and spread. These contribute to local income and employment generation in a substantive manner and being often local craft and material based these have served as workshops of innovation. In a manner, these rural enterprises have played a role in dissuading distress-driven rural to urban migration. The promotion of clusters of micro, small and medium enterprises (MSMEs), particularly the policy emphasis on linking local production to the global markets, has implied a serious undermining of some of the arduous constraints facing the ‘moving-up’ of the enterprises located in and/or based upon resources – both human and natural - from the rural regions. Proposing an intervention in building up an innovative ethos in the rural enterprise sphere would also, quite imminently, involve raising questions about the ‘preparedness’ of the cluster ‘stakeholders’ and limits faced by rural clusters functioning within the framework of sub-national market imperatives and imperfections of a resource-technology-business support institution. The study makes a case for ‘empowering’ rural clusters (ensuring access to affordable and reliable supply of electricity to enterprises) and holds that looking for newer markets (especially, within the domestic and regional space) would not only act as a catalyst for innovations in methods, materials and applications but also potentially develop useful networks in learning.
4.

Innovations – drive and driver: journey to develop a unique system of plant moisture application through System of Water for Agricultural Innovation (SWAR)

K S Gopal, Centre for Environment Concerns, Hyderabad

The paper tries to draw insights from the experiences of the authors in the context of undivided Andhra Pradesh when the National Rural Employment Guarantee Act was drafted. Experience from Maharashtra’s State Rural Employment Guarantee Act had highlighted many broadly known aspects of the employment guarantee scheme that needed to be tackled to maximise its effectiveness and scope. While the NREGA was being developed by the UPA, the authors decided to use the National Food For Work (NFFW) to understand and test crucial aspects needed to the workers well being. NFFW was a scheme having food and cash component and piloted in 180m districts by the UPA, before NREGA was legislated. The Centre for Environment Concerns (CEC), an NGO with which the author works, entered into a voluntary services offer agreement with the AP state department of rural development in 2005-06 to implement the NFFW in select villages of one Mandal in Ananthapur in Rayalaseema region and the other in Medak in Telangana region. This provided many insights on the issues and how to address them.

5.

Traditional Governments and the natural resources management in Manipur: A case study of Sekmai village

Rakesh S. Khwairakpam, Doctoral Candidate, Tata Institute of Social Sciences, Mumbai, India

In Manipur, the traditional governments continue to control and management the larger area of natural resources even after the implementation of three tiers governments such as central State and Local governments of India. The area where this system is in vogue is among all the recognised Scheduled Tribes (ST) and the eight Scheduled Caste (SC) Loi inhabited areas. The ST inhabits all the five hills districts and the SC Loisinhabit in the foothills in Manipur. Sekmai is one of the SC Loi villages which has been controlling and managing all the Khuman Ningthou Ching (community forest), Turen (rivers), streams and land since the time immemorial. The Phamneiba (traditional government) used to control and manage almost all the community natural resources for centuries. But recently forest and the river has been transferred to the indigenous parliament. The paper will study the natural resources management system prevalent during the Phamneiba period. It will also explore the present resource management system of the Sekmai Indigenous parliament.

Keywords: Phamneiba, Sekmai Indigenous Parliament, Natural resources management, Khuman ningthou ching and Turen
A community operated compensation scheme for crop damage by wild herbivores

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Damage to agricultural crops by protected species in the vicinity of wildlife parks is an important but underestimated problem. Since, measures to protect crops are generally met with limited success in areas with high animal density, some form of compensation for the damage is necessary to avoid resentment in local farmers. Currently, in India, compensation is paid following a panchnama and deciding the extent of damage visually. Since objective and realistic assessment of damage is difficult, farmers have large scale resentment for being undercompensated. We suggest here an alternative model of compensation which is community operated. It is based on a novel method of recording the net loss in produce which ensures honesty in self reporting. The data collection and compensation calculation is based on principles of game theory in human economic behaviour in such a way that it would facilitate good agricultural inputs and honesty in reporting the produce. The realistic data collected this way can be used for many purposes. Beyond compensation for wild herbivore damage the concept highlights management principles in which there is built in reward for honesty and therefore a community can run a programme for its own benefit with minimum organisational help from government.

Keywords: Crop damage compensation, community data collection, community operated system, game theory, economic behaviour.
Exploring the Grassroots Innovation of Bamboo Bicycle in Imphal City of Manipur: Geography of Sustainability Transitions Perspective

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This paper focuses on lack of spatial and the regional sensitivity of sustainability transitions theories in the urban context of Imphal city of Manipur. Empirically this paper challenges the unsustainable existing regime of urban transport sector in Imphal and discusses the environmental activism of Manipur Cycle Club (MCC) in the heart of Imphal city for popularizing bicycles with the idea of better environment, economy and health. Since its inception on 23rd January 2011, the members of the MCC have been organizing cycle campaign around the city for spreading the message of low carbon sustainable city. They also support the global cycle movement known as Critical Mass. MCC drafted the state policy for mitigation and action on climate change and also submitted memorandum to the Chief Minister stating the existing condition of urban transport system and suggested means for a better management of the city.

Keywords: Grassroots Innovation, Sustainability Transitions, Strategic Niche Management, Bicycle, MCC, Imphal City
2.

Phenomenological Approach to Study the Essence of Grassroots Innovations
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Recently, India has demonstrated a huge potential in the innovation landscape, however, the grassroots innovation (GI) phenomenon is still undermined and the aspirations of the individual grassroots innovators (GIrs) have been overlooked. Little is understood about the experience of the grassroots innovators (GIrs) and what sense they make about the grassroots innovation phenomenon. The ecosystem for individual innovators at the grassroots is weak thus adversely impacting the GIs that may have a commercial future (Gupta, 2013) and aspirations of the individual GIrs have been disregarded by the policymakers and formal sector (Dheeraj, Basant and Gupta, 2003; Gupta, 2013; Pathak, 2008). The voices and the essence of their lived experience are also undermined in the innovation and business management research. Therefore, this paper seeks to fill the existing gap and proffers the use of phenomenological approach to discern the essence of the GI as experienced by the GIrs. This study proposes a constructivist episteme and interpretive stance, to explore the GI phenomenon. The in situ revelation of the essence of the GI phenomena aids the sui-generis conceptualisation of grassroots innovation which can serve as a useful guide for development agencies, policymakers, activists, and researchers.

3.

Understanding Modes of Creativity for Effective Innovation at Grassroots
Peer Mohideen Sathikh, Acting Associate Chair (Academic), Design and Media College of Humanities, Arts, & Social Sciences, Nanyang Technological University

Creativity is defined by the author (2010) as “the result of a playful exploratory process, by a person/group, who/which is open, curious and imaginative in a conducive environment whose result is novel and useful.” Qualitative differences do not appear all of a sudden in any system, company or society unless creativity is synthesised properly. Moreover, qualitative differences alone will not qualify for innovation unless a value proposition of some order is realised.

The value propositions of innovations at grassroots level, in many ways, are different from innovation of the urban centric world. Smith et al (2012) in an article titled Supporting Grassroots Innovation: Facts and Figures state one defining characteristic, “grassroots innovation must emerge from, or be directed towards, local development”. What this usually translates into are projects such as developing drivers and gear trains for their cycle rickshaws or low cost water pump or rainwater harvesting, etc. The value propositions in such development directed grassroots innovations are rather obvious, though they may or may not be accepted by the local community till such value proposition is translated into money or other tangible benefits.

Listening to the pundits of the “bottom of the pyramid (BOP) innovation”, such as C.K. Prahlad, R.A. Mashalkar and others, one gets carried by the urge to translate a global innovation process with the assumption that all grassroots innovation needs to be
development directed and will lead to some form of monetary benefits. Is this all there is, to grassroots innovation? Innovation at grassroots level has become a means to revive, modernise and contemporise the surviving art and culture heritage in meaningful ways that benefit the people, culture, heritage and the society. The value propositions in such innovations, often, do not amount to tangible benefits immediately, but bring about qualitative differences that eventually lead to benefits. This paper highlights the need to understand difference in creativity in order to affect a paradigm shift in thinking about grassroots innovation through thorough definitions, literature studies and case studies. Through this paper, the author intends to highlight the need to re-align our thinking on grassroots innovation and points to possible innovation processes that effectively harness the outcomes of idea creativity and artistic creativity in an effective manner at grassroots level.

4. Identification and Acceleration of Farmer Innovativeness in Upper East Ghana

Tobias Wünscher, Center for Development Research

Global change demands farmers to adapt more rapidly to changing conditions than ever before. Innovation can be part of the adaptation portfolio. While the generation of innovations has traditionally been attributed to research organisations the farmer’s own potential for the development of innovative solutions has largely been neglected. In this study we explore the innovativeness of farmers in Upper East Ghana. We employ a farmer innovation contest for the identification of local innovations and for the stimulation of innovative behaviour. Awards such as motorcycles function as an incentive for farmers to share innovations and develop new practices. We use an experimental set up to test the potential of the contest as a policy tool for the fostering of innovative behaviour. Farmer innovativeness is measured as an index which we generate from various innovative behavioural patterns. Two contest rounds have already been completed in 2012 and 2013, with two more rounds foreseen for 2014 and 2015. We have so far received a total of 92 applications, many of which present highly innovative practices. Baseline data for the impact assessment of the contest were collected but final results will only become available in 2016, after the last round of the contest. Nevertheless, the results so far indicate that farmers do actively generate and test innovative practices to address prevalent problems. These local solutions can help overcome some of today’s global challenges and justify the use of an innovation contest for their identification.

Keywords: Innovation policy, innovation incentives, Award, Contest, Upper East Ghana
5.

**Empowering Rural Lives – A Success Stories from Agri-Business Incubation Program, ICRISAT**

SM Karuppanchetty, Chief Operating Officer, Agri-Business Incubation (ABI) Program, ICRISAT

In India and around the world, the demand for agriculture produce is on peaks. To bridge in gaps the price differences between consumer and producer and to give boost to the agriculture community by increasing the profit margins the Agri-Business Incubation program (ABI), of Agribusiness and Innovation Platform, ICRISAT is directly linking marginal farmers to markets to sell their produce and incubating the individual entrepreneurs to start up the new business ventures. ABI has initiated a number of reforms such as funding, mentoring, commercialisation of technologies, business consultancy, intellectual property rights and legal supports, with large no of networks with an objective to earn more profit margins to the farmers and further by diversifying the profit margins to increase research efficiency in production. This paper explores the success stories of BR Cooking Spray Pvt Ltd., Eruvaka Technologies and KKFF incubated at the grassroots at the Agri-Business Incubation program (ABI), and role played by ABI, ICRISAT in successfully mentoring, commercialising the product.

**Keywords:** Innovative technology, Environment, Farmers, mentoring.

6.

**Innovative Service Delivery Model to Serve the Rural People: The VLE Model**

Dr. Ajith P, Education Specialist, UNICEF, Chhatisgarh

Dr. Anita Goyal, Associate Professor Indian Institute of Management, Lucknow, India

VLE (Village Level Entrepreneurship models are becoming increasing popular in the Indian context. The promotion of rural entrepreneurship will provide jobs to many people especially rural youth and women. This will also lead to better utilisation of all resources in rural areas including human resource. When a company decides to sell its products and services in rural markets, one of the most important decisions it will make is the design of its distribution network. The existing model of using redistribution stockists for distribution small villages would be very expensive and unviable. The role of VLE in effective rural distribution is critical. The paper discusses the challenges of rural distribution for marketing organisations and the role of VLE development. The innovative VLE models adopted by few pioneering organisations in the Indian rural markets are examined to get an insight into the benefits of the VLE model for all stakeholders. Analysis of the existing models has enabled the development of a generic VLE model which can be adopted by other organisations interested in empowering rural people through entrepreneurship. The paper also introduces the concept of ‘partsumer’ which is closely linked to VLE. The ethical aspects of the rural supply chain are also highlighted. Key Words: Service innovation, Rural entrepreneurship, VLE model, Rural marketing channel, Partsumer
Organising grassroots design: Epistemic practices employed by members during the design of technological innovations within grassroots communities

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Despite continued efforts to make development-oriented design empathic, participatory and user-centred, research and practice on design for development continue to distinguish between researchers, designers and users. Design efforts involving economically and socially marginalised communities in the Global South continue to frame the members of such communities as low-income, low literacy users for whom technological solutions need be designed (and who are presumably less capable of independently designing technological solutions). Joining with recent calls for greater reflexivity among design researchers and practitioners regarding their implicit assumptions and biases about communities as entities that must be designed for, I present a critique of social, material, and cultural differences that are cast as: (a) challenges to the research and practice in the field (e.g. Best & Smyth, 2011; Brewer et al., 2006; Dell, Vaidynathan, Medhi, Cutrell, & Thies, 2012), or, (b) clichéd accounts of entrepreneurial zeal and homogenised resourcefulness that is practised in the face of adversity (e.g., Rajdou, Prabhu, & Ahuja, 2012).

I trace such differences to scholarly assumptions regarding similarities and distinctions between the researchers’, designers’ and users’ attributes and knowledge practices. I describe how the local epistemologies practised by members of marginalised communities have the potential to be neglected or discriminated in three circumstances that universalise and homogenise community members: (a) when the creative abilities and knowledge practices of community members are ignored or treated as constraints on field research (represented metaphorically by the label janta, the public), (b) when the creative attributes and knowledge practices of community members are valorised and cast as being incommensurably distinct from attributes and practices of their educated and resource-rich counterparts in the academy and industry (represented metaphorically by the label jaadoo) and, (c) when resource-
constrained individuals’ enterprising abilities are framed as ideal templates for firm-level business practices of innovation (represented metaphorically by the label, jugaad).

To contest these labels, I identify communicative practices underlying collaborative knowledge sharing within grassroots communities by synthesising reflections on my assumptions, biases, and learning that occurred when conducting field research on the organisation of technological innovations with a critical review of the scholarly and popular literature on design, development, social innovation, and entrepreneurship. I share my learnings about the ways in which members develop novel, affordable technological solutions for locally occurring problems in their communities. In doing so, I draw on my participation in a five-day Shodhyatra in Jharkhand, India with members of the Honey Bee Network, and open-ended interviews, guided conversations and participant-observation of grassroots innovators and their local collaborators across 25 rural, semi-urban, and urban communities in India over three months.

I demonstrate how the “go-along” method can enable field researchers to “actively explore their subjects’ stream of experiences and practices as they move through, and interact with, their physical and social environment” (Kusenbach, 2003, p. 463). My findings presented in part as a conversation with my informant, collaborator, and mentor Amrutbhai Agrawat suggest that individuals who develop technological innovations at the grassroots are frequently motivated by a perceived responsibility toward their local communities. Such grassroots innovators may or may not remain sanguine about the imitation of their designs by others. Their openness in sharing design-related knowledge is associated with the adoption of an empathic design process in which innovators leverage their social and material embeddedness in local communities to observe and reflect on technology use in naturalistic settings. Grassroots innovators engage with human needs in specific geographical, economic, social, and cultural contexts and embody the potential for knowledge-rich, resource-poor communities to develop successful solutions to local problems. Grassroots innovations represent a community-based and user-driven model of technology design based on empathy and social responsibility that that problematises labels such as traditional, indigenous, and grassroots. As design for development scholarship develops its transnational agenda, we offer our research design and findings as points of entry for researchers to reconfigure the relationship between designers, users, and the contexts in which their interactions are situated.

2. Design of an efficient and ergonomic bangle-making furnace and tools
RuTAG, IIT Delhi

This paper presents ideas for improving the performance of bangles-making furnace and the working conditions of the artisans making bangles. The focus is on modification of bangle-making furnaces being operated in the Bharatpur district of Rajasthan, India. The traditional furnace in use in this region uses powdery agro-waste as fuel, and is inefficient, polluting and non-ergonomic, although it has been modified over the years by the artisans themselves for
better performance. However, the problems of inefficient fuel combustion, very high working temperatures around the furnace, discomfort in handling the tools, and health problems due to smoke and the working posture have been persistent. After the addition of a chimney to the furnace by an NGO, Lupin foundation, the smoke could be taken out of the working area but other problems were still left unaddressed. The Rural Technology Action Group (RuTAG) IIT Delhi has taken the initiative for finding solutions to these issues. The furnace has been redesigned for higher efficiency and drastic reduction in smoke with the use of briquetted fuel on a grate, a compact combustion chamber and controlled air supply. The foldable ground chairs have been adapted for the use by the artisans considering the ergonomics of the operation. Improvements in the tools have also been devised to reduce the discomfort in their handling. The approach is to design a system which will be acceptable to the artisans, through periodic feedbacks from them and incorporating the same to arrive at a better design.

3.

Low cost technologies for cold arid desert

Dr Shashi Bala Singh, Outstanding Scientist & Director, Defence Institute of Physiology and Allied Sciences (DIPAS), Defence R & D Organisation, Timarpur, Delhi

Leh-Ladakh is a cold, arid desert with a harsh climate and remains in a landlocked condition for six months during winter. Complicating matters further is the lack of oxygen and heavy snowfall. These factors lead to a very short agricultural season. This region is characterised by extreme, low precipitation, very low humidity, high UV-radiation, high wind velocity and a highly permeable immature coarse textured soil. Sustainable agro-animal production is a big challenge here. Defence Institute of High Altitude Research (DIHAR), a constituent laboratory of DRDO, is actively engaged in scouting the local traditional knowledge and its validation, value addition and eventual dissemination and distribution to the farmers via the state agriculture department. For augmenting the fresh food supply in the region, DIHAR has developed various technologies for greenhouses, vegetable production, veterinary sciences, potato storage, onion cultivation, vermicomposting, germplasm conservation using local knowledge or resources. DIHAR has also contributed to post harvest value addition of the local produce. The paper documents how DIHAR has been using traditional knowledge to transform the region.

Keywords: Traditional Knowledge, Value Addition, Validation
The Himalayan Ecology Project

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The Himalayan Ecology Project began with the Industrial Design Department partnering with the Deer Park Institute, located at Bir, in the Kangra District of Himachal Pradesh. The objective was to gain insights on rethinking the design of products, processes and systems for communities in the Himalayan region. Tasks like identifying areas for design interventions, developing and reinforcing green design practices, creating innovations towards sustainability and reclaiming, recognizing and reviving local traditions were carried out. Water purification, passive heating, waste management and its up-cycling and renewable energy, creating products for sustenance of local traditions and sustainable livelihood generation from local knowledge systems were identified as potential areas for design impact. After brainstorming, ideation and modelling, a final design proposition was made. Sixteen rooted and grounded design solutions that stem from the ecology of the region, using materials and processes prevalent locally. It was that generate employment opportunities while integrating with the existing style of living of the community.
5.

Using Fuzzy NPV for Appropriate Technology Project Valuation in Indonesia

Case Study: Small Holder Coffee Processing Industry Development in Belu, East Nusa Tenggara

Yusuf Andriana, Elok Wahju Hidajat, Wawan Agustina, Cahya Edi Wahyu Anggara
Development Center for Appropriate Technology Indonesian Institute of Sciences West Java, Indonesia

Indonesia is the third largest coffee exporter in the world after Brazil and Vietnam, but the majority volume of coffee export from Indonesia is in the form of coffee beans. Most coffee production in Indonesia is dominating by small holder plantations. East Nusa Tenggara (ENT) is a province in east Indonesia which has a high production of the coffee bean, but coffee farmers in ENT live in high poverty. To increase the incomes of the coffee farmers in East Nusa Tenggara, value addition on the coffee bean is needed. Coffee bean processing involved several activities from on farm activities until processing the end product to the customer. Our study was focussed on imparting training to the entrepreneurs on processing coffee mix and how to use full colour paper-metal sachet as primary packaging at local community coffee farmer to increasing their income. We introduced several changes for packaging that included packaging equipment and use of full colour paper-metal sachet as primary packaging. We used Fuzzy NPV for evaluating the feasibility of the investment in these technologies. There was high level of acceptance of the processing technology among the local coffee producers. Initially, the low level of knowledge and skill about the secondary processing of coffee proved to be an obstacle in the adoption of technology. However, after personalised capacity building and intensive training the farmers could grasp the process.

Keywords: appropriate technology, fuzzy NPV, small holder coffee, project valuation, SME development
6.

Involvement of Design Values, knowledge and process for Grass root innovators to create market able products

Umang Shah, Sr. Industrial Designer, LUMIUM

It has been observed that innovations or prototype at the grassroots create a very interesting buzz in different levels of society. However, only a few pass through the different phases of product development to arrive at the stage of mass manufacturing. Even then, often, acceptability is a challenge. We would like to showcase here, with different case studies, how use of design process, design values and design knowledge can transform just an idea or a proof of concept by grassroots innovators into a ready to produce product that can be adopted by the masses.

Keywords: Design Thinking, Technology Adoption, Scalability

7.

Case study: Giving voice to the farmers, machine operators, local service providers and small scale manufacturers in designing scale-appropriate agro-machinery for Rural Bangladesh

Sharmistha Banerjee, MSc Integrated Product Design, Assistant Professor, Department of Design, IIT Guwahati

This case study describes the Human Centred Design (HCD) approach adopted to re-design a two-wheeled power tiller (2WT) based agro-machinery, Bed Planter (BP), suitable for low-income farmers possessing small farms which are less than a third of an acre in size, in southern Bangladesh. The HCD process attempted to rope in the voices of farmers, machine operators, local service providers (LSPs) and small-scale manufacturers in ascertaining their current difficulties, needs and aspirations as well as in the design of the machine. The HCD process also took into account local small-scale manufacturers’ production capabilities and ways to enhance the same so as to enable local manufacturing of the product and create employment opportunities thereby. It describes an attempt to collaboratively work with the grassroots, build empathy and design together. This case study describes the semi-structured interviews, contextual inquiry, co-creation workshops and mock-training sessions conducted with all the involved value chain actors and the learning made in the process. The assignment is part of the project Cereal Systems Initiative partnered for South Asia “Mechanisation and Irrigation (CSISA-MI)- a project by International Maize and Wheat Improvement Center (CIMMYT) Bangladesh and International Development Enterprise Bangladesh (iDE-B) and is funded by the USAID Mission in Bangladesh under the Feed the Future (FtF) Initiative.
The assignment used the BP developed by Bangladesh Agricultural Research Institute (BARI) and its reverse engineered version by a local workshop owner as the starting base.

**Keywords:** Human Centred Design, scale appropriate agro-machinery, bed planting, small-scale farming

8. **Crowdsourcing transparency for Indonesia Presidential Election**

**Elisa Sutanudjaja,** Kawal Pemilu’s administrator Open Data Evangelist and Urbanist

During the last president election in Indonesia, there were some doubts on the fairness surrounding the election process. Then several citizens initiated various types of crowdsourcing platform to enable other citizens and volunteers to enter and/or monitor election process and calculation. Some of them created a platform that enables fellow citizens to enter digitised data of the scanned result from the voting booths. The highlight of this initiative is KawalPemilu.org, when eventually they managed to finish election results counting one week earlier than the official results and only differ by 0.14%. This grassroots innovation succeeded to return and build the trust of the people on the election process and the Indonesian National Election Committee (KPU). This initiative is important because it marks the beginning where the people become the subject on the election process. Not the government, but the lay people who campaign on how people can guarantee the fairness of the election. In this exposition, we present the insight of the platform and hopefully can share it to others.

9. **A study of ethical issues concerning doctors, pharmacists and pharmaceutical representatives in the Indian health care industry**

**Anula Gupta,** Dept of Management Studies, Government Engineering College Ajmer

The Indian healthcare industry is at crossroads when it comes to the ethical aspects which govern it! When patients go to physicians they often are treated in an impersonal process that not only alienates the patient but also prevents the physician from knowing the patients’ needs. Sometimes hygiene is also not maintained. The paper tries to touch upon many such ethical drawbacks facing the medical fraternity and have tried to do justice to the Doctor-Patient, Pharmacist-Patient and Doctor-Pharmaceutical Representative interfaces in a way that will bring out the lacunae in the medical profession openly and objectively.
1. “Home Kaizen- an unique experiment of involving workmen’s wives and families in workspace ambience improvement”

Capt Mohanram
V Kovaichelvan TVS Motors

Post-1991 economic reforms, Indian companies faced competition from global entrants to their markets. To survive and grow, they had to scale up rapidly to world class standards. TVS Motor Company (TVSM) adopted Total Quality Management as its mantra for reaching global competitiveness. Two key elements of the model were Total Employee Involvement and Continuous Improvement (Kaizen). World class production standards demanded very high levels of order and cleanliness in the workspace, which was achieved with active employee participation. In India workmen often stay in squalid and unhygienic ‘third world’ surroundings and homes. In stark contrast, they are expected to maintain and operate ‘first world’ factory environments. Such a drastic change in behavior day in and day out creates tensions. TVSM realised that this severe disconnect had to be bridged before world class factory ambience was achieved and sustained. Substantial improvements in the habits and living environments of workmen were necessary, before they could be expected to adhere to high standards of hygiene and discipline in the plant. This could be achieved only with the active support and enthusiastic participation of workmen’s families, especially their wives. Shortly after Kaizen processes were implemented at the workplace, workmen were encouraged to share the concepts with their families to improve their homes and surroundings. The company implemented a novel program of training and assisting the families, to bring order, systems, and cleanliness and continues improvement in the households. Classes and demos were held on relevant aspects of Japanese 5-S systems and to explain Kaizen for workmen’s wives. After initial hesitation, the wives keenly embraced the
idea. They effected dramatic improvements in their homes and colonies. They came out with creative and innovative ideas to improve their homes, increase safety and ensure hygiene. TVSM encourages them by arranging a separate exhibition showcasing the innovations done by the families to improve their standard of living and ambience of the households, during annual Founder’s day celebrations. Prizes and certificates are awarded to best kept homes and innovative ideas. The winning families, especially the home makers, are honored and recognised by the Chairman and Managing Director in front of over fifteen thousand people participating in the function.

This has resulted in superior adherence to workplace hygiene in the plant, which is now renowned world over, for order, cleanliness and ambience.

Positive change does not occur automatically. Someone had to make it happen. It happened when people were made to believe in their intrinsic ability to change – individually and collectively; when they listened to the good ideas embedded within their hearts. It needed encouragement and a positive ecosystem of appreciation. Change occurred when people started believing that it was possible to live a fuller life.

TVSM’s Home Kaizen initiative is the story of a journey which achieved positive change in the homes and hearths of workmen by harnessing the creativity and innovation of their wives and its positive impact on work place ambience.

2.

Mainstreaming gender for inclusive innovation and development

Lindile L. Ndabeni, Institute for Economic Research on Innovation, Faculty of Economics and Finance, Tshwane University of Technology

In a gendered society, men and women are socialised for different tasks and are expected to develop different rationalities. Indeed, the attributes, relationships, and opportunities are socially constructed. Typically, gender is an important source of inequality as it often determines unequal access to socio-economic opportunities. Accordingly, mainstreaming gender is used to refer to integrating gender in policy development and analysis. Likewise, a gender perspective shifts our attention from the individuals to interactional and institutional structures and thereby, opens up opportunities for change. That is to say, the discourse on innovation and gender should shift the focus from individuals to the system which reproduces inequalities and make women invisible in the economy. The objective in this paper is to highlight that gender mainstreaming can actually support the achievement of socio-economic goals; and disclose how women become invisible in a discourse that is framed in a neutral language but is male coded and focuses more on male coded production. Overall, this paper views gender equality as a development goal; and as a means of achieving other socio-economic development goals.
Governance by Women Leaders in Union Parishad in Bangladesh: Unheard Voices and Grim Realities from the Grassroots

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Union Parishad (UP) has been serving as the lowest rural local government in Bangladesh since 1870. Women’s representation in the UP first began with the nomination system in 1976. Again women’s representation in the UP received further momentum in 1997 with the provision of direct adult franchise. Within these 2 decades, women leaders (WLs) have failed to ensure their effective participation in the UP. But it is deemed that through their ceaseless struggle and limited participation, WLs have contributed to governance in the UP. Against such a context, the paper is aimed at unravelling the research questions: how do WLs contribute to governance in the UP in Bangladesh? The paper is based on qualitative research methods that include hermeneutic phenomenological analysis, Focus Group Discussions (FGDs), case study, content analysis and observation methods. The findings of the paper reveal that the WLs are promoting governance though establishing transparency, accountability, social justice and reducing corruption in the UP. WLs are also trying to transform rural governance through increasing pro-poor benefits for the community people and maintaining better quality of development projects and following participative management style in the UP.

Key words: local government, Union Parishad, women leaders, transparency, accountability.

4.

CADS’ strategies in expanding opportunities for women and worker innovators in Zimbabwe

Lillian Machivenyika, Director, CADS, Zimbabwe

The knowledge of women and other workers such as innovator farmers has generally not been acknowledged by societies across the globe. Where they have tried to contribute, in many instances, their contributions have been given far lesser importance. Important innovations and discoveries by innovator farmers have gone undocumented. This paper discusses and shares some strategies which CADS has used to expand opportunities for women and innovator workers. Through publicizing local innovation by women farmers and other innovator farmers, using media such as the national television, CADS has also successfully managed to lobby for policy change with regards to appreciation and adoption of the work by women innovators. CADS has also successfully implemented its programs with a gender lens. Extensive business management and marketing training have been carried out to help women farmers increase farm income, select high-value crops for production and be aware of high quality standards. Women have also been mobilised into forming savings clubs which enable them to start income generating initiatives. Some of the groups have grown to
form Savings and Credit Cooperatives, (SACCOs) through the facilitation of CADS. These SACCOs have managed to secure startup capital with local enterprise development associations and acquired equipment for processing which has enabled them to generate income from food processing and marketing. To further adapt the knowledge of women CADS created a scholarship training program for the education and training of women on food processing with a bias towards recruiting women for the program which has seen empowerment of women enabling them not only to perform their roles as caregivers in a better way but creating employment opportunities for them. The success stories of how CADS has worked to expand the opportunities for women and innovator workers will be presented in this paper.

5.

Role of Micro Financial Institutions in enhancing Entrepreneurial skills among Minority (Islamic) Women: An empirical study

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Dr. Padma.Srinivasan, Associate Professor, Christ University Institute of Management, Bangalore

Indian women have been assuming the role of a homemaker taking care of their children, doing their household activities and also managing to make small savings to contribute to the family’s well-being. Islamic women, as a minority ethnic group, are allowed to participate in business space with purdah. As the business environment is vibrant, these minority women have realised the need to step out of their homes and empower themselves. Due to socio-economic reasons these women do not undergo minimum formal education which poses a problem. If this problem can be resolved, Islamic women can are made economically and financially independent. The positive aspect of their lives is that they cooperate with each other while at work at home or outside. In this context, Microfinance Institutions have been playing an important role in empowering women Entrepreneurs. Yet, there are certain issues such as lack of proper education and technical knowledge which are posing hindrances in these women’s business endeavours. This paper will study the extent to which Microfinance institutions are helping these Islamic women overcome their financial and technical challenges. Having started the business, when she faces problems, support comes from her fellow workers within the group. Yet there are other types of problems and issues faced by these women. To compete with the growing business needs is another challenge for these women. How to overcome these issues and bring about a holistic approach to the problems will be the basis of study. Data will be captured through interviews with minority women who are based in South Bangalore District, Karnataka. The research will be based on primary data, mainly by interview method where 50 women will be interviewed. Other sources will be the secondary sources such as books, websites and reports.
Medicinal plants used by farm women to cure disease and common ailments in Africa

Omede, Ugbede David, P.R Kanani M.Sc. (Agril. Extension), Professor and Head Department of Agricultural Extension, COA, Junagadh Agricultural University Junagadh, Gujarat

Background: Medicinal plants are those plants that are used (parts, extract etc) in treating and preventing specific ailments and diseases that affect human beings. Hence, the important role of medicinal plants in health care delivery (services) cannot be over emphasised. The local people have a long history of traditional plant usage for medicinal purposes. Despite the increasing acceptance of traditional medicine in African rural communities among farm women, this rich indigenous knowledge is not adequately documented. Documentation of plants used as traditional medicines is needed so that the knowledge can be preserved and the utilised plants conserved and used sustainably. The primary objective of this paper is to summarise information on traditional uses of medicinal plants used by farm women in some parts of Africa to cure diseases and some common ailments. In this paper fifty (50) medicinal plants with their scientific (species), family, local, common names and parts used for malaria therapy in Okeigbo, Ondo state, southwest Nigeria by farm women was identified. Also fourteen (14) medicinal plants that are used alone (not in combination) for malaria therapy and their method of extraction was reported. There were trees (38%), shrubs (38%), herbs (21%) and climbers (3%) used as herbal medicines in south-central Zimbabwe. Among the eighteen (18) major ailments and disease categories and plant species reported Gastro-intestinal system and Sexually Transmitted Infection ranked highest. Finally in this paper twenty six (26) medicinal plants with their scientific name, family, growth habit, vernacular name, part(s) used and use(s) and reported biological/pharmacological activities were identified.

Keywords: Medicinal plants, Malaria, Gastro-intestinal system, Sexually Transmitted Infection, Okeigbo Southwest Nigeria, South-Central Zimbabwe
7.

Policy Discourses & Ground Reality: A Need of Social Justice for Innovative Practices at Grassroots

Dr Tanu Shukla, BITS Pilani

Any configuration that is enforced in a pertinent context might suffer from deficiencies and inefficiencies. In recent times, there have been greater commitments by government and international organisation to curb gender inequality for which we require innovative practices at grassroots for sustainable development. The suppression of women is identified by UN as one of the crucial apprehensions that claim an affirmative action. Education is viewed as an acute instrument to uplift the marginalised sections, empower the subjugated; thereby enabling a society to achieve the MDGs at an accelerated rate. The progression in approaching the MDGs for a developing nation is basically firm by the improvement of women’s capabilities. Gender stereotypes in the society have led to the construction of normative certainty about the diverse roles expected to be performed by both gender. The descent of these normative dogmas may be ascribed to sexual division of labour in the society. Determination of such normative credence in the society is armoured by the element that individual in the society irrespective of their gender practices gender stereotypes. The impressions of social roles on behaviour are, predominantly, robust in settings with encounter in role related expectations. It is evident that the capability approach has potential for addressing feminist concerns but it delivers a very generalist outline and no distinct list of capabilities exist in the capability approach framework. This paper strives for larger implications for gender equality and considers capability approach as the theoretical framework to investigate the objectives of study. Hence, this paper is an empirical inquisition with qualitative and quantitative method, attempts to develop the list of capabilities which is important in measuring gender inequality for sustainable development. The findings of this paper will be useful for policy makers to make more meaningful normative frameworks to relocate gender inequality in outline of capability approach which could be referred as innovations in grassroots practices.

8.

'Semiformal' as a link between 'informal' and 'formal' systems in society

Usha Jumani, PGDM and FPM from IIMA

There are two concerns which need to be understood at deeper philosophical levels:- One is the use of the term ‘informal sector’.- Two is explaining the organising principle/s for society. ”Informal” and “formal”™ are two ends of a continuum which depict the extent of verbal-written life transactions of a person in the society. The greater the life transactions of a person are based on written transactions, the greater is the shift to the formal end of the
continuum. “Organised” and “unorganised” are two ends of another continuum which reflects the different level of organisation. Organising is a slow continuous process of enabling a group of people to perceive common interests and act collectively. This is quite different from verbal and written transactions. Yet the two terms “informal sector” and “unorganised sector” are used interchangeably, which also reflects a lack of clarity. Is “informal sector” an appropriate term to explain the socio-economic reality of a country like India? Researchers have moved from referring to large proportions of the Indian population as belonging to the “informal sector” to calling it the “informal economy” but have not yet attempted to understand this phenomenon as a systemic process. There is an informal system and a formal system both of which encompass work, trade, finance, enterprises, justice, governance, property rights, social protection, insurance, service provision like education, health, water and sanitation, to list some facets of life. “Informal” and “formal” are systems, a way of structuring society, a philosophy of life and living. The appropriate term should be “informal systems of society” and “formal systems of society”. Both the systems have their organising processes, their ways of functioning, and their own validity. The efforts to establish the formal system as superior to the informal system is what causes issues of exclusion, invisibility, and being ignored for large sections of our population. The institutional innovation of the “semiformal system” can provide an effective mechanism to understand the linkages between the informal and formal systems. In fact, such linkages exist and are being used increasingly to include more and more people on various life transactions. 

What is the semiformal system of society? How has it developed? How does it function? What is its efficiency, effectiveness, and equitableness? What role can it play in building low cost institutions which are necessary for all-round systems sustainability in society? What role can it play in meeting the societal challenge of providing an organisational umbrella for all people? How does it emerge as an organising principle for society? This paper explores these questions by studying real examples of semiformal systems in selected facets of life from the Indian context to develop greater conceptual clarity about this institutional innovation.
1. “Edusafar”- it as a tool for teacher networking, information sharing and learning processes

Kamlesh Zapadiya, Shree Fulzar Sim Primary School, Jasdan, Rajkot

The teacher faced a severe problem of sourcing web based information which could help him to resolve the educational needs and also upgrade teacher himself or herself for future academic courses. In his geographical area, which is very backward, having internet connection was a priced possession, the whole world was using internet for sourcing and communicating information and these teachers were deprived of this fact. Six teachers came together and made up their mind to resolve these problems. After putting lot of efforts they managed to get and internet connection even though the signal strength was weak and also the flow of electricity was irregular. The six teachers started to write their own blogs and started to share information, but they thought that the outreach of sharing information was limited as it was blog so they thought that a proper website would be an ideal initiative. The teachers launched a website named “EDUSAFAR”. Through this website material pertaining to teachers, students and education was disseminated. The website was teacher focused and many articles, authors; content writers and other individuals who had contributed in education or any other important initiatives were also connected as they were the main source for providing and creating information and knowledge base for teachers on website. The other major outcome was that a teacher’s network and individuals interested in education started to come together and an informal network has started to form. Secondly this website also provides a platform for teachers to interact and resolve their confusions and queries pertaining to education. The innovation has a lot of scope in training teachers as well as perspective building of student teachers.
2.

"MY FAVOURITE SCHOOL" – Multi-grade and multilevel learning system through short stories without use of compound consonants

Bhavesh Pandya, CRC-CO Deesa, Banaskantha

A newly appointed teacher, Bhavesh Pandya joined in 1999 in a primary school in Dedol, block Deesa, district Banaskantha which had only two teachers which included school principal also for teaching one to six standards. Banaskantha is one of the backward districts of the state having high prevailing population of backward classes. The first challenge which showed up was to combat the situation of classrooms attended by students without a teacher. To arrest this problem and make things more operational and workable a constructive approach was framed to teach multiple classes with one single teacher-Bhavesh Pandya. With support of the school principal the challenge was dealt and an effort of teaching multiple classes with single teacher achieved successful results. While this process of handling multiple classes other matter which surfaced very quickly and strongly was that students had very poor reading and learning skills and that was affecting the learning outcomes of every student, which was also found in higher grades. The challenge was big and many attempts were done to arrest this problem, an idea was contemplated to resolve this problem with help of short stories. The teacher started to use short stories as a tool for improving reading and learning skills among the students and this innovation started to show the positive results. The students were able to identify letters and words in the text matter which also helped students to read and learn other subjects and that was the prime outcome of innovation implemented and there were also other products of the process which came out while implementing the innovation for an instance that teacher started to write short stories without use of compound consonants which served as the content matter for reading and learning. The innovation also provides scope as a material which can be used as reference material in teacher training programme and these stories were published in school text books for standard I to 8 and also in education degree colleges.

3.

Peer teacher-driven network for learning: State Innovation and Research Foundation (SIRF)

Sidharam Mashale, Solapur, Maharashtra

Starting as a voluntary group of teachers inspired to form a “dhadpad manch” by an education officer in 1997, the State Innovation and Research Foundation (SIRF) is today a registered voluntary network of innovative government school teachers. The initial innovation of the group was the "teachers' clinic"--good teachers would visit different schools on the weekends and solve educational problems Later, with support from IIM Ahmedabad, the activities expanded to about 3000 innovative teachers. SIRF provides a platform for the exchange of ideas and showcasing of actual experiments through local
conferences of the member-teachers. All expenses are met by the teachers themselves or through small donations. SIRF is actively working on issues related to Right to Education, continuous evaluation of children and the role of School Management Committees. SIRF has validated about 2000 innovations in elementary education in Maharashtra and is now involved in assisting the State Educational Council for Research and Training in identifying innovative teachers and their innovations in about eight districts.

4. “Vidyadham @ Boru”-individualised and peer learning with the help of information and technology

Mehul Suthar, Vidyadham Boru Primary school, Mansa, Gandhinagar

There were many problems which were faced by teachers in routine in the school during 2011 in Boru primary school. But the most important part was to rise above these problems and bring school to new heights. So the teachers of the school thought to do something new and innovative which will score heights for the school, in this regard they thought that today it is world of information technology and appropriate use of it will help them to achieve their dream and co-incidentally they got an opportunity to establish school based IT related infrastructure for educational purposes. The infrastructure included 80 laptops, e-content in each laptop, a K-Yan (computer cum projector), charging cart etc. The teachers learned how to use these gadgets and thereafter how to use these IT based educational products in their own learning and student learning. The basics of using computers were taught at the both levels that is teacher and student level. Use of IT based content and teaching and learning processes made education more interesting which resulted into improvement of the regular attendance in classroom, increase in confidence level of students and teachers both, quick access to web based information for teachers simultaneously reducing the dependency for getting material. The other major outcome was that the learning among the students enhanced due to peer learning processes and also helped in doing fast evaluation of digital answer sheets and doing various kinds of analysis thereafter. The IT gadgets were used to supplement the teachers who were absent for a day or two in school and whole class was managed by students themselves or other teacher. This innovation has set an example and have motivated donors to come forward and contribute for supporting IT related matters and other activities. This innovation has scope for teachers training and also building perspective of B ed./D Ed./M Ed students.
5.

“BE NACHIKETA”- Voluntary Teachers’ Network
Anand Thakar, Primary School Vadiyavala Pay Centre, Una, Junagadh

A group of teachers in Una block, in Junagadh district identified that there was a serious problem that even after good education there was lack of talent and creativity among students in short all round development. So to overcome this issue they came together and did brainstorming for resolving this matter. They came up with an idea of starting extra classes after school hours in those respective primary schools where students were falling weak. In these extra classes the weak identified students were brought together and classes were taken based on creativity. Here the teachers used the tools like music, art and craft and drawing in 12 different schools in Una. All the experts and teachers involved in these activities come regularly and the expenses are being born by the voluntary teachers. A proper process was evolved for seeking parents support for this activity. All the material and other material required for conducting these activities is being brought by the teachers and the products created through these activities are exhibited. The innovation and activities focused on listening, speaking, reading and writing and the creative motifs were aligned with these four principles. Innovation provides scope of improvement through listening and reading which helps students to understand and make meaning of the words/sentences properly. Similarly through speaking and writing various expressions and thoughts are developed among students and so combining all factors leads to overall development of students. Four workshops have been conducted till date. Considering the pedagogy aspect the innovation provides a scope for also improving concentration among children and developing communication skills. Another outcome of these activities is that a very strong voluntary network of committed teachers and individuals roped in educational activities directly or indirectly is taking shape. This innovation provides a scope for path to reach and achieve indicators of school comprehensive evaluation, Right to Education and policy matters.

6.

“SAGAR SHALA”- A school for migrant children and children of shifting fisherman community
Dharmendra Kumar, Yusuf Meharally Centre, Bhadreshwar, Mundra, Kutch

Kutch which is one of the largest district of India and is bordering to Pakistan has a very tough geographical set up which also has rich cultural heritage. YMC started to work after cyclone in 1996 which was for limited period and after the devastating earthquake in 2001 YMC started to work in Kutch in a full-fledged way. YMC was into rehabilitation of the earthquake victims. During the distribution of the doles under earthquake rehabilitation it came to their notice that from Muslim community there was only girl who had signed in the register of beneficiaries and rest had thumb prints instead of signature in that register which had names of beneficiaries who received material. Devendrabhai who was volunteering this distribution shared the information and a survey was carried out and it was established that
literacy levels were very low in that area. The main reason they found out was that the people belonged to fishing community which was a shifting community and were unable to avail continuous education. Secondly, the other community identified was of salt pan workers who had no access to schools as they were staying in salt pan itself so literacy levels were low. To address this problem “SAGAR SHALA” was established in tent and process of imparting education started, but another big hurdle surfaced immediately, as government was not ready to mainstream the children who received education in these schools. The organisation advocated the matter with the state government very strongly and finally it was resolved. Similarly the children of salt pan workers were also imparted education through these schools. Secondly the children of migrant workers who came from hindi speaking states to Kutch in search of livelihood faced problem of getting education as there were no hindi schools. YMC did survey of such children and started hindi schools for such children. This innovation and outcomes have scope of teacher training material and also can create a space for new provisions in policy.

Session 2: Papers 7-12
Chair: Poornima Varma, Faculty, IIM-Ahmedabad

Date: Jan 21, 2015
Time: 14:00-15:15
Venue: Audi-2, KLMDC

7.
Quality in school education: real fuel for India’s growth engine

Mohammad Mushir Khan, MBA student BITS-PILANI

Education, without an iota of doubt, is one of the prime bottlenecks in the economic growth of India. In a significant leg up to the government's literacy initiative, a national survey results published in January, 2013 has revealed that almost twenty three crore children are studying in thirteen lakh schools across the country. There is 13.67% growth in student's enrolment from Class I to XII. It is a fact that the provisions enacted by the Indian Parliament like “Right To Education” (RTE) along with other measures like “Sarva Shiksha Abhiyan” (SSA) and “Mid Day Meals” (MDM) are indeed some of the vital reasons behind such encouraging results. The Government with measures like the Right to Education act, “Sarva Shiksha Abhiyan” and Mid Day Meals has succeeded in getting almost 96% of the eligible students (based on age) enrolled in schools. However, out of these students, 29% have got enrolled in private schools whereas the rest are studying in government run schools. The real problem lies in the quality of education offered at schooling level. There is a need to re-think on the government policy on school education in India. The paper, after carefully studying
various survey reports and other government/non-government documents recommends measures to be considered by the academic planners in the Government, for improving quality of school education. It is not that the policies are not appropriate but because of various reasons, they are not appropriately implemented, particularly in the government run schools, where the real masses are acquiring education.

8.

Are students being effectively transformed?

Rishabh Garg, University of Chicago

The Indian Education Commission, prevalently known as Kothari Commission, 1964-66 makes several recommendations right from Early Child Care to University Education. One of them is the Continuous & Comprehensive Evaluation (CCE).

Of the two key aspects, the continuous factor caters to the growth and development of a child and rejects the judgment of child’s performance on the basis of few periodic tests and/or through a single paper-pen examination. The comprehensive factor includes scholastic and co-scholastic aspects. The scholastic facet involves academic subjects, work education, physical and health education, art education, etc. Co-scholastic aspects comprise participations and achievements of a child in a range of activities including literary & creative, scientific, aesthetic, fine arts, performing arts, dexterity, wits, team work, emotional skills, value system, etc., in each subject. But, do the students really learn skills or just fill themselves with information? Are they truly endowed with talents to acquire proficiency? And do they comprehend whatever they have gathered so that they can make things happen? Providing grades, instead of marks, could somehow shrink the intra examiner and inter examiner disparity in assessment, but there has been no effect on the anxiety and fear of examinees. The system that has reasonably done well, in transforming the conventional class-rooms (black board-chalk-duster culture) into a collaborative-cum-inter active course group at junior level, has turned out to be almost disastrous at higher level. CCE, instead of making students more participative, expressive and inventive in the concerned subject, has become an instrument to grant liberal marks to bump up their overall percentile in the report cards. The CCE should have been implemented step by step taking the feedback concurrently. Then, subject wise orientation of teachers should have been prearranged for the faculty before commencement of academic year. However, CCE was made compulsory and slapped on the academic fraternity without any ground work. The secretarial guidelines are full of flaws and need to be reviewed methodically. CCE is an effective form of teaching, learning & evaluation and unless it is meticulously planned and directed it cannot produce tangible results.

Keywords: CCE, Child Creativity, Growth & Development, Comprehensive Education, Value-based Knowledge, Skills.
9. Use of currency coins as learning resources to create interest about history among secondary school students

Mr. Rajesh Patil, Teacher, Saraswati Junior College, Paras, Dist.: Akola (Maharashtra), TEA Alumni (U.S.A.)

Indian history is full of diversity. Innumerable emperors, kings, sultans, monarches, nawabs and invaders created their impact in various regions at different times. Multiple religions, faiths, creeds, uncountable languages added colors to this broad canvass. Comprehending Indian history becomes a daunting task for school children because of this vastness. Broadly students face two major difficulties, firstly repeated names of persons and many battles at the same place is difficult to figure out and secondly the chronological order of regimes and the successors create confusion. We have three Chandraguptas belonging to two different dynasties with different nicknames, equal number of Akbars difficult to understand their relation. Many Ahemadshahas and three battles at Panipat in different periods. Shivaji had a son named Sambhaji and also a brother with similar name. There are similar names of sultans, badshahas and Bahamani rulers. The names of British governors and their chronological order tests the patience of students. All this culminate into making history learning, a tedious task.

But history can be the most interesting subject if attached with some concrete proofs and supported by exact ‘time frame’. Since twenty three years, the researcher has been using currency coins to support historical details. Coins, especially the old one’s attract the attention of students and make them inquisitive. Repeated class exhibitions about particular era coins before the topic helps students to understand the topic in a better way. They try to attach information gained during coin exhibition with historical details and try to find out similarities and differences. Coins offer exact dates, years, messages and pictures of the personality it belongs to. Above all, the exact period of coins clear the confusion about chronological order.

Coins have a global acceptance. The researcher used American special quarter dollar coins to comprehend the ‘Unification of U.S.A.’ at Gallaudet University, Washington D.C. during the TEA Program, Spring 2012.

Key words: - currency coins, learning resources

10. Mother Tongue based Active Language Learning (M-TALL) is critical to children’s quality education

Binay Pattanayak, Education Specialist, UNICEF Office for Jharkhand

Issues and challenges in Jharkhand’s multilingual environment

Jharkhand is a multilingual state based on its rich cultural traditions from 32 tribal communities and more than 18 languages. In every village of the state, children relate and
communicate in various types of languages, other than Hindi. The state government, in a unique manner has declared 12 tribal and regional languages as official languages of the state. They include Santhali, Ho, Mundari, Panch Pargania, Nagpuri, Khortha, Kharia, Kurukh, Kurmali, Odia, Bengali add Urdu other than Hindi.

However, education of children is pre-school learning centre (Anganwadis) and Primary school (classes I to V) is initiated in Hindi, which is not the mother tongue of a majority of children in the state. This creates a high level of language disadvantage for every child. Consequently, neither a child, in a majority of cases, understands the teacher or text in neither the classroom, nor the vice versa. Attitude of teachers and school also adds further salt to the children's frustration. Lack of comprehension and continuous disadvantages related to children's identity and development accumulate in the form of fear, frustration and illusion. Majority of children discontinue their participation in school activities and ultimately leave the school.

11.

21st Century Teaching technique to transform passive classrooms to student centric learning centers “A case of Nagpur Interactive Creative Educations (NICE) Program

Sujit G. Metre, Datta Meghe Institute of Management Studies, Nagpur

In the words of Mr. Bhau Gawande, a retired Joint Director of Education, Mumbai who was also a senior consultant to UNICEF and UNESCO through MPSC, Mumbai “education, as we know, and as it is imparted in the schools, is exam based” . Teaching is imparted by cascading the incessant flow of information, as though children are like empty pitchers. As per the belief of the majority of teachers, teaching happens but no one bothers whether learning occurs or not. Whether the children understand or not, they are expected to remember and reproduce crammed text from the books on the answer sheets in prescribed time limit. Children feel compulsion and burden of learning this way. Once the examination gets over, they try to forget at first possible instant all the toil they had put in the entire session. The school education system is facing the problems of shortage of teachers and schools, heavy syllabus and school bags, and disinterested students. India’s literacy rate is 74%. Yet only 1% Indians are rich and 55% Indians are very poor. The main reason for this is lack of interest and enthusiasm in students. The education the way it is imparted do not open the minds of the students and uses their brains in a very mechanical and limited way. The paper discusses how the innovative teaching technique transforms the teaching ¬¬ learning in the class room by bringing in focus, improving concentration, enabling thinking, encourage discussions, instill listening, and increase creativity. It also suggests the role of teacher as facilitator.

The technique is a six stage process. Details available on TEDx Video available at www.youtube.com/watch?v=uzu9RY4tP-A Department of Education, ZP Nagpur (Secondary board) has executed this technique for all schools in Nagpur District under the Nagpur Interactive Creative Educations (NICE) Program. These include the city of Nagpur along
with 24 other small towns. The Sample included students from class V to class X. The demonstrations of the technique were followed by feedbacks from Principals, teachers and students. The analysis of data reveals following: 99% students want to be taught by this technique. 90% teachers found this technique very useful. The technique improves concentration (approx. to 40%) and enthusiasm (almost 100%) The technique brings down the teachers burden by 50%. The technique brings savings in time by 50% for syllabus completion and the technique improves result by 50%. Thus the Nagpur NICE experience needs propagation, replication and validation in higher learning too. The 21st Century Teaching Technique is unique, simple and effective and can provide solutions to India’s many problems including poverty and employability. The paper also discusses the probable roles of government, media, NGOs, social workers, academicians, and parents in empowering creative educators.

**Keywords:** The 21st Century Teaching Technique NICE Employability

12.

**Use of Dramatisation in teaching at Primary School Level for Gujarati subject**

**Dr. Ashish Thaker**, Assistant Professor, Revaba Sarvajanik college of Education, Mehsana

**Yupal Shukla**, Assistant Professor, V M Patel College of Management Studies, Ganpat University

In communicative language teaching drama methods play an important role because of their holistic approach. Bharatmuni has considered Natyashastra as the Shastra which satisfies the people of varied interest. He stated that no art, knowledge, sculpture or events of the world are so that cannot be found in drama. Thus all the arts and knowledge (Vidya) can be dramatized and the dramatized creation contains some special characteristics. It activates the emotions of the actor, cultivates natural discourse, and brings about dynamism and interest in the events. These special characteristics of drama make the message easily understandable. Especially in language teaching dramatization may useful method and it should be checked.

The present research work is an attempt to observe the effectiveness of teaching by dramatization of some of the points that can be dramatized for the Gujarati subject taught at primary level. The researcher, being associated with teaching at primary level for a long time and an author of more than 25 one-act and multi-act plays, has made an attempt to use his rich experience in educational research.
1. Innovation Networks: Social Capital and Successful Network Performance

Dr. Avantika Singh and Dr Rohit Mathur, Assistant Professor, Department of Management Central University of Rajasthan, Kishangarh District Ajmer, Rajasthan

Innovation networks are loosely connected networks of various actors (including individuals, groups and organisations) which share information through horizontal, two-way communication, engage in high frequency of interactions, cooperate and collaborate in order to innovate. This paper conceptualises that successful network performance requires high degree of social capital. Social capital refers to the density and embeddedness of interactions rooted in trust, mutual understanding, co-operation, shared values and shared knowledge. The paper identifies a number of cases of successful innovation networks, for example, the Honey Bee Network, traditional knowledge networks, R&D networks, disaster management networks, the film-making network, the fashion designing network, labour networks and open-source software communities. The paper identifies the reasons for network success as high-density of interactions, two-way communication, horizontal information flow, power symmetry, trust, collaboration and reputation. The paper concludes that a high degree of social capital can lead to successful network performance. The imperative is to catalyse development of social capital at grassroots through appropriate institutional changes at macro (policy) level as well as micro (implementation) level.
Design is a driver of innovation and is recognised as a key differentiator for providing a competitive edge to products and services. New avenues of innovation are needed to serve a billion. The idea to connect with the wider community for sustainable ideas and design is fundamentally about accessibility, ease and widespread research.

The usability of products, services, urban spaces, towns, cities lies in their intuitive response going back to its users. The systems needs to be in conscience with the evolving lifestyle and needs of humanity. The resources of nature may fall short soon hence a reverberating methodology is pre-emptive for survival, facing variety of challenges. Around the world vernacular styles have evolved over time, thriving over the odd challenges of nature. Traditional forms and features; because of their origin in the life and economics of rural societies; are seldom suited to urban conditions. With the application of latest technologies and material sciences an amalgamation can be achieved. In present day scenarios; Architecture and Design are not limited for designing tangible buildings and products but much more than that including a holistic approach towards providing total solution for living, working, sustaining nature and thriving in coherence with that. Holistic approach while designing a city, urban areas, neighbourhoods, dwelling units, commercial and recreational spaces, breathing zones, etc.

Harnessing energy will be the driving force, in designing machines around us. As generating power is getting more and more fuel consuming and polluting day by day, a new approach of designing gadgets, machines and everything around us can lead us towards cleaner ideas. Self sustaining building services, neighbourhoods and cities will be the new order of living tomorrow. Speciality City, Vertical Garden City, Underground City would take shape and would be providing comfortable condition within reach.

I’d like to cite example of tube hotels in Japan here. After all as per Albert Einstein “Imagination is more important than knowledge”.

**Keywords:** Vertical Neighbourhoods, Self Sustaining, Harness, Venture below Earth Surface, Automation

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**Not Janta, not Jaadoo, and not Jugaad: A critical reflection on the categorization of grassroots community members as users, innovators, and entrepreneurs**

Prashant Rajan, Ph. D., Adjunct Assistant Professor, Department of English, Communication Studies, Iowa State University
Despite continued efforts to make development-oriented design empathic, participatory and user-centred, research and practice on design for development continue to distinguish between researchers, designers and users. Design efforts involving economically and socially marginalised communities in the Global South continue to frame the members of such communities as low-income, low literacy users for whom technological solutions need be designed (and who are presumably less capable of independently designing technological solutions). Joining with recent calls for greater reflexivity among design researchers and practitioners regarding their implicit assumptions and biases about communities as entities that must be designed for, I present a critique of social, material, and cultural differences that are cast as: (a) challenges to the research and practice in the field (e.g. Best & Smyth, 2011; Brewer et al., 2006; Dell, Vaidynathan, Medhi, Cutrell, & Thies, 2012), or, (b) clichéd accounts of entrepreneurial zeal and homogenised resourcefulness that is practised in the face of adversity (e.g., Rajdou, Prabhu, & Ahuja, 2012).

I trace such differences to scholarly assumptions regarding similarities and distinctions between the researchers’, designers’ and users’ attributes and knowledge practices. I describe how the local epistemologies practised by members of marginalised communities have the potential to be neglected or discriminated in three circumstances that universalise and homogenise community members: (a) when the creative abilities and knowledge practices of community members are ignored or treated as constraints on field research (represented metaphorically by the label janta, the public), (b) when the creative attributes and knowledge practices of community members are valorised and cast as being incommensurably distinct from attributes and practices of their educated and resource-rich counterparts in the academy and industry (represented metaphorically by the label, jaadoo) and, (c) when resource-constrained individuals’ enterprising abilities are framed as ideal templates for firm-level business practices of innovation (represented metaphorically by the label, jugaad).

To contest these labels, I identify communicative practices underlying collaborative knowledge sharing within grassroots communities by synthesising reflections on my assumptions, biases, and learning that occurred when conducting field research on the organisation of technological innovations with a critical review of the scholarly and popular literature on design, development, social innovation, and entrepreneurship. I share my learnings about the ways in which members develop novel, affordable technological solutions for locally occurring problems in their communities. In doing so, I draw on my participation in a five-day Shodhyatra in Jharkhand, India with members of the Honey Bee Network, and open-ended interviews, guided conversations and participant-observation of grassroots innovators and their local collaborators across 25 rural, semi-urban, and urban communities in India over three months.

I demonstrate how the “go-along” method can enable field researchers to “actively explore their subjects’ stream of experiences and practices as they move through, and interact with, their physical and social environment” (Kusenbach, 2003, p. 463). My findings presented in part as a conversation with my informant, collaborator, and mentor Amrutbhai Agrawat suggest that individuals who develop technological innovations at the grassroots are frequently motivated by a perceived responsibility toward their local communities. Such
grassroots innovators may or may not remain sanguine about the imitation of their designs by others. Their openness in sharing design-related knowledge is associated with the adoption of an empathic design process in which innovators leverage their social and material embeddedness in local communities to observe and reflect on technology use in naturalistic settings. Grassroots innovators engage with human needs in specific geographical, economic, social, and cultural contexts and embody the potential for knowledge-rich, resource-poor communities to develop successful solutions to local problems. Grassroots innovations represent a community-based and user-driven model of technology design based on empathy and social responsibility that that problematises labels such as traditional, indigenous, and grassroots. As design for development scholarship develops its transnational agenda, we offer our research design and findings as points of entry for researchers to reconfigure the relationship between designers, users, and the contexts in which their interactions are situated.

4. Garden of entrepreneurial theories

Soumodip Sarkar, Professor, University of Evora, Portugal

Our paper intends to make several contributions to the understanding of the innovation and entrepreneurship process in an area that has received scant attention. At a conceptual level, this study draws attention to how different streams of research thought merge in terms of organisational features and behaviour patterns. Our analysis of entrepreneurial behaviour based on different theoretical and methodical traditions, goes towards the enrichment of a “garden of entrepreneurial theories” ready for a variety of seeds from many different disciplines and perspectives. (Gartner et al., 1992, p. 27).

Keywords: grassroots innovation; social entrepreneurs

5. An ecological perspective of integrating grassroots innovation into rural development strategy

Carolina, Centre for Appropriate Technology Development, Indonesian Institute of Sciences Subang, Indonesia

Rural development strategy is at present a big issue for Indonesia along with the implementation of Act 6-2014 that clearly states rural environment as a potential ecosystem to that should be made resilient. The diversity of this ecosystem on economic, socio-cultural and environment aspects is acknowledged as potential provider of resources essential for vitalisation of the rural economy. The policy provides privilege to approximately 79,000 villages to design and implement their own development plan. As a consequence, the need to have an appropriate strategy is utmost important. In reference to the urge of focussing on local resources, we recommend utilisation of grassroots innovations (GRI) as a potential driver for rural development. As endogenous
innovations initiated within the socio-ecological system, GRIs are utilised and developed further with the force of necessities. Those traits are strong foundations to attain sustainable productive utilisation. However to truly become the driving force of rural development, a strategy should be directed towards creation of enabling environment for the GRI to flourish and fulfil its role.

In reference to a case study of oyster mushroom farmers’ group activity in Bandung District of West Java Province in Indonesia, we explore important components in the ecosystem of the grassroots innovation. Descriptive analysis of the case brings clear evidence that as an activity based on endogenous innovation, appropriate approach should always start from appreciation on the strategic role of the local innovators relevant to their ecosystem which is a prerequisite to establish rural development strategy in pursuit of rural prosperity.

Keywords: ecosystem, grassroots innovation, rural development.

6.

Approaches to Pro-poor Grassroots Innovation making in India in a historical and comparative way: A Critical Assessment

Dinesh Abrol, Amshika George, Amit Akoijam, John Rollins, Praveen Ranjan, Sunny Dhiman, T P Raghunath and Vikram Singh

In this paper, we argue that the challenge of promotion of pro-poor grassroots innovation-making needs to be viewed as the problem of management of transition to a new path of pro-poor development involving a shift to the practice of paradigms of sustainable agro-industrial production in India. Pro-poor grassroots innovation-making calls for an exploration of context specific paradigms of multi-sectoral agro-industrial production in which peasants, artisans and rural labour can learn to participate and implement the values of socially sustainable development. It argues that under the resource constrained conditions that prevail in their own context of the limited access to resources, capabilities and markets they are required to use diversity-sensitive agro-ecological approaches for the design of socially sustainable development. In order to achieve the goals of this kind of transition the social movements must mobilise the poor to organise and emerge as the social carriers of pro-poor grassroots innovations by working in collaboration with the institutions of formal S&T sector for the implementation of such approaches.

With a view to understand the implications of the newly emergent scenario for the future interventions, in this paper, we have therefore, chosen to focus on the relevant political aspects of pro-poor innovation-making in India. In what follows, we discuss the role and contribution of the political traditions in the mobilisation of people for creation of pro-poor grassroots innovations. First of all, the focus is on the socio-technical frames used by the leaders of these political traditions to guide the course of societal interventions for the achievement of a pro-poor socio-technical success in India. Now, while the number of social carriers of innovation who can directly contribute in the mobilisation of the people for pro-poor innovation-making is greater than ever before, but in this connection we ask - what are
the lessons that can be learnt from the past efforts of the State and those of the social movements to stimulate pro-poor innovation generation in India? What determines success and failure? Finally, what kind of measures does the State need to take to make the transition to a new path of agro-industrial development?

In this context, the paper examines the experience of implementation of pro-poor grassroots innovation-making at the level of efforts undertaken in particular for the development of rural livelihoods since the beginning of Indian independence. Section 1 traces the evolution of the three main phases of pro-poor experiments in innovation-making with respect to the development of rural industries. A brief outline of the accommodation of the pro-poor grassroots innovation-making efforts by the three main political schools of thought namely Nehruvian, Gandhian and Left in India is presented. Second, it then attempts to answer the central question of learning appropriate lessons through the presentation of three detailed case studies of the “politics of institution building in formal S&T sector and higher education”, the “promotion of knowledge production in State sector research and development (R&D) agencies” and the “innovation system building by social movements for pro-poor technology implementation”.

It is argued that during the 1950s and 1960s, there was a lot of diversity in initiatives, and these were put into place by a variety of actors. After the mainstream Nehruvian leadership decided to give priority to the development of basic and capital goods industry, the same leadership also chose to accommodate in the planning process, the technological upgrading of economic activities being undertaken by the poor in India. A trajectory of gradual niche ‘involvements’ to uplift the poor followed during the 1970s and 1980s in the context of development of appropriate technologies in which the activists of different political traditions took actively part and tried innovation-making.

Second, with liberalisation, after the 1990s the strategy of State including of the knowledge institutions vis-à-vis pro-poor innovation making changed to a new configuration of interventions along with the changes in the strategies of pro-poor development the diversity of initiatives by the social movements is now under challenge. In the midst of these developments an important new pathway is under promotion through the National Innovation Foundation (NIF) directly under the leadership of Honey Bee Network (HBN).

Section 2 discusses the main results of the investigations undertaken into the work of the PSMs and the Honey Bee Network identified non-formal innovators in India. The authors conclude that the HBN needs to incorporate the principles of cooperation and collective participation in the selected strategies of intermediation to accelerate the outcomes and impact of grassroots innovations. However, the authors also note that today among the actors promoting “pro-poor innovations” in India we should include also several new actors and very unlikely champions of the poor – namely large firms, including foreign multinationals. They are also seeking to be the carriers of inclusive and frugal innovation in order to cater to the consumption needs of the poor. In the case of their own strategy, as things stand, corporate self-interest dominates. Corporations are not able to offer to the poor the benefits of competence enhancement and organisation of local production.
The authors point out that we are seeing the multiplication of failures to build partnerships with the poor as producers on the part of these corporations because of higher transaction costs given the diversity of interactions, difficulties in interpreting local demand, inability to deal with heterogeneity and underestimation of the investment required in local capacity building for deeper inclusion of the peasants, artisans and rural workers. Since these limitations are because of the way these corporations handle the construction of vertically integrated supply chains or even networked systems there is a need for the initiative from the social movements as a whole to explore how we can cooperate to deal with the emerging challenge.

Section 3 argues that while in the case of social movements some of the grassroots innovations do address the production and consumption needs related problems of the poor people, but even in their case the capacity to empower them to become producers cannot come without augmenting at the level of local markets the arrangements of intermediation away from the direction of making each one of them competitive as individual producer. Results indicate that while the desire to share and help each and every one remains strong among non-formal grassroots innovators, the HBN and PSMs need to look into the challenge of competition arising from larger scale businesses in the markets under consideration.

On the basis of the analysis of the field experience carried out under the project on grassroots innovation movements at the CSSP, JNU, the paper concludes that though much success has been obtained in respect of insertion of the grassroots innovation making initiatives, but the tendency to leave to the individual producer to function on his own and grow as such without changing the organisation of production the system of production and innovation is coming in the way of upgrading the systems of production and consumption as a whole.

7.

Network of business and dynamics of internationalization of the S.M.E.

Hamid Akdim, PhD student in Economics and Management, Rennes University (France)

The insertion of companies in networks of partnership is a lever of competitiveness. The managing entrepreneur can, on one hand, fill the lack of the resources from which suffer most of the S.M.E., and on the other hand, to break its isolation by mobilising on common projects with other business managers, in optics of mutualisation of the skills. This communication has for objective to make an abstract contribution allowing understanding the contribution of networks in the dynamics of the process of internationalisation of the S.M.E. To this end, we led a qualitative research with S.M.E. of the region of Fès-Boulimane. We were able to notice that the network has four main contributions: an informative contribution, a commercial contribution, an organisational contribution and a strategic contribution.

Keywords: S.M.E., Internationalisation, Networks
8.

Institutional and technological innovations in polycentric order

Franz W. Gatzweiler, Center for Development Research, University of Bonn

Technological innovations can lead to productivity growth among marginalised poor smallholders in agriculture. Depending on the institutional environment - which can be enabling or inhibiting - innovation, adoption and diffusion can contribute to improving productivity. Successful and sustainable technological innovations need to be accompanied by institutional changes which secure respective benefit flows to the marginalised and thereby reduce marginality. This contribution explains specific features of institutions, their polycentric organisation in nested hierarchies and the emergence of value from innovations, and how technological and institutional innovations mutually affect each other. Examples are provided in which different institutional environments have led to the creation, adoption and diffusion of technological innovations among rural smallholders. The cases show that overcoming institutional constraints and building new institutions and social infrastructure is as important as the technological innovations themselves. Understanding institutional environments and creating incentives to engage in the innovation process will help marginalised smallholders to live better lives.

Keywords: Institutions Innovation, Polycentric order, Marginality, Poverty

9.

Interactions with makers and grassroots innovators

Anna Waldman-Brown, MIT, Fab Lab Network

The global ‘Maker Movement‘ is a trend toward the democratisation of technology by means of do-it-yourself culture, open-source sharing, and small scale manufacturing. Related initiatives include community workshops such as makerspaces and Fab Labs, giant Maker Faire festivals worldwide, and support for new inventions (and their inventors) through entrepreneurial competitions and activities. This movement has attracted significant media attention and interest from educators, multinational corporations (including GE, Intel, Cognizant, Microsoft, and Godrej Group) and national governments (including the United States, the United Kingdom, Russia, Nigeria, South Africa, Peru, and China). Although informal sector activities often overlap with do-it-yourself culture, our research indicates that many Maker initiatives in developing countries have ignored existing grassroots innovators--often in favour of top-down policies that supplant existing initiatives while attempting to target similar users. This paper discusses how the present lack of integration between Maker initiatives and the informal sector resembles neo-colonialism through technological determinism; in addition, the popularity of creating new community workshops detracts from the support available for existing grassroots facilities and industrial clusters. This paper
discusses how Maker Movements in the United States, Ghana, Nigeria, and Kenya attract elite actors, who ironically celebrate the methods and frugal creativity of grassroots innovators while ignoring the informal sector. There lacks a collaborative effort to incorporate grassroots innovators into spurring local technological development and creating opportunities for bottom-up innovation. This would require targeted initiatives to tap into the local skill and expertise from the informal sector, including their deep understanding of local markets for the goods and services that they provide. Due to the difficulty of documenting ideas from grassroots innovators, their contribution to the global Maker discussion remains limited and underappreciated. The paper identifies successful international collaborations with the informal sector, including Peru (bringing traditional weavers into Fab Lab Lima), Togo (collaborations with electronic waste-pickers and WoeLab Fab Lab), and Ghana (introduction of beekeeping through the Ghana Regional Appropriate Technology Information Service). The authors use exploratory and case study research methods to develop a framework for assessing how these interventions succeeded. To conclude, the authors provide recommendations for how the Maker Movement can embrace grassroots innovators in mutually beneficial collaborations.

Keywords: Informal sector, distributed manufacturing, innovation, Africa, fab labs, intellectual property, technology

10.

**How traditional society can question the potential of smart cities in Africa. The Low High Tech experience in Togo**

Abedjionou Koffi, Researcher, L'Africaine d'architecture

Innovative co-working spaces (third places?) - Collaborative arrangements between work and relaxation - are emerging in many major sites of the city of tomorrow. Why develop these areas in Africa? What shape what size gives them? What role can they play in the revival of African cities? Why is it important to give an experimental and creative dimension to this revolution? These are concerns that have mobilised the research “L'Africaine d'architecture” in the development of inclusive urban utopia "African HubCities" and its "#RepLab" programme of creation and duplication of small local tech-hubs, of which, WoeLab is the first model. L'Africaine d'architecture explored the possibilities of an alternative architecture as practiced in Africa today by highlighting the so-called "modernity anchored" whose purpose is to serve strictly modern line projects delivering up to date traditional forms but also to promote resources dynamic and knowledge of wine. The real challenge of this neo-vernacular posture was far to explore the urban scale. The platform is interested in new technologies since 2012 and a correspondence identified by Koffi Abedjionou between the “hacker ethic” and African traditional societies values. #LowHighTech concept emphasises this paradoxical closeness and make possible a new approach of technology; putting it in the reach of all; including the poorest strata of society. #LowHightech finds its application at the urban scale in HubCity an African "smart
city"project. WoeLab was the first tech-hub established to serve this urban ambition. Today it is an unusual place - the only one in Africa open free of cost to everybody as per the Democracy Technology ethic. WoeLab is, in fact, a real neighbourhood Fab Lab incubator-accelerator for boosting both open native hardware technology projects and international approaches of digital solidarity. It is a single framework for emulation where young Africans through their collective intelligence and free mentoring can get direct access to the inventors. The WoeLabs project that best embodies #LowHighTech philosophy is the W.Afate 3D printer in recycled materials. This is the first African contribution to the 3D print technology presented as being at the source of a new industrial revolution."

**Keywords:** Technology, Democracy, Smart City, Sharing City, FabLab, 3D print, vernacular earth, architecture, anthropology, making open source, Technology Commons, grassroots; rooted modernity
1. Policy support for innovation at grassroots in developing countries: Perspectives from Nigeria

**Chux U. Daniels**, Science Policy Research Unit (SPRU), University of Sussex, UK

This paper examines government policy support for innovation at grassroots in a developing country’s context, taking into account the idiosyncrasies of the actors and sectors involved. Currently, traditional policy approaches inadequately support innovation at grassroots. There is therefore a need to re-evaluate existing [science, technology and] innovation policies and to develop policy instruments useful for supporting innovation at grassroots. Drawing from existing literature and cases from Nigeria, the paper explores the roles that such public policies could play in supporting innovation at grassroots, which may be jointly developed by NGOs, formal sector, and individuals in the informal sector, unattached professionals or companies in collaboration with local people. The paper concludes by suggesting areas that policy support could help in fostering innovative activities at grassroots, thereby addressing local problems and contributing to development.

**Keywords:** Government Public Policy; Innovation at Grassroots; Science, Technology and Innovation; Developing Countries; Nigeria

2. Innovations for and at grassroots in Russia

**Olga Ustyuzhanova**, Research Fellow at Tomsk State University

In a transition economy, the conventional concept of grassroots innovations [Honey Bee Network newsletter 1990, Gupta, 1989, 1992, 2006 and 2011a, 2011b] to describe innovations for inclusive development may have limited application. Based on these researches it's possible to define basic factors, triggers and environment of GRI development in India, such as large informal sector of economy and high poverty level as main environment for GRI generation; shortage of resources or access to it (i.e. water, food,
energy) as a factor of GRI demand; existence/creation of infrastructure for GRI promotion with active participation of government, academic sector and business; recognising of GRI occurrence by the government in order to provide grassroots innovators with needed support (legal, financial, infrastructural, policy).

These factors and GRI itself need to be conceptualized in the social, economic, cultural and historical context in terms of national innovation systems. With a limited size of informal sector in Russia (about 17-18 per cent of Russian economy), the innovations by individuals, mostly educated (self-employed or otherwise) working at community level is defined as innovations at grassroots [1]. Innovations from individuals in informal sector could be considered as grassroots innovations. In the absence of much research work on this subject, I am drawing upon the field work done on innovations of individuals in formal as well as informal sector.

In part one, I discuss the innovation policy of Russia and the degree of inclusiveness evident in these policies. The extent to which needs of the grassroots people are targeted and/or support to ‘innovations at grassroots’ and ‘innovations for grassroots’ is directed will also be reviewed. I would also discuss the extent to which conditions for emergence of grassroots innovations are available in Russia similar to the conditions in India where disadvantaged communities have shown enormous capacity for innovation and entrepreneurship through their own efforts. In the second part, I describe an example of innovation in traditional knowledge. The illustrations of ‘innovations at grassroots’ both by individuals and industry are discussed in part three.

3.

Temporal Aspects of task partitioning in Open Innovation projects

Shantam Shukla, FPM Student, IIM-Ahmedabad

Open innovation is an invitation for members external to the organisation to contribute in internal innovation efforts of the organisation. Designing project execution plans and processes, which facilitate participation of external members, is critical for success in any open innovation program. Scholars largely agree that innovation development practices such as modularity and partitioning of tasks allow to pool distributed expertise for specific tasks of project, which may otherwise may be outside the organisation and not accessible for product development. Though it may enhance value creation ability within organisations, managers are at times concerned with development of external dependency, which may lead to issues of hold-up and opportunism. A possible way to mitigate such concerns is by focusing upon duration of tasks while designing the product development plan. In this research, we argue that innovation managers not only need to partition tasks to encourage participation from external members but also need to focus upon temporal aspects of partitioned tasks. An in-depth case study on development of Wikispeed suggests that smaller duration tasks attract more participation of external members interested in contributing to open innovation projects. Also smaller duration tasks do not lead to hold-ups as the efforts can be replicated or replaced without significant effort. Further issues of opportunism are absent as there is limited dependency upon specific individuals or contributors. However, the study suggests that
organisations need to possess high absorptive capacity to assimilate and benefit from large volumes of small inputs it receives in this process.

**Keyword:** open innovation design; task partitioning; time

4.

**Supporting grassroots innovation and entrepreneurship in India: Reflection on two case studies from Gujarat**

*Saumyaranjan Sahoo,* Doctoral Student, EDII, Gandhinagar  
*Dr. Astad Pastakia,* Development Consultant

Most of the Grassroots Innovators have poor educational background, financial instability and lack entrepreneurial skills. Business incubators assist new ventures to support technology commercialisation, technology transfer, innovation acceleration, economic development and job creation. Technological business incubators like GIAN have played the role of facilitator in giving initial support to germinating enterprises of these grassroots innovators, by providing mentoring support, technological support, financial support and even market linkages. Despite such efforts by incubators with innovation having huge market potentials, the success rate of commercialisation of these innovations has been mediocre. There is a need to assess the role technological or business incubators in the grassroots innovation ecosystem. The findings that are extrapolated from the analysis of two case studies from Gujarat are presented. Suggestions and recommendations have been provided to improve the entrepreneurial ecosystem supporting grassroots innovators.

5.

**A study for conceptualization of technological innovation in rural Indian context**

*Sonal Singh and Bhaskar Bhowmick,* Indian Institute of Technology, Kharagpur

This paper describes the conceptualisation of technological innovation in rural Indian context based on a field survey. In this regard, the paper attempts to determine the variables of technological innovation from review of literature and to identify the factors of technological innovation by analysing empirical data. Close ended questionnaire and face-to-face interviews of individuals in rural areas involved in entrepreneurial activities and somehow related to technological innovation have been carried out. The paper has used mixed methodology comprising a case study and exploratory factor analysis. The paper explains three cases relevant to technological innovation of rural entrepreneurs. The findings reveal three set of factors which may explain the underlying perception of rural people regarding technology innovation. The future scope of this research could incorporate large sample data, greater number of variables of technological innovation and conduct in other countries.

**Keywords:** Innovation, Technological Innovation, Rural Entrepreneurs, India
6.

Smart Micro-grid: A Unique way to enlighten India

Lipi Chaya, PhD Scholar, Nirma University

One of the most crucial requirements of rural empowerment is energy. A microgrid is a miniaturisation of centralised power grid. It is an element of future smartgrid technology. Smart microgrid includes energy management system, renewable energy resources and energy storage. It is an efficient and cost effective way to enlighten the cities, villages and remote areas. Smart microgrids increase reliability as they integrate redundant distribution, smart switches, automation, power generation, power storage and other smart technologies. Local power generation and storage allow portions of the grid and critical facilities to operate independent of the centralised grid when necessary and thus eliminate blackouts. Technologies such as smart switches and sensors automatically fix and even predict power disturbances, unlike today’s system where switches have to be reset manually in case of an fault and outage. The smart microgrid can reuse the energy that is produced during electricity generation for heating buildings, hot water, sterilisation, cooling and even refrigeration. Microgrids enable consumers to meet some or all of their electricity needs by generating their own power, whether it is through sources like wind, solar, geothermal, microturbines and so on. This “bottom-up” consumer approach can reduce reliance on fossil fuels and lower greenhouse gas emissions based on open market economic value.

Keywords: Micro Grid, Smart Grid, Smart Micro-Grid, Renewable energy resources

7.

Interaction between grassroots innovators and the formal sector in the creation and diffusion of technological innovations in Rural China

ZHANG Li-yan, Prof. and Director of the Center for Innovation and Entrepreneurship,
Tianjin University of Finance and Economics, Tianjin China
LIU Rui-han, Student of Tianjin University of Finance and Economics, Tianjin, China

The research studies the process of 1885 farmer innovators innovation, creation and diffusion. The paper focuses on understanding the interaction between grassroots innovators and the formal sector in rural China. The results show that:

1) Although there are many interactions between grassroots innovators and the formal sector, they are not enough;
2) The interactions mainly exist at the diffusion stage;
3) The interactions are usually triggered by the government and grassroots innovators, but not the enterprises and universities /research institutes;
4) The interactions help the creation and diffusion of rural innovations.
Evolutionary economics, innovation snail, triple helix and other processes of economy

Nikolay A. Badulin, PhD, Assistant Professor of Innovation Technology Department, Tomsk State University, Tomsk, Russia

The Triple Helix model of innovation is gaining more and more supporters. At the same time there remain 3 open questions which, if addressed, could help reinvent it from a visionary theory to practice theory:
1. Why is the triple helix model used to describe social progress?
2. How does the triple helix model describe the current position and direction of a given society?
3. What forecast can be made for a given society and its outlook?

Our insight tells us that Henry Etzkowitz’s Triple Helix arguments are correct, but how can they be substantiated? This paper reviews literature on the triple helix model and tries to offer a simpler substantiation.
Honey Bee Network Collaborators

Chair:
Gajendra Singh, Former President, Indian Society of Agriculture Engineers

Co-Chair:
Ramesh Patel, Secretary, SRISTI

Date: Jan 21, 2015
Time: 14:00-15:15
Venue: Class Room-RJMCEI

1.

Palle Srujana
A voluntary Organization in promotion of grassroots Creativity
and Traditional Knowledge

Brig P Ganesham, Palle Srujana

Palle Srujana is a voluntary organization working for ‘aiding and promoting’ creativity at Grassroots level in the Telangana and Andhra Pradesh. It pursues the mission of National Innovation Foundation–India (NIF-India) in these as part of nationwide Honeybee network. We scout across the rural regions for knowledge and innovations. The knowledge, thus acquired is documented and processed ensuring due recognition to the knowledge provider. The Grassroots innovations (GRI) are provided support for validation and reengineering. Palle Srujana also helps the innovators to get their technologies patented and take them to national and international level for recognition. The rural knowledge is disseminated horizontally, from land to land and village to village through Chinna Shodh yatra, magazines in local language, participating in various farmers’ meet, visiting villages etc.

Palle Srujana being a Voluntary organization, entire activity is accomplished through pure volunteerism. We involve students, elders, women, private and public institutions and organizations, NGOs, and Government in the entire value chain of the GRI. The grassroots knowledge is linked to the formal system for validation, value addition, patenting, reengineering, manufacturability, marketability and business incubation etc.
“Pathe Pathshala” - A Peoples’ University on move; conducts classes for farmers, pastoralists, students and women, at their place, in their time and with their language. These classes are meant to diffuse small but effective, low input based skills, technologies to the farming and rural community for easing their toils in livelihood options such as crop husbandry, livestock keeping, fisheries and other small skill oriented aspects of rural life.

At the same time, “Pathe Pathshala” is the site to document outstanding indigenous traditional practices of people from different walk of life. Innovative ideas of students, traditional culinary skills of rural women and grass root innovations of farmers, artisans, weavers, blacksmiths and innovative services provided silently to the society by hidden heroes and heroines are also documented.

Currently many training classes for people are conducted by different agencies on different livelihood options like agriculture, fisheries, and livestock keeping etc. These training classes are mostly conducted in towns and cities in scheduled time, place and with jargon based languages which many of the farmers are not at all acquainted with. Most of the time, these farmers are reluctant participants in these trainings, because they usually have to leave their daily works, daily wages, family members, daily chores and most importantly their natural environment, where they are comfortable, normal and more friendly. This is the one of the most important dark side of the modern training programmes conducted by agencies like Government run institutions, Universities and NGOs. Because of these impediments, training arrangers and conductors fill up their classes with persons who never have the liking and who have least connection with the subjects taught.

3.

Sundaram Verma, Collaborator, Honey Bee Network, Rajasthan

Sundaram Verma, a progressive farmer from a village in Rajasthan, India, who is known for his innovative approaches in agriculture among the local farmer community on one side and for his systematic working style among the scientific community on the other side.

Since his childhood only he was a bright student more inclined towards science but away from sports and games. He did his graduation in science and learned farming in parallel to his education. His innovative and learning attitude always took him to various workshops and seminars on agriculture topics and made him experiment different ways of cultivation to choose the best. This attitude turned him the only farmer in the region growing chilly which got diminished after a series of diseases which attacked the region. This gives him handsome profit in the season.
Experimental nature also made him the innovator of a Dry Land Agro-Forestry technique which enables the plant to survive with only one liter of water given to it at the time of plantation.

He has been spreading the word about these techniques among the other farmers across the globe through various workshops and conferences such that more and more people could be benefited with these. After his association with Honey Bee Network he has linked about 1500 innovators and Traditional Knowledge (TK) holders from various places from Rajasthan and collected over 10000 examples of innovations and TK for NIF database out of which over 10 has been recognized at different levels and categories.
(FlnF-HBN): Blending of Formal and Informal Science: experience of Honey Bee Network

Session 1: Papers 1-7
Chair:
Akshai Agarwal, Vice Chancellor, Gujarat Technical University
Co-Chair:
Amit Dinda, Faculty, Department of Pathology, AIIMS

Date: Jan 21, 2015
Time: 16:00-18:00
Venue: RJMCEI Auditorium

1. Efficacy validation of and value addition in grassroots practice against agricultural pests

Devkaranbhai Rabari, Innovator
Dhananjay Tiwary, Scientist, Department of Biotechnology

The grassroots practice containing neem [Azadirachta indica A. Juss.], cumin [Cuminum cyminum], garlic [Allium sativum L.], namejava[Enicostemma littorale Blume], and kadvu kariyatu [Andrographis paniculata (Burm.f.) Wall. ex Nees] showed promising IGR activities against lepidopteron pests. Detailed experiments were carried out as per guidelines provided by the NIF-CSIR joint implementation committee and periodic discussions with NIF.

It was evident that the activity of the practice was primarily due to the presence of neem in the mixture. To investigate the farmer’s wisdom to use other ingredients along with neem, the photo-stabilization role of other constituents in the mixture was studied. The HPLC profile of the practice (mixture) and neem alone was generated after UV exposure of the samples for various time periods. When neem extract alone was exposed to UV radiations, the marker peaks showed instability of the peaks. Most of the marker peaks in the mixture remained stable after UV exposure. This shows that the other constituents stabilise the neem constituents from photo degradation and forms the scientific basis for the farmer’s choice to use other ingredients (cumin, garlic, namejava and kadvu kariyatu) to develop such formulation for practical application of neem. The Wettable Powder (WP) formulation of this practice was prepared for field evaluation.

2.
Novel Ethnomedicinal therapeutic effective against Typhoid fever

Late Shatrughna Prasad Vaidya¹, Debprasad Chattopadhyay², Hemanta Mukherjee², Durbadal Ojha² and Shanta Dutta³

¹Traditional Knowledge holder

²ICMR Virus Unit, ID & BG Hospital Campus, GB-4, First floor, Dr Suresh Chandra Banerjee Road, Beliaghata, Kolkata

²National Institute of Cholera & Enteric Diseases, Kolkata

The aim of this study is to validate the anti-typhoid activity of tender leaf extract of a local plant, practised by herbal healer Shri Shatrughna Prasad Vaidya, Jharkhand which has been documented by National Innovation Foundation India. The in vitro and in vivo therapeutic potential of the crude aqueous and methanol extracts of leaf was evaluated on a number of clinically isolated multidrug resistant (MDR) Salmonella enterica Serovar Typhi (S. Typhi), causative agent of typhoid fever. To determine the in vitro antibacterial activity, minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of the extracts were tested by agar and broth dilution methods. The growth curve assay was performed to determine the extent of growth inhibition; while protein ELISA and mRNA expression were used to demonstrate the mode of action. The in vivo safety and protective efficacy of the extract was tested in mouse model infected with S. Typhimurium NCTC74. The MIC of the extract was 128-1024 µg/ml against MDR S. Typhi strains. The animal study revealed that the extract was non-toxic (LD₅₀ 2400 mg/kg) up to 1200 mg/kg (p.o.) with normal histopathology and haematology; and significantly protected the challenged (1.26 x10⁸ cfu/ml) mice at 92.5 mg/kg (i.p.) and 300 mg/kg (p.o) dose, compared with untreated animals. Further, we observed a dose-dependent increase in pro-inflammatory cytokines (TNF-α, IL-12, IFN-γ), along with reduced PGE2 synthesis by inhibiting COX-2 and concomitantly enhanced NO production by increased iNOS2 mRNA expression in extract treated peritoneal macrophages infected with the bacterium. Thus, the results conclusively prove the claims made by the herbal healer.

3. Methodologies of institutional recognition for veterinary knowledge holder(s) – An approach in the regions of Jammu & Kashmir, Tamil Nadu and Gujarat, India

Ravikumar R.K., Vivek Kumar. NIF, Sudeep Kumar, Mohinder Bhadwal, Sakarabhai Kallubhai Bhariya, Traditional Livestock Healer and Khumaji Badaji Kataviya, Innovator

The nature of health care facility available to the animal health sector is of different kind from other service delivery systems. Various stakeholders in this sector have to cater to the need of welfare and productivity as a part of essential service. This involves large resources, mobility, physical endurance and skilled network of professionals at different levels. State
animal husbandry departments try to cater to this demand. However, constraints in reaching out to needy population remains a challenge not only in India but in other countries as well. Further, research priorities are positioned towards development of technologies that are expensive. There are a lower number research studies on problems faced by livestock owners, unavailability of low-cost alternative medications and erosion of inherent knowledge.

In this context, the role of indigenous knowledge holders needs to be repositioned. Their valuable contribution to welfare of livestock health and sustaining novel medicinal practices needs to be institutionally recognised. National Innovation Foundation-India (NIF) had taken initiatives in such activities as well as in promoting wider use of their knowledge. It is equally paramount to locate, deliberate and understand their efforts so that local knowledge can flourish effortlessly. This minimises pressure on state animal husbandry departments and enables them to provide better quality of service. Traditional livestock healers share their knowledge and skill in their nearest vicinity for sustaining health care. The uniform pattern of their existence and to provide their service without expectation has been their hallmark. There were initiatives in the past to promote their practices but fewer efforts were made for recognising their selfless efforts in their own premises. This is paramount for sustaining their wisdom and for inculcating pride through their knowledge and practices.

The collaborative effort with Sher-e-Kashmir University of Agricultural Sciences & Technology, Jammu has enabled NIF to reach out to six districts viz. Jammu, Samba, Kathua, Udhampur, Reasi and Rajouri districts in the state. Interactive meetings and recognition by scientific stations, with the help of animal husbandry department in their premises, had enabled healers to share native practices. The recognition of indigenous knowledge-holders in their village by the scientific community and at veterinary dispensaries/hospitals, units where livestock owners seek service, is distinctive and such working models need to be replicated.

Such interactions are critical for deliberating upon different ailments and methods of treatment among professionals trained in veterinary discipline and traditional knowledge-holders. Such interactions have been demonstrated in this paper.

Many times difficulties were expressed in wider use of technical knowhow learned from livestock healers. However, the use of different technologies for overcoming ailments requires considerable expertise or livestock owners need to learn from experts. Areas of intervention have to be identified wherein indigenous knowledge shared by community or knowledge holders is available at low or no cost may be encouraged and be recognized for farm animal welfare.
4.

Validation of antimycotic potential of traditionally used Indian herbal extracts against dermatophyte strains causing human skin disease

Gulam Ahmad Magray¹, Hakeem Abdur Rehman¹, Robert, Rammeharsinh¹, Nida Afzal Khan¹, Shri Ombeer¹, Vijay Kumar², P. K. Singh¹ and Shubha Trivedi²

Microbiology Research Lab, Christ Church College, Kanpur²
National Innovation Foundation, Ahmadabad¹

National Innovation Foundation India have scouted and documented thousands of herbal grassroots practices of which sizable amount are for the human problems. Aim of this study was to validate the claims of herbal healers related to skin problems. Isolations of dermatophyte strains were made from 77 Tinea suspected patients reporting at OPD of L L R Hospital associated with GSVM Medical College, Kanpur in around 17 visits. Clinically most dominant dermatophyte infection was of Tinea corporis (49) followed by Tinea pedis (12). The survey revealed higher incidence of disease among female patients belonging to mostly economically lower income group. Samples of herbal extracts and their formulations were provided by National Innovation Foundation, Ahmadabad. In vitro efficacy of herbal extracts for antimycotic potential was tested employing three differential methods viz; disc diffusion, agar well diffusion and broth dilution method and results were compared with the data obtained using standard recommended drugs Itraconazole (10 mcg), Ketoconazole (10 & 30 mcg), Miconazole (30 mcg) and Nystatin (50 mcg).

Amongst botanicals supplied eight were individual plant extracts, four samples contained mixture of more than one plant, five samples were cream formulations and four soap formulations of extracts. Water or DMSO (2%) soluble preparations of botanical extracts were used in trials at varying concentrations of 15 mg to 100 mg/ml. Separate controls were prepared for DMSO and for bases of cream and soap. Zone of inhibition was measured in both disc and well diffusion methods. The data on ZOI was employed to determine Activity index (AI) which represented the efficacy of botanical as compared to the ZOI produced by Standard drugs. With regards to zone of inhibition cream formulation of CPPS showed strongest inhibition followed by that of soap formulations of RoA1, HaTu, Bele and OrCu with AI ranging between 40-100% against all the three test strains of dermatophytes.

Maximum susceptibility (MIC) of all the three test organisms were obtained with formulations of CPPS formulation (15 mg/ml) followed by RoA1, HaTu, Bele and OrCu. Amongst mixture of botanicals the response ranged from 30-40 mg/ml with CPPS, CPP and BVCL combination. The results of the study are indicative of the need to develop new combinations by adding value to the traditionally practised herbal products for successful management of dermatophyte infection.
5.

Biological evaluation of some selected medicinal plants (NIF leads) for their hepatoprotective and anti-arthritic activity

Amirdaraj Kaaniv¹, Bhoodhathan Kaani¹, Ayyathurai Konar¹, Vipin Kumar¹, Pawan K Singh¹, Chandrashekhar V M²

¹National Innovation Foundation-India (NIF), Satellite Complex, Premchand Nagar Road, Nr. Mansi Circle, Satellite, Ahmedabad-15

²Department of Pharmacology, BVVS Hanagal Shri Kumreshwar College of Pharmacy, BVVS Campus, Bagalkot-58710, Karnataka

Aim of this study was to evaluate some selected herbal grassroots practices (from the database of Nationa Innovation Foundation) which were being used by the healers to combat liver disorders, inflammation and anti-arthritis. The efficacy of the herbal extracts were studied under in vitro and in vivo condition using rat models for inflammation and anti-arthritis. In vitro free radical scavenging activities of the selected herbs NIF-SI and NIF-HT were carried out by DPPH, superoxide, hydroxyl, nitric oxide radical and lipid peroxidation assay methods. In vivo hepatoprotective activity was conducted against CCl₄ and paracetmol induced liver damages (oxidative stress) models. Anti-arthritic activity of NIF-PDAK, NIF-DEAK, and NIF-CFBK against FCA (Freund's complete adjuvant) induced arthritis in rats.

The herbal extracts of NIF-SI and NIF-HT showed potential free radical scavenging activity in in vitro systems. Similarly, NIF-SI and NIF-HT leads showed significant (p<0.001) hepatoprotective activity by decreased in the lipid peroxidation (LPO), significantly reduced the serum alanine aminotransferase (ALT) and aspartate aminotransferase (AST) levels and increased antioxidant enzymes superoxide dismutase, catalase and reduced glutathione, total thiols as compared to CCL4 and paracetmol control groups. Anti-arthritic activity of NIF-PDAK, NIF-DEAK, and NIF-CFBK against FCA induced arthritis in rats. The above study supports the claims of the herbal healers.
6.

**Phytopharmacological studies on indigenous medicinal plants**

1Thakor Makvana Pachalbhai, Mrugesh Patel, Samir K. Shah, Mamta B. Shah

1National Innovation Foundation India, Satellite Complex, Nr Mansi Circle, Ahmedabad
2L. M. College of Pharmacy, Ahmedabad
3Sardar Patel College of Pharmacy, Bakrol

The objective of the present study was to investigate the anti-asthmatic potential of an herbal practice shared by grassroots innovator to National Innovation Foundation India. The characteristic microscopical features of plant sample includes striated cuticle, uni-tobicellular and thick walled simple & covering trichomes and bi-collateral vascular bundle in leaf; xylem vessels that are scattered and bigger in outer region & smaller & radially in inner region, hollow pith in stem; cortex with stone cell and fibres and fibrous xylem in root. Preliminary chemical tests indicated presence of alkaloids, phenolics, carbohydrates & flavanoids. Simultaneous HPTLC method was developed for estimation of stigmasterol and lupeol. The anti-asthmatic activity was evaluated against histamine induced bronchospasm in guinea pigs.

Egg albumin induced asthma in guinea pigs and on rat mesenteric mast cell degranulation. The hydroalcoholic extract exhibited significant activity in all the models and the activity of the extract can be attributed to mast cell stabilization and antihistaminic actions. The results show that the plants have the anti-asthmatic potential as claimed by the innovator.

7.

**Evaluation of Antihypertensive Activity of Four Herbal Grassroots Practices**

Ghulam Hassan Qadiri, Badri Mahato, Abdul Rehman Sada, Gulam Hassa Pala, Tejal Gandhi

1National Innovation Foundation India, Satellite Complex, Nr Mansi Circle, Ahmedabad
2Anand Pharmacy College, Anand

This investigation was carried out with the objective to evaluate few herbal practices tagged as anti-hypertensive by the grassroots herbal practitioners scouted and documented by National Innovation Foundation India. Male Sprague-Dawley rats were given weekly subcutaneous injections of deoxycorticosterone acetate salt (DOCA) at a dose of 12.5 mg/rat for 5 weeks. The rats were randomly divided into fifteen groups of six rats each. Group one served as Normal control, Group II animals were exclusively uninephrectomised (UNI), and Group III-XV uninephrectomized rats were subcutaneously given DOCA-salt once daily for 5 weeks. Different herbal extracts were dosed once a day orally for 5 weeks. Body weight, food intake, urine output were weekly measured. Systolic blood pressure (SBP) was determined once a week by tail-cuff plethysmography. Data represented as mean±S.E.M were analysis by applying one-way ANOVA followed by Dunnett’s post-hoc test. Statistical
significance was set at p<0.05. DOCA-salt and uninephrectomy model successfully established hypertension in Sprague-Dawley rats evident from the blood pressure value of 5 weeks study, which was 108.72% higher compared to normal control animals. 28 - 36% significant reduction in the blood pressure values were observed in the groups administered with plant extracts significantly debased the blood pressure value up to 54.75% compared to the model control group. The study support the claims made by the innovators.

Session 2: Papers 8-13
Chair:
Akshai Agarwal, Vice Chancellor, Gujarat Technical University
Co-Chair:
M N Patel, Vice Chancellor, Gujarat University
Date: Jan 21, 2015
Time: 18:30-20:00
Venue: RJMCEI Auditorium

8.

Innovation imperative: The case of Mushtaq Ahmad Dar, a young Kashmiri innovator
Nitin Maurya, NIF
When apathy and indifference remain persistent, innovation becomes imperative. Coming from a remote village in the Anantnag district of Jammu & Kashmir state of India, Mushtaq Ahmad Dar is a serial innovator who has come up with a number of useful machines, each of which addresses a technological problem, people have been living with for ages. He has conceived and developed a green walnut peeler, a brown walnut cracker, and a tree cum pole climber among others. Not only has he reduced drudgery but also improved output and livelihood opportunities through his machines. The article is about this young man, now in his early thirties, and his journey of innovations, embarked upon in a little known village of an insurgency affected district of his state, which took him to the President House in the capital of the country.

9.

Reversible reduction gear for marine diesel engine and Z- drive propeller
Mohanlal, Innovator, Binoy Kurian, Mentor and Gulshan Vashistha, NIF
Mohanlal observed the inconvenience of the local fishermen while fishing with boats using diesel engines or petrol-start kerosene run engines which had an inbuilt gearbox. The boats with diesel engine had a long tail propeller system without gearbox, which affected their
manoeuvrability. Beach landing was very difficult using the conventional inboard marine diesel engines. Moreover, the kerosene run engines consumed more fuel and polluted the water affecting the marine life adversely. After rigorous research and development, Mohanlal developed a gearbox and manually tiltable Z-drive system for small capacity diesel engines to overcome the above problems.

Tasked with changing Mohanlal’s realities, NIF worked with him to gain a thorough understanding of the economics of his business; from cost optimization, by changing the raw material from SS306 to EN8- a 20% reduction in cost, to gaining operational efficiencies, by getting his business base shifted from Allepey to Coimbatore for cheaper labor. This, coupled excruciating negotiations with Matsyafed board to realize a 20% rise in contracted payments. Getting the order was just the first step; Mohanlal had little money left and no experience with execution. NIF led the effort to secure funding from Indian Merchant Chambers and staff stayed at the factory in Coimbatore to lead operations. NIF led the effort to fulfil the orders on time and helped set up processes that Mohanlal uses till date.

10.

How come you never go there? – Linking formal and informal sector through open innovation in the cotton industry

Mansukhbhai Patel, Innovator and Marianne Esders, PhD Candidate, Centre for Sustainability Management, Leuphana University, Germany and

For open innovation to become more inclusive and sustainable, it is necessary to look at those stages of the innovation value chain where opportunities for collaboration between formal and informal sector remain unheeded. In a second step strategies to deal with such inertia can be derived. The author has selected the case of a grassroots innovator, Mansukhbhai Patel, who has developed a cotton-stripping device. This device is crucial for increasing the efficiency of a pre-ginning process in a dry-land variety of cotton. It also helps in the reduction of negative social and environmental impacts in the cotton post-harvesting process of the low-staple hybrid variety v 797 mainly grown in the dry-lands of Gujarat, India. The areas where inertia determines the involved actors’ ability to collaborate, to exchange knowledge and other resources and to deal with associated risks and uncertainties have been identified and elaborated. Here, different aspects of an extended capabilities approach discussed elsewhere (Esders forthcoming) becomes relevant for the mitigation of inertia. A list of strategies has been derived that can be helpful for formal-informal sector collaboration to become more reciprocal and mutually beneficial. Finally, limitations of the study have been highlighted and recommendations made for future research.
11.

Role of Intermediaries in bridging and blending innovations from formal and informal sectors for an Inclusive Innovation system

Dharambir Kamboj, Innovator and Anamika Dey, NIF

With the increasing opening up of the innovation ecosystem, the role of intermediaries is becoming crucial for facilitating interactions between formal and informal sectors of science, technology and other economic activities. The knowledge systems of both the sectors have evolved differently as they focus on optimising different parameters depending upon the heuristics used by the actors in both the sectors. Collaboration between the two can fill the void in the national innovation system; particularly, in the sectors or the regions neglected or unreach by the formal sector. Role of intermediaries becomes crucial in such interactions and collaborations. Though the concept of intermediary organisations and functions has been recognised in the past, they were mainly supplementary to other functions. But with the need felt, full-fledged intermediary organisations like National Innovation Foundation (NIF) have evolved through the work of Honey Bee Network and IIMA over last about three decades. In this paper, we first try to assess the functions that NIF performs and their impacts on bridging the two sectors. We then, take a case study of the Multipurpose Food Processing Machine by Dharambir Kamboj and his journey from a rickshaw puller to an innovator to become finally a successful entrepreneur. I study the problems faced by the innovator and the formal institutions involved with the value addition in his innovation and the role NIF played in forging the collaboration. The study also deals with the hurdles that such intermediaries face while bringing different actors into the arena as they deal with the grassroots innovators on one hand and public institutions and business corporations on the other.

12.

Proprietor of Mangal Herbal Soap

Smt. Khumujam Jina Devi, Innovator and Debati Devi, NIF

As a victim of domestic violence Khumujam Jina Devi (61) started her journey working as a cook in hotels at the local market. The proprietor of Mangal Herbal Soaps used to work with many NGOs involving non-violence movement. Though she couldn’t save her eldest daughter due to poverty, she faced the loss by engaging herself in developing thoughts and ideas. To meet her family's increasing daily needs she has been making and marketing many useful household and fancy items other than her well known Herbal Medicated Soaps. After she came in touch with National Innovation Foundation (NIF) through an NIF awardee innovator Ksh. Nicholson Singh, many remarkable changes have occurred in her life. Thereafter, several government and non-government institutions and organisations have also started supporting and recognising her hard work and achievements. She is a role model for many other victims of domestic violence.
13.

Kudrat reformer

Prakash Singh Raghuvanshi, Varanasi and Hardev Chaudhary, NIF

Prakash Singh Raghuvanshi is a small farmer lives in a Tadiya village (UP) in a desperately poor area of India. His village was devoid of improved varieties and need-based farming facilities for better cropping and people of that village was very unhappy with the agriculture results. Though, he has a poor eyesight, he felt this problem from his heart. He dreamed with open eyes to overcome such problems of farmers of his area. In year 1995, he started his combat for the development of plant varieties especially for paddy, wheat, pigeon pea and mustard. He faced lots of tides and falls in the way of crop improvement but in present consequence he has developed more than 15 varieties (eg. Kudrat series) with better yield and other anticipated traits.

NIF in the year 2007, identified his extraordinary work in the area of agriculture and awarded him for the same. NIF provided technical, financial and business development support for his improved varieties. The Arati Seeds and Research Pvt. Ltd. is doing production and marketing of three of his varieties in the states of Maharashtra, Chhattisgarh, Madhya Pradesh and Karnataka. So far more than one lakh farmers all over the country have been benefitted by the varieties developed by him. The article details the problem sources, and best practices of the innovator.

अपनी खेती, अपना खाद | अपना बीज, अपना स्वाद (Our fertiliser in own field/Our taste of own seed) :- Prakash Singh Raghuvanshi
Farmer Participatory Research Approach in Farm Mechanisation

Er M D Vora, Assistant Professor (Farm Machinery and Power Engineering), College of Agricultural Engineering and Technology, Anand Agricultural University

A comparative demonstration and research trial of crop harvesting equipment was conducted on the farmer’s field. The manual harvesting of fodder crop by using local sickles was conducted by farmer himself which consumed manpower equivalent to about 27 to 28 man-days for harvesting of 1 ha area of fodder (Sorghum) crop. A self powered smaller sized reaper was hired by the farmer from the nearby place. The time taken by it was 1.2 days/ha and the cost 60% higher (as charged by service provider) than the manual cost calculated on basis of prevailing labour rates. The reaper, which could be mounted in the front of the mini-tractor, was provided by the university to conduct harvesting of fodder (sorghum). It took 0.6 days for harvesting of 1 ha and cost 60% less (actual cost incurred) than the cost as in manual method. The results obtained were compared to draw conclusions for the convenience and benefit of farmers in terms of man-power required and change of cost in conventional (manual) method. As costs in terms of currency keeps on changing continuously, the comparison of costs in terms of man power requirement paved way for generating a standing nature of recommendation for the benefit of farming community which can last for longer duration until recommended technology become obsolete. The conclusion drawn from the results of comparison indicated that hourly machine capacity of harvesting by self powered and mini-tractor operated reapers were equivalent to the 18 to 23 and 35 to 45 human-hours respectively.

Keywords: farm mechanisation, mechanical crop harvesting, reaper
2. Rooting frugality in science and engineering

Balkrishna C. Rao, Assistant Professor, Department of Engineering Design, Indian Institute of Technology Madras

Although frugality and other concepts such as mass production of innovations lend themselves to sustainable solutions for tackling the crises of our times, the act of indulging in these innovations has to be tempered with their detailed knowledge. In other words, frugal innovations and other creative ideas, have to be firmly supported on the sound principles of science and engineering. Such an association would not only endear these ideas in critical sectors such as health care and aviation but also rope in the private sector and other entities to increase their market share for commercial products. Therefore, this effort will focus on deepening the association between frugal innovations and science and engineering and thereby make the Jugaad concept more than a makeshift arrangement. In so doing, this work will examine the current state of the involvement of scientific principles and how this could be improved beyond some makeshift arrangements of Jugaad. In particular, existing scientific methodologies will be examined for their use in making frugal innovations of superior quality. The need for injecting more science and engineering into frugal innovations is crucial from the perspective of a possible explosion in the numbers of such products in the foreseeable future and the consequent “cross talk” resulting between many of these frugal products. It should be noted that, notwithstanding the focus on frugal innovations, the findings of this effort are applicable to other newer innovative concepts as well.

3. Accelerating technology innovations in institutions of higher learning

Prof PB Sharma and Prof AK Raghav, Amity University Haryana, Gurgaon

Synergy between education and research has been amply emphasised by the National Knowledge Commission in its report to the Nation in 2007. The institutions of higher learning in India are sitting on the goldmine of opportunity to cause innovations in plenty on the strength of the creative ability of its talented students and faculty. What is needed is the enabling environment in which the mind is focused on industry and society relevant research and innovations involving the creative student community even though they are for their UG studies. It requires percolating the culture of research and innovations right down to UG levels as creative research requires not much financial support and innovations acknowledge no age or qualification.

The Paper presents the strategic framework for accelerating innovations in Universities of Technology and Colleges of Engineering. A few case studies of success story at Delhi Technological University and Amity University Haryana are presented. Today in Indian
context, the technological innovations are success key for high economic growth, skilled manpower, world class infrastructure and high job potential. Knowledge exchange between higher education institutions and the R&D and manufacturing industry plays vital role in overall growth of the country. Amity University Haryana has been taking steady progress to promote research and technological innovations. It has developed technology park and technology incubators. Such activities promote R&D environment and students are often heard of discussing and focussing on new products and patenting ideas. New minds pushes faculty to think on more innovative and alternative approaches for not so efficient systems seen around. Alternative more efficient and more economical systems are in creation stages in any field of engineering and sciences. Some case studies are reported in the present paper.

4.

Factors explaining students’ inclination towards entrepreneurship: Empirical study of Ethiopian university students

Buzeye Zegeye, Wollo University, College of Business and Economics, Department of Management, Dessie, Ethiopia

This study investigates the inclination towards entrepreneurship among university students in Ethiopia. Specifically, it aims to examine the relationship between entrepreneurship education and inclination towards entrepreneurship. The influence of demographic characteristics and family business background on university students’ inclination towards entrepreneurship is also being examined. An empirical test carried out on the data gathered from questionnaires demonstrates that two entrepreneurship education variables are found to have statistically significant relationship on the inclination towards entrepreneurship. At the meantime, two demographic variables and a family business background variable have an effect on university students’ inclination towards entrepreneurship. Finally, based on the findings, the implications of the study have been forwarded.

Keywords: Entrepreneurship education; inclination towards entrepreneurship; demographic characteristics; family business background; University students

5.

Characterising the grassroots innovation process, to develop value-driven case studies for engineering pedagogy

Geetanjali Date, Ph. D Research Student,
Dr. Sanjay Chandrasekharan, Homi Bhabha Centre for Science Education, TIFR, Mumbai

Design and engineering can play a critical role in solving everyday problems of the large 'base of the societal pyramid' in India. However, our engineering education system grooms students primarily for industrial roles. Recent engineering education research highlights this state of affairs, and calls for reforms to curricula and pedagogy, so that students are
encouraged and equipped to address complex societal and sustainability problems. To embed pressing real-world problems and sustainability issues in Indian curricula and pedagogy it is important to understand design in the “wild”, by developing rich case studies of the many technologies developed by rural innovators in India. Our study seek to characterise the non-formal practice of successful grassroots innovators identified by the National Innovation Foundation, particularly their design principles and cognitive practices. The objective is to develop detailed case studies of these innovations and the cognitive practices of the innovators, such that the case studies could be integrated into the engineering design curricula. These cases may also provide a way for students and grassroots innovators to work together at the level of class and course projects. To better situate the cases, this study will be contrasted with parallel case studies of formally trained engineers solving similar problems.

In this paper, we present our preliminary observations from an empirical study of a grassroots innovator's and a group of engineering students' practice of developing a micro hydro turbine, as a part of this larger study.

**Keywords:** building; case study; concept integration; design; engineering; equity; grassroots innovators; real-world problems; sustainability; values

6.

**Linking grassroots innovation with technology and applying sustainable environmental technology to industrialising grassroots innovation**

**Eng. Q.C. Kanhukamwe and Eng. A. Phiri**, Harare Institute of Technology, Ganges Rd, Belvedere, Harare

Zimbabwe is awash with grassroots innovations which have not been tapped to provide sound sustainable technological development in Zimbabwe. Basically in Zimbabwe, current approaches in technological innovations have constantly taken an approach of up-down which often does not really articulate to local problems and as a result are not well received by the communities. At the same time the research and academic institutions which are supposed to incubate and articulate them to local terrain have limited influence and hence become largely irrelevant and result in limited impact. For grassroots technologies to be locally relevant, research and academic institution should take a leading role in incubating and commercialising grass roots technology. They should provide the link between the industry and the communities from which grassroots technology comes from. This paper explores the potential of linking grassroots innovations with technology and applying sustainable environmental technology to industrialising grassroots innovation in Zimbabwe. The paper further examines the potential of grassroots realisation through international collaboration and the aspects of patenting at an international stage.

**Keywords:** grassroots, technology, sustainable, collaboration, implementation and environment
7.

Mason guide tools for masonry construction in mitigating effects of earthquakes

Dr Rajnish Shrivastava, Director, National Institute of Technology Hamirpur,

Dr Hemant Kumar Vinayak, Assistant Professor, Civil Engineering Department, National Institute of Technology Hamirpur

The paper presents development of an earthquake resistant building construction guide tools for the state of Himachal Pradesh. Most of the constructions in Himachal Pradesh are non-engineered constructions being carried out by masons without any adherence to codal guidelines. This had led to rampant hazardous construction highly vulnerable to earthquake damages. This copyrighted work assists the mason and supervisor to construct earthquake resistant masonry construction. This paper also presents the owners guide tool developed for the construction of masonry buildings. The development of tools is based on the survey of existing construction practice in the Hamirpur district of Himachal Pradesh. The developed tools are further used for the capacity building of construction workers in the training programs and workshops organised by national, state and district level disaster management authority for Earthquake Safe Construction.

Keywords: Mason, Non-engineered construction, Earthquake, disaster mitigation

8.

Changing dynamics of higher education research and innovation in India: Key issues

Sheeraz Ahmad Tantray, M.Phil-PhD, Central University of Jammu

There is the need for dynamism in higher education, research and innovation in India due to changing lifelong learning needs, growing communication and information technology usage and enhanced networking and social engagements, both with the economic sector and community at large, which have become strategically interlinked in terms of their objectives and modalities. The widening gap between basic and applied research is dominating the challenge of “think global and act local”, necessitating flexibility in research systems and pragmatic approaches serving societies in the widest sense. The advent of knowledge society along its principal engine, the knowledge economy and widening “Digital Divide” has shaped the social change resulting in the acceleration in the risks of marginalisation. With most of the innovations occurring outside academic environments, the diminishing dividends of Indian higher education with public money at stake has failed to translate the knowledge into innovative actions thus losing competitiveness in the global knowledge society The need for growing dynamism of “research for innovation” and “research on innovation” with meta-analysis of crucial knowledge systems, the need for growing partnerships between governments, the economic sector and the research institutions so that new knowledge becomes linked to developmental goals has been thoughtfully deliberated in the present
paper. Though the analysis focuses on redefining of Indian higher education system, the
global trends and future directions are also mentioned therein.

**Keywords:** Applied research, Knowledge Economy, Digital divide, Innovation
Title: Dynamics of Technology Commons: A case of Bullet Santi

Mahesh Patel, NIF

The Concept of technology commons emerged as a part of diffusion study in the case of Bullet Santi, a unique contraption developed by grassroots innovator Mansukhbhai Jagani. The concept is based on the need to bundle lead technological innovations and their derivative innovations so that people to people learning, imitation and replication would not only be tolerated but even encouraged. However, technology commons ensure that sharing of this bundle with firms is mediated only through licensing. The concepts of knowledge commons and technology commons are attracting attention from a Collaborative Innovations Model perspective. However, current implementations have been limited to software technologies only, but Honey Bee Network experience shows its relevance in engineering technologies which needs further exploration.

The purpose of this paper is to establish a case for establishing formal platform for standardization of components followed by streamlining the manufacturing process and its business based on involvement of all stake holders of incubation value chain. The obvious questions that might arise are about the relevance of second hand equipments, future of derivative design and development efforts, customized offering and so on. But more importantly it sets forth a framework for ethical coping of technologies, overcoming inability of the innovator to meet market demand and encouraging improvements/tailor made adaptation by small entrepreneurs to scale up their business to next level. The case also highlights the generosity of the people for sharing knowledge and technical know-how to address a consumer need.

The concept needs further in-depth study to test its validity and relevance in the background of current intellectual property rights regime, product development processes and viability of
formal business platform in this competitive global market. However the findings prove that there is a scope for establishment of new value chain by involvement of formal sector, which in turn would change the overall value creation to holistic value co-creation.

2.

Social and Economic Impacts Assessment of Mushroom Production in Uganda
Xiaoping Wei¹, Qui Sun¹, James Akanyijuka², Pradeep Malakar³, Zhiqing Zhao¹, Chen Yang¹, Guowu Ou¹, Peace Byandusya²

¹Guizhou Academy of Agricultural Sciences, China; ²Mushroom Training and Resource Centre, Kabale, Uganda; ³Institute Food Research, Norwich, UK

In Uganda, mushroom cultivation is regarded as an effective strategy to address shortage of arable land, provide smallholder farmers with additional income, and improve socio-economic status of women. There is a thriving market for high quality, fresh and dried mushrooms. Uganda government has made great efforts to improve the mushroom industry through various programmes. However, the mushroom production in Uganda remains at a low level. The project, Optimizing Mushroom Spawn Production in Uganda, funded through the AgriTT (Agricultural Technology Transfer) programme, aims to identify constraints and challenges local mushroom growers have encountered, transfer practical innovations developed by Chinese farmers to Uganda grassroots, and assess the social and economic impacts of the project. We focus on to what degree the mushroom production can improve local farmers’ livelihoods, enhance the cooperation between or within communities, and empower local women. Our goal is to combine innovations developed by both Uganda and Chinese mushroom growers, and create a model by which Uganda farmers can find a way to fund and implement these innovations appropriately.

3.

Promoting Farmer Experimentation and Innovation in Sahel (PROFEIS)

Case of Mali

Assetou Kanoute, Djibril Diarra, Souleymane Diarra, Ousmane B. Diallo, Abdou Y. Maiga, Samba Traoré

This paper starts with 2 citations: the first comes from an old sage man from Mali saying “when a old Man passes away, it is a library that burns” meaning that Africa is rich in knowledge (Amadou Hampaté Ba); the second citation is from local language Bambara but translated in French, it said: l’oreille apprend de nouvelles choses tous les jours meaning that “the ears learnt new things every day”. In this case, the key elements that come out are “learning” and “new”. Africa is rich on knowledge and African farmer are creative.

After more than 4 decades of development interventions in SSA, improvement of the livelihood and incomes of poor resource farmers have been the challenges of all partners. During the last decade, the situation has been worsening with the climate change. The causes are many, diversified, complex and interrelated. Taking all farmers in the same
agroecological zones and therefore in broad sense do not work. Capital investment is necessary but not necessarily efficient for success in a harsh ecology. A very good strategy can be developed with a high investment but can fail.

This paper tries to answer two key questions: 1) how poor resource farmers in Sahel can be recognised by the public? 2) how to better anchor researchers, extension agents with farmers in a collegial partnership for knowledge and mutual learning? Promoting farmer experimentation and innovation in Sahel (PROFEIS –Mali) is an action research programme and also a national platform to promote the local innovation. The paper draws the rich practices, experiences and knowledge of poor resource farmers in Sahel. It also presents the Participatory Innovation Development (PID) approach, its concepts, and principles. The process to reach poor resource farmer innovations is described. This paper presents the governance of the PROFEIS –Mali and the key steps developed. The two main types of farmer innovations (technological and institutional innovation) are illustrated with examples in this paper. Potential themes of research from some farmer innovation are indicated. Lessons, challenges and way forward with some farmer innovations are presented.

4.

An Approach for optimisation of agricultural parameters and resources using wireless automation

Jignesh G. Bhatt, Pari S. Acharya, Niyati P. Doshi, Dharmsinh Desai University, Nadiad, Gujarat

For agriculture-based economy in India, water requirements for irrigation keep changing abruptly due to market demands, desired crop quality-quantity, rain uncertainties, global warming, power availability, etc. Uncontrolled irrigation severely affects production targets and crop yields due to inefficient irrigation. Apart from soil type, other critical parameters like soil moisture, fertiliser, sunlight availability and weather conditions play a crucial role in deciding irrigation magnitude and frequency. Recently, wireless sensor network (WSN) has attracted attention of global researchers as an emerging technological platform for novel applications and is being used to explore unexplored domains. The paper puts forth a WSN based system in form of proof-of-concept, to help achieve better crop yields by optimisation of irrigation and water saving. The work included identification of critical parameters as well as development of technological framework for remote data acquisition and control. The prototype model developed presents a cost-effective, energy-efficient, adaptive and scalable system for preventing the wastage of precious water as well as for real-time compensation for rapidly changing weather conditions. Simple and user-friendly Graphical User Interface (GUI) of the system helps acquire and analyse measured parameters based on which decisions regarding the irrigation schedule have been taken in real time.

Keywords: Agriculture management, Automation, Instrumentation, Irrigation control, Technological innovation, Optimisation, Wireless Sensor Network
5.

Traditional knowledge and farmer innovations in the Central and Eastern Himalayas

Ajay Rastogi, Nawraj Gurung, Reetu Sogani and Prakriti Mukerjee
Smallholder Innovation for Resilience (SIFOR)

This paper provides the context and the results of a qualitative survey on farmer innovations in the Himalayan region of India. The study carried out in five villages each in the Central and the Eastern Himalaya addressed two key research objectives: i) to identify traditional knowledge (TK)-based innovations and practices that enhance productivity, and ii) to understand the conditions and processes which foster vibrant and resilient innovation systems. There are several challenges being faced by the farmers and notable amongst those are the crop raiding by wild animals and stray cattle, changing climate and weather patterns, degradation of forests and loss of soil moisture and productivity. Farmers are developing methods to cope with these challenges and several innovations in their farming technologies, market practices and institutions were identified. Mixed cropping is now intensively practised and has helped improve productivity by increasing moisture, reducing crop-raids by animals, planting crops to suit the changing weather patterns, and making food available throughout the year. Farmers have also modified their composting techniques to increase moisture content to counter the deficiency in rainfall; and have developed biopesticides which have reduced crop failure due to insects and other diseases. Innovations like increasing production of finger millets and reintroduction of locally extinct crops like alsi (flax seed) have helped improve marketability due to resurgence in their demand. Government research and extension agencies have also contributed to several innovations through the adaptation of their technologies by pioneering farmers.

6.

Prevalence of food insecurity among the small holders in rural Bangladesh, an empirical study

Tanvir Shatil, Staff researcher, Research and Evaluation Division (RED), BRAC
Md. Shakil Ahmed, Research Associate, Research and Evaluation Division (RED), BRAC

Poor people especially in underdeveloped countries are facing food insecurity and trying to cope up with this threat from their own experience and strategies. Copping strategies are embedded in the practice of the community people. So, whatever discussion happens regarding aspects of food security, nutritional status and safe food in the policy spheres and academics, there are some community perceptions and understandings that differ from the common academic understandings. These perceptions mainly emerged from the local context. People suffering from different extent of food insecurity try to explain it with the reflection of their past experiences subject to the present context. In Bangladesh, among the smallholders food security is perceived as availability of enough rice grain in their granaries to meet up with the yearlong demand. They are not concerned about the nutritional status or safety of the food rather they emphasise the access to food where they need not to strive. These
perceptions have emerged from the past experiences they came across. Considering the circumstances the current study tries to reveal the gap between theoretical and community perception regarding food security and the facts which trigger the food insecurity among the small holders of rural Bangladesh. This study triangulates both quantitative and qualitative findings to answer the basic research questions. It is to be noted that coping strategies of a household are much more depending on the context. The people who have occupational diversity and strong social capital are less likely to suffer from food insecurity. The farmers having own farming land and substantial level of income are also less likely to be food insecure. On the other hand the household of a single occupation and affiliated with more than one MFI has the high probability to be food insecure. Number of loan from different organisations and loan repayment behaviour intensifies the adverse situation. This prevalence and intensity of food insecurity mostly considered from the perception of small holders. They have hardly any chance to think about nutritional status and safe food which encompasses the theoretical definition of food security. To ensure food security as per the academic definition requires establishing a pipeline of information from policy level to rooted people to enhance their awareness and perception towards academic understanding.

Session 2: Papers 7-12
Chair:
Vasanth Shetty, Dean (Vety) and OSD, Veterinary College, Karnataka

Co-Chair:
Sanjeev Saxena, Chief Scientist ICAR

Date: Jan 22, 2015
Time: 11:30-13:00
Venue: Wing-11, Committee Room

7.

Farmers’ rights and sustainable agricultural development
Hardev Chaoudhary, NIF

Indian economy depends on agriculture for its sustainable development because about 65% of the population is living in rural areas and over 80% of them are dependent on agriculture and allied activities for their livelihood. Indian farmers have been playing vital role in generating & conserving rich genetic diversity in many crops over last 7000 plus years. Crop improvement is dominated by public R&D, with about 25% of investment from private sector. Our annual requirement of seeds is over 60 lakh tons. The Indian farming community supplies over 85% of the seeds every year.
The traditional right of farmers on saving, sowing, exchanging and selling planting material is strongly entrenched with its strong link to the livelihood. Private seed sector places priority on hybrid seed technology (90%) to beat farmers’ rights on seeds. Farmers’ rights and freedom to function as the biggest, most de-centralized supplier of locally well-adapted seeds has helped India to make the transition from a grain deficient to a grain surplus nation. Once the farmers’ rights to sell seeds is taken away, the shortfall in the market of 52 lakh tons of seed will be filled by MNCs. If that happens, India will lose control of its seeds production, its agricultural development and its food security.

There are many successful attempts of innovative farmers reported for improved crop varieties in the cereal, pulses, oil seed and spices sector which have both served to strengthen agriculture seed business and improve the productivity of the agricultural sector. NIF has filed 27 applications of farmers’ plant varieties for registration under Protection of Plant Varieties and Farmers’ Rights Act- 2001 out of which registration certificates have been issued for three farmers.

The farmer having the rights on plant varieties is an essential component of our food security, sustainable agricultural development and their better livelihood.

8. **Holistic land and livestock management**

   **James Chawarika**, Community Worker, Harare, Zimbabwe

The Ministry of Women Affairs, Gender and Community Development has come up with a Programme on Holistic Land and Livestock Management with the aim of eradicating poverty and hunger at household level through the promotion of the “*Green Economy*”. The aim of the programme is to increase food production at household level Holistic Land and Livestock Management process involves the use of livestock such as goats and cattle through hooves-action to heal the land and increase crop production with limited use of chemicals and fertilisers while also dealing with effects of climate change. It encompasses the practice or system of conserving soil and water through the use of surface cover/mulch to minimise runoff, degradation and erosion in order to improve the conditions for plant growth. Crops and pastures are planted using minimum tillage techniques. The following are key components/pillars for a successful implementation of the framework: 1. Exposure to conceptualise the Holistic Land and Livestock Management framework by the traditional leaders (Councillors, Chiefs, Headmen). 2. Capacity building of the technical staff (MWAGCD, Agritex, Livestock, Veterinary Department and representatives for the identified sites in a District).
9. Evaluation of Indigenous Veterinary Medications for Curing Bovine Ephemeral Fever in Regions of Himachal Pradesh

Dr. Alok K Sharma*, Sheikh Hefajat Hussain, S. Ponnan, R. Periyasamy, Amar Singh, Lakshmanbhai Pabbabhai Bharwad, Dr. Devesh Thakur, Dr. R.D. Patil, Ms. Arpna Tandon

*College of Veterinary & Animal Sciences, HP Agriculture University, Palampur

Bovine ephemeral fever (BEF) or ‘Three-Day Sickness’ is a clinically severe, short-duration, non-contagious disease of cattle and buffaloes. Salient features of the disease are its acute and aggressive clinical symptoms and the rapid recovery. The study was conducted to evaluate the clinical efficacy of 5 different herbal medications selected and provided by NIF. The study was conducted in 14 different locations in HP, including 13 Veterinary Hospitals and one Organic Dairy unit of HP Agriculture University at Palampur. Five ITK-based herbal medications provided by NIF were tested for clinical trial. Each medication was tested on 20 animals. The results showed that BEF-infected animals showed marked neutrophilic leucocytosis with immature forms along with the lymphopenia and eosinopenia. Biochemically, a significant decrease in serum concentrations of total protein, calcium and alkaline phosphatase were seen, however, the mean values of serum levels of glucose and creatinine were significantly increased. The five herbal medications for found to be effective in treating BEF as compared to conventional treatment.

10. Effect of dietary supplementation of AHP/FA/MM on performance and protection against bacterial infection in commercial broilers

Vasanth M S, Kartik Chandra Maity*, Amit Bera, Shivakumar M C, Suresh B N, and Manjunath L

The effect of AHP/FA/MM, an herbal powder was evaluated on the performance and protection against bacterial diseases in broiler birds. Two hundred day-old straight run commercial chicks were assigned to two groups and each group consisted of two replicate of 50 chicks each. One group was fed with commercial broiler diet without herbal supplement served as control and another group fed commercial broiler diet fortified with AHP/FA/MM powder @ 2g/day/50 birds for 7 days during starter phase which served as test group. At sixth week increased body weight (43 grams), decreased feed consumption (55 grams) and better feed efficiency (0.065) was observed in group of birds fed with AHP/FA/MM. It was concluded that the dietary inclusion of AHP/FA/MM powder had beneficial effect on growth performance and protection against bacterial disease in commercial broilers.

**Key words:** Broilers, Disease protection, Growth response, Herbal supplement
11. Clinical validation for mastitis in animals

Dr. M.S.Bhadwal*, Shri.Becharbhai Samantbhai Devgania, Dr. Pranav Kumar, Dr. S.A. Khandi and Dr. R.K. Bhardwaj
Faculty of Veterinary Sciences & Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, R.S.Pura, SKUAST-Jammu (J&K) INDIA

A treatment trial was conducted to study the effect of test medicine in mastitis in cows. A total of 12 cows in 2nd to 4th lactation with an average milk yield of more than 12 liters were selected for the study. These animals were suffering from clinical mastitis diagnosed on basis of inflammation in the affected quarters. It was observed that abnormal milk containing flakes were noticed in 8 cows, varying in colour, from thick yellow (6 cows), watery (4 cows) to pinkish (2 cows) were found among selected animals. California mastitis test was (++) to (+++) in the affected quarters.

12. Participatory Technology Development in Indigenous Veterinary Medicine (PTDIVM) - Experience of TANUVAS

Sudeepkumar N.K*. Periyasamy P., Periyaveeturaman, Naveen K., Selva Raju D., Thirunavukkarasu D., and Raja M.J.
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In India livestock has been playing a crucial role as one of the livelihood options for the marginalised sections of the rural society. More than 50 per cent of the bovine population is owned by small, marginal and landless farmers. In addition more than 70 per cent of the workforce in dairy sector is women who are marginalised. Similarly the small ruminant animals and backyard poultry too accounts a greater role as a valuable asset and income generating activities of marginalised sections of rural India. The production from the marginalised community accounts to greater significance towards the national economy. The milk as a commodity tops the list of commodities in contribution to the national Gross Domestic Product (GDP). In total, livestock sector accounts nearly 4 per cent of the National GDP and more than one-fourth of agriculture GDP. Even though the contributions of the livestock sector is significant to economy it suffers with various issues which include poor financial support, limited reach of formal animal health sector, extension system and along with other reasons which limits its potential.
Historically state Animal Husbandry Department suffers from budgetary difficulties (Ahuja et al. 2003). In recent years the public sector has been on withdrawal mode through privatization of various services (Jothilakshmi et al. 2011). This altogether limits the availability of formal animal health services. In particular, the reach of formal animal health system in tribal areas, remote and geographically isolated areas were meagre. Outside the formal animal health service system community based indigenous veterinary medicine (IVM) which has built upon over centuries extends support to unreached areas and excluded marginal sections of the society. IVM are in the form of knowledge and behaviour in harsh and poor resource conditions which provides solutions to animal health problems. These are extremely practical solutions which are available to members of community within the community. It provides solutions utilizing available resource in their local situations and with a least cost. But at the same time these knowledge were in the form of family secrets, undocumented and at the stage of extinction as there no followers or people to take up the profession. Thus knowledge accumulated for generations by trial and error were in the form of tacit knowledge (Hoffmann et al. 2007) which were not expressed in language as similar to formal science. This necessitates converting the tacit knowledge to expressive through documentation and needs to be scientifically validated. In addition their content has mix of curative and non-curative procedures/practices. So it needs to be verified on the lines of science for further scaling up for the benefits of wider livestock farming community.
1.

**An electronic platform for facilitating financial trading of non-exclusive license of technology**

**Akhilesh Gupta, Kamal Rabha**, Center for Industrial Technology & Innovation Economics, Mumbai

Any kind of intellectual property such as patents, copyrights, trademarks, source code, designs, logos, and trade secrets can be licensed. Mostly patentee (“seller”) searches a potential licensee (“buyer”) by himself or with help of a third party and thereafter meets with the potential buyer for closing a deal. This approach is not only costly but involves traditional way of marketing. Further practically it is not suitable for grassroots innovators. Another way to search a potential buyer is to list your technology on various third party web portal for a fixed fee model or revenue sharing model. An interested buyer may contact you for closing the deal. This approach is also not only costly but involves a lengthy process and is not suitable for grassroots innovators. Further problems with these approaches are that there are no standardised terms and conditions of license making them non-transparent. These approaches have lack of contract and valuation standards, lack of market transparency thus leading to inadequate price discovery, inaccessibility to technology at fair and reasonable price. Thus there is a need for a simple, transparent and cost effective approach to assist grassroots innovators for commercializing their innovations. The present paper makes a case for to developing a simple electronic exchange for facilitating non-exclusive trading of technology licenses similar to any other electronic exchange for stock trading. The research involves developing a model whereby the trading of technology licenses is based on market based pricing and on standardised terms creating transparency. Such an exchange is likely to be cost effective and suitable for grassroots innovators due to the transparent model, standard licensing terms, no-fee listing of technology. In implemented this could serve as a catalyst for the promotion of the innovation in our nation.
2.

National Digital Literacy Mission: Harnessing collective energies for a digitally literate India

Shrikant Sinha, Chief Operating Officer, NASSCOM Foundation

NASSCOM Foundation, the social development arm of NASSCOM, was established with the vision of leveraging Information and Communication Technologies (ICT) for empowering and transforming lives of the underserved by channelising the support of member companies for social development. This paper will explore the journey of National Digital Literacy Mission to build an ecosystem for the creation of a digitally literate India through mutually beneficial partnerships with government and non-government stakeholders. A sound grasp of ICT is fundamental to participation in society, and the basis for this engagement was initiated through NASSCOM Knowledge Network (NKN). As part of post-tsunami relief effort, the Foundation established information centres across India. These NASSCOM Knowledge Centres were built to provide access to technology to underserved communities and help bridge the digital divide by promoting digital inclusion. Through NKN centres, the Foundation realised that infrastructure development should be balanced by investments in digital literacy. As government moves more of its services into the digital domain, it gives people an impetus to start using digital services. Consequently, National Digital Literacy Mission was launched with the belief that digital literacy support for the underserved will work to bridge the digital divide and facilitate economic and social integration.

With the inclusion of CSR mandate under the Companies Act 2013, the Foundation is leveraging the capabilities of corporate India to supplement the government’s efforts on digital literacy. Integrating digital literacy skills into the agenda of different stakeholders will ensure that people are not only able to access and use digital technology, but are also able to use it in a manner that enhances their lives. Therefore, NASSCOM Foundation is now working together with public, private, and not-for-profit sectors to help disadvantaged groups develop digital literacy skills. Sharing of resources and collaboration through public-private partnership will advance digital literacy in the country and address the most critical challenges for the development of a knowledge economy.

3.

Title of Paper: Utility of User Networks for Development Communication: An ICT Social Network driven approach for Diffusion of Innovation

Rahul Sudhakar Mane, Research Associate, Communications Division, Mudra Institute of Communication

Media information is critical to adoption of innovation, albeit in different context related to democratic practices. Lead users in any population adopt specific, informed ways of not just reading but introducing new ways and approaches of how to make best use of innovations in their lives. Lately, communities are evolving as “Innovative Agency” for the successful adoption. This analysis also underscores significance of diversity of users along demographic
lines and different positions they occupy within organisation, user communities, and networks and beyond. As Rogers proved diffusion of innovation is greatly driven by homophilic followers who are having similar exposure in terms of education, social status, and beliefs with their opinion-seeking counterparts. However, in the context of how various communities to which mass media caters knowledge and further due to media convergence (largely cultural shifts discussed above), there is need to check how heterophilic individuals and communities are coming together (and through what way) enabling adoption of innovative agricultural practices.

My argument is that in contemporary times, these networks are being influenced, shaped and remade by the pervasive expansion of media. In the societal framework, diffusion depends upon interpersonal communication, geographical proximity, institutional and individual coercion and pressure of social networks. Further, with support of literature and emerging scenario, I claim that innovations adopted are independent of their macro-environmental context but evolve through specific settings of geography, societal culture, political conditions and globalisation.

My effort will be to understand the potential of “communities in social networks” in ICT domain and their potential in bringing people together from various communities and also from various stakeholders. Here social networks are imagined as significant media of social change and thus there will be an effort to suggest different models which can be adopted by organisations/institutions who are working with communities in their area of operation/expertise/interest.

**Keywords:** culture, creativity, social networks, innovation, diffusion

4.

**Mason Guide tools for masonry construction in mitigating effects of Earthquakes**

**Dr Rajnish Shrivastava,** Director, National Institute of Technology Hamirpur  
**Dr Hemant Kumar Vinayak,** Assistant Professor, Civil Engineering Department, National Institute of Technology Hamirpur

The paper presents development of an earthquake resistant building construction guide tools for the state of Himachal Pradesh. Most of the constructions in Himachal Pradesh are non-engineered constructions being carried out by masons without any adherence to codal guidelines. This had led to rampant hazardous construction highly vulnerable to earthquake damages. This copyrighted work assists the mason and supervisor to construct earthquake resistant masonry construction. This paper also presents the owners guide tool developed for the construction of masonry buildings. The development of tools is based on the survey of existing construction practice in the Hamirpur district of Himachal Pradesh. The developed tools are further used for the capacity building of construction workers in the training programs and workshops organised by national, state and district level disaster management authority for Earthquake Safe Construction.
Keywords: Mason, Non-engineered construction, Earthquake, disaster mitigation

5.

Grassroots innovation: The Malaysian Story: YIM paves the pathway by innovation walk

Othman Omar, Yayasan Inovasi Malaysia

Malaysian Innovation Foundation or Yayasan Inovasi Malaysia (YIM) is an agency under the Ministry of Science, Technology & Innovation (MOSTI) Malaysia. YIM is given a mandate to inculcate innovation and creativity among Malaysians, particularly a movement towards innovative society and sustainable development. Since 2010, YIM has run a successful program in Malaysia called Innovation Walk also known as JI. Essentially JI is a scouting program to document ideas, creativity and innovations among the grassroots community. The scouting group consists of academia, researchers, scientists, patent experts, engineers, volunteers and other experts. They visit grassroots communities, provide consultation, evaluate the innovations discovered and give recognition. The complete JI program involves three main stages: DISCOVER; DEVELOP & DELIVER. Innovations that have been discovered at grassroots level will go through an evaluation process by a panel of experts. Only products that have potential social and market relevance will be recommended for development and advancement. The presentation at this forum aims at sharing YIM’s journey, experiences; discuss issues and challenges in making inroad with JI movement. YIM will also share her Status Quo and Quo Vadis.

Keywords: Inclusive innovation; grassroots innovation Malaysia; innovation walk program; innovation discovery, development and delivery; issues and challenges grassroots innovation in Malaysia
Learning and creativity based use of informal knowledge in the Horticulture sector of Jammu and Kashmir

Sheeraz Ahmad Alaie, PhD, Central University of Gujarat

Horticulture sector is the main economic backbone of Jammu and Kashmir, which can be viewed both as a formal and informal sector activity. Within the formal context, it involves the government institutions based on certain rules and regulations. On the other hand, informal activities comprise of farmers and community. Farmers involved in the sector have the knowledge acquired by their lifelong experiences and learning from their working environment. They act as core actors in the horticulture system. This paper examines the role of various forms of knowledge and innovations generated in the process in the horticulture sector with special reference to apple industry in Kashmir valley. In order to explore the system of horticulture, regional innovation system (RIS) approach is used. The data was collected from both primary and secondary sources. Knowledge exists in both the forms in doing the farming practices regarding the apple production in Kashmir valley. The formal knowledge more preferred and focused as compared to the informal knowledge. The use of informal knowledge in the sector has also a great role which is not considered in the subject. The research works defines such important role by taking the example of some disease treatment methods by the farmers based on their own experience and knowledge. The corroborative ways to use both forms of knowledge is more beneficial in the sector.

Keywords: horticulture sector, innovation system, learning and informal knowledge
7.

Innovative strategies for using social media, e-commerce and other platforms to link grassroots to Global markets

Prof Ruma Agwekar, MBA Finance, SIBM, Pune University

The research has isolated five case studies of innovative social media strategies. Through the research it became evident how mind and media work together. The objective is to reach out to the masses, gain wider acceptance amongst the communities, for social and commercial purpose. The globally known networks amongst the case studies are The Indus Entrepreneur (TiE) – Non-Profit Organisation, Brahmakumaris–NGO, Mahratta Chambers of Commerce Industries and Agriculture, Unitedbuzzz and SME Chamber of India. All these social groups and organisations have made use of social media to reach out to the rural economy. Social Media, although is vulnerable to open libel and slander, the research acknowledges the wide and impartial use of social media in years to come. The indulgence towards rewarding and protecting the rights on social media is on the rise. It will also have a global applicability and reach for the bottom of the pyramid.

Keywords: Mind, Markets, Innovation, Strategy

8.

Open and Democratic Access to Knowledge for Grassroots Communities

Arul George Scaria, NLU, Delhi

Gaining access to knowledge resources is still a distant dream for the vast majority of people in India. This paper (and the panel discussion in general) intends to explore two questions – (1) Why do we need more open and democratic access to knowledge resources for grassroots communities? and (2) How do we ensure more open and democratic access to knowledge resources? This paper will be trying to explore these questions by taking access to legal research products in India as a case study. The initial part of the paper highlights the developments in digital technologies that have radically changed the way knowledge is produced today. This part will also highlight why sharing of knowledge resources is the more optimal approach to production of knowledge in the current technological scenario. The second part of the paper will examine the current modes of production and dissemination of legal research in India and ask whether they are optimal approaches. The third part of the paper will highlight the obstacles in access to legal research products in India. This part of the paper will also try to explore what innovative modes of communication and legal or policy changes may ensure better access to legal research products for the grassroots communities.
9. Dealing with Citizen Grievances in a 'Smart' City

Dipti Gupta, FPM Student, IIM A

In the era of rapid urbanisation, there is an urgent need for creating cities driven by efficient growth path. Smart cities should optimise energy and provide a good quality of life. These cities would be characterised by institutions which are well integrated with each other through the use of technology. Well laid out institutional infrastructure is required to provide transparent and inclusive service delivery. New experiments of this kind will inevitably entail mistakes on part of officials in policy formulation and implementation. Citizens have a greater role in expressing the complaints not only for redressal of grievances but also giving feedback for improvement in success of the concept. Understanding the significance of grievance redressal mechanism in effective governance, in this paper an attempt is made to propose ‘intelligent’ institution for addressing grievances for upcoming smart cities. In the first part the theory behind grievance redressal and the existing mechanisms in India and across world is studied. In the second part proposal would be made for an appropriate design of a sustainable institution for governance which is technology driven for future smart cities.

10. Spreading the good word: harnessing social media for diffusing grassroots frugal innovations

Anil K. Gupta, Chintan Vinod Shinde, Chinmay Somani, Marianne Esders

Information flow is critical for diffusion of innovation. Information flow can happen through social networks both in the online and offline space. Since social networks are an important medium of information exchange, many studies have been carried out for understanding their dynamics and structures. Though social networks are nowadays associated with online social media, the principles established in the offline context are still applicable in some cases.

The purpose of this study is to understand the diffusion of knowledge through Facebook. Facebook connects more than one billion subscribers and can, therefore, be an effective medium for widespread dissemination of information. The information network, thus created by connecting various users, can be leveraged to facilitate diffusion of sustainable grassroots innovations. Detailed analysis of such information networks can increase our understanding of network characteristics that facilitate efficient information flow. In an efficient network the transaction costs can be considerably reduced. In addition, the study also strives for greater understanding of the structure of knowledge networks, the information flow in different geographical locations and ways to identify important actors in the network who help in sharing information.
Making Indian culture and its cultural diversity innovative

Parwez Nazir, Assistant Professor, CAS, Department of History, Aligarh Muslim
University, Aligarh

Throughout the ages India is known for its cultural diversity, which makes it unique of all the civilisations of the world. With the passage of time, the very unique cultural heritage became India's identity which attracted the foreign travellers, who kept coming from the time immemorial and left revealing and fascinating accounts of rich legacy of India's past. Travellers’ accounts are the repository of information for understanding India's culture and cultural diversity. After globalisation, information and communication technology has reshaped the orientation and perspective of the people's attitude largely and thinking broadly. Traditional and oriental learning somehow has lost its utility because it offers least opportunity of employability. To make cultural history creative, more innovative, people's friendly and attractive for the next generation, India's culture and cultural diversity needs to be preserved. Ever changing nature of the society with growing problems and more challenges, People in modern times are interested India in art and architecture, paintings, music etc. rather than dynastic political history. They want their leisure time to spend in a more fashionable way engaging themselves in creative and innovative distress-free pursuits to achieve more happiness and pleasure which they could find in the cultural related diversity reflected in the splendid historical monuments, diverse regional paintings, *sufiana* and *arifana kalam* in devotional and spiritual music, soothing *Bhakti* songs etc. Remains of rich cultural heritage is found in every city, small towns or even *qasbas* of the country which makes India a tourist friendly country. India's culture and cultural diversity has immense potential for the development of tourism and for a better economic prospect in the country. Only through scientific and target oriented planning and infrastructural development, India can emerge as one of the best destinations for national and international tourist. India has remained famous for its handcraftsmanship, indigenous skill and craftsmanship, professional
expertise and regional artisanal diversities which made its products valuable and were in
great demand all over the world. Cotton textile, silk products, ivory works, wooden works,
stone cutting works are a few examples needs preservation at all cost to make India of 21st
century culturally more creative and innovative with its traditional roots of multiculturalism.
Religious places of Hinduism, Islam, Buddhism, Jainism, Christianity and other religions,
their different sects and sub sects represents the diversity of cultural heritage as they had their
own distinctive style of art and architecture and texture of paintings and every one
significantly contributed to make India's distinctive composite culture. Multiculturalism
developed in India by way of mutual cooperation and the philosophy of give and take,
development of Indo-Islamic architecture is its best example. Indian classical music and later
Indo-Muslim synthesis in it has made it more creative and innovative, promoting of which
should be the motto for achieving unity and peace in the society, essential for the sustainable
development. Teachings and preaching of Sufi and Bhakti saints spiritually integrated the
society by bridging the gulf and strengthening the bond of love between the communities and
caste necessary for the healthy development of the society, their ideals like service of
mankind and spiritualism needs revivalism in an era of consumerism to ensure happiness and
peace in the society. The philosophy of Ahimsa, the core of India's cultural ethos, is to be
fostered in the imaginative creativity of the people to ensure a violence free society which
needs an innovative persuasion.

2. 'Pabuji Ki Phad' - A lost art or a social need

Dinesh Yadav, BITS Pilani

During a period of two years of tenure as an assistant professor in BITS Pilani, I witnessed
six to seven children every day, performing with their stone pieces (using them as khartal) in
buses and around the bus stand of Pilani. When, out of curiosity I started interacting with
them, I came to know that these all are children of Bhopas leaving as nomads in Dera (a
small tent made of row wood and pieces of cloths) around BITS boundary and few of them
came from nearby village Morva, stay in the bus-stand during the day time and leave by
evening. They beg for money in buses while singing in their row rustic voice and playing this
stone made Khartaal. I didn't like their singing but what I should appreciate is the playing of
these small pieces of stone with a great amount of skill and style.

This is the prevailing situation of the people, who carried the form of Pabuji ki Phad for more
than six hundred years.

The Bhopas are the priest singers of the folk deities in Rajasthan. They perform in front of a
scroll, known as Phad that depicts the episodes of the narrative of the folk deity and functions
as a portable temple. The Bhopas carry this phad traditionally, and are invited by villagers to
perform in their localities during hard times of sickness or misfortune. The 'husband and
wife' known as Bhopa and Bhopi generally performed the vernacular epic of Pabuji Ki Phad.
Bhopi (wife) is an essential part of the performance, she contributes in the performance in
two ways, one; narrating and singing the story, second; illuminate the hand-painted screen or
phad with a oil lamp/ diya on which the various exploits of Pabuji are depicted. In the world
at large, women performers of folk epics are relatively rare. Studying the Pabuji ki phad,
therefore, offered a unique opportunity to investigate gendered epic traditions and women’s epics as a distinct sub-genre. The voice of rural women in Rajasthan is seldom, if ever, heard and my research sheds light on their perspectives and the socio-religious worldview of women of the adivasi Bhil tribe, a poor, low caste minority in Rajasthan, often denied basic rights and entitlements. There has been much written and documented on Pabuji ki Phad, but unfortunately nothing much been done for the promotion of this wonderful performing art form neither there is any significant work has done to bring them into mainstream of today 'development'.

3.

Preserving traditional art through social business: A case of Mithilasmita-Madhubani paintings

Ankur Joshi, S K Tapasvi, Management Development Institute (MDI)
The paper explores how traditional art can be preserved through social business by studying the case of Mithilasmita. It is a small organisation working for preservation and promotion of traditional art of Mithila region- commonly known as Madhubani paintings. The case brings to the light the concept of governance which envisages role of multiple actors. The government which framed rules and regulations for preservation of art was not successful in achieving outcomes alone. An entrepreneur shares the same concern and tries to address the need of society through a social business model. It may be a beginning for Mithilasmita, but the case provides learning for trying out similar model in different phenomenon. Through this conceptual paper we also present a framework of governance for improving implementation process and social well being.

4.

Folk Route: Changing preferences in urban spaces

Utpala Desai, PhD (Indian Culture)
This work verbally recites a crusade initiated by a young music composer and his (art) entrepreneurial efforts to create collaborative platforms for nurturing appreciation among urban audiences addicted to entertainment offered by television. Nishith Mehta, in his late thirties has spent the last decade of his youth in wandering, listening to different music, experimenting and creating fusion music. Armed with first-hand knowledge of folk/tribal music traditions he decided to provide a platform to these decaying, ignored traditions in urban spaces and inspire creative revival of grassroots’ music. He ventured to reshape the aesthetic preferences of urban audiences and support livelihood of artists who have, for generations pursued art. His first endeavor in 2007-08 resulted in creation of fusion music of tribal, folk and Algerian singer digitalised as CD. This was followed by Deshaj Sur, a festival of regional folk music in 2013. By 2014 it has matured into a series of experimental music fests called Folk Route/Tribal Route in open air spaces of Amphitheatre. The movement has
brought amazing changes in aesthetic preferences of the young audiences and inspired creativity among traditional performers to keep pace with the young. The paper identifies an art entrepreneurial effort that has captured full audiences in Ahmedabad’s urban spaces.

5.

Intangible heritage transformations- Patachitra of Bengal exploring modern New Media

Dr. Lopamudra Maitra Bajpai, MA, MDMC, PhD, Assistant Professor and Visual Anthropologist, Symbiosis Institute of Media and Communication SIMC-UG, Pune, India

A traditional performative art from eastern India- the patachitra tradition is an integral part of intangible heritage and is an important essence of folk and traditional media. Through centuries- the patachitra has been a platform where several methods of communication have converged- including visual messages, oral traditions and music- all of which helped to amalgamate, involve and portray nature, society and culture co-existing through a lucid dialogue. Thus, these paintings- on one hand portrayed society and its ideations like simple photographs down the ages. This paper especially on the patachitra traditions from Bengal and is based on extensive fieldwork through various seasons in the region from 2004- through 2012 (especially in the districts of Bankura, Purulia, West Mednipur and Birbhum of West Bengal). As times changed over the years- especially moulding mass media and communication to adapt to global technological transformations over the last hundred years, folk and traditional media got influenced as well. This was also reflected in India- especially over the last 15 years as the worldwide- web explored a common platform for all forms and types of existing media and communication. The transformations within the intangible sector of folk and traditional media got reflected in various ways. Thus, as patachitra from Bengal got to be displayed within New Media, a transformation evolved within the paradigms of local modes of entertainment- it found a voice within the global platform. With several ethical issues questioning the survival, sustainability and continuity of the folk tradition of patachitra from Bengal and changing social roles, reflected in specific gender participations, this paper explores the various transformations which occurred within the representation of the old tradition in modern New Media and the issues involved therein.

6.

Intervention framework for transforming survival appropriations of music-skilled rural artistic and innovative persons with disability into sustainable livelihoods

Govind Dhaske, PhD, MA (Social Work), Research Assistant, Indiana University School of Social Work, Indianapolis, US

Prashant Sude, MA (Social Work), National CSR Hub, Tata Institute of Social Sciences

The rural cultural entrepreneurship demonstrated by various rural artists skilled in music and other art forms is going through a phase of crisis. With emerging market economic structures,
the integral and culturally rooted rural artists are facing social as well as economic exclusion. Due to the lack of support through sustainable artistic structures and institutions, the decline in such potent creative entrepreneurship puts a question mark on the ethicality of dominant growth approaches. Within the range of excluded cultural, entrepreneurial groups, artistic and innovative persons with disability are the most vulnerable group found appropriating their survival through stressful livelihood. While a large number of persons with disability survive through various forms of beggary, their art-related entrepreneurial potential, and self-employment ability, is less recognised and supported by the existing policy system. Based on the cumulative learning experience of a non-profit programme on organisation, skill development, and promotion of music focused artistic entrepreneurship of rural persons with disability, the proposed paper presents a policy and programmatic intervention framework for transforming survival appropriations of artistic persons with disability into sustainable livelihoods. In the light of the paucity of research and literature in the topical area, the paper uses primary ethnographic insights derived from direct practice, interventions, and mediation for rural artists with disabilities and secondary data from schematic policy and non-profit interventions.

**Keywords:** Rural cultural entrepreneurship, persons with disability, sustainable artistic structures, economic exclusion, intervention framework, policy.

**Session 2: Papers 7-11**

**Chair:**
Sudha Gopala Krishnan, Executive Director, Sahapedia

**Co-Chair:**
Susantha Goonatilake, Royal Asiatic Society Sri Lanka

**Discussant:**
Judy Frater

**Date:** Jan 22, 2015

**Time:** 14:00-15:30

**Venue:** Audi-1, KLMDC

7.

**Sowing the Seeds Right: The struggle for cultural preservation vs. “cultural losses” in a globalized world: an innovation framework**

Ravi Poovaiah, Professor, IIT Bombay

Innovation is not about technology alone as is often thought to be today. Those at a technological advantage are not the only ones really innovating. The need to find a different way to re-organise the idea of innovation arises from our desire to address this asymmetry
located in two sets of biases: (i) firstly, in techno-centric worldview that makes innovation and technology synonymous, leaving little room for an objective understanding of what technology realistically achieves for innovation, and equally, what it can equally destroy in its wake without leaving behind any documented trail of destruction, blighted as they are, by the passage of time; and (ii) secondly, the mistaken notion that those who are technologically blessed do not need culture, nor is culture crucial to innovation. The altered perspective under which we seek to understand innovation will demonstrate that every society advanced or not - possesses technology, but not all technology translates into innovations, nor is that a necessary precondition for the flowering of society. Equally, every society by virtue of having social organisation, will demonstrate some form of culture or the other and fostering culturally contextual ways to innovate. In other words, the reason to understand technology and culture place in society is crucial to realizing their relationship with innovation itself.

**Keywords:** localisation, exogenous, marketisation, emerging vs. mature, multinational, ethnographic, culturally mediated, organic, intuitive, shapeshift, pedagogy

8.

**Up scaling Local Creative Artisan ARCH Cluster: Case of Metalware Cluster in South India**

V.P.Sriraman, Bharathidasan Institute of Management, Trichy

Up scaling of local creative artisan ARCH (Artistic, Rural, Cultural, and Heritage) clusters is the need of the hour. There are many artisan clusters in India that are on the verge of decline due to many challenges including the lack of manpower, money, and markets. Even though they are present in small pockets, they are finding it very difficult to make the ends meet. If ignored, these creative artisan clusters would vanish. Even though, the Government is doing its might, it is still not enough for up-scaling this age old local creative artisan ARCH cluster. This case brings out such a handicraft cluster in Tanjore District of Tamil Nadu. The case discusses about the Indian Handicraft Industry and specially the Art Metalware, Artplate and its manufacturing process, the background of artisans, current ways of doing business and the existing institutional setup.

**Keywords:** creative, cluster, ARCH, artisan, rural, cultural, upscale, artplate

9.

**Creativity & innovation of the traditional Craftsmen of Kashmir Handmade Pashmina- perspective from the grassroots level**

Asma, MPhil, Central University of Jammu

Crafts have been traditionally been regarded as a saleable thing. However craft in local lives of the people who inherit specific traditions is altogether different thing. The art and craft of making Pashmina shawls, indigenous to Kashmir region of India, is a perfect combination of
innovative process, and aesthetic creativity, which has been perfected by the communities for over 600 years. This traditional knowledge of making pashmina is a long held secret, as it is only the artisan communities of the Kashmir who have the skill and knowledge to create softest and lightest Kashmir Pashmina, that is famed world over and has been successful getting geographic indication (GI) for the name “Kashmir Pashmina”. However, is securing the association of name with the place enough? What about the propagation of knowledge? Is sustainability only about securing future? What about the knowledge that was relevant in the past? In this era of Globalisation and hyperconsumerism, the industry of Pashmina in Kashmir has been subjected to many blows, including the advent of power looms, machine made shawls, piracy of designs, subjecting it to unfair competition which once enjoyed monopoly. This has caused the artisans to discontinue this ancient art of weaving pashmina— their innovation and gift to the world. In addition, the government policies are essentially too “welfare” and poverty alleviation oriented rather than innovation-led that fail in serving the purpose of guarding this traditional knowledge. I intend to give voice to the challenges faced by the artisan communities who create masterpieces with the use of their arcane and unique knowledge of the art inherited by them over centuries. Their social status and their knowledge of weaving Pashmina, believed to be originated here, remain unprotected in many other ways despite acquiring GI. It is about time to give up the sympathetic attitude toward the craftsmen, who are regarded merely a producer of textiles for functional and purely economic use, and place them in an economy that harnesses their creativity and knowledge as a resource that is directly beneficial to them giving them a legal standing and secure future without creating a distinction between high and low culture, the way it was intended before medieval India.

Keywords: Pashmina, traditional knowledge, creativity

10.

Max Weber’s Bureaucracy and Buddhist Monastic Organisation as Possible Templates for Management

Susantha Goonatilake, President, Royal Asiatic Society Sri Lanka

Around 100 years ago, Max Weber, described what he and others considered a “modern” form of administration, namely bureaucracy. The classic work of Rice “The Ahmedabad Experiment” showed the limitations of Western assumptions. But much earlier, there had been theorists in the subcontinent. Chandragupta’s Chief Minister Kautilya (4th century BCE) was one such theorist. But a more detailed description of organisational structure and workings are found in the workings of Buddhist monasteries among other formulations theorised that Asian cultural systems unlike the Protestant one, did not have the prerequisites for industrial development. The present paper attempts such a comparison. It is argued that Weber’s theories were a product of the times and place he lived in - a Protestant Germany that emerged into nationhood. Some of the required Buddhist mental training has crept into modern management. It is argued that as the economic axis of the world turns towards Asia,
examination of earlier Asian practices in organisations like those in Buddhist monasteries could provide insights into better management forms and practices. With Asian countries currently developing faster than the Protestant ones, a comparison between the Weberian and the Buddhist organisation forms could have lessons for our own creativity.

11.

**The main goal of this project is to acquire and capture the knowledge which has been locked up in the minds of a few remaining elderly persons**

Tariq Zaman, Postdoctoral Research Fellow, Institute of Social Informatics and Technological Innovations (ISITI-CRI), Universiti Malaysia Sarawak (UNIMAS) Malaysia

The Penan were traditionally nomads of the Borneo rainforests. During their nomadic journey “Toro”, the Penan groups communicate with each other by making signs called “Oroo”. These signs are made from natural objects such as sticks, leave and branches. With settlement, many of the signs are being lost as Oroo’ is considered of no use by the younger generation. In 2014, Universiti Malaysia Sarawak and the Penan community of Long Lamai from Upper Baram Sarawak initiated a research project on digitalising and preserving the Oroo’, sign language. As a first stage, we created an information repository of 50 signs. The information repository includes data such as photo and video description of the signs, the embedded messages, and the objects used to create Oroo’ signs. Furthermore, we also developed software tools for Penan kids to learn Oroo’ language. The main goal of this project is to acquire and capture the knowledge which has been locked up in the minds of a few remaining elderly persons. These symbols serves as a means to connect indigenous wisdom, way of life, communication medium, and a cultural heritage that has been preserved across time. This rich repository has helped bridge the gaps across generation and is promising to preserve traditional knowledge and wisdom.
Panel (CC): Coping creatively with Climate Change

Papers: 6

Chair:
Gurdeep Singh, Vice Chancellor, Vinoba Bhave University

Co-Chair:
Lillian Machivenyika, Director CADS

Date: Jan 22, 2015
Time: 14:00-15:30
Venue: Class Room- RJMCEI

1. CADS’ Experience in promoting agro-biodiversity in the face of climate change in Zimbabwe

Lillian Machivenyika, Nhamo Dapi and Tsitsi Nyamupingidza, CADS, Zimbabwe

Climatic change characterised by increased frequency of droughts and other risks faced by farmers that include rapidly changing markets, socio-political disruption, pest problems and the unpredictable availability of agro-chemicals are a threat to farmer livelihoods. Agro-biodiversity has played an important role in improving resilience in the wake of these risks. However, consumer preference for the traditional crop varieties has not kept pace with the supply of these crops resulting in an erosion of agro-biodiversity and associated knowledge systems. To counter this, CADS has promoted the production and mass marketing of traditional varieties, conducted conferences and workshops and promoted research into the nutritional values of traditional crops including amaranth, sorghum and millet. CADS has successfully worked on an initiative of value-addition of traditional crop varieties. CADS has developed products such as puddings and yoghurts out of crops such as amaranth, and biscuits out of millet and sorghum. CADS has gone a step further by linking farmers with markets for their different traditional crop varieties resulting in increased incomes for rural farmers. The integrated farming approach that CADS has promoted has also resulted in crop production systems supporting livestock production. This has resulted in an increase in the number of crops grown by the farmers either for fodder production or for food consumption. CADS has worked with farmers for many years to create resilient agro-diverse farming systems and communities and promoted increased consumption. Therefore, the demand for traditional crops by both consumers in the farming communities and urban communities has
also increased. This is reversing the erosion of agro-biodiversity and the associated knowledge systems. The success stories of the work done by CADS in promoting the production and consumption of traditional crops and the tools used to achieve this will be presented in this paper.

2.

Innovation and experimentation by farmers in the Kumaon and Garhwal Himalayas in the state of Uttarakhand in north India for climate change adaptation in agriculture

Sonali Bisht, Prolinnova network

Climate change is a reality and is having an adverse impact on the livelihoods of vulnerable people, especially smallholder farmers with little risk taking capacity. Climate change adaptation responses need to be specific to the location, its microclimate and available livelihood assets. Adaptive mechanisms are being created by farmers locally to deal with the situation. By recognising these adaptive mechanisms, building on them and disseminating them, farmers across similar landscapes can be helped with low cost and affordable responses creating greater capacity to deal with climate change. Identification and recognition of farmer innovations, dissemination for validation by other farmers, documentation, upscaling and outscaling become important to spread the knowledge and ability to cope with climate change situations. Beside farmer innovation and participatory innovation development, agriculture research organisations are also aware of the problems and engaged in their own research which needs dissemination and validation by farmers through joint and comparative experiments which gives farmers knowledge and choice. The discoveries and processes on the ground need to reach policymakers at local, national and international levels to enable better decisions to be made for both process and content. Men and women farmers in the Kumaon and Garhwal mountain villages in the state of Uttarakhand in India are facing the impact of climate change. Dependent on subsistence agriculture for their livelihood and food security, many instances of innovation to deal with climate change and secure a decent harvest can be found. The innovativeness of these farmers needs to be recognised and fostered. Validated innovations when disseminated widely bring relief to other farmers and also help build innovative adaptive communities.
3.

Nexus of climate change and food insecurity towards effective mitigation measures using underutilized crops

1Aladejebi, O. J.*, 2Oladeji, S. O. and 2Edewor, S. E.
1Department of Agricultural Economics and Extension, Federal University, Oye Ekiti, Ekiti State, Nigeria
2Department of Agricultural Economics and Farm Management, Federal University of Agriculture, Abeokuta, Ogun State, Nigeria

This review is presented on the nexus of climate change and food insecurity towards effective mitigation measures using underutilised crops. Despite the fact that Nigeria is blessed with a large land mass and a large population, we are still plagued with a serious problem of food insecurity due to subsistence of farming by majority of the farmers, inability of the country to modernise its agriculture and the adverse effects of climate change. This review shows the very important role that certain underutilised crops including several types of cereals, roots, legumes and fruits, play towards ensuring food security due to their high calorific value and presence of essential micronutrients, tolerance of poor soils and resilience amidst seasonal droughts. These crops can survive the extreme climatic conditions prevalent in Sub-Saharan Africa. The major problem associated with the productivity of these crops is small-scale production. Certain environmental factors such as drought, soil salinity and acidity, pests and weeds and diseases also contribute to large losses in their yield. Therefore, there is a need for an in-depth research on these crops so as to boost food production and ultimately provide for the ever increasing population in Nigeria and Africa as a whole.

4.

Perceived climatic variability and agricultural adaptations by material resource poor farmers: mainstreaming informal knowledge with formal knowledge systems

Ranjay K Singh, Central Soil Salinity Research Institute, Karnal-132001, Haryana, India
Angchuk Dorje, Defense Institute of High Altitude Research, Ladakh, India
Rajesh Khedi, Grassroots Innovator of Climate Resilient and Ecologically Sustainable Innovations, Khedi,
Surjit Singh, Grassroots Innovator of Rice Variety Resilient to Compounded Vulnerability, Baras, Karnal, Haryana

The climate change policy of India has recognised Community Knowledge (CK) and Grassroots Creativity (GC) as part of adaptive practices, and enhancing location specific agricultural sustainability. However, there are three major issues: (i) neither communities alone nor external agencies and governments have ready and promising solutions for combating all levels of climatic variability, (ii) how best GC & CK can be used with formal knowledge to adapt with climatic variability, and (iii) what should be framework to mainstream CK & GC with climate
variability and adaptation programmes in agriculture? Therefore, there has to be a synergy between GC and CK, and formal knowledge systems to fill in this gap and adapt climate change in agriculture. There could be a reciprocal learning between CK and GC, and formal systems. Both the systems can be integrated to enhance local strategies for sustainable adaptation agriculture. The knowledge and creativity of Material Resource Poor (MRP) farmers has not been much recognised until the recent climate change policy of India (NAPCC, 2008). Based on the questions raised earlier and arguments made, the following objectives are proposed with this workshop proposal: (i) to present and discuss perception of MRP farmers about climatic variability and vulnerability in sustaining agricultural resources and livelihood in varied environments of India, (ii) to discuss the identified adaptive strategies and practices, based on CK and GC, employed by MRP farmers that enhance sustainability of agricultural resources and livelihood security, and (iii) to identify indicators for framework and mainstreaming GC and CK-led adaptive practices with research and polycentric policies for enhancing agricultural sustainability.

5.

Farmers' creativity in coping with climate risks: A study of paddy farmers in eastern Uttar Pradesh

Anamika Dey, Research Scholar, IIM Ahmedabad

Climate variability, food insecurity and loss of agro-biodiversity are likely to stay with us for a long time unless policies are designed to counteract them based on the analysis of current coping strategies at community and farm level. As the number of extreme climatic events like floods and droughts are increasing, newer challenges to community resilience are emerging. But some farmers in the rain-fed regions tend to sense the writings on the wall much earlier and pick the warning signals much ahead of others owing to their high degree of dependence on climate. They experiment in order to survive and in the process invent/develop coping strategies, which are then interwoven into varieties, institutions and traditions. Their strategies of survival are often a result of well-informed and deliberated volition rather than just by chance. In agricultural systems, farmers need to be seen as not only solution receivers but also as solution providers and implementers whereas the formal science acts a facilitator and partner in co-creation. The study of coping strategies of these farmers in terms of a) practices they follow b) decisions taken at different stages of the crop and intensity and level of extreme events c) indicators and heuristics that they use to decipher nature, market and society would help us to devise long-term adaptation policies. These are likely to be more acceptable and adoptable, ensuring food security for future.
6.

Assessing vulnerability: An adaptation strategy to cope with the changing climate for sustainable future

MTR Khan, Faculty, Centre for Rural Development, Lal Bahadur Shastri National Academy of Administration, Mussoorie  
MD Omprakash, Faculty, Indian Institute of Forest Management, Bhopal

The world has been witnessing frequent variations in the climate with impacts on the natural resources and ecosystem environments. The extended summer, change in the rainfall pattern (intensity and duration) and variations in the onset and departure of seasons are directly impacting the cultivation, status of natural vegetation and surface and sub-surface water in a watershed area. This highlights the necessity for the governments, development organisations and finance institutions to integrate management into climate change adaptation strategies. Among the more recent efforts in combating the impacts of climate change in a community, watershed management has shown a more effective at micro levels since intervention is more site-specific that it can address the local requirements of the area. The vulnerability of climatic variations is mainly due to the water stress, degradation of vegetations, deterioration in health and hygienic conditions, gender biasness in decision making process and poor information communication technology. The present article highlights the vulnerability in the Himalayan region due to the variations in the climatic conditions and identifies the impacts through watershed development programmes. The study on the Jusho-Bakro micro watershed treated by the TERI under the programme DROP has produced positive impacts at the micro-watershed level to withstand the changing climate and its severity on the natural resources and livelihood of the community, especially to the women and children who are more vulnerable in terms of health, gender biasness and economic dependencies. This paper will look into a cost effective strategy for management and climate adaptation that will make benefits to the poverty reduction, livelihood improvement and biodiversity conservation as a strategic solution of sustainable development in adapting the climate change impacts and its severities.

Keywords: Climate change, adaptation, vulnerability, ecosystem, forest, GIS and remote sensing
Poster Presentations

1.

Design of Intelligent Food Carriers for Android-based Application
“Refrigerometer”

Pritam Kale, Virendra Pawar, VIT, Pune
Ganesh Bhutkar, IIT-Mumbai

“Refrigerometer” is an Android-based Application (App) for home users such as wife and other family members. It aims to provide information about food item quantity, food item expiry, opened door, excess power consumption and other requirements associated with domestic refrigerator. To understand user perspectives, their requirements and related problems, a Contextual Inquiry (CI) is conducted initially with about 10 households along with 13 home users. The CI has provided vital insights into several major aspects of refrigerators, their usage and home user interaction. It has also helped in setting major aims of the App – “Refrigerometer”.

There are several food carriers used in refrigerator for food storage. The food items are stored mainly in food carriers such as plastic boxes, trays or plastic bags as observed in CI. This research paper is focused on design of intelligent plastic tray used for storage of lemons or eggs. This tray is a specially designed carrier using a load cell for sensing a weight of lemons or eggs stored on it. A reorder level for item can be set through an App. The App can generate a refrigerator alarm as well as App alert for home users if item quantity reaches to or below reorder level.

Thus, a design of intelligent carrier has helped in providing information about food item quantity, which is one of the major aims of the App. In future, this research work will be extended to detection of food item expiry.

2.

Indonesian Agribusiness Traditional On Beef Cattle: Innovation, Networking, and Profitability

Yanu Endar Prasetyo, Wawan Agustina and Takijah Salim
Center for Appropriate Technology Development
Indonesian Institute of Sciences

Fattening beef cattle business in Indonesia, the majority are still run traditionally. Every farmer in the different regions have different methods and local wisdom on running the cattle business. Interestingly, the people's farm is mostly combined with the main farming (rice fields and plantations) that has many variants of a pattern on maintenance and typical marketing. This study describing the level of profitability and contribution of fattening beef cattle people in Subang, West Java, Indonesia. This study using case study method on a group of cattle \Sinar Sri\ as the subject of mentoring programs based business development agribusiness beef cattle for ten months. The intensity of interaction observation and data
collection can directly record maintenance techniques with patterns: 3 (three) months 6 (six) months and 9 (nine) months. Notes are then analyzed in this paper. The results showed with an average ownership 4 cows the average amount of gross income (gross farm income) breeders “Sinar Sriâ” per 3 months is Rp. 66.3 million - with an average expenditure of farmers (farm expenses) per 3 months Rp. 61.316 million. The average level of profitability of fattening beef cattle reached 10.81%. While the contribution of fattening beef cattle counted only 0.37% of the average income of farmers Rp. 14.952 million/years divided by the average income of breeders and non-breeders (rice farmer with an average land ownership of 0.7 ha of Rp 40.5 million/year). This paper also describes how the agribusiness network pattern of beef cattle breeding that are currently running in the countryside Subang ranging from marketing network meat and dairy farms waste.

Keywords: Grassroots Innovation Networking Profitability Beef Cattle

3.
ICT based solutions for education in rural India

Using touch screen networked devices to increase literacy among the poor

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DA-IICT (Dhirubhai Ambani Institute of Information and Communication Technology)
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Knowledge is power. In today's Information age, education is the de facto tool which enables thinking by transforming information into knowledge. It is valued to such an extent that the right to education is considered to be one of the fundamental rights of the people. However education is often disparaged. According to the United Nations, India is home to a staggering 287 million illiterate adults [1]. 50% Indian children in the age group of 6-18 years do not go to school[2]. On the other hand, Information and Communication Technology (ICT) has become ubiquitous in today’s world with an ever increasing adoption rate. The poster describes a novel 3 step model which leverages the tremendous potential of ICT to help solve the problem of mass illiteracy in rural areas. The methodology used is described in detail in modular form with the significance of each part highlighted. The 3 steps in the model include: 1) Establishing an infrastructure of networked devices – this involves setting up a network of MiFi routers which convert the mobile telecom operator’s signals into WiFi. The MiFi routers are a wireless, portable, low cost solution to bring internet access to remote areas which do not have broadband access. Tablet computers are connected to the internet through these MiFi routers and used to deliver content to the children 2) Partnering with a local NGO having experience in teaching in the target area 3) Teaching through interactive mobile applications and web services. The proposed model is cost effective, robust, easily implementable and highly scalable. This approach is flexible and 5 times less expensive than the model currently being used by many Governments and Non-Governmental Organisations to disseminate ICT for education. It also takes lesser time to deploy and is more efficient in facilitating learning among children. Comprehensive pre test and post test surveys among
children have shown an average of 230% increase in the test scores. The model is currently being implemented in 5 villages across Gujarat and in Mauritius, Africa. It has been covered by IEEE in 160 countries across the globe:
The later part of the poster covers possible extensions and describes adjustments to the proposed model which will facilitate implementation in other geographic regions, thus empowering developing countries marred by mass illiteracy.
[1] Madhavi Rajadhyaksha."India has highest illiterate adults” Times of India (Sep 8, 2012)
http://articles.timesofindia.indiatimes.com/2012-09-08/india/33695844_1_international-literacy-day-illiterate-adults-india-literacy
[2] 7th All India Education Survey [Online]. Available:
http://www.ncert.nic.in/programmes/education_survey/7_survey_reports.html

4.

The Located Strategic Intelligence in the service of an economic, social and political entrepreneurship

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Most of the resistances in the institutional, social and economic evolutions are mainly of the routine and the habits. Why to change something which) works for years, even centuries? The resistance in the changes is generally accompanied with a “managerial nearsightedness ”(incapacitated to define a strategy on the long term and the importance of the court-term), even of a “managerial farsightedness” (incapacitated to make a decision on the short term, considering joint decision-makers' significant number).
Albert Einstein wrote: “We cannot solve a problem with the same type of thought as the one who created it. “It is essential to change the way of thinking and to look at our environment.
The domain of the economic Intelligence developed in France, since 1994. It concerns mainly the uses and the practices connected in search of information, informative protection and the development of the practices of influences for companies. If these practices are necessary, they confine today to defend and to optimize the approach of high value-added international large companies. Segments as voluntary and united sector, more classic companies, public and political organizations do not benefit from such practices.
Further to doctoral researches on the subject (2010–2014), it was possible to develop a new model of management of the information and the understanding of territories. The Localized Strategic Intelligence has for vocation:
• The use and the strategic, operational and territorial localization of the informative practices of the search of information, the protection and the influence
• By the pooling of precise material and human resources
• To get and select the useful weak signals
• And to act in a way targeted at the identified public and private networks, allowing the achievement of the objectives of the organization, whatever is its intrinsic purpose.
A number of experiments have been allowed to demonstrate its applicability within the framework of companies, of associations, of public services, and of communities. If it is today possible to spread this practice to any shape of organization, it is also necessary to enter in new one era of the economic, social and political entrepreneurship. This entrepreneurship has to get on, here, as the action to undertake and to act on its environment.

5.

Developing an educational framework for ecological sensibilities: A philosophical perspective

Deborah Dutta, PhD Student, Homi Bhabha Centre for Science Education

Sustainability means the ability to endure. In its modern form it is a concept born out of the desire of humanity to continue to exist on planet Earth for as long as possible without comprising in the present standard of living for the average masses (at least). However, when combined with the word 'development', it instantly begs questions like whose development are we concerned about, what needs to be sustained and why should the present generation be bothered at all. This paper aims to discuss the notion of sustainability as having emerged from environmental contexts and examine some inherent contradictions in the concept of “sustainable development”. In order to develop a philosophical basis for ecological sustainability, I will further attempt to analyse the meaning and implications of value, experience and growth as associated with aims of education from a perspective offered by thinkers like Dewey and map these goals onto what may be understood as a desirable relationship with nature. From these propositions, I will then try and develop a framework of education for ecological sensibilities (EfES), thereby addressing the latter as a core value of education rather than a subject or discipline to be dealt with. The argument being made in paper is that issues of sustainability are thus closely linked to market forces, social injustice, human and animal rights and technology. Central to each of these arguments is the notion of our relation with the environment, and core values that we as a society need/ought to cherish. It requires understanding that there is no nature out there to protect or preserve, that the planet does not require the existence of our species for its survival, and most importantly, the problems we face are not due to structural issues in society seen in terms of unequal distribution of wealth and resources but rather due to misplaced value systems and culture. The critique for sustainable development is thus a critique of particular aspects of human nature itself. Education then is seen as a key endeavour in legitimising and valuing particular skills, knowledge and ethos needed for a cultural transformation seen as a prerequisite for an ecologically sustainable future.
6. Innovative start and stop system

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There are about 14.2 million vehicles on Indian roads in which two wheelers account to 10.2 million, above 72% (2011 census). Indian economic and climate conditions are suitable to ride two wheelers throughout the year. But Indian road system is more clumsy and not rider safe. In addition, there are a number of signal points in urban areas which kills time and fuel leading to health hazards. Similar systems may exist in other countries in Asia having similar economy, population and social fabric. Indian government is striving hard to implement start and stop systems from four-wheelers to two wheelers. In recent years Indian government had made a treaty with “TE Connectivity Company” in order to design this kind of systems for two wheelers. Indian first bike launched with I3S technology is ought to be first hybrid vehicle using this technology [1]. Keeping this issue in mind, a start and stop system is designed using the footrest of the motorbike as stop system and helmet as a start system. A sensor is kept in the footrest which is connected to a chip which operates the engine kill switch. The chip is programmed such a way that after a particular time interval the kill switch is operated and the engine goes off which lowers the usage of fuel. The start system involves voice recognition module in the helmet that is used to trigger the start switch to start the vehicle thus making the safety and security measures mandatory and also improvising comfort strands. Start action is stimulated by a voice recognition module such that when the user gives start command, an electric pulse is created by the Axon II microcontroller so as to start the engine. The voice recognition module is placed in the helmet. The setup in the helmet syncs with electronic chip in the bike via Bluetooth module, which receives the pulse from the helmet and starts the engine. Stop action is stimulated in response to the pressure sensor placed in footrest. When pressure is released, a signal is sent by the sensor to the engine kill switch to cut off the fuel supply which turns the engine off.

Keywords: Pressure sensor, NC555 timer, voice recognition module, Axon II microcontroller, Bluetooth module, Integrated circuit, Engine Kill switch

7. Sustainable capacity-building model: a case of tribal women empowerment in Jharkhand

Sharad Agarwal and Abhilash Acharya, FPM, IIM Ranchi

Financial Inclusion is one of the primary requisites of achieving the United Nations Millennium Development Goal of eradicating poverty by 2015. Various measures have been undertaken by the policy makers at different levels to achieve financial inclusion in our country. In this article, we present a sustainable four-stage model of achieving financial
inclusion where the excluded population itself feels the need and importance of the financial services in their lives and they then search for alternatives to connect with the financial institutions. We contend that such demand of access to financial services by the previously un-banked or financially excluded population is much more sustainable for both the financial institutions and their extremely rural clients. We present the model of the process implemented amongst the tribal women (mostly BPL-card holders) by Jharkhand Mahila Samakhyaa Society (JMSS) in Jharkhand, along with a success story of three “Mahila Samoohs” who not only succeeded in getting them financially included but also became financially literate and are a great source of inspiration for the remaining population in their village. Others in the nearby villages are trying to emulate them in order to become financially included and thus reap benefits of economic empowerment. The need of the hour is to shift focus towards spreading awareness on banking and banking services such as savings, credit facilities etc. among the rural folks in this country. The paper discusses the need for addressing the demand side of financial inclusions and a model, which has been successfully implemented in the state of Jharkhand by JMSS. The model basically depicts the empowerment of tribal women entrepreneurs surviving in the remotest parts of Jharkhand, which led to a significant hike in the demand of financial inclusion from their side as they felt banking services are increasingly becoming necessary in their lives. The model is unique as it talks of financial inclusion of the tribal women of Jharkhand, which is one of the poorest states of India and the sources of livelihood generation are almost negligible in the rural areas.

**Keywords:** tribal women, empowerment, sustainability.

8.

**Frugal Innovations in Architecture**

**Ar. Kamal Passi, M.Arch (Pursuing), CCA, Chandigarh**

Survival of the Fittest is how Charles Darwin defined it. The entire history of humanity is about survival. It has improvised, adapted and survived disasters. Each time it confronted a catastrophe, natural or manmade, it has dealt with it in many ways to tackle it. Despite the fact that we have weakened our mother Earth while dealing with issues of population, food, shelter, etc., we still have a fair chance to redeem ourselves. We have learnt many lessons and have realised the futility of unnecessary and thoughtless consumption. There is a revived sense of purpose in discovering means and ways to improve our lives without harming the Earth of its precious resources. Today, the fear of losing our resources is driving Governments, corporations, and people, to make judicious and optimised use of our resources, and inculcate a sense of belonging for them in our daily lifestyle. The aim of this paper is to bring forth the indigenous concept of frugal innovations in India and to evaluate it as a means of formal education in a system that somehow isn’t able to inculcate such brilliant solutions in dealing with the various problems plaguing our society. As far as Architecture is concerned, all our modern day Low Cost construction techniques are a refined result of frugal innovations. Apart from that, our vernacular architecture also are the bettered models of
certain frugal innovations that were carried out a particular point in time. With globalisation taking place at a rapid pace, and we falling for a more modernistic and westernised lifestyle, preserving our values and traditional systems is of great significance. Our culture has always believed in judicious use of resources, and scarcity of any sort, brings out the best in us. It is that knowledge that needs to come to the forefront. Be it a traditional mud house or a slum dwelling, etc., there are numerous indigenous examples of human ingenuity and wisdom. It also becomes of great significance because it is important that the current and future generations become aware of such simple yet brilliant solutions that are often not even brushed up in our present day education model.

**Keywords:** frugal, architecture, vernacular, low cost

9.

**Redesign Games**

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When we were children, we were every time busy in playing different types of sports activities including mental and physical. Some games are still popular in Indian Rural and Urban areas i.e. Gulli-Danda, Carom board, Chess, Ludo, Snake and ladders, Football, Cricket etc. In young generation child’s brain development at the level of younger activities. Why not we rethink about all above said games for the Redesign Process of Sports activities and its overall design concept? Just like why not we think if football is not in a shape of Round may be in the Square. Then what would be happening? May be it’ll work in different nature. Have we thought about that why Chess has only 64 square boxes? Why not in circle or triangle shape? May be it’ll create another type of mental exercises. In the class of BFA 1st and 2nd year (Bachelor in Fine Arts - Applied Arts) in the Faculty of Visual Arts, Banaras Hindu University I have tried to redesign with students all these types of basic games and result came in very innovative and new shapes with brilliant ideas of playing. With this research paper (case studies) I am exploring the redesign process of the Games and its effect.  
**Keywords:** Innovation, Games, Creativity, Indian Games, Graphic Design

10.

**Is the game changing??**

**Chinese low cost disruptive Innovation Vs Indian Frugal Innovation**

*Ankita Chhabra*, FPM Student, Strategic Management, IIM Indore

In an environment that is characterized as hyper-competitive and turbulent, the importance of innovation is gaining acceptance. Earlier, firms in developing economies focused on technology acquisition and adaptation because innovation required a high level of resource commitment and long periods of sustained efforts. The trend appears to be changing with the
introduction of a number of innovations from countries like India and China. The paper attempts to detect patterns in ‘what and how’ firms in these countries innovate. The patterns when linked to the environment in which firms operate provide insights that others can use to ramp up their innovative offerings. Low cost innovations emerging from these countries can easily be exported to neighbouring international markets and when modified using the reverse innovation paradigm can serve as platforms for entry into developed markets. Global players who are familiar with the concept of reverse innovation may now have to include in its ambit reverse innovation of products and business models developed by firms in developing economies and consider various options like collaborative joint ventures or acquisitions to take advantage of the innovative potential for low cost or frugal innovation that these environments offer.

11.

Are You a Social Innovator?

Best practices and frequent errors based on Spanish Cases

Dr. Blanca Herrero de Egaña Muñoz-Cobo, Benefactor Innovación Social Sl

We would like to give voice, impulse and share what grassroots social innovators are doing in Spain, for a social, human, inclusive and better world. We will give real samples and we will show what we have learnt not only from our successful projects but also for those failed. We will list best practices and frequent mistakes from Spanish cases. We would like to propose two ways:

1. Multimedia poster: We will show a video pitch (which will take 3 minutes).
2. We will do a traditional Poster: pictures, graphics and short of literature.

We expect to have visitors interested in sharing cases, lessons, best practices and frequent errors in grassroots social innovations. We expect meeting both local and international grassroots social innovators. We expect learning from local and international social innovators and chance makers, methodologies to identify, impulse, support, spread, and improve, grassroots social innovators projects.

12.

12 hour processing cardamom dryer

Joby Jose, SSLC

Aiming to help cardamom farmers to cut the cost and time in drying cardamom, I am developed a new machine which is likely to nudge the conventional dryers. The conventional machine consumes 24 hours to dry cardamom while the new one would use only 12 hours.
Announcement
Third International Conference on Creativity and Innovations at Grassroots [ICCIG]
January 19-22, 2015, Indian Institute of Management, Ahmedabad

Giving voice, visibility and velocity to creativity and innovative potential of common people at grassroots has been the key goal of inclusive development. Honey Bee Network has emerged as a committed new social movement in support of knowledge rich, economically poor people. In order to enrich the ecosystem for inclusive and empathetic innovations, the Third ICCIG will pool the insights from the ground and global playfields of ideas, institutions and initiatives.

Twenty five years ago, Honey Bee Network started to raise the voice for collaboration between formal and informal sectors, respect for local/indigenous knowledge for conservation of biodiversity and associated knowledge system, sharing of benefits through ethical supply chains and recognizing, respecting, rewarding local communities and individual innovators and traditional knowledge holders. Today, the concern for inclusive innovation has become much more widespread but the voice of the knowledge rich, economically poor people and the youth is still not heard adequately.

We invite the young (in body and/or mind) scholars, academics, corporate leaders, policy makers, activists, administrator, local community representatives, organizational leaders, various social and cultural networks engaged in empowerment of local creativity, public and private initiatives for making society more fair and just in dealing with various segments.

Key themes:

1. Institutional transformation:

1.1. Common property resource institutions play a critical role in sustainable natural resource management at all levels in society. We need to learn from indigenous/local institutions, which have succeeded in managing resources well for so long. The concern for conservation has been declining while designing infrastructure projects and various urban and rural interventions. How to give voice to perfect strangers and other natural beings is becoming a big challenge for conservationists.

1.2. Public/private, civil society institutions create norms for exchange of knowledge, information, resources and ideas across formal and informal sectors. How do we create mutuality in the norm setting processes in both the sectors?

1.3. The crafted institutions often fail to build upon existing institutional infrastructure. The political economy of existing institutions needs careful analysis to expand the space and scope for disadvantaged people. The grafted institutions build upon existing norms and values and therefore may have higher sustainability. The issue needs to be debated and
1.4. Public delivery systems impact the life of almost every citizen world over. The mantra of public-private partnership has broken new ground but has also sometimes led to unfair exploitation of social and natural resources. The need for transparency and social accountability has triggered a lot of experiments and innovations in public systems. These need to be consolidated so that the change agents involved in these transformations can ally themselves with other creative people.

2. Educational innovations

2.1. How do teachers at primary or secondary school level transform educational context in government schools in which the poorer children often study, can their creativity become the hub of educational policy?

2.2. How do we democratize the access of disadvantaged children to the high quality content and mentors?

2.3. Can teachers learn from children, and build upon their curiosity, compassion and empathetic value system?

2.4. The academia-industry-informal sector linkage in higher education is weak, what are the strategies which have worked? Can techpedia.in model illuminate such linkages worldwide?

2.5. Can innovations by technological youth become a pivot of frugal engineering, products and services for the inclusive development? How can students of higher education search, spread, celebrate innovations and sense the unmet needs of various societies?

2.6. Innovation in governance of education need to be tracked and transferred across institutional and cultural boundaries for more democratic and transparent systems.

3. Cultural creativity

3.1. How does one prevent deskillng of society through large scale employment programs building upon manual rather than mental labour ignoring in the process unique cultural and other skills?

3.2. Can entrepreneurial open collaborative platforms be generated for nurturing folk and grassroots culture and its incorporation in developmental programmes and philosophies?

3.3. The culture of creativity spawns numerous innovations at grassroots without which the engine of economic and social progress would not run. What are the facilitators and inhibitors of cultural creativity in different societies? The culture of resistance provides the
fodder for pluralism and diversity. What are the emerging trends in strengthening such resistance in the wake of globalization and massive consumerism?

3.4. While culture occupies such an important space in our consciousness, the governance including the ministry dealing with culture is considered a very low importance position. Nations are built or destroyed depending upon how cultural core of the society evolves through various struggles.

3.5. Can conscious creativity be shaped by different modes of entertainment that the society patronizes? Is individual choice of entertainment now limited to the modern entertainment industry? How can we revive and encourage local modes of entertainment to conserve the diversity in forms and functions of creativity.

4. Technological innovations

4.1. The concept of deviant research, grassroots innovations, frugal or empathetic innovations, inclusive innovations, farmers’ or workers’ innovations were much less recognized 25 years ago when Honey Bee Network was born. How do we assess the contemporary terminological and conceptual clarity or confusion in these concepts?

4.2. To what extent have various countries recognized the need for redefining the concept of National Innovation System to include the bridge between formal and informal systems of innovations?

4.3. Can companies and other organizations in public and private sectors join hands with innovations by youth and informal sector for creating genuine and authentic reciprocity and responsibility in the knowledge exchange?

4.4. What can we learn from the models of benefit sharing emerging through validation and value addition in people’s knowledge and creativity? Why have these models remained so underdeveloped in most parts of the world? What are the implications of such asymmetry and lack of accountability between formal and informal system for the sustenance of grassroots frugal/empathetic innovation systems?

4.5. What lessons can be learnt from Indian model of inclusive innovations as evident from the experience of National Innovation Foundation [NIF] for other regions and vice versa?

4.6. What are the gaps in the inclusive innovation ecosystem including the investment and entrepreneurial spaces in society?

4.7. What drives people to devise extremely affordable solutions? What is the tolerance limit of trade-off between accuracy and affordability and how does it affect its accessibility and acceptability?
4.8. What kind of new heuristics are learned from thousands of grassroots green innovations and traditional knowledge examples for innovations in totally unrelated sectors as well as for other communities? How do we learn from these innovations at four levels: [a] artefactual, [b] analogic, [c] heuristic and [d] gestalt or configurational.

4.9. What kind of motivations influences common people to innovate? We need to look at, both extrinsic and intrinsic motivations to derive a matrix of incentives wherein people do not have to wait only for the formal sectors to solve their problems. The idea is to create an ecosystem conducive for experimentation; alone or in partnership with communities, other innovators or scientists and technologists in formal or informal sector.

5. Public policy for empathetic innovation

5.1. Many countries and companies have started open innovation platforms in the recent past but adequate reciprocity towards the knowledge providers remains to be institutionalized. What role can public policy play so that knowledge exchange between the formal and informal sectors can become smoother?

5.2. The role of public, private and civil society organisations in development and diffusion of extremely affordable innovations remains fuzzy. Recent studies on the subject have to be critically evaluated to identify future directions.

5.3. The innovations in public governance and delivery systems play an important role in fueling democratic aspirations. How have different countries looked at increasing expectations and declining performance of the formal systems? What are the lessons one can learn from China, South East Asia, Africa, Latin America and European societies which need blending for inclusive development.

6. Biodiversity conservation, benefit sharing and development of ethical supply chain

6.1. Despite deliberations at inter-governmental panel at WIPO, Convention on Biological Diversity, Desert Conventions, etc., not much seems to have changed. What are the policy directions that can help us move towards a new consensus? Case studies of knowledge based interface between communities and outside organizations are welcome.

7. Mind to market

7.1. Innovative strategies for using social media, e-commerce and other platforms to link grassroots to Global [g2G] markets.

7.2. Role of risk capital in linking innovations with enterprise
7.3. Protection of intellectual property rights of knowledge holders, evolution of the concept of ‘Technology Commons’ and open source technologies.

7.4. The central concern would be to explore the ways in which large corporations can join hands with small innovators to reach the consumers at the base of economic pyramid.

7.5. How does recognition and reward for innovators influence their motivation to collaborate and deal with markets collectively?

7.6. Which of the new IP models can do justice to the need for protection and incentives for collaboration?

8. Innovations in urban spaces for more accessible social infrastructure

8.1. In view of the rural to urban migration, lot of knowledge has moved to urban spaces. The urban markets are often unable to discriminate or valorize such place-based knowledge.

8.2. Before the erosion of knowledge becomes irreversible, what kind of strategies be developed for knowledge based enterprises in urban areas that put special emphasis on the traditional/tacit knowledge of urban workers.

9. Integrating women’s knowledge creativity and innovations in the innovation ecosystem

9.1. The knowledge of women and other workers has been given far lesser importance so far. How do we expand opportunities for women and worker innovators?

9.2. Which kind of institutional innovations facilitate the uncovering of the creative potential of women and other workers?

10. Coping creatively with climate change: community perceptions and innovative response for a sustainable future

10.1. Given the erratic nature of whether induced changes in many parts of the world, the traditional coping strategies are becoming weaker. Which kind of institutional and technological interventions are required to increase the capacity of communities in coping with climate risks? Are there innovative models available, which have achieved enhanced resilience?

10.2. The agro-biodiversity has played an important role in improving resilience in the wake of risks. However, consumer preference for traditional varieties has not kept pace with time. What are the strategies that have reversed the erosion of agro-biodiversity and associated knowledge system?
11. Designing organisations/social networks/open innovation platforms for linking formal and informal sector in reciprocal, respectful and mutually rewarding manner

12. Empathetic innovations: Beyond reverse, emergent, open and frugal innovations

13. Circular economy and green supply chain to support grassroots innovators

13.1. Why should the society turn to grassroots innovators for frugal designs? As grassroots innovators use second hand components to a large extent, their innovations are often not recognized in the formal sector, more so in the legal fraternity as standards for them do not exist. So, what are the steps necessary to “legitimize” these innovations and the impetus they would give to popularize circular economy?