

Format of Final Report  
COVER PAGE  
UNIVERSITY OF DELHI  
INNOVATION PROJECTS 2015-16  
FINAL REPORT

1. PROJECT CODE: MH 301

2. PROJECT TITLE: **Climate Variability, Water Security and Livelihood Resilience: Role of Traditional Knowledge and Modern Technologies in Rajasthan, India**

3. NAME OF COLLEGE/INSTITUTION: Miranda House

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### CERTIFICATE OF ORIGINALITY

This is to certify that the Project Investigators and students of the Delhi University Innovation Project have code **MII 301** and title "**Climate Variability, Water Security and Livelihood Resilience: Role of Traditional Knowledge and Modern Technologies in Rajasthan, India**" of the Miranda House College/Centre have carried out research work submitted as Final Report to the University of Delhi. The research work and report are original. Any plagiarism dispute arising out of the project will be our responsibility.

  
Dr. Bashabi Gupta  
Project Investigators

  
Dr. Snigdha Singh  
16 Oct 2016



**Utilization Certificate**  
**Innovation Project 2015-16**  
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Principal Investigators: Dr. Bashabi Gupta and Dr. Snigdha Singh

College: Miranda House

Grant sanctioned		Rs. 4.5 lakhs		
Amount released in first phase		Rs. 3 Lakhs		
Amount released in second and final phase		Rs. 1.5 Lakhs		
S.No.	Budget head	Amount sanctioned (Rs)	Amount utilized (Rs)	Balance amount (Rs)
1	Equipment/Consumables	125000	125000	Zero
2	Travel	80000	80000	Zero
3	Stipend	120000	119000	1000
4	Honorarium	25000	25000	Zero
5	Stationery	20,000	20000	Zero
6.	Contingency	80000	80000	Zero
<b>Total</b>		<b>450000</b>	<b>449000</b>	<b>1000</b>
<b>Total amount utilized: 449000</b>				

Certified that out of Rs. 450000 sanctioned under the Innovation Projects scheme 2015-16, Rs. 449000 has been utilized for the purpose of the research.

*Bashabi Gupta*  
Dr. Bashabi Gupta 6/10/16

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*pr* 04-11-2016

## Final Report

### 1. Project Title

Climate Variability, Water Security, and Livelihood Resilience: Role of Traditional knowledge and Modern Technologies in Rajasthan, India

### 2. Project Code

MH 301

### 3. Abstract:

Ability to build resilient livelihoods and coping with external shocks are perhaps the two most fundamental challenges facing the global community today. This is especially critical in the regions of resource scarcity where variability and rapid processes of change increases risks and vulnerabilities. ‘Sustainability’ has been defined as the ability to “create, test and maintain adaptive capacity” (Gunderson and Holling 2002). The newly adapted Sandai Framework for Disaster Risk Reduction (March 2015) also emphasizes on building up of resilient communities as climate variability will be difficult to control and mitigate. It is predicted that the external shocks will be of increasing importance over the coming decades as climatic change coupled with dynamic changes in economic and demographic systems reshapes livelihoods at rates and scales that are probably unprecedented in human history. Research in South Asia and in other parts of the world provides preliminary insights into the critical roles of diversification of livelihoods, human mobility (migration and commuting), transportation, financial and communication systems, resilient ‘adaptive’ infrastructure, institutional systems, secure water supplies and natural resource conditions play in livelihood resilience and adaptive capacity at the household and regional level (Hussein and Nelson 1998; Moench and Dixit 2004; Wisner, Blaikie et al. 2004; Brown 2005). Rajasthan is taken as a case study as it falls in the arid climatic zone in western India and faces acute water insecurity in many locations. Dynamics of climate change, water security and livelihood resilience interacting as factors that govern everyday lives of the population are clearly visible. Situating the study here also gives the benefit of looking at nuances of the impact of sudden shifts in the climate variables along with the adaptation strategies developed.

#### 4. Introduction

Ability to build resilient livelihoods and coping with external shocks are perhaps the two most fundamental challenges facing the global community today. This is especially critical in the regions of resource scarcity where variability and rapid processes of change increases risks and vulnerabilities. ‘Sustainability’ has been defined as the ability to “create, test and maintain adaptive capacity” (Gunderson and Holling 2002). The newly adapted Sandai Framework for Disaster Risk Reduction (March 2015) also emphasizes on building up of resilient communities as climate variability will be difficult to control and mitigate. It is predicted that the external shocks will be of increasing importance over the coming decades as climatic change coupled with dynamic changes in economic and demographic systems reshapes livelihoods at rates and scales that are probably unprecedented in human history. Research in South Asia and in other parts of the world provides preliminary insights into the critical roles of diversification of livelihoods, human mobility (migration and commuting), transportation, financial and communication systems, resilient ‘adaptive’ infrastructure, institutional systems, secure water supplies and natural resource conditions play in livelihood resilience and adaptive capacity at the household and regional level (Hussein and Nelson 1998; Moench and Dixit 2004; Wisner, Blaikie et al. 2004; Brown 2005). Rajasthan is taken as a case study here as it falls in the arid climatic zone in western India and faces acute water insecurity in many locations. Here we see the dynamics of climate change, water security and livelihood resilience interacting as factors that govern everyday lives of the population. Situating the study here also gives us the benefit of looking at nuances of the impact of sudden shifts in the climate variables along with the adaptation strategies developed.

Across much of the developing world, agriculture serves as the fundamental livelihood basis for most of the world’s poor. Agriculture is, in turn, dependent on access to reliable water supplies whether directly from rainfall or through irrigation systems. If climatic variability and extreme events increase as a consequence of climatic change, already vulnerable agricultural livelihoods will be increasingly under threat. The ability to move out of poverty – and in many cases the ability to survive – will depend on their capacity to increase the resilience of existing agricultural livelihoods and, in many cases, diversify and move into new non-agricultural livelihood systems.

The resilience of agricultural systems will, in turn, depend heavily on strategic approaches to water management capable of addressing constraints as they arise at local and community levels (Moench 1999; Moench, Dixit et al. 2003).

With this background, the current study tries to appreciate the fact that rather than rebuilding existing patterns of vulnerability, it is increasingly essential to restructure disaster responses away from palliative measures and develop approaches that respond to underlying structural problems within livelihood systems as well as immediate needs drawing from the traditional knowledge and blending it with the modern technologies in Rajasthan. It tries to understand the nuances of practical mechanisms which need to be developed and implemented that integrate disaster relief, disaster risk reduction and development. Adaptive capacity depends heavily on mobility and access to systems and technologies that enable people, information and goods to flow freely into and out from affected areas. It also depends on the ability of local populations to create and accumulate financial and social capital – the resources required to evolve new livelihoods or strengthen existing ones. Thus the purpose of this study is to summarize some of the preliminary results emerging from existing theoretical and applied research and our own filed impressions collected from the field on adaptation and livelihood resilience and explore implications for policies related to disaster risk reduction and development. Because most of the world's population, particularly the poor, depends on agriculture for their livelihoods, it focuses heavily on agriculture and the role climate and related water issues play in relation to it.

#### 5. Research problem/hypothesis/objectives

- To understand climate variability in different agro-climatic zones of Rajasthan through climatic parameters like temperature and rainfall.
- To historically map the emergence and adaptations of vulnerable communities with respect to conserving and accessing water through traditional knowledge systems.
- To trace the changing nature of livelihoods with climatic variability and the emergence of modern water technologies associated with it.
- To comprehend and assess the conflicts, cooperation and gendered nature amongst the different social-economic groups with respect to water resource scarcity and management.
- To study the coping strategies and livelihood resilience in face of climatic variability.

#### 6. Methodology Techniques/Sampling /Tools/Materials

- Literature review on climate change and climate variability, traditional water harvesting structures and irrigation strategies and modern technology form the background of the analysis.
- The macro-level analysis of the general trend of climatic variability in terms of rainfall was done at the state level and at the district level. The secondary data analysis was worked on the basis of published socio-economic data in order to indicate broader background trends and choose sample districts.
- Extensive field work was done in four districts of Rajasthan for around 350 households. The micro-level study at the household level formed the core of understanding of changing livelihoods, adaptations and coping strategies of different socio economic groups with structured questionnaires, narratives, oral histories, focus group discussions. Several interviews of key informants were done to understand the issues in greater depth.
- Field observation was done to Investigate traditional structures in Rajasthan like in and around Mehrangarh Fort and Jodhpur city, Ajmer dargah, and Villages in Jaisalmer, Badmer, Jodhpur and Ajmer.

Sr. No.	District	Villages
1	Jaisalmer	Hamira, Keeta, Daobla
2	Jodhpur	RampuraBhatian
3	Barmer	Patodi
4	Ajmer	Kakarda, Resulpura, Tellara

- Work is going in the direction of publication of an edited book with contributions from every team member along with the principal investigators. The objective is to ensure proper documentation, and dissemination of the knowledge gathered through the project.

## 7. Result and Discussion (main text, tables with titles, graphs and figures with legends)

### In detail

The analysis of rainfall in Rajasthan for the past 113 years (1901-2014) was undertaken on district-level.

The monthly mean rainfall for all the districts of Rajasthan for the period between 1901-2014 was used to calculate the Coefficient of Variation.

### Data Analysis

TABLE 1: RAJASTHAN: Rainfall Variability (1901-2014)

Sr. No.	DISTRICTS	MEAN ANNUAL RAINFALL (mm)	S.D. (mm)	Coefficient of Variation (DECREASING ORDER)
1	JAISALMER	188.46	86.71	46.01
2	BARMER	292.54	132.42	45.26
3	BIKANER	260.62	109.12	41.87
4	JALORE	448.42	187.22	41.75
5	SIROHI	608.15	250.68	41.22
6	PARTAPGARH (2008-2014)	536.60	217.25	40.49
7	JODHPUR	316.05	125.41	39.68
8	NAGAU	410.39	155.01	37.77
9	PALI	515.52	194.14	37.66
10	GANGANAGAR	237.58	88.89	37.41
11	CHURU	365.28	133.56	36.56
12	HANUMANGARH	304.30	102.59	33.71
13	AJMER	531.71	178.35	33.54
14	SIKAR	474.31	157.31	33.17
15	JHUNJHUNUN	461.45	146.00	31.64
16	RAJSAMAND	609.52	192.59	31.60
17	JAIPUR	581.12	177.08	30.47
18	BHILWARA	621.67	186.40	29.98
19	UDAIPUR	781.77	227.63	29.12
20	DUNGARPUR	907.66	258.04	28.43
21	TONK	627.66	177.86	28.34
22	ALWAR	610.66	170.83	27.98
23	DAUSA	666.44	185.61	27.85

24	BHARATPUR	686.37	188.95	27.53
25	DHAULPUR	764.52	202.15	26.44
26	KARALI	745.43	190.69	25.58
27	BANSWARA	946.18	241.82	25.56
28	SAWAI MADHOPUR	713.22	178.73	25.06
29	CHITTAURGARH	805.25	197.51	24.53
30	BUNDI	721.62	175.64	24.34
31	BARAN	830.20	195.72	23.57
32	JHALAWAR	907.36	211.89	23.35
33	KOTA	795.80	185.54	23.31

Jaisalmer, Barmer, Bikaner, Jalore, Sirohi and Partapgarh showed very high coefficient of variations (above 40), meaning rainfall is erratic in these districts.

On the basis of location, the 33 districts of Rajasthan were divided into 3 regions, which are given below. Further, Rainfall variability for the three regions of Rajasthan, as depicted above as a whole, was calculated. The following results came out

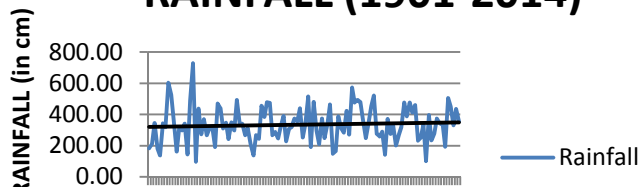
FIGURE 1: Regions in Rajasthan

Region	Average rainfall (1901-2014) (in cm)	Standard Deviation	Coefficient Variation	of
WesternRegion	333.92	131.51	<b>39.38</b>	
North- EasternRegion	623.90	177.60	28.47	
SouthernRegion	755.98	211.72	28.79	

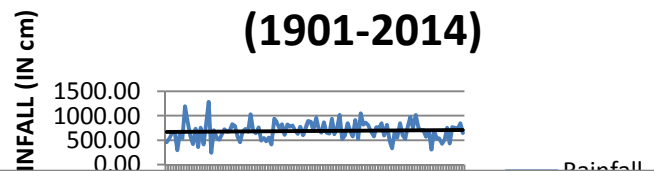
## RAJASTHAN, INDIA



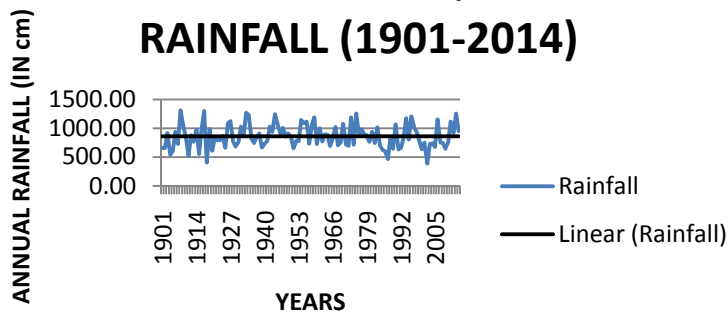
### RAJASTHAN WESTERN REGION, ANNUAL RAINFALL (1901-2014)



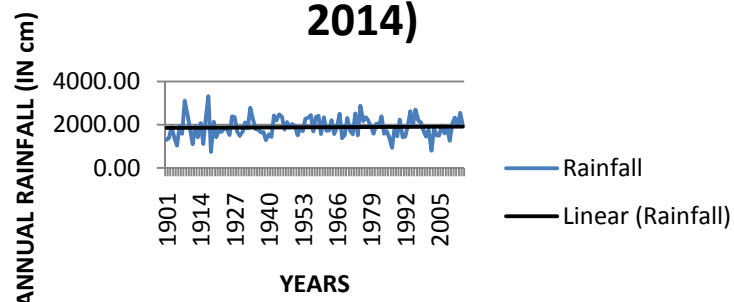
### RAJASTHAN NORTHEASTERN REGION, ANNUAL RAINFALL (1901-2014)



### RAJASTHAN SOUTHERN REGION, ANNUAL RAINFALL (1901-2014)



### RAJASTHAN ANNUAL RAINFALL (1901- 2014)



The field survey done in 8 villages of Rajasthan brings out the following observations –

### Blend of Traditional and Modern Water Structures: Accessing and Conserving Water

Among traditional water structures talabs were more prevalent in Jaisalmer, Baoris in Jodhpur and the water structure like Nadis, Okhiri, Beris were prevalent in Barmer. Among modern water structures wells, tube wells, pipe lines and water tankers were prevalent and was seen across all the districts.



Deep Well



Water tank in a village



Bullock driven water harvesting from well



Water tanka in a house



Modern Tankers and Water Market



Traditional Khadin at Barmer



Beri – traditional water harvesting structure



Water storage in households



Community Tanka



Baoli – traditional water harvesting structure

## **Water Technology of Royalty: Planning and Architecture**

The fort depended entirely on rainfall for water supply because arid climate of Marwar never gave scope for rivers to flow perennially. The water management of Mehrangarh fort and city was brilliantly planned during its construction. Natural depressions were identified and rock fissures exploited to the hilt to channelize overflowing water from one water body to the other by tactical use of elevation. The choice of material for the fort was also made as per the climatic conditions. Sandstone easily available in the region of Marwar was used to construct the fort to give breathability and endurance to the structure.



Mehrangarh Fort

## **Water Security: Conflicts and Co-operation**

- **Sharing:** As it is known that water sharing is very common in the villages of Rajasthan because of the scarcity of water in this place and this ritual continues. While conducting the survey we came across the fact that people never hesitate to share water in times of need especially at times of marriages and other important functions.
- **Scarcity:** Rajasthan is a water scarce area. In Keeta village (Jaisalmer) the scarcity of water is worse among the lower caste groups, in Patodi village (Barmer) people walked as far as 2 to 3 km to serve water from Beri or Okhiri.
- In Dabla (Jaisalmer), however, scarcity is less since government provides supplied water. Same can be said for RampuraBhatiyani (Jodhpur) and Tellara (Ajmer) villages.
- **Conflicts:** Conflicts regarding water is very rare to be seen as everyone understands the problem of scarcity of water. However, conflicts sometimes arises due to dilapidated conditions of sewage system.
- **Technology:** While for some introduction of pipelines had improved the condition of water accessibility, for others the supply pipes set up by the government remained dry most of the time. People buy water from the tankers who get water either from the Indira Gandhi Canal about 35 kms away, nearby ponds or sometimes through wells.

## **Traditional and Local Knowledge: Predicting Drought**

- The symptoms noticed in the environment for prediction of drought are interesting. These are a few of the many rituals, stories, superstitions shared by the villagers during our field survey.
- A primary school teacher shared his childhood experience of a ritual called DhaniChadhna, performed lavishly by the men on the special occasion of Akha Teej, where two young boys together hold two bamboo like sticks (black and red) under their armpits facing each other. The priest would start chanting. Now when asked to drop the sticks, if the black one falls on the red, it would mark a drought season “kaal” in their local language whereas, red stick on black would mark the season with more rainfall.

- In Patodi, (Barmer) Old men shared their way of predicting drought. They said that in the months of April and May they take 4 small sized earthen pots, fill them with water and bury the filled pots underground. After 4 months, if the pots were still filled with water it would mean that there would be no rainfall however if the earthen pots were broken and the water is spilled, it was taken as a sign of fortune where the village would receive rainfall.
- Some people considered that at the time of sowing if they saw a sack of grain, or a newly married women, they consider it a shagun and the production is supposed to be high.
- Others reported that when there's cloud cover in rainy season and if wind speed is more, it will take away the clouds and hence no rainfall.

### **Prediction of drought and animal behaviour**

- In Keeta (Jaisalmer) many associations with the drought like conditions were shared starting from the birth of more male calves in a particular year to the situation when cows start bringing some fodder in their mouth that is taken as a sign of approaching drought.
- In contrast to it, when sheep move in the opposite direction of the wind, it is a sign of approaching rains.
- Also there is a bird named "PalamChiriya" whose voice is used as an indicator for more rainfall.
- In Tellara, (Ajmer) we were also informed that the eggs of a bird named Titri are used as indication. According to a household the eggs laid by the same was directly proportional to the amount of rainfall.
- On some occasions, after Holi, they interpret the birds chirping which is believed to be understood by the priest and he predicts the intensity of drought. Prediction of drought and plant behaviour
- If Tulsi flower blossoms more, then more rainfall will occur and vice versa. The fire of "HOLIKA" on festival of Holi is also significant. The direction of this fire signifies the

zamaana in that direction for the coming season.

In Dabla, (Jaisalmer) presence of Aakta plant in a region signifies low water availability/ low rainfall in that region.

In Rampura Bhatian, (Jodhpur) An old lady shared that the fruits beared by a neem tree in a year is directly proportional to the amount of rainfall. The same belief was shared about the Sangri tree in another household.

### **Agriculture and Livelihoods**

Agricultural land: Net sown area in western Rajasthan comparatively less as land remains fallow due to lack of water. Agriculture is the main occupation of the people in the surveyed villages. Land holding varies from large to small according to the caste.

Cropping pattern: Cereal crops such as bajra, jowar, wheat and barley cover the largest cultivated area.

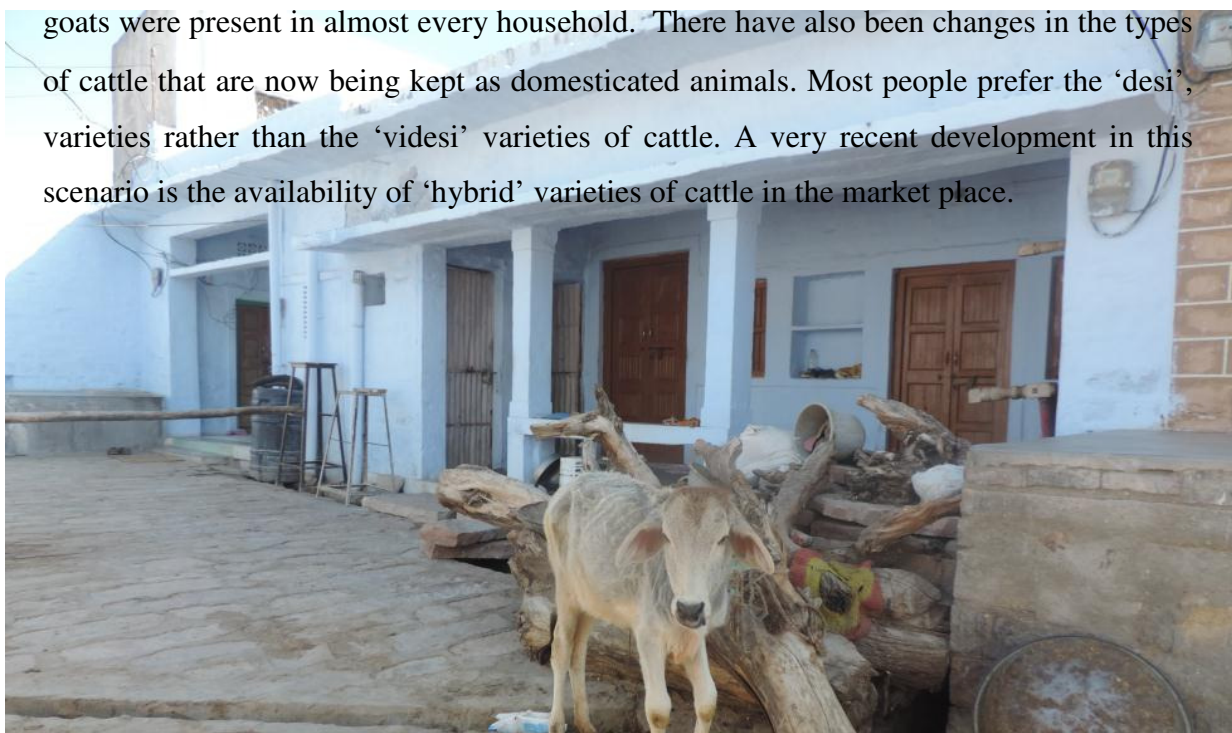
Mixed cropping pattern was followed by every village which was surveyed.

Irrigation: Rainfall was the only source of irrigation in the villages. Most of the households in all the villages depended on Rainwater for agriculture.

A few households had the facility of tube wells.

### **Livestock and Livelihoods**

Livestock included Cows, Goats, and Sheep, Camel, Buffaloes and Oxen. Cows and goats were present in almost every household. There have also been changes in the types of cattle that are now being kept as domesticated animals. Most people prefer the 'desi', varieties rather than the 'videsi' varieties of cattle. A very recent development in this scenario is the availability of 'hybrid' varieties of cattle in the market place.



## Livestock



Tubewell

### **Water and Culture: Traditional ways**

A rich water culture has been developed by people of Rajasthan and water management structures only constitute the tangible aspect. Evidence of intangible nature can be seen in the cultural interaction with water through various festivals, rituals, songs, folklore, sayings and metaphors.

At present many could not recall such songs perhaps due to the limitations of oral tradition, or many of the songs come up simultaneously or perhaps because of decrease of water scarcity with coming of modern technology. Meghmalahar and Panihari were some of the most popular songs related to water that they could remember

Traditional wisdom transferred from one generation to another orally through experience give ample evidence of a know-how of geographical conditions. At the Ajmer Sharif, the secretary of the Dargah committee, Sayed Wahid Hussain informed us how a particular Mazhar within the premises of the Dargah would be washed with neem leaves by young

boys of the Madrasa.



Rajasthani Women in traditional clothes during water based ceremonies at time of the daughter's leaving her natal home after marriage



Meeting with Manganiyars in Hamira,  
Jaisalmer

### **Water and culture: Modern ways**

Another aspect was that memory of much of this traditional knowledge is fading away, specially among the younger generations, while the senior members of society still recall these rituals and using certain traditional water structures. What appears is that there is greater reliance on government supply of water, which has led to callous behavior towards water. It is now important to investigate as to where do modern technology and traditional knowledge intersect and to what extent.

Maharaja Dilip Singh and Maharaja Gaj Singh II -According to them, with the coming in of modern technology it has led to other problems like decreasing water table. Said that “now the old system and the new system don’t merge”. There is no regard or that there is ignorance about the topography of the area and of how to utilise it.



## **Results**

- The area of study under focus were Jaisalmer, Jodhpur, Barmer and Ajmer. Of them, two regions lie in the Thar desert region and face acute shortage of water.
- The study makes it clear that water scarcity remains a deep issue in people's lives even today. However, to restrict the role of water scarcity to a problem would be a hasty judgement.
- The processes of societal integration with water and the generations who have built their lives around water security is definitely an area of further intensive research. A deeper insight into the lives of common people brings out extraordinary circumstantial aspects of water security in the villages.
- The fact that class and caste based hierarchies have defined water security issues in the villages is a field of further discussion.
- On looking at intangible aspects of the culture of Rajasthan, a plethora of rituals, festivals, beliefs seem to have evolved around water. Concentrating on this study's special emphasis on tapping oral history helped in tracing the survival of these festivals. But to identify the survival rate of songs, the research has to dig deeper into the lists of songs with musician communities for which sadly there is no accessible categorical classification.
- Rather than working on a comparative analysis of traditional knowledge with modern technology, this research has tried to identify the clash and points of symbiosis which have been reached along with those that vary according to the combinations adopted by people and communities as seen through the work of Jal Bhagirathi Foundation, Dargah operated Jhalra at Garib Nawaz, privately owned Mehrangarh Fort, state owned Padamsar and other water bodies around the Jaisalmer Fort, and Gadisar Lake.
- It was implicit while conducting the household level survey during our fieldwork that

we must not forget that the concept of adaptation relates to both technological adjustments as well as changes in human social relationships.

- Also, human perceptions of climatic changes are specific to individual societies in their varied locations and the social hierarchies present that very much influence how a particular population will respond in the face of environmental shifts. This is intimately tied to how a society defines the place of humanity in nature, how climatic change is perceived in terms of its magnitude and duration and the influence of social memory on planning strategies.

- Different segments of society have different motivations for action when faced with environmental change. These can result in a diverse range of strategies. Social and technological resilience versus resistance to change can be critical factors in the ability of societies to adapt to new environmental conditions. Resilience may vary between segments of society leading to greater resistance to change among those members of society who benefit from current conditions.

#### 8. Innovations shown by the project

- This project has the potential to chart the future course of action for vulnerable communities of Rajasthan that combines traditional and modern technology.

- During the Fieldwork in Ajmer innovations were in understanding the changes in livelihoods dependent upon animal resources that meant looking at the newer varieties of manure available.

- The newer varieties of manure especially Azola is being developed, field tested and marketed amongst the farmers from the Ajmer Krishi Vigyan Kendra. We are now in the process of talking with the scientists at KVK Ajmer to create a value chain for Azola as a fertiliser and to understand the social impact of this farm in the changing production dynamics.

- Charting changes in the livelihood structures and inclusion of women in farming is an important part. When sex selective migration become prevalent in a region, feminization of agriculture become a reality.

## 9. Conclusion and Future direction

## 10. References in APA format

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## 11. Publication/s from the work. (attach copies)

There is a book contract that has been signed with R.K. Publishers, New Delhi.

The book with articles from all the researchers in teh project will be published in 2017.

12. Conference Presentation/s (attach copies)

- Gupta Bashabi March 18-20 2016: Landuse/ Land Cover Change and Sustainable Livelihoods: Studying Interlinkages of Disaster Risk Reduction in the Arid Zone In Rajasthan, India, Organised by International Geography Union and SBS College (Morning) at Patel Chest Auditorium, Delhi University. Paper accepted for Oral Presentation.

- Sarkar Anindita March 18-20 2016: Challenges and Strategies for Livelihood Resilience: Linking Traditional Knowledge and Modern Technologies in Water Insecure Rajasthan, India', in the 9th International Geographical Union (IGU) Conference on "Land Use Change, Climate Extremes and Disaster Risk Reduction", University of Delhi, Delhi, India.

13. Patent/s and Technology Transfer (attach copies)

N.A.

14. Media Coverage (attach copies)

The Innovation Project was displayed in the Annual Cultural Festival of the Department of Geography at Miranda House, Globe 2016.(February 5, 2016) Globe 2016 was covered by DU Beat and DU Times.

It was displayed in a seminar on 'Does India need a pulses Revolution' organized by the Department of Geography, Miranda House to celebrate the International Year of Pulses 2016 as declared by the 68<sup>th</sup> UN General Assembly on February 16, 2016.

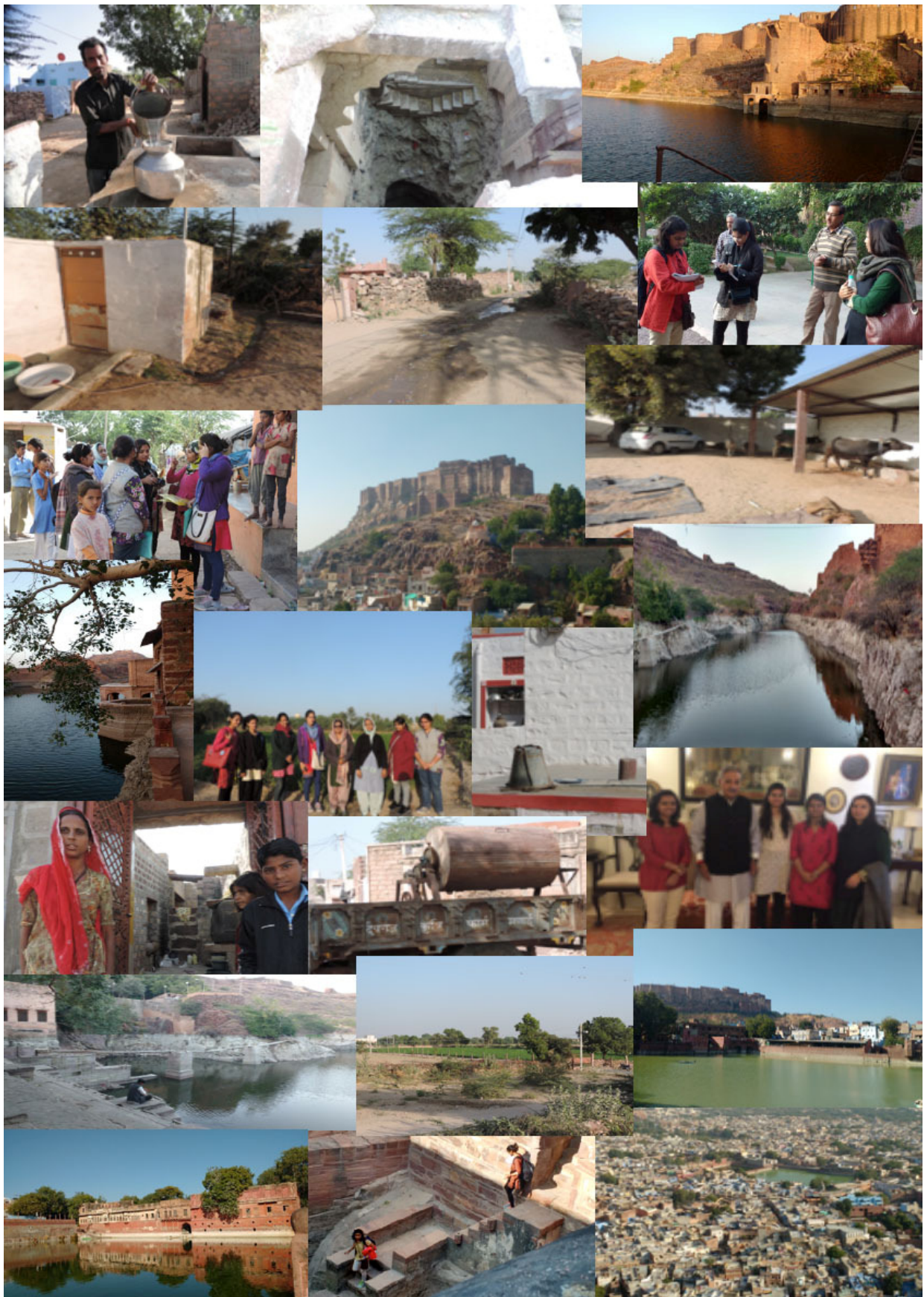
The Seminar was covered by DU Times, Aapka Times and Miranda House CampusMag Chapter.

It was one of the 20 selected projects for appreciation by the University of Delhi on the occasion of the 94<sup>th</sup> Foundation Day on May 01, 2016.



Display of Innovation Project at various events

15. Pictures related to the project







Photoscape of Ajmer

16. Annexure/Any other information



The Innovation Project team participated in the launch event of Centre for Excellence in Disaster Research, JNU followed by a National seminar on 'Exploring Social Sciences Tools in Teaching Disaster Research' on 21 September 2015



The Innovation Project team Presented at International Day of Disaster Reduction Programme 2015 on October 13, 2015 at Miranda House



The students attended a workshop by the Project mentor Prof. M H Qureshi on Preparation for Field Survey. A glimpse of the work was also presented by the students on this day.

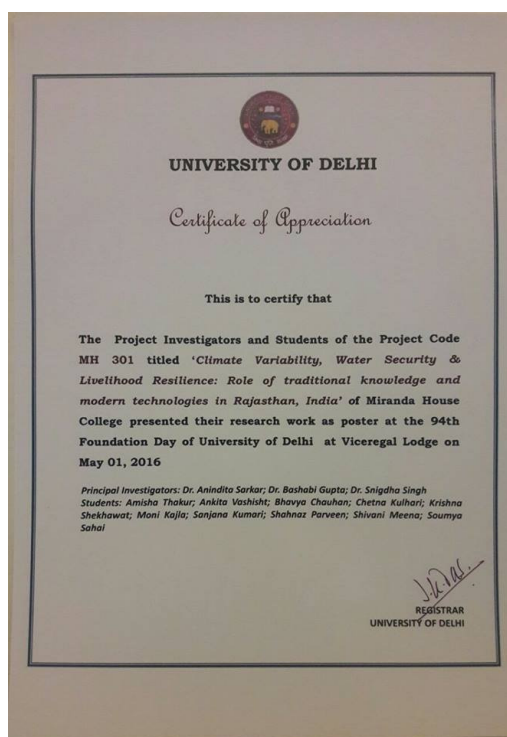


Two Innovation Project Team Members Sanjana Kumari and Krishna Shekhawat presented the project to a Russian Student Delegation that visited Miranda House. The interactive presentation included an overview of the project followed by briefings on Geographical and Social status of Rajasthan.

**Workshop on GPS & GIS:** A workshop on GPS and GIS was attended by the students in the department which was conducted by special resource person Dr. Manjeet Singh.



A Mentor Session was held by the Department of Geography & History so as to facilitate the Research in the project. Prof M. H. Qureshi (mentor), Department of Geography, JamiaMilliaIslamia shared his experiences and knowledge with the student researchers. This was followed by the students presenting their field observations and findings and future plans for the project. (May 25, 2016)



The University of Delhi Innovation Project MH301, was one of the 20 projects across the University chosen for appreciation by the University on the occasion of its 94th Foundation Day. (May 1, 2016)