

RAHUL ANAND
MASTERS OF DESIGN
PRODUCT DESIGN
IDC IIT BOMBAY
2012-2013

AN OTHER INTERNSHIP REPORT

on Summer Internship
(may-june, 2013) done by Rahul
anand, at an NGO called LEDeG
situated in Leh, as part of the re-
quired curriculum. He is curren-
tly pursuing Masters of Design
course at IDC IIT Bombay.
Year 2013. 126130006



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MENT

To my loving parents and sister, thank you, for all your enduring support and endless encouragement.

To my IDC Faculty, for guiding me through the field of design and formulating the core principles of design philosophy and encouraging me to explore new places and rural backgrounds during my internship.

To people at LEDeG, Leh, especially Thinlay and Mr Lobzang Tsul-tim, for providing me a wonderful opportunity to work at the organization and become part of various projects during such a short time period.

To Mauli, Yutaka, Stanzin & Petrujska for providing me great time at LEH, making me feel at home.

To Anand, Siddhartha,Vinoth & Kislay for keeping me sane.

— Rahul Anand, *July Seven, 2013*

INTERNSHIP BACKGROUND

i wanted to do my summer internship in a rural backdrop so as to understand the various issues and the lifestyle being followed there, which would give me a meaningful insight into the needs and solutions required for such regions. Moreover i wished to do it in a remote region which is still untouched by the current technology and modern lifestyle, which would help me to see the old technology and ways of doing things as it happened before industrial revolution. For this same purpose i chose Ladakh as my workplace and applied for a voluntary internship at one of the prominent NGOs called LEDeG situated in Leh. They responded to my application and appointed me to join from 30th June 2013.

STAKNA MONASTERY, LEH

PLACE PROFILE



THE NON GOVERNMENT ORGANISATION CALLED

LEDEG

LADAKH ECOLOGICAL DEVELOPMENT GROUP
Karzoo, Leh, Ladakh - 194101
Jammu & Kashmir, INDIA.
Phone: 91-1982-253221

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In 1978, four years after Ladakh was opened to tourism, Helena Norberg Hodge, a scholar of the Ladakhi language, started the 'Ladakh Project' over the concern that the winds of change might prove too strong for the fragile roots of a culture that had developed tenaciously over the millennia in an equally fragile environment and change would need to be carefully guided.

In 1981, LEDeG grew as an indigenous institution out of the Ladakh Project (now ISEC). In 1983, it was registered as an autonomous NGO under the Societies

Registration Act of India. In 2011, LEDeG will complete 30 years of working to promote ecologically sustainable models of development in Ladakh.

The Vision of LEDeG is to create/maintain a sustainable future for Ladakh region deriving its inspiration from the local culture and environment and incorporating adept modern technology also.

*REFERENCED FROM LEDeG Brochure

HIERARCHY OF MANAGEMENT

LEDeG has 32 full-time employees who tend to the general administration and implementation of various projects. In turn, employees report to a working committee of eight members through an appointed Director.

Each year, the organization has several national and international volunteers who get involved in various ongoing projects in Leh satisfying the organization's need for staff.

I was one such volunteer, helping the organization in various schemes and on-going projects as per my skills. I reported to Thinlay, the alternative technology head and for some projects I worked directly under Lobzang Tsultim, the director of the organization. I was working at the head office of LEDeG which is situated in Karzoo, Leh.

THE SCOPE OF WORK WAS VARIED IN NATURE, RANGING FROM ARCHITECTURE TO DESIGN.

The area of work was a varied one, which utilised my skills as an architect as well as a designer. From working on the quality improvement of the Compressed Stabilised Earth Blocks (CSEB) to designing packaging for LEDeG produced Apricot Oil, it was always new, fresh and challenging. I also took part in preparing questionnaires and surveys thereafter. Interestingly I also became part of the editing, graphics & subtitling team for a documentary on water conservation called "Chhuu". Documenting Rural Building Centre, the handcrafts and food

processing units of LEDeG through photographs and finally to make a brochure out of them was also an exercise in creative work flow.

Practically there were no limitations to any of these excursions, except one, and that was "Time". I had to leave a few projects in the middle of it, but thanks to distance communication technologies available today, I hope to continue working on those projects.

AREA OF WORK



PROJECTS

01



DESIGNING
CSEB MIX

This project involved designing a perfect mixture for getting high quality compressed stabilized earth bricks. It involved a lot of experimentation.

- page 9 Project Background
- page 10 Design Challenge
Design process
- page 11-12 Findings
Experimentation
- page 13-14 Design & Results

03



DESIGNING
POSTER

This project was about designing a road side hoarding which depicts the importance of water conservation in context of underground water reserve.

- page 17, 19-20 Design Sketches
explorations
- page 18 Background
Design Process
- page 21 Final Poster
- page 22 Environment Day

02



DESIGNING
LABELS

This involved designing of various labels, including front packaging for apricot oil bottle and price tags for some other products, produced by LEDeG.

- page 15 Design Sketches
Final Design
- page 16 Design Process
Price Tag Design

04



DESIGNING/EDITING
DOCUMENTARY

This involved in video editing/graphic design & subtitling of the documentary on water conservation in laddakh region.

- page 23 Screenshot of
Editing
- page 24 Editing,
Designing,
Subtitling
process

05



OTHER
PROJECTS

This involved documentation of Rural Building Centre, handicraft units and other units of LEDeG and designing of questionnaire for guest houses and public to gauge the water consumption of Leh.

- page 25 Photo
documentation
- page 26 Questionnaire
design & survey

06



DOCUMENTING
A LADAKHI
HOUSE

This involved architectural documentation of an indigenous house which is about 125 years old. This documentation was done with an NGO called Tibet heritage Fund (THF)

- page 27 Drawings:
plans, elevations
and sections
- page 28 Experience with THF

DESIGNING A BETTER MIX FOR CSEB*

PROJECT BACKGROUND & CONSTRAINTS:

LEDeG has a Rural Building centre about 15 kms from its main office. The Centre has various facilities to manufacture building materials ranging from CSEB blocks to Ferro cement roof vaults. It supplies these building materials to local construction sites.

The Rural Building Centre at Leh, has been trying to achieve quality CSEB blocks for quite some time (around 2 years). But it was noticed soon, that the bricks were not of similar quality as their counterparts in other regions. Despite of using stated ratios and using latest machines (see P2) the quality of the resulting blocks was poor.

* WHAT IS CSEB?

CSEB stands for compressed stabilised earth brick/block. They are a mix of soil, cement, sand/clay which is compressed in a machine (see image P2 & P3) and then cured for certain time (and not fired) to get good strength building material. They are sustainable as compared to fired bricks, as they can be easily crushed and reused when their self life ends. They have low embodied energy, very low carbon footprint, low carbon emissions and cost effective, besides being thermally more comfortable.



**TO DESIGN A BETTER MIX FOR
THE COMPRESSED STABILISED
EARTH BLOCKS SO AS TO
ACHIEVE BETTER PERFORMANCE
AND HIGHER STRENGTH BRICKS
FROM THE PROCESS.**

THE CHALLENGE

I was told that they took the soil and brick samples to Auroville Earth Institute which found no major problems with the soil, although it found the brick to be of inferior quality. This rendered the resulting bricks to be useless for any construction purposes. LEDeG had invested a lot on the machines and training of labors to operate the machine.

I was faced with the daunting task of improving the very basic building block—the brick itself, which had yet not yielded result after so much effort.

DESIGN PROCESS

The project & design process went on continuously throughout the internship period.

I accepted the challenge, and immediately on the second day visited the RBC to inspect the bricks and the materials from which it was manufactured.

I figured out a lot of problems on the first day itself.

PROJECT
ONE

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page
09



DESIGNING A BETTER MIX FOR CSEB*



IMPORTANCE OF CSEB FOR LEDEG & LADAKH

Ladakh is a very sustainable society. Here everything is practically used and re-used. Nothing goes to waste. But due to the intrusion of modern technologies and materials, this is changing fast. A lot of construction is happening in fired bricks and cement concrete which ultimately will become a problem for the Eco-sensitive region. CSEB will ensure that quality building material is available with maintaining the sustainable culture of the place.

**AFTER THE INITIAL INSPECTION
IT BECAME CLEAR, THE LADAKHI
SOIL HAS VERY LESS COHESIVE
PROPERTIES BEING MORE SANDY
IN NATURE THAN CLAYEY**

THE FINDINGS

The dried brick surface was easily scratched by finger which indicated lower cohesion. The Brick was lighter than what it should be for the same volume indicating lower density hence lower compaction value. In the drop test, it failed miserably, breaking into various lumps (more than 5 lumps). After analyzing the materials, there were following observations:
The soil has too much gravel, i.e. pebbles larger than permissible size.
The soil has very less cohesive properties

Soil is more sandy in nature than clayey. Amount of water being used for initial mixture is less than what is required for the cement to completely cure and act as binding material.

This indicated that the first and foremost task needed to be done: finding a better soil i.e. with more clay and less gravel.



P2. AURAM 3000 CSEB CASTING MACHINE AT RBC



P3. CASTING BLOCKS



P4. STRENGTH TEST



P5. SAMPLE NUMBER THREE

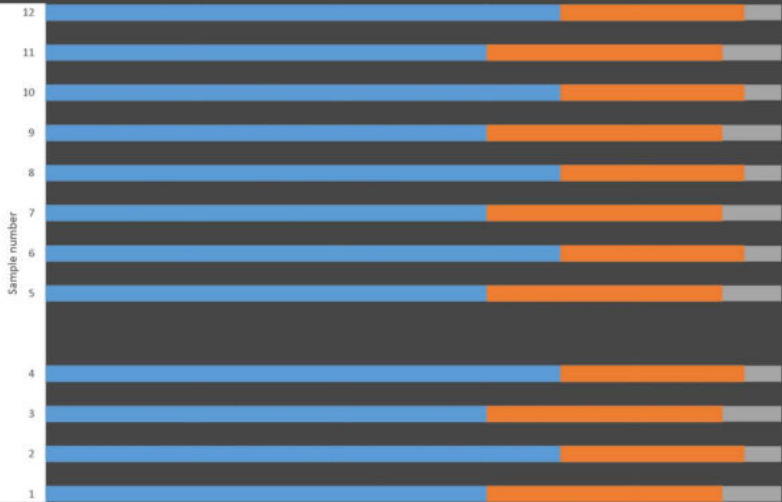
DESIGNING A
BETTER MIX FOR CSEB*

Sample Number	Soil	Clay	Cement	Drop test	Strength
01	60% (sandy, and too much gravels)	30-32% (gonpa)	8%	Fail, completely shattered(80% shatter)	5
02	70% soil different (the one with less gravel)	20-25% (gonpa)	5-6%	Breaks into blocks (not completely shatters) 60% shatter	8
03	60% (the one with less gravel)	30-32% (sampled from the hard layer of soil,spituk monastery)	8%	Breaks into blocks, shatters considerably less than all previous samples 40% shatter	9.5
04	70% soil (the one with less gravel)	20-25% (sampled from soft layer of soil, spituk monastery)	5-6%	70% shatter	6
05	60% (the one with less gravel)	30-32% (sabu village)	8%	60% shatter	7
06	70% soil (the one with less gravel)	20-25% (sabu village)	5-6%	50% shatter	9
07	60% (the one with less gravel)	30-32% (matho monastery)	8%	60%shatter	8
08	70% soil (the one with less gravel)	20-25% (matho monastery)	5-6%	50% shatter	9
09	60% (the one with less gravel)	30-32% (shang village)	8%	80% shatter	5
10	70% soil (the one with less gravel)	20-25% (shang village)	5-6%	70% shatter	6
11	60% (the one with less gravel)	30-32% (stok village)	8%	90% shatter	4.5
12	70% soil (the one with less gravel)	20-25% (stok village)	5-6%	80% shatter	5

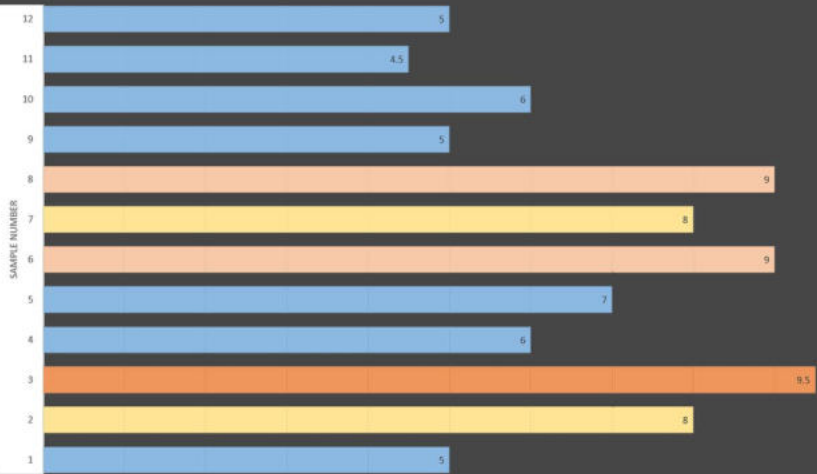
WE TRIED SOILS FROM DIFFERENT REGIONS MIXING THEM INTO DIFFERENT RATIOS. EACH SAMPLE WAS NOTED FOR THE SOURCE SOIL, THE RATIO OF SOIL, CLAY AND CEMENT AND THE RESULTS OF WET MIXTURE TEST.



In the following 4 weeks, we located and collected samples of soil and clay from around 5-6 places within 40 km radius of Leh. The 40 km radius limit was to ensure easy & cheap transportability of the soil to the Rural Building Centre which would keep the costs in check, later on.



SOIL:CLAY:CEMENT RATIO FOR DIFFERENT SAMPLES



STRENGTH OF VARIOUS SAMPLES (scale of 10)



RESULTS

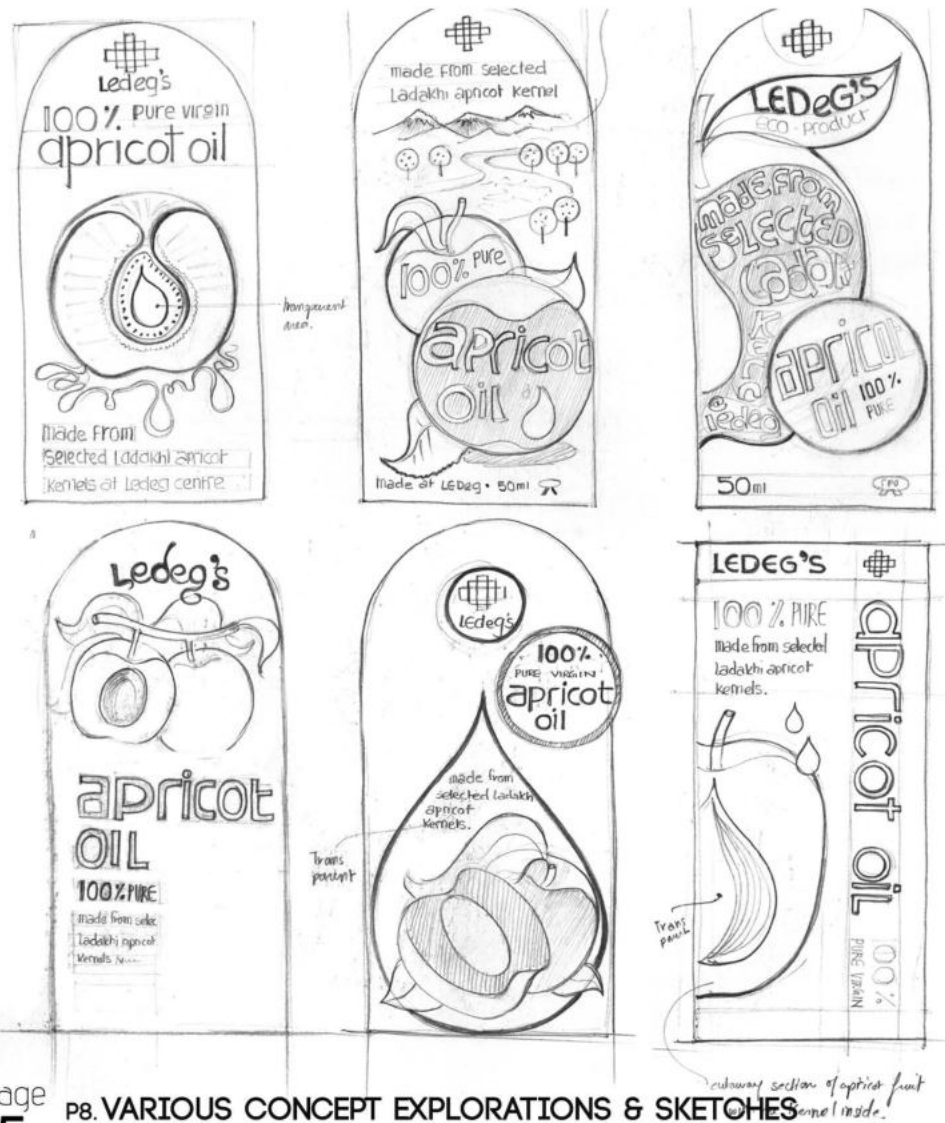
The samples were given required time for initial curing after which the standard tests (pierce test, drop test, scratch test) were conducted to get the best sample out of the lot.

After the final tests it was clear that the all the hard work was not in vain. A few samples yielded good results, especially the ones mixed with the clay from spituk monastery. The soil from this region was particularly clayey in nature and very fine, which was the needed ingredient to improve the quality of the soil mixture.

Also a slight increase in cohesion was noticed in all the samples due to increase in water content during mixing which led to better curing and binding strength of samples. They had pretty good strength and high scratch resistance. Also they were very dense and compact.

FUTURE

Research is still being carried out on the best 3 samples, to repeat the results and further improve the quality. (see image P7)



P8. VARIOUS CONCEPT EXPLORATIONS & SKETCHES



P9. FINAL GRAPHIC



P10. FINAL GRAPHIC ON BOTTLE

TO DESIGN A FRONT COVER FOR THE PACKAGING OF APRICOT OIL PRODUCED BY LEDEG'S WOMEN SELF HELP GROUPS

DESIGN PROCESS

The only constraint in this project was that the bottle shape & size was predetermined. The design process involved trying out various concepts depicting various features of the product such as their Ladakhi origin, or that they are produced from the apricot kernels. (see image P8) This was achieved through interesting visual graphics. The initial sketches (image P8) were discussed with the director and he finalized one of the concepts. This was later on developed as a final graphic on Photoshop & illustrator and made print ready. (see image P9 & P10)

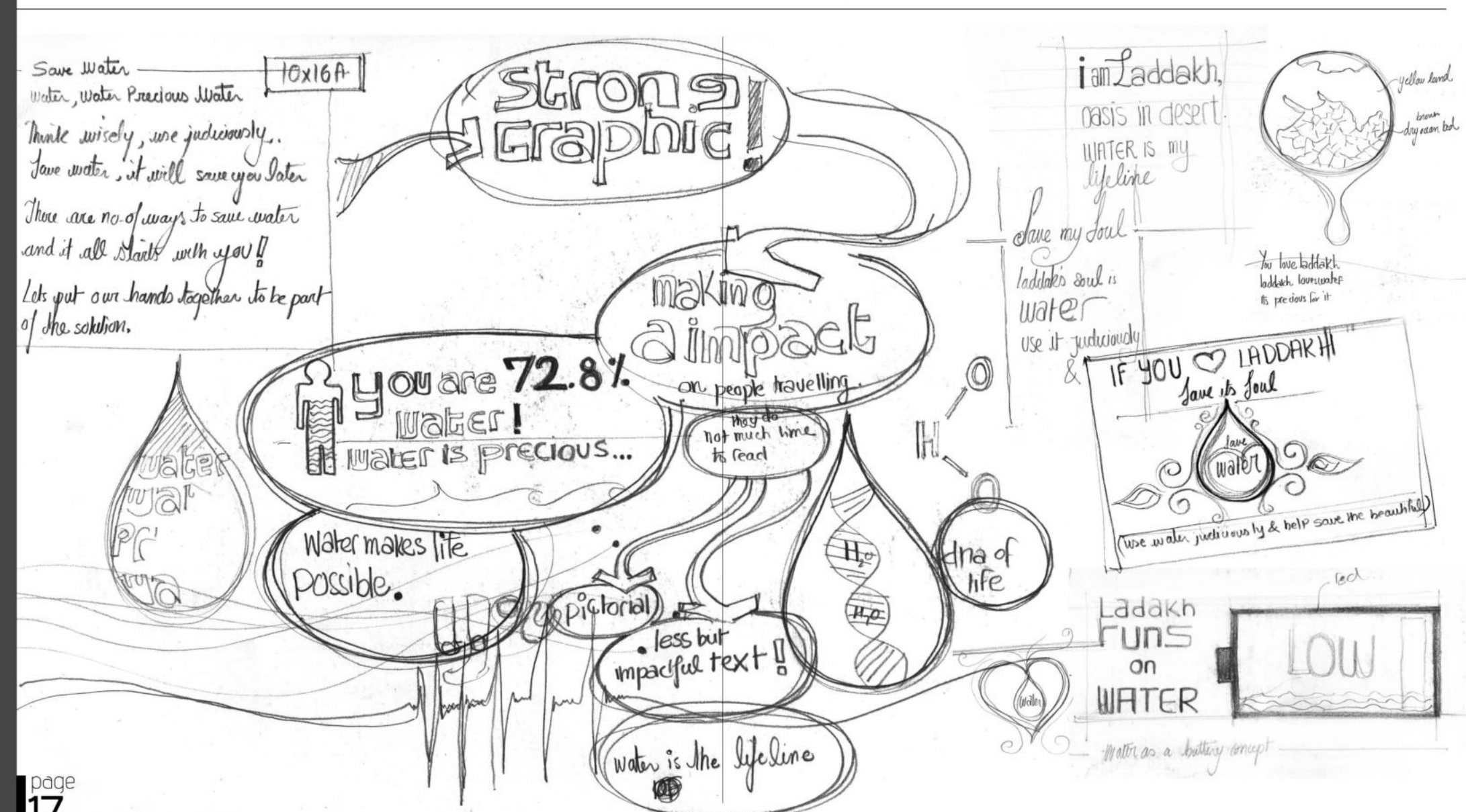


P11. PRICE TAG DESIGN

PRICE TAG DESIGN

Design for price tag, for cloth handicrafts. It clearly mentions the price and denoted the size and cloth type in an more personal and communicative way rather than being a bulleted entry. (see P11)

DESIGNING A POSTER FOR WATER CONSERVATION



VARIOUS CONCEPTS & EXPLORATIVE SKETCHES FOR THE POSTER

PROJECT THREE



THE BACKGROUND

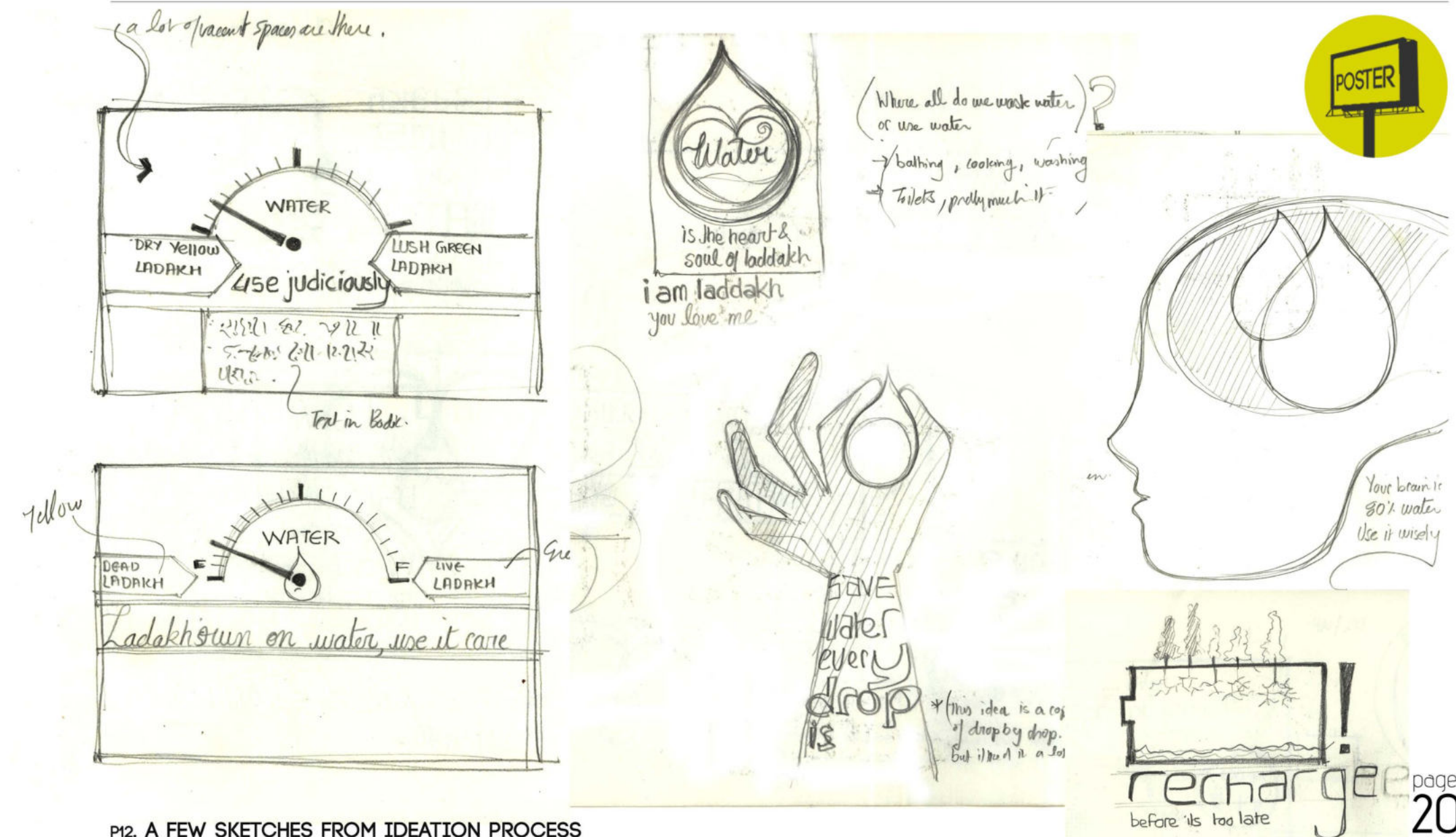
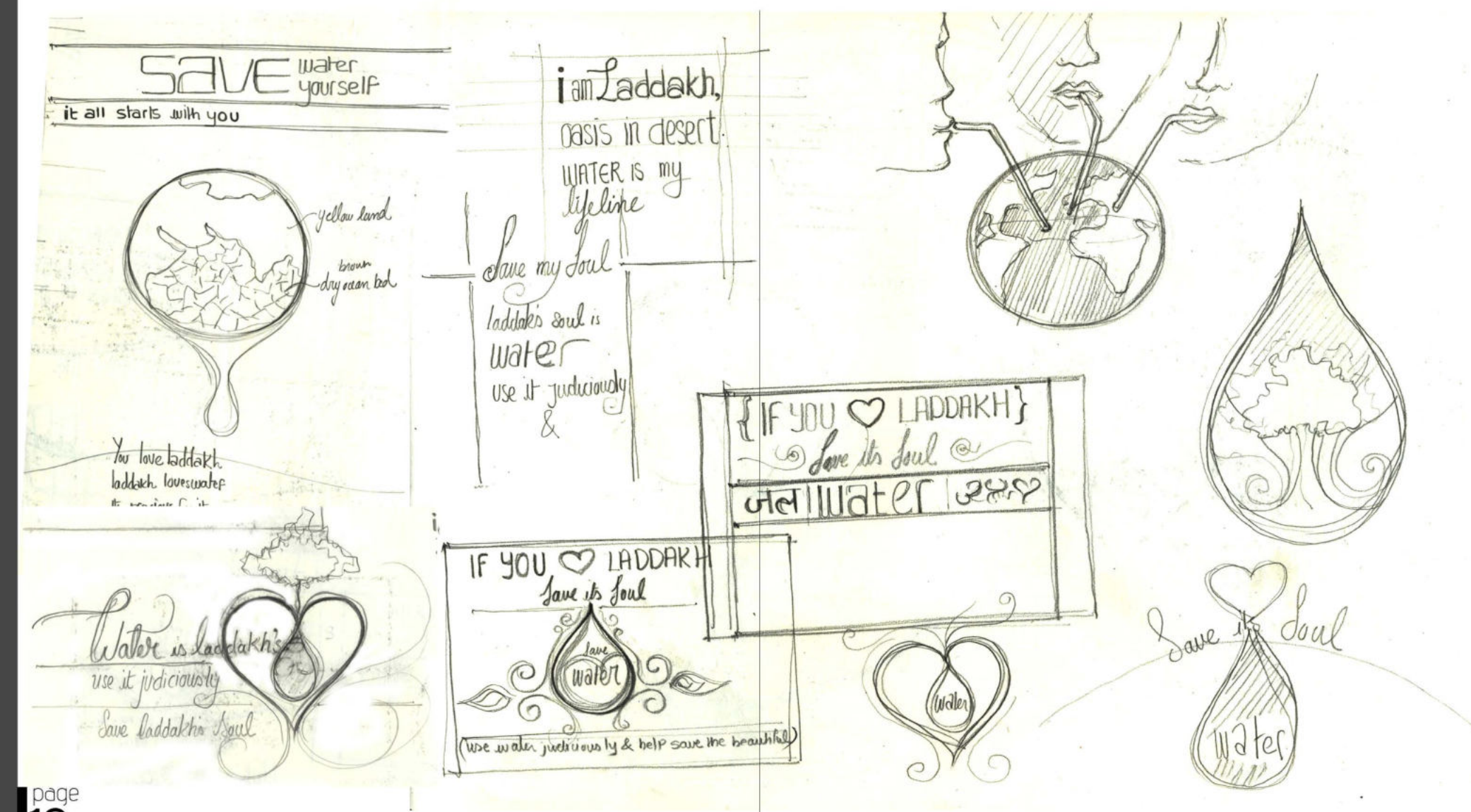
Before my intervention, it was supposed to be a simple text banner printed on flex board and stuck on a frame on Leh-Manali highway. I intervened, initially, to oppose the "Flex banner" because it goes against the philosophy of the organisation, flex being harmful to the environment.

TO DESIGN A POSTER, SIZE 16'X10' TO BE PLACED ON THE LEH-MANALI HIGHWAY WHICH ALERTS/INFORMS THE PEOPLE ABOUT THE IMPORTANCE AND WISE USE OF WATER IN LEH

DESIGN PROCESS

I suggested that being on highway, a text heavy poster is sure to be overlooked, so we need it to be more graphic in nature which conveys the message instantly and effectively. Then the design process started with the emphasis on graphics rather than on text. The connection and importance of underground water in Ladakh is more than anywhere else, Ladakh being a cold desert. The initial concepts dealt with interpreting underground water as the soul of Ladakh without which it has no existence. While

While dealing with similar concepts and discussions the idea of Ladakh running on water was coined, water being a fuel of Ladakh. Interestingly while designing and ideating on the same, my mobile phone flashed low battery, and the idea of underground water being a battery, struck in my mind. I immediately started working on the concept and discussed with the director. He liked the idea and I developed onto it, to achieve the final outcome, which was appreciated much.





SAVE WATER *before* ITS TOO LATE

འཇིག་པ་བཞོལ་དེ་བསམ་སྒྲོ་སྒྱུ་ལ། རུ་ཡང་ཚར་སྤིང་པའི་གཏེར་ཞིག་ཡིན།

UNDERGROUND WATER IS A PRECIOUS & LIMITED RESOURCE, USE IT WISELY

P13. FINAL POSTER



WORLD ENVIRONMENT DAY

P14. POSTER FOR ENVIRONMENT DAY



5th June is the world Environment Day. Being a NGO geared towards sustainable development of Ladakh region, i suggested to do something to inform and raise awareness about the day in the LEH city. Everybody seemed to agree with the idea and we started with preparations

THE EVENT

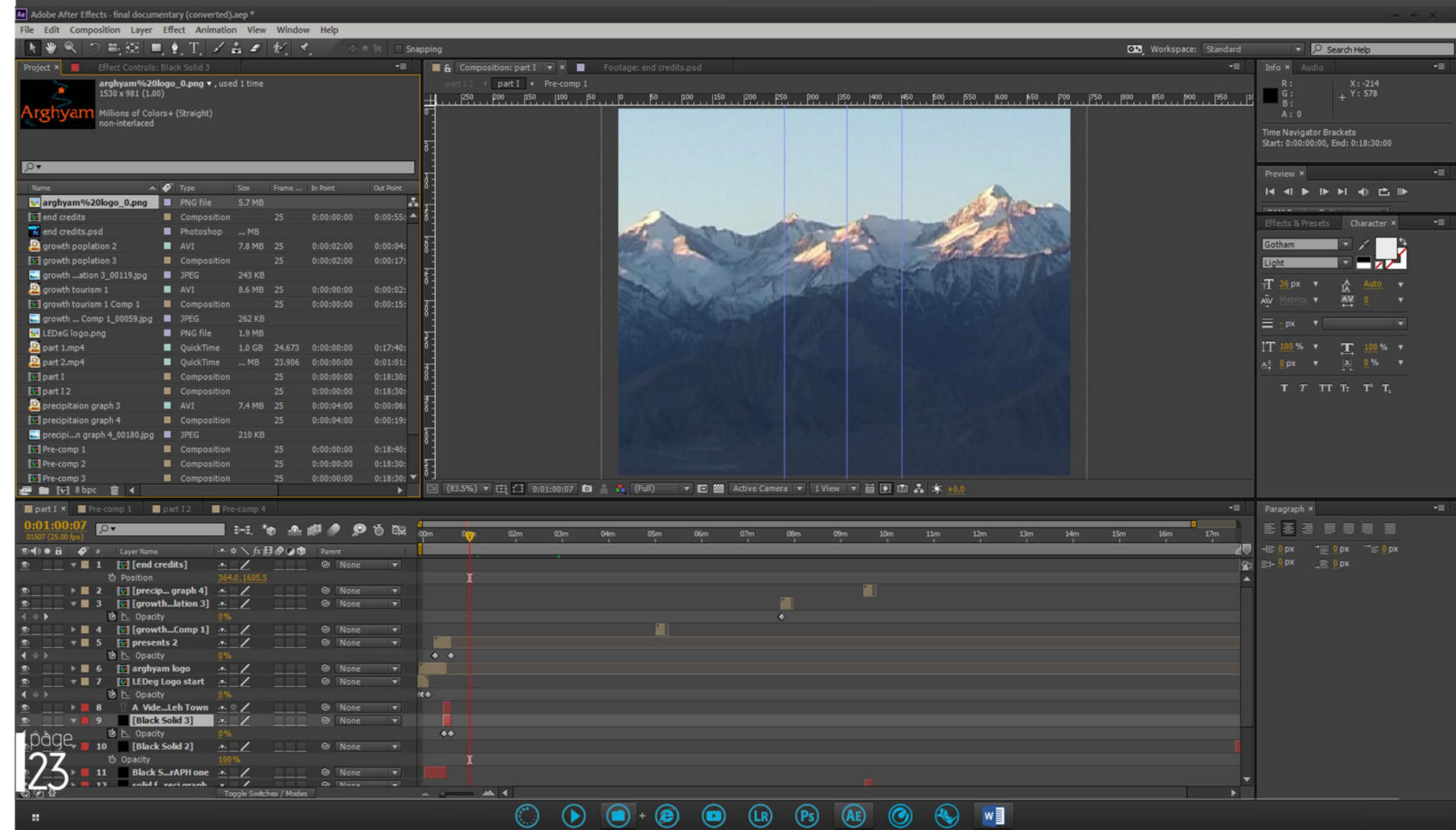
Thinlay told me that we have a lot of posters and pamphlets on various topics like "How to conserve water in Leh geared towards tourists & guest houses" that are just lying and gathering dust. So we decided to put a stall in the main market and distribute these posters. To gather the attention of people, we concluded we need some posters/banners. As there was less time we decided to hand paint the posters ourselves. I came with a few ideas/graphics which we painted onto cloth overnight. (image P14)

On the environment day we distributed a lot of posters and a lot of people seemed to be interested and appreciated or endeavor. But the most rewarding was when we saw later that some guest houses and restaurants have actually put those water conservation posters near their bathrooms and hand wash areas.



P15. THE TEAM

DESIGNING/EDITING DOCUMENTARY



PROJECT FOUR



TAKING VIDEO INTERVIEWS

It was pretty interesting to take interviews from various eminent people and record their opinion on camera. In particular i found Mr. Norphels concept and views to be really interesting. We took 4 interviews out of which 2 made it to the final documentary.

TO FORM AND BECOME A PART OF EDITING TEAM, ADDING GRAPHICS, A COUPLE OF INTERVIEWS AND SUBTITLING THE VIDEO DOCUMENTARY "CHHUU"(water)

DESIGN PROCESS

The documentary was originally shot last year, and compiled by a studio in Leh. The original running time for the documentary was around 25 minutes. My task was to approach the Secmol Audio/Video studio, form a team and cut short the video to around 10-15 minutes. Also as the graphics/effects incorporated by the original editor were not up to the mark, they had to be updated as well. Finally, as the documentary was in local language –bodig, it was required to subtitle the documentary in English.

This translation was done with the help from an eminent scholar, Mr Schmitt at LEDeG with the help of Thinlay Dorjai. I teamed up with Secmol Studio editor Tashi Namgyal and brought down the total running time of documentary to around 15 minutes. After the subtitling, the documentary is ready to be uploaded on internet as well as DVD distribution which will help in raising awareness about the precious resource of water, its conservation & management in LEH Town.

PHOTO DOCUMENTATION

LEDeG has a lot of units distributed in various regions of Ladakh, varying from a Rural Building Centre to Handicrafts unit which is actually a group of women and local craftsmen who make indigenous products. I was told to do a photo documentation of these places so as to be able to make individual brochures of these units which would then can be distributed to various tourists and people who come to LEDeG and its front shop. I did the photo documentation and the brochure is to be designed based on these images and literature documentation done by me.



DOING THE SURVEY

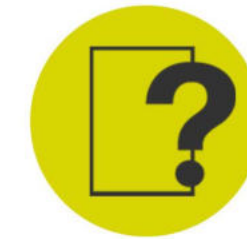
The survey involved going to individual houses and asking them to fill the form (tick based) if they are able to it, or otherwise asking them the questions in Hindi/bodig and filling the form ourselves. A very interesting fact that came up during this session was the Indian tourists used considerably more water than foreign tourists.

I DID PHOTOGRAPHIC DOCUMENTATION OF THE HANDICRAFTS & FOOD PROCESSING UNITS OF LEDEG WHICH IS TO BE COMPILED IN A BROCHURE AS WELL DESIGNING A QUESTIONNAIRE AND TAKING SURVEYS BASED ON THAT

THE QUESTIONNAIRE DESIGN

We had to design a questionnaire geared towards the individuals/houses/guest-houses for inquiring their source of water, bore well status, agricultural status & sanitation infrastructure. It involved coming up and noting down the data/answers that were needed for the analysis which was supposed to be done by people at Argyham. We worked in a discussion mode to throw up questions and then selecting/rejecting them for putting into the final questionnaire. The questionnaire was divided into sections

OTHER PROJECTS



to simplify the process of questioning and gathering data into clear demarcated fields. This was made into a prototype questionnaire and send to analytics team who suggested minor changes and it was finalized and ready for survey.

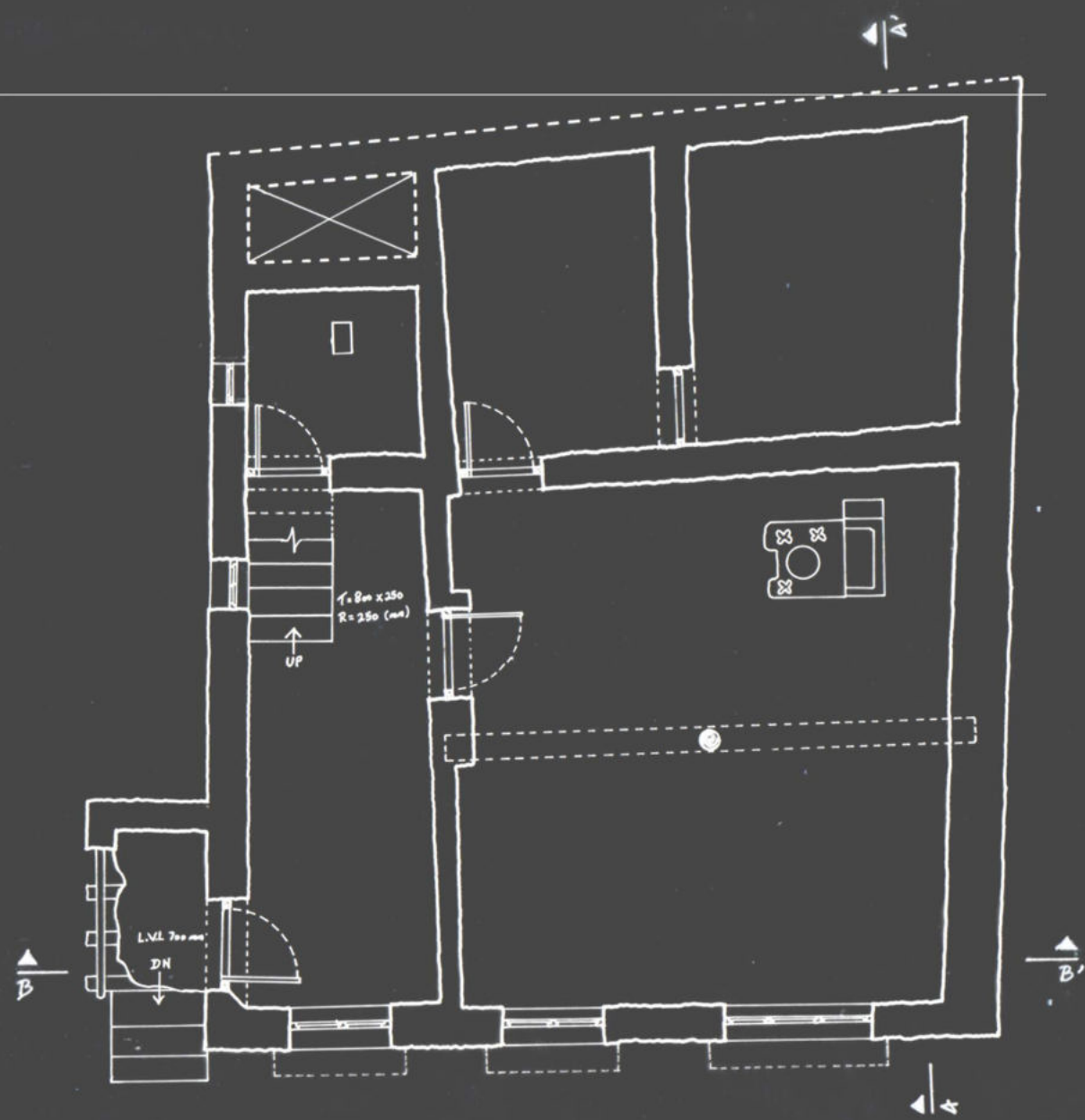
INDIGENOUS HOUSE DOCUMENTATION



WEST ELEVATION



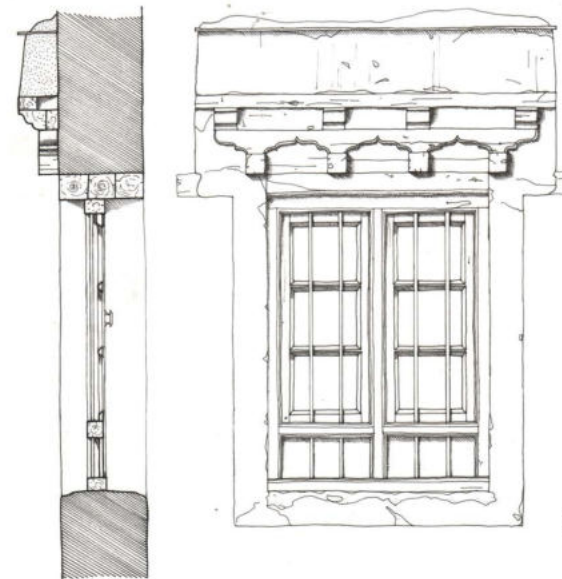
SOUTH ELEVATION



PLAN: SUKU HOUSE

DOING THE DOCUMENTATION WITH TIBET HERITAGE FUND

I was really interested in understanding the local architecture and was looking for opportunity to get into some old indigenous house. LEDeG used to get over by 4 pm in the evening. After that i was free. It was during this time i joined another NGO called THF which works in restoring old houses and buildings in ladakh and tibet. I became part of the documenting one of the houses called "Suku House" which is to be restored.



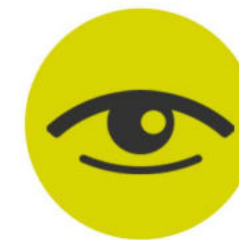
THE INTICRATE WINDOW DETAILS

THE EXPERIENCE

It was not just understanding the local architecture but to witness the strength and beauty of simple materials- mud stone and wood to create such beautiful sustainable pieces of low tech. The house i was involved in was around 125 years old and still in a pretty condition. As an architect i did measurement drawings and drafted the documentation drawings to scale. A lot of locals were also working there, who had no formal education in architecture. So i was also given the task to educate them about

the architectural methods, drawing & drafting and various terminology. I also taught them softwares like autocad and photoshop. The details of windows in ladakhi architecture holds a very special attention as it is very beautifully and intricately carved in local wood. The walls are made of stone upto sill level upon which mud bricks are laid. The roof is wooden and plastered and rests on wooden columns with stylistic column head.

EXTRA PROJECT



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NOMAD MOTHER & CHILD, TSO-KAR, LADAKH



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Working at LEDeG was a very wonderful experience, where i learned a lot. As the scope of work was varied in nature, i got exposed to a lot of things going on in the organization, different schemes and projects spread out across various villages. LEDeG being a prominent and old NGO, the people there have a lot of expertise and experience in what they are doing, and you receive a lot of critique on your work which adds a lot to you as a person. The NGO attracts a lot of volunteers from various nations, which gives you an opportunity to work and learn in an international culture and understand the diverse nature and views towards architecture design, technology, Eco-sensitivity, culture, ethics and social fabric. Being situated in Leh, Ladakh, it provided me a wonderful opportunity to witness the beauty of Himalayas.

LEARNINGS & REFLECTIONS

A few words cannot possibly confine what I have learned in one month of my stay at Leh, Ladakh. There is a lot that I learned from the work, including how to make people aware about the design, how to work on a project confidently that you have not handled before. I understood a lot about how important and easily, sustainability can be achieved through a basic building block. I assimilated, that one should have a very open and free mind to be a creative designer. You have to drop all your preconceived notions about so many things and evolve as a new person for every project you do, how big or small it may be. I learned, true innovation happens in the field, when you get dirty with the actual prototypes and samples. I learned a lot from the Ladakhi people and their amazing simple sustainable ways. It was very interesting to work on the CSEB project and see it getting successful within a short period which nobody had anticipated. Working on the documentary, I learned a lot on video editing and similar tech. It was a mixed experience, and in the end the most important thing that I learned was something about myself, my capabilities, my limitations and my future aspirations. I wish to go back to Ladakh after my post graduation and continue this journey.

jullay

-jullay is a ladakhi word which is used to express gratitude towards each other, it is often used in ladakh as a substitute for thankyou, hello, good luck and so on. Simple and beautifully effective.

REFERENCES



ALL THE IMAGES USED IN THIS
REPORT ARE SHOT BY ME.

BOOKS & JOURNALS

*CSEB MANUAL by Satprem ,
Auroville Earth Institute. 2008*

*Arghyam Water Health Manual,
2012*

Leh at a glance, 2010

LEDeG Brochure,2010

WEB & SOFTWARES

*Adobe Photoshop
Adobe Lightroom
Adobe Illustrator
Adobe After Effects*